JOURNAL OF THEORETICAL AND APPLIED MANAGEMENT
Jurnal Manajemen Teori dan Terapan

https://e-journal.unair.ac.id/jmtt
p-ISSN: 1979-3650 e-ISSN: 2548-2149

Original Research

Volume 18, No. 1, 2025 OPEN ACCESS

Enhancing Worker Productivity through the S-O-R Theory in Human Resource Management

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Abstract

Objective: This paper examines the influence of empowering leadership on positive worker behavior and work productivity in various organizational settings.
Design/Methods/Approach: This study used a survey-based quantitative design with a causal predictive approach. Partial least squares-structural equation modeling (PLS-SEM) analysis was conducted on a research sample of 268 employees from various profit and non-profit organizations. Respondents were at least 18 years old.
Findings: The findings reveal that empowering leadership positively relates to creative, collaborative, and innovative behavior. Creative and collaborative behavior affects positively to work productivity, whereas worker innovative behavior does not affect work productivity.
Originality/Value: This study is one of the first to apply the S-O-R theory in the context of empowering leadership and its influence on positive worker behavior and work productivity. By using this framework, the research explores new dimensions of leadership impact in organizational behavior, offering valuable insights for human resource management in diverse settings. This research captures how empowering leadership (stimulus) influences employee behavior (organism) and subsequent work productivity (response).
Practical/Policy implication: The result of this study is useful for HR managers seeking to enhance employee work productivity and innovation through leadership strategies. By adopting an empowering leadership style, HR managers can foster positive behaviors such as creativity and collaboration, which ultimately lead to higher organizational performance.

Keywords: Empowering leadership; Work productivity; Positive work behavior; S-O-R theory

JEL Classification: D22, D23, L20

DOI: https://doi.org/10.20473/jmtt.v18i1.63886
Received: October 3, 2024; Revised: January 5, 2025; January 15, 2025; February 25, 2025; Accepted: March 4, 2025; Available online: April 21, 2025

Published by Universitas Airlangga, Department of Management, Faculty of Economics and Business

1. Introduction

Human resources (HR) in a company context are employees who work for the company to get compensation. Increased HR Work Productivity can be achieved if the company can practice human resource management (HRM) to the fullest so that employees can provide their best performance, which is reflected in high work productivity (Darmawan, 2020). Work productivity growth plays a crucial role in addressing challenges such as inflation, aging populations, and the need to fund the transition to net-zero emissions. It also drives the sustainability of living standards and fosters inclusive growth. Without work productivity growth, the world faces the risk of economic stagnation or inflation. Meanwhile in reality, work productivity decreased in developed countries from an average of 2.2% annually before the 2008 financial crisis to less than 1% from 2012 to 2022. In emerging economies, work productivity growth also slowed, from 5.9% before the crisis to 3.4% over the last decade (McKinsey, 2024). The report shows that global work productivity growth has significantly slowed in recent years. Gallup's reports found one of the effective HRM practices that enhances work productivity is leadership. Team managers influence 70% of team engagement and companies with engaged managers got 27% higher revenue per employee and a 59% higher engagement rate among employees. Leadership is a key element to improving work productivity and effective HRM practices (Gallup, 2018; Zhao et al., 2020).

Over the past few decades, many studies have discussed the ideal leadership style to improve individual performance, organizational commitment and team performance (Luedi, 2022; Northouse, 2022; Zhao & Ali, 2024). One leadership style currently widely discussed is empowering leadership (Kundu et al., 2019), which experts define as the process of sharing power and allocating autonomy and responsibility to followers, teams, or collectives through a series of behaviors modeled by the leader to increase internal motivation and achieve organizational goals (Cheong et al., 2019). Empowering leadership is particularly important in the context of work productivity because increased work unit core task proficiency and employee proactive behaviors contribute to organizational success (Martin et al., 2013). Empowering leadership has been extensively studied for its impact on individual and team performance, with various studies highlighting its positive effects on motivation, job satisfaction, and productivity.

