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Article

Driving performance at the National Transportation Safety Committee: The mediating role of engagement and motivation in transformational leadership

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MANAGEMENT | RESEARCH ARTICLE

Driving performance at the National Transportation Safety Committee: The mediating role of engagement and motivation in transformational leadership

Cris Kuntadi¹, Winda Widyanty², R. Nurhidajat³, Martha Fani Cahyandito⁴, Pungki Sariadi² and Mochammad Fahlevi^{5*}

Abstract: This study aims to analyze the influence of transformational leadership on the employee performance of National Transportation Safety Committee (NTSC) with the mediating role of work engagement and work motivation. The study employed a census approach utilizing structural equation modeling (SEM) to analyze the data collected from all employees of the NTSC in Indonesia. Primary data were gathered through a comprehensive questionnaire, which was administered to the entire population of 107 NTSC employees, ensuring complete coverage and representation. The results of this study indicate that transformational leadership has a positive and significant effect on work engagement, work motivation, and employee performance. The results show that work engagement and work motivation have a positive and significant effect on employee performance. While the



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Cris Kuntadi currently serves as a Principal Expert Widyaiswara at the Ministry of Transportation of the Republic of Indonesia. In addition, he is also a lecturer at Bhayangkara University of Jakarta Raya. He obtained a D3 Accounting degree from the State College of Accountancy (STAN), then completed his Bachelor of Economics-Accounting at the University of Indonesia (UI). In 2000 he continued his education to master's degree in management at Gadjah Mada University (UGM) and International Business at Erasmus Universiteit. He earned his Doctoral degree in Administration in 2009 at Brawijaya University.

PUBLIC INTEREST STATEMENT

Cris Kuntadi, bring with me a strong background in the fields of accounting, auditing, and financial management. With a total of 139 articles published in 2023, which have been cited 172 times, I have deepened my knowledge and contributed to the advancement of thinking in this field. Furthermore, I also have the honor of being the author of the book "SiKencur (Fraud Control System)", which discusses governance of bureaucracy free from corrupt practices. I believe that integrity and accountability are the cornerstone of any organization or system, and I am committed to promoting these principles within society. I am eager to actively participate in initiatives or organizations that prioritize transparency, accountability, and sustainability. I am confident that with my strong background and my dedication to ethical business principles, I can make a meaningful contribution in efforts to build an environment free from corruption and safeguard the integrity of every organization. Thank you for considering this, and I look forward to positively contributing to achieving these noble goals together.

mediation test results show that work engagement and work motivation have an indirect effect on employee performance. The current study provides fresh insights and validates extant knowledge on transformational leadership, work engagement, work motivation and employee performance within the NTSC. This study suggests NTSC management to communicate the company's vision and mission to employees with openness and realize improvements in operational standards so that the performance created in the organization provides value that can be understood appropriately. In addition, management also needs to create policies that are in line with the NTSC vision and mission.

Subjects: Work & Organizational Psychology; Business, Management and Accounting; Public Administration & Management;

Keywords: transformational leadership; work engagement; work motivation; employee performance; National Transportation Safety Committee

1. Introduction

The integrity of a nation's transportation safety framework is often predicated on the efficiency and efficacy of its oversight bodies (Lee et al., 2022). In Indonesia, the National Transportation Safety Committee (NTSC) is at the forefront of this critical task (NTSC, 2023). The year 2021 was marked by a surge in transportation mishaps, predominantly within the maritime domain, underscored by a dramatic increase in fishing boat accidents (Rahayu, 2021). This alarming trend raised the specter of systemic issues within the NTSC, signaling a potential emergency status within the maritime sector. Concurrently, the aviation sector grappled with its own set of tribulations, the most catastrophic being the crash of a commercial jetliner shortly after its departure from Soekarno-Hatta International Airport (Christina & Jamie, 2022). These incidents collectively point to a pressing need for scrutiny into the role of employee performance within the NTSC, which, by extension, affects the nation's transportation safety record. In this critical juncture between the operational challenges faced by the NTSC and the strategic management of its workforce, the interdependence of organizational structures and human resource capabilities becomes starkly evident. The spate of transportation mishaps in 2021 not only spotlights the vulnerabilities within Indonesia's maritime and aviation sectors but also throws into relief the vital role of the NTSC's employees, whose performance is inextricably linked to the country's overall transportation safety.

The exigency to delve deeper into the factors influencing the NTSC's workforce is underscored by the emerging consensus that employee performance is a pivotal driver of organizational success in both the public and private realms, as posited by Maskuroh et al. (2023). As underscored by Mariappanadar (2020) human resources stand out as a central force within a company, overshadowing other facets like working capital. Even with the influx of advanced technologies and state-of-the-art equipment, their utility falls flat in the absence of competent human resources to harness and maintain them. As the only assets capable of driving other resources, employees, when optimally motivated and engaged, can transcend organizational aspirations. Integral to this achievement is the role of leadership. As highlighted by Kuntadi (2017). Manoppo (2020) defines transformational leadership as "a leadership style that changes followers to overcome their interests by changing their morals, ideals, interests and values, motivating them to work better than expected". The next factor that affects employee performance is the engagement of an employee in a job called work engagement which is a direct involvement between employee contributions and work. Work engagement is an assumption that is the opposite of boredom. This aligns with the view that work engagement is a positive, fulfilling, and job-related mental state distinguished by vigor (a lively and eager willingness to put forth effort), commitment (actively participating and feeling inspired), and immersion (being deeply focused and contentedly involved in one's work) (Böckerman et al., 2012).

In addition, it is necessary to be motivated which is a potential focal individual that can increase the potential in activities and provide encouragement that can move one's will to work. According to (Mariappanadar, 2020), motivation is a process that explains the intensity, direction, and persistence of an individual to achieve a goal Pham et al. (2019) suggest that motivation is a condition of the soul that encourages a person to achieve maximum performance. NTSC is a non-structural institution tasked with carrying out transportation accident investigations to find the causes of accidents to realize transportation safety. One of the outputs produced by NTSC is an investigation report published on the NTSC website. During the period 2018 to 2022 the number of reports produced by the NTSC continues to increase.