Empowering leadership is characterized by the delegation of authority, sharing power, and providing autonomy, which leads to increased self-confidence and a greater sense of control over work (Chen et al., 2024). It has been found that creative and collaborative behaviors are promoted when employees are empowered by their leaders, as they feel trusted to make decisions and contribute innovative ideas (Ahmed et al., 2022; Kim & Beehr, 2021). As a result, team work productivity is often enhanced, since these behaviors encourage higher engagement and problem-solving among team members (G. Tang et al., 2020). Moreover, it has been shown that innovative work behavior is positively correlated with work productivity improvements, which are driven by empowered teams (Lisak et al., 2022). Most research results believe that empowering leadership can have a positive impact on the behavior of individuals and teams in an organization, but, based on the results of the meta-analysis, several research results contradict this result (Lee et al., 2018; Li et al., 2017): empowering leadership does not always result in good team performance (Cheong et al., 2019). A further research shows a negative impact of empowering leadership is task uncertainty and employee resistance, which worsen their work productivity (Humborstad et al., 2014). Previous research shows contradicting results on the effect of empowering leadership on productivity and performance of organizational members, and thus requires further research involving intervening variables in the relationship between empowering leadership and work productivity. Based on that research gap, this research added collaborative behavior, creative behavior, and innovative behavior as intervening variables. With the distinct research findings and observed phenomena, this study introduces a novel approach to enhancing HR productivity.

This study makes significant contributions to the literature on work productivity within the context of human resource management. First, it expands understanding of the effects of empowering leadership on work productivity by highlighting the role of collaborative, creative, and innovative behaviors as intervening variables. This focus aligns with the efforts to achieve Sustainable Development Goal (SDG) 8, which emphasizes the importance of inclusive and sustainable economic growth, decent work for all, and enhanced labor productivity. Second, the study introduces a novel perspective by exploring the relationship between empowering leadership toward positive worker behavior and work productivity through the Stimulus-Organism-Response (S-O-R) framework. Third, this study contributes to the human resource literature by elucidating the mediating factors in the relationship between empowering leadership and work productivity.

This research offers practical insights by providing evidence-based guidelines for organizations aiming to enhance work productivity. These guidelines include strategies to mitigate negative outcomes, such as ambiguity and resistance, and to maximize the potential for collaboration, creativity, and innovation. The literature review discusses the theoretical frameworks, previous research findings, and hypotheses relevant to this study. The methodology section outlines the quantitative approach employed, detailing the use of structural equation ,modeling (SEM) with partial least squares (PLS) and presenting the data analysis results. The subsequent sections report the research findings, discuss their theoretical and practical implications, and conclude with the limitations of the study and suggestions for future research directions.

2. Literature Review and Hypotheses Development

2.1 S-O-R Theory

Stimulus-Organism-Response (S-O-R) theory is a well-established framework from the field of environmental psychology, initially proposed by Woodworth in 1929. This theory builds upon the classic Stimulus-Response (S-R) model developed by Pavlov in 1927, extending its application to include psychological and emotional responses. The S-O-R framework was further refined by Mehrabian and Russell in 1974, who used it to examine how external environmental stimuli affect human behavior through emotional and cognitive responses (Sun et al., 2021). According to this model, the stimulus (S) refers to external factors, often environmental or situational influences, that trigger responses in an organism. The organism (O) represents the individual's internal states—such as emotions, perceptions, or psychological processes—that mediate the response. The response (R) represents the actions or behaviors that the organism exhibits in reaction to the stimulus. This model is widely used in fields like consumer behavior and environmental psychology to understand human responses to various external stimuli (Alagarsamy et al., 2021; Ming et al., 2021; Zhang et al., 2021).