Based on several studies on employee performance that have been carried out by previous researchers, the results of research explain that Transformational Leadership factors affect Employee Performance as shown by research conducted by Audenaert et al. (2021), but there is also research showing that transformational leadership does not have a significant effect on employee performance (Deole et al., 2021). Furthermore, research conducted by Khan et al. (2018) and Shao & Bernstein (2019) research results shows that there are work engagement factors that have a positive and significant effect on employee performance. Then from the research results of Ahmed & Faheem (2020) work motivation has a positive and significant effect on employee performance, whereas based on the research of Dan et al. (2020) work motivation factors have a positive but not significant effect on employee performance. Based on research by Schwatka et al. (2016) work engagement mediates between transformational leadership and employee performance, while the results of Morf & Bakker (2022) motivation mediates the effect of transformational leadership style have a positive and significant effect on employee performance.

However, there is a discernible gap in the research specifically addressing the influence of these factors on the performance of employees within NTSC, such as Indonesia's NTSC. The rise in transportation incidents under the NTSC's purview raises questions about the role of transformational leadership, work engagement, and motivation in shaping employee performance and, consequently, transportation safety outcomes. Prior studies have yielded mixed results regarding the effects of these factors on performance. For instance, while Audenaert et al. (2021) found that transformational leadership positively influences employee performance, Deole et al. (2021) did not observe a significant effect. Similarly, divergent findings have emerged concerning work motivation, with Ahmed and Faheem (2020) reporting a positive impact, whereas Dan et al. (2020) found the effect to be positive but not significant. Additionally, the mediating role of work engagement and motivation between leadership styles and employee performance has been supported by Schwatka et al. (2016) and Morf and Bakker (2022), but a tailored investigation into the NTSC's context is notably absent.

Our research will revolve around the following central questions:

RQ1: How does transformational leadership influence the work engagement of NTSC employees?

RQ2: How does transformational leadership influence the work motivation of NTSC employees?

RQ3: How does transformational leadership influence the performance of NTSC employees?

RQ4: How does work engagement influence the performance of NTSC employees?

RQ5: How does work motivation influence the performance of NTSC employees?

RQ6: How does transformational leadership indirectly influence employee performance through work engagement and work motivation at the NTSC?

These questions are aimed at dissecting the intricate relationship between leadership, employee engagement, motivation, and performance within the NTSC. The research seeks to unravel the threads of this relationship in the context of the NTSC's operational environment, which has seen a concerning rise in transportation incidents. Addressing these questions will provide a clearer picture of the impact of transformational leadership on the motivational and engagement levels of employees and how these, in turn, affect their performance. This focus is particularly pertinent in the wake of conflicting findings from previous studies, such as those by Audenaert et al. (2021) and Deole et al. (2021) regarding the influence of transformational leadership, and the varying results on work motivation reported by Ahmed and Faheem (2020) and Dan et al. (2020). Furthermore, the proposed research will explore whether work engagement and motivation mediate the relationship between transformational leadership and employee performance, a connection supported by research from Schwatka et al. (2016) and Morf and Bakker (2022), but not yet investigated within the NTSC's specific context. By filling these gaps, the study aims to contribute substantive empirical evidence to the discourse on organizational behavior within safety oversight bodies and offer actionable insights for enhancing the NTSC's performance and, by extension, transportation safety in Indonesia.

The structure of this paper has been meticulously designed to guide the reader through a comprehensive journey from theoretical groundwork to practical implications. Following the introduction, which sets the stage for our inquiry into the dynamics of NTSC. The second section, the Literature Review, delves into the existing body of research. It critically examines the theories and prior findings related to transformational leadership, work engagement, work motivation, and employee performance, establishing the academic context for the study. In the third section, Methods, the paper outlines the research design, the participant pool, data collection procedures, and the analytical techniques employed. This section ensures transparency and reproducibility of the research process. The fourth section, Results, presents the findings of the study. It interprets the data in light of the research questions and hypotheses, offering a clear view of the empirical evidence gathered. Moving into the fifth section, Discussion, the paper contextualizes the results within the broader literature, providing an in-depth analysis of what the findings mean for the NTSC and the field at large. The sixth section, Conclusions, synthesizes the insights gained from the research. It recaps the study's contributions to the understanding of how transformational leadership affects employee outcomes in the NTSC. Seventh, the section on Limitations and Recommendations for Future Research candidly addresses any potential shortcomings of the study and suggests avenues for further inquiry, ensuring that the research can serve as a springboard for subsequent studies. The eighth and final section, Managerial Implications, translates the research findings into actionable strategies for NTSC's leadership and management. This section aims to bridge the gap between theory and practice, providing valuable guidance for enhancing organizational performance. Each section builds upon the previous, culminating in a holistic understanding that not only illuminates the academic landscape but also paves the way for practical application within the managerial realm.

2. Literature review

2.1. Social Exchange Theory (SET) & Self-Determination Theory (SDT)

Social Exchange Theory (SET), as initially conceptualized by Blau (1964), posits that social behavior is the result of an exchange process aimed at maximizing benefits and minimizing costs. Within the context of organizational behavior, SET has been employed to understand the dynamics of employee-employer relationships (Shah et al., 2023). According to Cropanzano et al. (2017), work relationships are characterized by reciprocity, where positive actions from the employer lead to positive responses from the employee (Rabiul & Yean, 2021; Rabiul et al., 2022). This reciprocity can manifest in various forms, such as trust, loyalty, and mutual commitment (Shah et al., 2023). Ekowati et al. (2023) expanded on this by emphasizing the role of power and interdependence within relationships, suggesting that the balance of reciprocation is central to maintaining engagement and satisfaction in the workplace.

Self-Determination Theory (SDT), developed by Ryan and Deci (2000), suggests that individuals possess innate psychological needs for competence, autonomy, and relatedness. These needs are universal and apply to all domains of life, including work. Gagné and Deci (2005) assert that when these needs are satisfied, employees are more likely to experience intrinsic motivation, which in turn enhances performance and well-being. SDT has been applied to understand motivation within organizational settings, where the fulfillment of these needs can lead to higher levels of work engagement and job satisfaction (Vansteenkiste et al., 2006).

Both SET and SDT offer valuable insights into the complexities of workplace relationships and motivation. The exchange of social benefits, such as support from transformational leadership, can be interpreted through SET as a foundational element of employee motivation and engagement (Cropanzano et al., 2017; Shah et al., 2023). Concurrently, SDT provides a framework for understanding how these exchanges fulfill employees' psychological needs, thereby enhancing their intrinsic motivation and performance (Abbas et al., 2022a; Ryan & Deci, 2000). By integrating these theories, this research can better understand how leadership and workplace dynamics influence employee outcomes.

2.2. Transformational leadership

Transformational leadership transcends traditional performance expectations, promoting a higher level of positive engagement in tasks that surpass what is typically anticipated. This leadership paradigm weaves together elements from various approaches, including traits, behavior, and situational factors, and is primarily concerned with how leaders can enhance a sense of unity, build trust, bolster collective efficacy, and foster a culture of shared learning within a team. According to Singh et al. (2020), describe transformational leadership as a style that extends beyond simple transactional exchanges, such as rewards for performance, to one grounded in trust and a deep sense of commitment. Mulla and Krishnan (2022), elaborate on this by suggesting that transformational leaders motivate their followers to transcend their personal agendas for the broader organizational benefit, exerting significant influence in the process. Leadership, at its core, is fundamentally about influence—the capacity of leaders to shape the thoughts, behaviors, and actions of others. From the vantage point of Social Exchange Theory (SET), transformational leadership is viewed as a sophisticated exchange system. It moves beyond tangible transactions and encompasses the socio-emotional currencies of the workplace, such as respect, loyalty, and mutual commitment. This form of leadership fosters an environment where the reciprocal nature of social interactions is enriched by emotional and psychological exchanges, creating a work atmosphere that is not only productive but also emotionally rewarding (Blau, 1964).

SET suggests that when leaders engage in transformational behaviors, such as articulating a vision, providing intellectual stimulation, and showing individualized consideration, they foster high-quality relationships (Cook et al., 2013). These relationships, characterized by mutual trust and obligation, encourage followers to reciprocate with higher levels of performance and engagement (Chernyak-Hai & Rabenu, 2018). Moreover, transformational leadership under SET is seen as a means of accruing “social credit” with followers, which generates a sense of indebtedness and compels them to go above and beyond their contractual obligations. The voluntary efforts and extra-role behaviors that result are indicative of the powerful influence transformational leaders wield, as they motivate followers not just through direct exchanges but through the cultivation of strong, interdependent relationships (Abbas et al., 2022b; Fahlevi et al., 2022).

On the other hand, SDT provides an intrinsic motivational perspective to the impact of transformational leadership (Ryan & Deci, 2000). According to SDT, human beings have fundamental needs for autonomy, competence, and relatedness. Transformational leaders, by empowering their followers, fostering a sense of belonging, and challenging them with meaningful tasks, effectively satisfy these intrinsic needs (Manoppo, 2020). When employees feel autonomous, competent, and connected within their roles, their intrinsic motivation is heightened, which is a stronger and more sustainable driver of performance than extrinsic motivators such as financial incentives (Ryan &

Deci, 2000). SDT posits that transformational leaders enhance followers' intrinsic motivation by supporting their psychological needs, leading to greater well-being and more creative and dedicated work output (Gagné & Deci, 2005). This supportive role resonates deeply with followers, encouraging them to internalize the values and vision of the leader, thus aligning their personal goals with that of the organization (Khalifa Alhitmi et al., 2023).

Transformational leadership, through the lenses of SET and SDT, can be understood as a robust approach to leadership that not only fosters positive social exchanges but also fulfills intrinsic psychological needs, leading to a workforce that is more engaged, motivated, and high-performing. The integration of these theories offers a nuanced understanding of how transformational leaders can effectively influence their followers and leverage this influence to achieve and exceed organizational performance expectations. The following hypothesis has been proposed:

H1: Transformational leadership influences the work engagement of NTSC employees.

H2: Transformational leadership influences the work motivation of NTSC employees

H3: Transformational leadership influences the performance of NTSC employees

2.3. Work engagement

Dwivedi et al. (2020) define engagement as an optimistic mindset, marked by an individual's intention to fulfill job responsibilities with vitality (exhibiting energy and resilience), commitment (being actively involved and excited by challenges), and immersion (being focused and delighted in one's tasks). Work engagement is thus described as a state of mind that is positively rewarding and job-centric, infused with enthusiasm, loyalty, and deep focus (Unanue et al., 2021). Ginting et al. (2020) take this further, characterizing engagement as the degree to which employees internalize their job role, committing themselves to their work, and manifesting their role through physical, mental, and emotional faculties during their performance. The mental dimension pertains to employees' perceptions and beliefs regarding their workplace and leadership. Emotionally, it encompasses the feelings, whether positive or negative, that employees harbor towards their organization and its leaders. The physical dimension, meanwhile, involves the actual energy expended by the employees in executing their job functions. Work engagement can be understood as a reciprocation to the positive social and organizational environment fostered by employers (Blau, 1964; Ekowati et al., 2023). When organizations provide supportive leadership, meaningful recognition, and fair rewards, employees reciprocate with higher levels of engagement vigor, dedication, and absorption in their tasks (Bakker, 2017). This reciprocal relationship is essential to SET because it underscores the notion that positive contributions from the organization lead to positive employee behaviors in return, creating a cycle of mutual benefit and satisfaction.

SDT posits that work environments which support these needs help foster intrinsic motivation, which is a key driver of engagement (Setiawan & Hastuti, 2022). The cognitive, emotional, and physical dimensions of work engagement described by Ginting et al. (2020) align with the SDT framework. Cognitively, when employees' beliefs about their organization and leadership are positive, they are likely to feel more competent and connected to their work. Emotionally, when employees have favorable feelings towards their organization, they are likely to experience relatedness and intrinsic motivation. Physically, when employees invest energy into their roles, it is often a sign that they feel autonomous and capable, which are essential for engagement. SET and SDT provide a multi-faceted framework for understanding work engagement. SET emphasizes the importance of positive exchanges between the employee and the organization, while SDT highlights the need for satisfying innate psychological needs. Both theories suggest that when these conditions are met, work engagement is likely to be high, leading to positive outcomes for both the employee and the organization. The following hypothesis has been proposed:

H4: Work engagement influences the performance of NTSC employees.