The S-O-R theory has begun to be adopted in several studies in the fields of learning and human resources to understand how external stimuli influence behavior through internal psychological processes. Cheng applied the S-O-R model to investigate how media richness, human-system interaction, and human-human interaction in Massive Open Online Courses (MOOCs) influenced medical professionals' learning engagement (LE) and learning persistence (LP), showing that these stimuli impacted emotional, cognitive, and social LE, which subsequently enhanced LP (Cheng, 2024a). In another study, Cheng examined how network externality, personalization, and sociability in MOOCs shaped learners' engagement and persistence, with LE dimensions mediating these effects (Cheng, 2024b). Cheng also applied S-O-R to examine how media richness and social interaction influenced nurses' learning engagement in MOOCs, affecting their intention to continue using the platform and their task performance (Cheng, 2024c). In other study, the S-O-R model was used to analyze the impact of generative AI adoption on employee engagement and performance with the result showing that trust in and attitudes toward GenAI influenced employees' psychological states and enhanced their work performance (Manresa et al., 2024). Another study focused applied S-O-R to conceptualize HR outsourcing effectiveness and developed a scale to measure service performance, demonstrating how external stimuli impact internal psychological states (Sim et al., 2021). Similarly, research by Kim et al. (2022) used S-O-R to examine how organizational citizenship behaviors (OCBs) perceived by customers influenced service performance, with customer satisfaction mediating the relationship. Furthermore, S-O-R has been used to explore how internal communication affects frontline employees' organizational identification and job satisfaction, leading to improved customer-oriented behavior (Ferdous et al., 2021). These studies collectively illustrate the growing relevance of the S-O-R model in understanding the complex relationships between external stimuli, internal psychological states, and employee outcomes in human resource management.

In this study, the S-O-R theory offers a robust framework for understanding the relationship between empowering leadership, collaborative, creative, and innovative behaviors toward work productivity. Empowering leadership serves as the external stimulus, as it creates an environment that influences employees' internal psychological states (e.g., motivation, confidence, autonomy). The organism in this framework is represented by employees' behaviors—specifically, collaborative, creative, and innovative behaviors—which are influenced by the empowering leadership style. These behaviors then lead to the response, which is work productivity. The response (R) in this framework is the work productivity, with work productivity being a direct outcome of the positive behaviors stimulated by empowering leadership (Cui & Yu, 2021; Kim & Beehr, 2021; Mutonyi et al., 2020; Wang, 2022). Thus, the S-O-R theory helps explain how leadership practices influence employees' internal states and, ultimately, their performance.

2.2 The Effects of Empowering Leadership

Empowering leadership is a leadership style that emphasizes delegating authority and responsibility, enabling subordinates to have greater autonomy in deciding how they approach their work. This form of leadership is designed to foster self-motivation by giving employees more control over their tasks (Wang, 2022). The concept is grounded in the theory of structural empowerment, which focuses on leaders who share power and delegate tasks to employees, thereby enhancing their sense of competence and ownership (Richardson et al., 2021). Empowering leadership involves increasing the meaningfulness of work, promoting employee participation in decision-making, demonstrating confidence in high performance, and reducing bureaucratic barriers that hinder autonomy (Pitambaran & Nyma, 2023; Wu, 2020). Empirical studies have shown that empowering leadership can improve employee performance by enhancing their work and career self-efficacy (Hao et al., 2018). From the perspective of empowerment motivation, it is suggested that empowering leadership fosters autonomous motivation in employees, which is a key driver of organizational success (O'Donoghue & Van Der Werff, 2022). Building on the foundational understanding of empowering leadership, this study hypothesizes that empowering leadership positively affects employee positive behavior.

Creative behavior in the workplace involves the generation of new ideas and solutions that are relevant and useful to the organization (Alif & Nastiti, 2022). Empowering leadership encourages creativity by giving employees the freedom to explore innovative approaches and take ownership of their tasks, which enhances their ability to think

outside the box (Dani & Mohamed, 2020; Kim & Beehr, 2021). Studies have shown that autonomy, a core dimension of empowering leadership, is positively correlated with increased creativity and innovative thinking among employees (Hassi et al., 2022).. A meta-analysis of 25 empirical studies found that empowering leadership encourages creativity (Hoang et al., 2021). Similarly, research from 266 studies reveals that empowering leadership has the most significant influence on employee creativity and innovation compared to other leadership styles (Lee et al., 2020).

Empowering leadership plays a crucial role in enhancing employee creative behavior. By offering employees autonomy and the freedom to make decisions about how to approach their work, empowering leaders provide an environment conducive to creativity (Abualoush et al., 2022; Zhou et al., 2024). Research has shown that autonomy significantly influences employees' creative behavior by allowing them to explore new ideas and innovative solutions without being constrained by rigid procedures or micromanagement (Dani & Mohamed, 2020; Kim & Beehr, 2021). Empowering leaders demonstrate confidence in their employees' abilities, which increases employees' self-efficacy and encourages them to take creative risks (Anwar & Humayun, 2023). Thus, this study hypothesize that higher levels of empowering leadership will lead to increased creative behavior among employees:

H1: Empowering leadership positively affects worker creative behavior.