2.4. Work motivation

Work motivation may be viewed as the intrinsic capacity that enhances an individual's ability to perform tasks (Van Knippenberg, 2000). Kelly et al. (2020) describe it as an inner force that propels an individual towards their objectives. This drive for motivation may originate from the person's internal attributes or external influences. Yu et al. (2020) characterize motivation as an impulse within individuals that spurs, steers, and structures their actions. DeGeest et al. (2016) outline that work motivation comprises the chosen direction of actions at work, the intensity of the effort put forth, and the endurance to maintain effort over time. Specifically, the chosen direction of actions is reflected in how an individual elects to engage with their work tasks, gauged by their willingness to fulfill job responsibilities and adhere to workplace regulations. From the standpoint of SET, work motivation can be seen as a response to the social exchanges that occur within the workplace (Blau, 1964). When employees perceive that they are being treated fairly, supported by management, and rewarded adequately for their efforts, they are likely to feel a sense of obligation and trust that motivates them to reciprocate through increased effort and commitment to their work (Asaari et al., 2019). This exchange relationship suggests that motivation is not merely an individual trait but also a result of the dynamic interactions between employees and their organizational environment (Fahlevi, 2021).

DeGeest et al. (2016) add another dimension to the concept by breaking down work motivation into behavioral direction, effort level, and persistence. Behavioral direction refers to the choices employees make regarding their actions at work, whether to engage or disengage with certain tasks. Effort level pertains to the amount of energy an employee is willing to invest in their work, while persistence denotes the consistency of effort over time despite obstacles and setbacks. Integrating these perspectives, work motivation within the NTSC could be influenced by both the social exchanges between employees and the organization (as per SET) and the extent to which the organization fulfills employees' psychological needs (as per SDT). Motivated employees are likely to display behaviors that are aligned with organizational objectives, exert high levels of effort, and demonstrate resilience in the face of challenges, contributing to enhanced overall performance. The following hypothesis has been proposed:

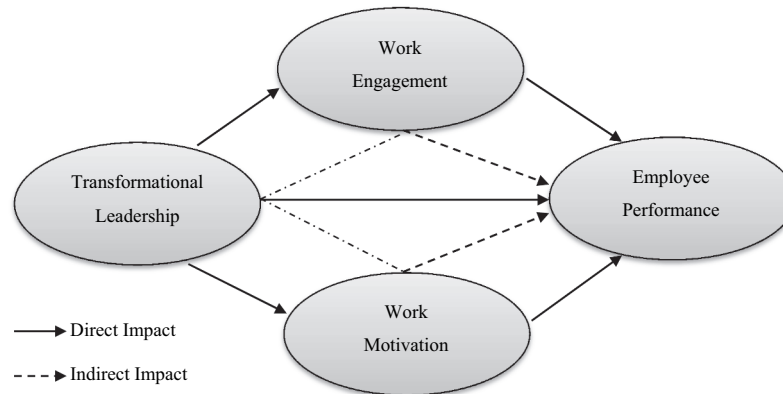
H5: Work motivation influences the performance of NTSC employees.

2.5. Employee performance

Cooke et al. (2020) describe performance as the actual work accomplishments or the tangible outcomes that an individual achieves, reflecting both the quality and quantity of work done in accordance with their assigned roles and responsibilities. Additionally, Spencer et al. (2016) conceptualize employee performance as the actions employees take or fail to take within their organization. It is the manifestation of an employee's work in terms of both quality and quantity, consistent with the responsibilities they have been tasked with (Govindan et al., 2016). When viewed through the SET, it is posited that employees are inclined to exhibit enhanced performance when they sense a fair exchange in the workplace, where their contributions are met with appropriate rewards and acknowledgment (Shah et al., 2023). This exchange motivates employees to maintain or improve their performance levels, as they seek to balance the inputs, they provide with the outputs they receive from their employer.

This hypothesis integrates the principles of both SET and SDT by suggesting that transformational leadership creates a supportive and motivating environment that fulfills employees' psychological needs and fosters beneficial social exchanges. In turn, this environment enhances employees' intrinsic motivation (SDT) and encourages them to engage in positive reciprocation behaviors (SET), such as increased work engagement and motivation, ultimately leading to improved performance. The following hypothesis has been proposed:

Figure 1. Research conceptual framework.



H6: Transformational leadership indirectly influences employee performance at the NTSC through both work engagement and work motivation.

2.6. Research conceptual framework

To develop the hypothesized structural model, the relevant literature was reviewed in an integrated manner. This review sequentially covers the general concepts of transformational leadership, work engagement, work motivation, and employee performance.

The framework illustrates in Figure 1, the hypothesized relationships between the constructs of transformational leadership, work engagement, work motivation, and employee performance, including both the direct and indirect pathways through which transformational leadership is posited to affect employee performance at the NTSC.

3. Methods

In this section, general methodological issues are discussed, including demographic sample information, data collection procedures, and data analysis techniques.

3.1. Population and sample

The population of interest consists of all the employees of the NTSC, which amounts to 107 individuals. This entire population serves as the sample for the study, meaning that a census sampling technique is employed (Lind et al., 2018; Saunders et al., 2009). Census sampling is used when the entire population that is being studied is relatively small, and every member of the population can be included in the study (Sekaran & Bougie, 2016). This approach ensures that the findings are directly applicable to the entire population without needing to generalize from a sample (Cochran, 1977). It is particularly useful when every individual's response is important to the research, which seems to be the case for this study focused on NTSC employees.

In the demographic data presented in Table 1, the sample is broken down into various categories such as gender, education, and years of service. The distribution of these categories is presented in terms of frequency and percentage, which gives a clear overview of the sample's demographic composition. This information is crucial as it can influence the analysis and interpretation of the study's findings. The gender distribution indicates that the majority of the sample is male (73%), which could have implications for the study's outcomes related to gender dynamics within the organization. The education level is also varied, with the largest group holding a Magister degree (36%), followed by Graduate School (28%), which suggests a highly educated workforce. This could imply that the findings and conclusions drawn from this study may be more relevant to organizations with similarly educated employees. Years of service are categorized into three groups, with the largest group being employees who have 1–5 years of service (50%). This suggests that the organization has a relatively high proportion of employees who may be

Table 1. Sample demographic data

Variables	Values	Frequency	Percentage
Gender	Male	78	73%
	Female	29	27%
Education	High School	51	10%
	Three-year college	24	22%
	Graduate School	30	28%
	Magister	39	36%
	Doctorate	3	3%
Years of service	1–5 Years	53	50%
	5–10 Years	14	13%
	>10 Years	40	37%

considered relatively new to the organization, which can have implications for organizational dynamics and could affect aspects such as organizational loyalty or familiarity with the NTSC's protocols and culture.

The clear delineation of the population and sample characteristics provides foundational context for the study and helps in understanding the scope and applicability of the research findings. Given that the entire population of NTSC employees is included, the study's conclusions will be highly specific to the NTSC, but may not be generalizable to other organizations without similar characteristics

3.2. Instruments

The research has four major hypothesized constructs: transformational leadership, work engagement, motivation, and employee performance. The instruments used were initially developed in Bahasa. All items contained in the questionnaire are presented in Table 2. Before the questionnaire was distributed to all respondents, a wording test was carried out on 10 people to find out the respondents' understanding of the questionnaire. This was done to reduce the possibility that the contents of the questionnaire were not understood by the respondents during the main test.

As the measurement for transformational leadership, Yukl (1999) four dimensions were used. This measure consists of 10 items, three assessing idealized influence, two assessing inspirational motivation, two assessing intellectual stimulation, and three assessing individual consideration. This instrument was developed through a rigorous literature review and empirical analyses based on previous studies on the transformational leadership (Bass & Riggio, 2006). To measure work engagement, Bakker (2017) three dimensions were used in this research. Three assessing vigour, three assessing dedication, and two assessing absorptions. To measure work motivation, the three-factor dimensions of Robbins and Judge (2017) were used. This measure has three components corresponding to work motivation: (1) needs of achievement, two items; (2) needs of affiliation, three items; and (3) needs of the power, two items. Finally, to measure employee performance, the four-factor of Dessler (2017) was used. This measure has four components corresponding to employee performance: (1) Quality, two items; (2) Quantity, two items; (3) Reliability, three items; (4) attitude, three items.

The questionnaire was translated into Indonesian to ensure comprehension and relevance for NTSC employees. Adjustments were likely made to the wording of items to better fit the NTSC's specific context, such as including terminology familiar to the employees or aligning the scales with the organization's performance metrics. Such modifications are crucial to ensure that the constructs being measured are accurately reflected in the NTSC's unique work environment. Participants responded to the questionnaire items using a Likert-type scale, which ranges from 1

Table 2. Variable operationalization

Variable	Dimension	Indicator
Transformational Leadership Bass & Riggio, (2006); Yukl, (1999)	Idealized Influence	a. Respect from employees b. Trust c. Can be a role model
	Inspirational Motivation	a. Motivator b. Goal setting
	Intellectual Simulation	a. Creative idea b. Problem solver
	Individual Consideration	a. Career development b. Creating a good work environment c. Relations with subordinates
Work Engagement (Bakker, 2017)	Vigor	a. High energy levels b. Willingness to try c. Persistence in the face of adversity
	Dedication	a. Meaningful feelings b. Enthusiastic and take pride in work c. Feel inspired by work
	Absorption	a. Concentrate deeply b. Immersed in work
Motivation Robbins & Judge, (2017)	Needs of achievement	a. Develop creativity. b. Enthusiasm for high achievers
	Needs of Affiliation	a. The need to feel accepted by others in the environment where he lives and works (sense of belonging) b. The need for a feeling of progress and not failure (sense of achievement) c. The need for a sense of participation.
	Needs of Power	a. Have a good position b. Exerting the ability to achieve power
Employee Performance Dessler, (2017)	Quality	a. Accuracy b. Success
	Quantity	a. The amount of output produced b. Speed of completing extra work
	Reliability	a. Follow instructions b. initiative c. Careful
	Attitude	a. Attitude towards organization b. Attitude towards work c. Cooperation

(strongly disagree) to 5 (strongly agree). This scale is a common method for quantifying attitudes and perceptions in survey research, allowing for a nuanced capture of the degree to which participants agree with the statements presented.

3.3. Data analysis techniques

The selection of Partial Least Squares (PLS) using SmartPLS version 3.0 software for data analysis in this study is underpinned by the methodology's capacity to adeptly handle intricate models with multiple constructs and indicators (Ringle et al., 2020). This characteristic of PLS is particularly advantageous given the study's incorporation of complex constructs like transformational leadership, work engagement, work motivation, and employee performance, each with various dimensions. PLS's prediction-oriented approach is also a key factor in its selection, as it focuses on maximizing the variance explained in dependent variables, thus aligning with the study's goals of understanding and predicting the dynamics within the NTSC. Moreover, PLS is robust to non-normal data distributions, making it a more flexible choice in real-world research scenarios

where data often deviates from normality (Sarstedt et al., 2017). This analytical method is further valued for its ability to simultaneously test the measurement model and the structural model, providing a comprehensive examination of both the validity and reliability of the constructs (measurement model) and the hypothesized relationships between them (structural model). This dual functionality allows for a nuanced assessment of the causality and predictive validity of the proposed hypotheses within the study (Hair et al., 2019).

4. Results

4.1. Measurement model

In this research, the measurement model uses reflective indicators, where the relationship between each indicator and its associated construct, or latent variable, is evaluated by examining the correlation between individual item scores and the overall construct score, a process facilitated by PLS. The model's validity is assessed primarily through convergent validity, adhering to the guideline that indicator loadings should exceed 0.70. For discriminant validity, the Fornell-Larcker criterion is applied, which requires that the square root of the average variance extracted (AVE) for each construct should surpass its correlations with any other construct, thereby confirming that each construct is distinct (Sarstedt et al., 2017). As for reliability, internal consistency is examined, with composite reliability values above 0.70 considered acceptable in exploratory research, as suggested by Hair et al. (2019). These validity and reliability metrics are summarized in Table 2. Ringle et al. (2020) advocate for a loading factor above 0.7 to ensure that indicators are suitable reflections of their constructs. The square root of the standardized loading factor indicates the proportion of variance in indicators that a construct explains, with the remainder representing measurement error. Indicators with loading factors below 0.4 should generally be discarded, while those with loadings between 0.4 and 0.7 may be retained or removed based on the comparative strength of other indicators' loadings. For this study, a midpoint threshold of 0.6 was adopted for indicator loadings. Additionally, the AVE must exceed 0.5, denoting that latent variables account for the majority of the variance in the indicators. This criterion is pertinent only to reflective measurement models. Ideally, reflective indicators should demonstrate high loadings within a close range, signifying that each item effectively captures the essence of the latent construct it is intended to measure.