Collaborative behavior refers to employees' willingness to work together, share knowledge, and contribute to team-oriented goals within an organization (Nezami et al., 2024). It is a critical component of organizational success, particularly in environments that require teamwork, communication, and mutual support (Khatib et al., 2022). Empowering leadership, by providing autonomy and fostering trust, can significantly enhance collaborative behavior (Waseel et al., 2023). Empowering leadership creates an environment in which employees feel trusted and valued, which increases their willingness to collaborate with others (Zhang & Bartol, 2010). By providing employees with autonomy, resources, and involvement in decision-making, empowering leaders foster a culture of collaboration (Ahearne et al., 2005; Cheong et al., 2019). This encourages employees to share ideas, engage in problem-solving, and work together toward common goals, ultimately enhancing overall team effectiveness (Waseel et al., 2023). Furthermore, the autonomy provided by empowering leadership reduces the hierarchical barriers that typically hinder teamwork, enabling more open communication and stronger interpersonal relationships among team members (Chen et al., 2011). Thus, this study offers the following hypothesis:

H2: Empowering leadership positively affects worker collaborative behavior.

Worker innovative behavior refers to the deliberate and creative engagement in activities that facilitate the generation, development, and implementation of novel ideas (Wang, 2023). This behavior is instrumental in refining existing operational procedures, optimizing work processes, and advancing the quality of services or products to address emerging challenges and improve organizational outcomes (Oh & Lee, 2022). Empowering leadership is posited to foster employees' innovative behavior, which encompasses the implementation of novel ideas and the facilitation of organizational change and improved organizational performance (Li et al., 2016; Spreitzer et al., 1999). Leaders who empower employees by granting them autonomy in decision-making and providing support for taking calculated risks cultivate an environment that encourages innovation (Hassi et al., 2022). Empowering leadership reduces bureaucratic barriers and provides employees with the necessary resources and confidence to innovate (Cui & Yu, 2021; Embree et al., 2018). Studies have shown that empowering leadership is directly linked to increased innovation because it allows employees to experiment with new ideas and solutions, which are essential for organizational growth and competitive advantage (Hoang et al., 2021). Therefore, we propose the following hypothesis:

H3: Empowering leadership positively affects worker innovative behavior.

2.2. Work Productivity

Work productivity is commonly defined as the ratio of output to input (Laitinen et al., 2024), serving as a critical indicator of how efficiently resources are utilized to achieve organizational goals. In a business context, it refers to the ability to produce goods and services with optimal use of resources such as personnel, materials, capital, and time. As such, work productivity is a key measure of an organization's success in utilizing its available resources to generate valuable output (Aliahmadi, 2024). Work productivity is crucial for organizations as it reflects the efficiency and effectiveness of their operations, directly influencing profitability and competitiveness in the market (Bakhtiar et al., 2018).There are two common methods for measuring work productivity: labor work productivity, which is calculated by dividing the output produced by the hours worked, and multifactor work productivity, which involves assessing output per unit of a weighted combination of various factors, such as fuel, equipment, and materials (Shin, 2024). In business management, employee work productivity is often evaluated based on employee performance, which includes competencies, effectiveness, and efficiency in job execution (Srimulyani et al., 2023). Increased work productivity is vital for organizations, as it leads to reduced costs, higher quality of products or services, and enhanced customer satisfaction, all of which contribute to organizational success (Jameel & Ahmad, 2020).