The descriptive analysis and item internal consistency estimates presented in Table 3 offer insights into the validity and reliability of the constructs within the study. In the context of this study, certain items, such as TL1, WE4, WM4, WM5, WM6, and JP1, exhibited outer loadings below the threshold of 0.60. This threshold is often used as a benchmark for determining whether items have sufficient loadings on their respective constructs and hence contribute to the construct's reliability and validity. Items that fall below this benchmark are typically considered weak indicators of the construct and will be removed to improve the model's overall validity. The decision to exclude these six indicators from the model is a measure taken to enhance the reliability and validity of the constructs. By removing items that do not meet the minimum loading factor value, the researcher ensures that the remaining items are those most strongly associated with their respective constructs, thereby strengthening the internal consistency of the dimensions. This is a common step in PLS analysis to ensure that the model reflects the underlying theoretical framework and provides reliable and valid measures for hypothesis testing. Table 3 serves as a foundation for refining the measurement model by identifying and excluding items that do not contribute effectively to their constructs, which is crucial for ensuring accurate and meaningful results in the study's subsequent causality testing and predictive analysis.

Fornell-Larcker criterion states that the square root of AVE must be greater than the correlation of the reflective construct with all other constructs as shown in Table 4.

In this table, the diagonal elements (which are the square roots of the AVEs for each construct) are higher than the inter-construct correlations (off-diagonal elements), which suggests that each

Table 3. Descriptive analysis and item internal consistency estimates

Construct	Dimensions	M	Item	OL	AVE	CR
Transformational Leadership	Idealized Influence	4.37	TL1	0.591	0.501	0.741
			TL2	0.626		
			TL3	0.802		
	Inspirational Motivation	4.19	TL4	0.806		
			TL5	0.720		
	Intellectual Simulation	4.19	TL6	0.618		
			TL7	0.743		
	Individual Consideration	4.38	TL8	0.703		
			TL9	0.719		
			TL10	0.705		
Work Engagement	Vigor	4.25	WE1	0.745	0.543	0.822
			WE2	0.663		
			WE3	0.758		
	Dedication	4.36	WE4	0.570		
			WE5	0.735		
			WE6	0.776		
	Absorption	4.14	WE7	0.836		
			WE8	0.778		
Job Motivation	Needs of achievement	4.39	WM1	0.774	0.536	0.712
			WM2	0.811		
	Needs of Affiliation	3.82	WM3	0.859		
			WM4	0.407		
			WM5	0.525		
	Needs of Power	3.96	WM6	0.473		
			WM7	0.626		
Employee Performance	Quality	4.05	EP1	0.295	0.560	0.754
			EP 2	0.841		
	Quantity	4.56	EP 3	0.812		
			EP 4	0.795		
	Reliability	4.31	EP 5	0.724		
			EP 6	0.810		
			EP 7	0.848		
	Attitude	4.21	EP 8	0.782		
			EP 9	0.785		
			EP 10	0.623		

Note: M=Mean; OL= Outer Loading; AVE= Average Variance Extracted; CR=Composite Reliability; $n = 107$

Table 4. Fornell Larcker Criterion

	Transformational Leadership	Work Engagement	Work Motivation	Employee Performance
Transformational Leadership	0.768			
Work Engagement	0.702	0.769		
Work Motivation	0.744	0.693	0.880	
Employee Performance	0.755	0.753	0.781	0.784

construct is indeed distinct and shares more variance with its own indicators than with other constructs in the model. This is a key requirement for establishing discriminant validity in the model. The hypothetical values provided here would be replaced by the actual calculated values from the research data in a real-world scenario. Figure 2 shows the results of the modification with the results of measuring the loading factor for each item above 0.6.

4.2. Predictive relevance (Q^2)

Predictive relevance (Q^2) is a measure used in Partial Least Squares Structural Equation Modeling (PLS-SEM) to assess the model's ability to predict the data for a particular endogenous construct. It is a key metric when using PLS-SEM because unlike covariance-based SEM, PLS-SEM emphasizes prediction. The predictive relevance value is obtained by the formula:

$$Q^2 = 1 - (1 - R_1^2) (1 - R_2^2) (1 - R_3^2)$$

$$Q^2 = 1 - (1 - 0.451) (1 - 0.500) (1 - 0.716)$$

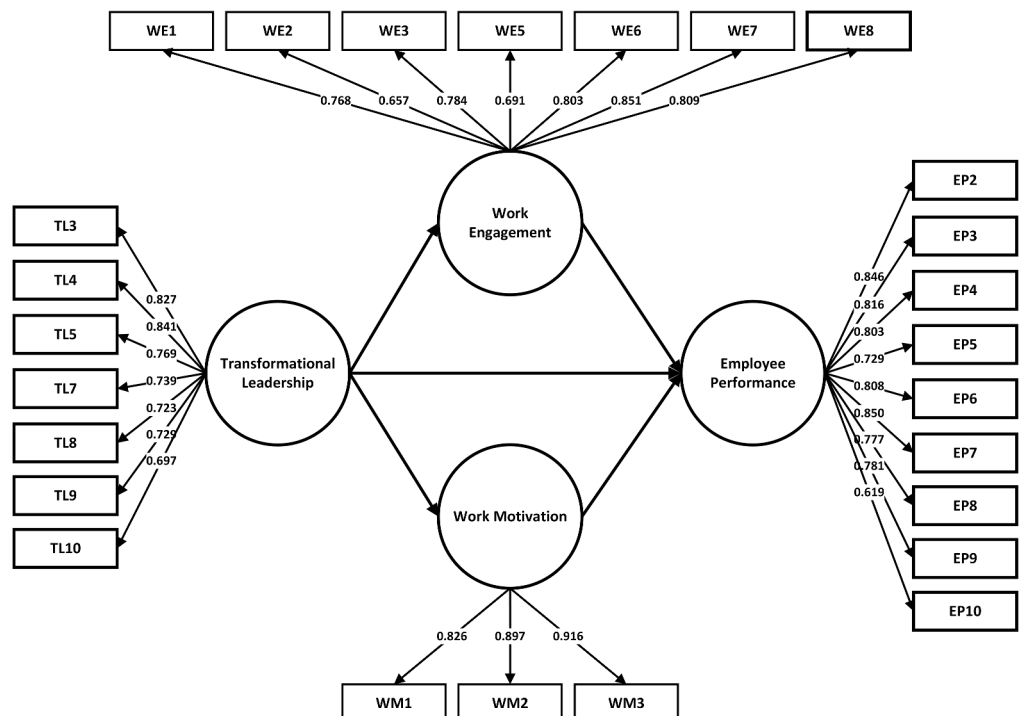
$$Q^2 = 1 - (0.549) (0.500) (0.284)$$

$$Q^2 = 1 - (0.077)$$

$$Q^2 = 0.923$$

The Q^2 value obtained is 0.923, which indicates that the model's predictive relevance is high. A Q^2 value greater than 0 suggests that the model has predictive relevance for the endogenous constructs. In other words, the model's constructs and pathways are good at predicting the endogenous variables. With a Q^2 value of 0.923, the model is considered to have substantial predictive relevance. This means that the independent variables provide a significant amount of information about the dependent variables, and the model is capable of making accurate predictions within the context of the data. In practical terms, a high Q^2 value implies that the model is

Figure 2. Loading factor testing modified.



useful and can be applied to make predictions about the endogenous variables. This is particularly important in applied research where the goal is often to predict outcomes or to identify which variables may have the most substantial effect on key outcomes.

4.3. Path analysis

To address the posed research questions, the study employed a bootstrapping procedure to assess the significance of path coefficients and corresponding T-Statistics, crucial for hypothesis testing within the structural model. Hair et al. (2017) advocate for the use of a 95% bias-corrected and accelerated (BCa) bootstrap confidence interval to determine the significance of path coefficients. This method accounts for potential biases and skewness in the bootstrap distribution, providing more accurate confidence intervals. As a supplemental approach, the p-value can be examined, with a threshold of less than 0.05 typically denoting statistical significance (Lind et al., 2018). The results from the hypothesis testing are summarized in a Table 5, which would typically include the path coefficients, T-Statistics, p-values, and the conclusions regarding the acceptance or rejection of each hypothesis. This approach ensures a thorough examination of the relationships within the model and contributes to the robustness and validity of the research findings.

Table 5 in the study presents a comprehensive overview of the hypothesis testing conducted to explore the effects of transformational leadership on work engagement, work motivation, and employee performance within the organizational context of the NTSC.

The direct effects highlighted in the table show that transformational leadership has a significant positive relationship with work engagement, as indicated by a path coefficient of 0.672. This is corroborated by a substantial T-statistic value of 10.754 and a p-value of 0.000, confirming the hypothesis with a high level of confidence. Similarly, transformational leadership's influence on work motivation is also significant, with an even higher path coefficient of 0.707, a T-statistic of 15.306, and a p-value of 0.000. These findings suggest that transformational leadership is a powerful driver of both engagement and motivation among employees. Furthermore, the data indicates that transformational leadership has a positive effect on employee performance, though this relationship is somewhat weaker compared to its impact on engagement and motivation. Nevertheless, with a path coefficient of 0.208, a T-statistic of 2.220, and a p-value of 0.027, the effect remains statistically significant. In terms of the influence of work engagement on employee performance, the results demonstrate a positive and statistically

Table 5. Hypothesis testing

Path	Original Sample (O)	T Statistics (O/STDEV)	P Values	Decision
Direct Effect				
Transformational leadership → Work engagement	0.672	10.754	0.000	Accepted
Transformational leadership → Work Motivation	0.707	15.306	0.000	Accepted
Transformational leadership → Employee performance	0,208	2,220	0,027	Accepted
Work engagement → Employee performance	0,342	3,678	0,000	Accepted
Work Motivation → Employee performance	0,392	4,495	0,000	Accepted
Indirect Effect				
Transformational leadership → Work engagement → Employee performance	0.222	3.528	0.000	Accepted
Transformational leadership → Work Motivation → Employee performance	0.282	3.961	0.000	Accepted

significant relationship, as evidenced by a path coefficient of 0.342, a T-statistic of 3.678, and a p-value of 0.000. This suggests that higher levels of work engagement lead to better employee performance. Work motivation shows a similar pattern of influence on employee performance, with a path coefficient of 0.392, a T-statistic of 4.495, and a p-value of 0.000, indicating that motivated employees are likely to perform at higher levels.

The table also explores the indirect effects, revealing that transformational leadership positively impacts employee performance through the mediating role of work engagement and work motivation. The path coefficient for the indirect effect of transformational leadership on employee performance via work engagement is 0.222, with a T-statistic of 3.528 and a p-value of 0.000. Likewise, through work motivation, the path coefficient is 0.282, with a T-statistic of 3.961 and a p-value of 0.000. These indirect pathways suggest that transformational leadership does not only directly influence performance but also does so by elevating engagement and motivation levels, which in turn enhance performance.

The findings presented in the table substantiate the transformative effect that leadership can have on employee outcomes. The significant relationships between transformational leadership and the mediating variables of work engagement and motivation, as well as their subsequent impact on performance, underscore the multifaceted role of leadership within the NTSC. These insights provide a deeper understanding of how cultivating an environment of supportive and inspiring leadership can lead to a more engaged, motivated, and high-performing workforce.

5. Discussion

This research was designed to explore how transformational leadership influences employee performance at the NTSC, particularly through the channels of work engagement and motivation. Confirming the findings of Hoai et al. (2022), the study underscores the significant positive impact of transformational leadership on enhancing employees' engagement in their work. NTSC leaders embodying the characteristics of transformational leadership—idealized influence, inspirational motivation, intellectual stimulation, and individual consideration—can significantly elevate their subordinates' level of engagement. This suggests that by actively sharing knowledge and implementing regular training, leaders can bolster the work engagement skills of their teams.