2.3 The Effect of Creative Behavior on Work Productivity

Creative behavior, defined as the cognitive process involving activities like problem-solving, idea generation, and evaluating ideas (Slåtten et al., 2020), is a significant driver of employee work productivity. Employees who engage in creative behaviors can develop novel solutions to challenges, streamline processes, and improve work outcomes. As a result, creativity is directly linked to higher work productivity, as it enables employees to approach tasks in innovative ways that lead to more efficient and effective work (Semedo et al., 2016; Żywiołek et al., 2022). Empowering leadership plays a crucial role in fostering creative behavior, as it grants employees the autonomy to make decisions and encourages them to take risks in exploring new ideas (Naz et al., 2020; Ucar et al., 2021). This type of leadership creates an environment where employees feel supported in generating creative ideas, ultimately enhancing their performance and the organization's work productivity (Gajdzik & Wolniak, 2022). Creative behavior not only contributes to solving organizational problems but also helps employees find new, more efficient methods for performing their tasks (Ardito et al., 2018; Luqman et al., 2021).

Higher levels of creative behavior among employees lead to better problem-solving abilities, which in turn improve individual and team performance. By implementing creative solutions, employees can streamline operations, enhance the quality of outputs, and increase overall work productivity (Probst et al., 2007). Thus, fostering creative behavior is essential for driving work productivity in the workplace, as employees who regularly engage in creative thinking are more likely to find innovative ways to achieve high-performance levels (De Clercq & Pereira, 2020).

H4a: Creative behavior positively affects work productivity.

H4b: Creative behavior mediates the relationship between empowering leadership and work productivity.

2.4 The Effect of Collaborative Behavior on Work Productivity

Collaboration refers to the process of working together with others to define, develop, or solve problems by pooling knowledge, expertise, and perspectives (Nezami et al., 2024). It is a critical behavior in today's organizational environments, where teamwork and shared decision-making are essential for success. Collaboration often involves the exchange of ideas, discussing varying viewpoints, and developing shared understandings that guide collective actions (Lister & Allman, 2024). In the context of work productivity, collaboration enhances organizational efficiency by encouraging a coordinated approach to tasks, sharing resources, and aligning goals across individuals and teams (Embree et al., 2018). Research has shown that collaborative behavior leads to improved teamwork competencies and a more cohesive work environment (Liu et al., 2021). The ability of people in the teams to collaborate effectively has been linked to enhanced problem-solving capabilities and greater flexibility in managing organizational challenges (Gray & Wood, 1991). Additionally, the use of collaborative technologies can further enhance work productivity by enabling seamless communication and faster decision-making (Schuh et al., 2014).

Inter-organizational collaboration, particularly, allows for the pooling of resources and expertise across organizations, which can help tackle complex challenges and improve the overall Work Productivity of both individuals and organizations (Jameel & Ahmad, 2020; Khatib et al., 2022). Collaborative behavior among employees leads to higher work productivity through the exchange of knowledge, ideas, and resources that drive innovation and problem-solving (van den Hout & Davis, 2022). When employees engage in collaborative behavior, they combine their individual strengths and capabilities, which results in more efficient work processes and improved decision-making. A collaborative work environment fosters better communication, enabling employees to address issues more effectively and swiftly (Larsson & Larsson, 2020). This collective effort enhances individual and organizational work productivity by improving task execution, reducing redundancy, and streamlining workflows. Additionally, It has been found that collaborative behaviors are promoted when employees are empowered by their leaders, as they feel trusted to make decisions and contribute new ideas (Ahmed et al., 2022; Kim & Beehr, 2021). As a result, team work productivity is often enhanced, since these behaviors encourage higher engagement and problem-solving among team members (T. Tang et al., 2020).

Furthermore, the use of technology in collaborative efforts has been shown to significantly improve work productivity outcomes (Schuh et al., 2014). Teams that collaborate effectively, both within and across organizational boundaries, create synergies that enhance work productivity, thereby improving the overall efficiency of the organization (Khatib et al., 2022). The stronger the collaborative relationships between employees, the more likely they are to perform their tasks efficiently and creatively, contributing to higher work productivity.

H5a: Collaborative behavior positively influences work productivity.

H5b: Collaborative behavior mediates the relationship between empowering leadership and work productivity.