The study's results resonate with the findings of Schwatka et al. (2020) and Cheung et al. (2021), who similarly reported a positive correlation between transformational leadership and work engagement, affirming the value of such leadership in improving the NTSC's employee engagement. The leadership approach at NTSC not only drives better performance through direct influence but also instills confidence in employees, which is crucial for performance enhancement, aligning with the observations made by Bakker et al. (2022).

Importantly, the study revealed that while work engagement and motivation are affected by transformational leadership, they also mediate the relationship between this leadership style and employee performance. However, their mediating role does not entirely account for the effects of transformational leadership on performance. Enhanced work engagement and motivation are associated with greater impacts of transformational leadership on performance, supporting the studies by Vu (2022) and Stirpe et al. (2022).

Work engagement at the NTSC manifests as a deep commitment to fulfilling work responsibilities, accompanied by confidence in one's role—factors that are linked to improved organizational performance. This aligns with the research of Mousa and Othman (2020), Deole et al. (2021), and Khtatbeh et al. (2020), which emphasize the positive influence of work engagement on performance. Similarly, work motivation—reflected in the intensity and focus with which NTSC employees pursue their objectives—translates into higher performance levels, echoing the findings of Mgammal and Al-Matari (2021) and Kim and Lee (2022).

In sum, transformational leadership within the NTSC is shown to be a cornerstone for both cultivating a motivated, engaged workforce and driving employee performance. The study suggests that NTSC management should continue to foster an environment where transformational leadership is practiced, as it has far-reaching positive implications for employee motivation and engagement, ultimately leading to enhanced performance. This is further supported by the work of Badi and Murtagh (2019), who found that work engagement mediates the relationship between transformational leadership and employee performance, as well as by Haddock-Millar et al. (2016), Tetteh et al. (2020), and Zhang et al. (2020), who highlighted the mediating role of work motivation. Thus, through both direct and indirect pathways, transformational leadership significantly contributes to the performance of NTSC employees.

The NTSC's investment in transformational leadership is validated by its significant contributions to enhancing work engagement and motivation, which are crucial for elevating employee performance. This approach not only addresses immediate performance goals but also aligns with the long-term development and progress of the organization, ensuring that the NTSC continues to operate effectively and safely within its critical sector. Both SET and SDT theories affirm that the leadership style embodied within the NTSC has a significant impact on creating an organizational climate conducive to high performance. SET underscores the importance of the reciprocal exchanges between employees and leadership, while SDT highlights the fulfillment of intrinsic needs as a pathway to enhanced performance. The congruence of the study's findings with these theories suggests that the NTSC's approach to leadership is well-aligned with key theoretical principles known to promote positive employee outcomes.

6. Conclusions

The study conducted within the context of the NTSC has established that transformational leadership is a key driver of employee engagement, motivation, and performance. Leaders at the NTSC who exhibit transformational qualities such as vision, inspiration, intellectual stimulation, and considerate attention to individual employees' needs have a pronounced positive effect on their teams. This leadership style not only directly contributes to employee performance but also fosters an environment where employees feel more connected to their work and motivated to excel. This study highlights that while transformational leadership directly influences employee outcomes, it also plays a vital role in enhancing work engagement and motivation, which in turn positively impacts performance. The NTSC's focus on developing transformational leaders could lead to a more dynamic, committed, and high-performing workforce. Implementing training programs that nurture these leadership qualities can be an effective strategy for the NTSC to amplify its organizational effectiveness and achieve its safety and performance objectives. The ripple effects of transformational leadership within the NTSC are clear, it not only uplifts individual employees but can also catalyze the collective progress of the organization. Therefore, investment in leadership development aligns with the strategic goals of the NTSC and can be expected to yield substantial returns in terms of organizational performance and effectiveness.

7. Limitations and recommendations for future research

This study recognizes certain limitations that should be considered. The sample is specific to the NTSC, which may limit the generalizability of the findings across different organizations or cultural contexts. Future research could benefit from a more diverse sample to enhance the applicability of the results. Additionally, the research model focused on a select set of variables. Including additional constructs such as organizational culture, human resource management practices, job satisfaction, and organizational citizenship behavior could provide a more comprehensive understanding of the factors influencing employee performance. To gain deeper insights into situational behaviors and the nuances of workplace dynamics, it is recommended to complement future studies with qualitative methods, such as observational studies, which can capture the richness and complexity of employee interactions within their organizational environment.

8. Managerial implications

This research admittedly has many shortcomings related to the lack of in-depth discussion in several units of analysis. The shortcomings of this research can be an idea for further research. Furthermore, based on the results of the research that has been done and the conclusions above, the following suggestions are put forward in this study. The management of the NTSC pays attention to these leadership factors by communicating the company's vision and mission to employees with management transparency as an assurance that the vision and mission are routinely communicated to employees. In addition, leaders can be examples and role models by demonstrating policies and behaviors that support the achievement of organizational goals. Furthermore, the NTSC management can also change the vision and mission of the company into a real vision and mission by realizing operational standard improvements so that in terms of performance created within the organization it provides value that can be understood precisely. Furthermore, the NTSC management can create policies that are in line with the vision and mission of the NTSC.

NTSC management should appreciate the employees and their time. By appreciating employees as well as their time, employees are happier and more satisfied overall when given flexible work options. It is also suggested to the NTSC management to help employees understand the goals of the organization and the purpose of the work they are doing. It will be difficult for NTSC staff to align their own work goals with the organization's vision if they don't understand it. It will also make the NTSC employees enthusiastic about doing their jobs because they see a correlation between what they do and how they contribute. The more employees invest in their work, the more important the organization is for employees, and this will encourage employees to contribute more. It is hoped that employees will always be enthusiastic and focused on work. The management of the NTSC should motivate their employees by inspiring them employees by setting goals, providing clear goals that they will achieve (e.g., travel goals, houses, physical objects, etc.) and providing opportunities for employees to seek the way and run it yourself to quickly reach those goals and create a greater sense of urgency in employees by providing information about the development of the organization. It is expected that employees will have development and the intention to grow for the progress of the organization. The NTSC management can also provide targets that must be achieved for each employee. With targets, employees can be more enthusiastic about completing their work.

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