2.5 The Effect of Innovative Behavior on Work Productivity

Innovative behavior is characterized by the creation, development, and implementation of new ideas and approaches that improve organizational processes, products, or services (Luo et al., 2024). Employees who exhibit innovative behavior proactively in problem-solving, develop plans to implement new ideas, and put these plans into action (Mutonyi et al., 2020). This behavior is essential for organizations seeking to remain competitive in dynamic markets. Innovative employees bring fresh perspectives, which not only foster creativity but also lead to more efficient and effective work practices (Giudice et al., 2023). Innovative behavior is closely linked to organizational success, as it

helps organizations adapt to changing environments, improve internal processes, and deliver products or services that meet customer demands (Akram et al., 2020; Surya et al., 2021). Innovative behavior stimulates continuous improvement, which enhances both employee performance and organizational work productivity (van Zyl et al., 2021). In sectors such as tourism, for example, innovations in customer service have been shown to improve satisfaction and work productivity (Novitasari et al., 2022).

Innovative behavior directly influences work productivity by providing employees with the ability to introduce new, more efficient methods of performing tasks. This behavior can result in product innovations or operational improvements that streamline work processes, reduce inefficiencies, and create added value (Mutonyi et al., 2020). One leadership style that gives employees the freedom to explore innovative approaches and take ownership of their tasks, which enhances their ability to think outside the box is empowering leadership (Dani & Mohamed, 2020; Kim & Beehr, 2021). Moreover, an innovative workforce is a key driver of work productivity, as it enables organizations to remain competitive and agile in an ever-changing market (Rehman et al., 2019). Innovative behavior also has a positive impact on employee motivation and work satisfaction, which in turn can lead to increased work productivity. Employees who are encouraged to innovate are more likely to feel valued and engaged in their work, which boosts their overall performance (Khan et al., 2020). Thus, fostering a culture of innovation within an organization helps to sustain high levels of work productivity and continuous improvement, as innovative employees are not only able to generate novel ideas but also successfully implement them in ways that improve organizational outcomes (Akram et al., 2020).

H6a: Innovative behavior positively influences work productivity.

H6b: Innovative behavior mediates the relationship between empowering leadership and work productivity.

3. Method

This research is designed as a survey study with a quantitative approach, aiming to explore the impact of empowering leadership on various workplace behaviors, including collaborative, creative, and innovative behaviors, and their subsequent influence on work productivity among Indonesian workers. The research data were collected through questionnaires distributed to a sample of the population using Google Forms. The respondents of this study are Indonesian citizens aged 18 and above, working as permanent employees across various industries. The sampling technique used is non-probability purposive sampling, selected to match specific criteria, including having worked for at least one year in their current job and being at least 18 years old. A total of 268 respondents were involved in the study. The data analysis method employed is structural equation modeling partial least squares (SEM-PLS) with SmartPLS 4 software, which is suitable for testing causality and predicting relationships between dependent and independent variables using multivariate analysis. SEM-PLS is particularly effective in evaluating the predictive power of empowering leadership on fostering creative, collaborative, and innovative behaviors, which can contribute to increased work productivity (Hair et al., 2019). Table 1 presents the detail of the variable measurements.

Indonesia is selected as the context for this research due to several critical factors that position it as an ideal setting for studying the effects of empowering leadership toward positive worker behavior and work productivity. First, Indonesia's labor work productivity remains relatively low compared to other ASEAN countries, making it a compelling case for investigating leadership practices aimed at improving workforce output. According to the ASEAN Summit data, Indonesian labor work productivity is at 74.4%, which is notably below the regional average of 78.2% (Juni Armanto, 2023). Second, according to statistical data, more than 50% of the Indonesian workforce is under the age of 40, with a significant portion of workers being in the 18-34 age range (BPS-Statistics, 2023); this workforce is characterized by a youthful and dynamic demographic, which is more receptive to contemporary leadership styles such as empowering leadership (Taufik et al., 2024). This demographic is often more adaptable and responsive to leadership approaches that promote autonomy and participation, making them a key target for empowerment-oriented strategies. Given these factors, Indonesia offers a unique opportunity to explore how empowering leadership can influence employee creativity, collaboration, and overall work productivity in a rapidly developing economy.

This study gathers data from a diverse range of sectors to ensure the findings are broadly applicable to Indonesian workers across various fields. Data collection was conducted throughout Indonesia, rather than being restricted to a particular city or region, allowing for a more comprehensive understanding of the national context and providing insights that reflect the broader workforce dynamics across the country.

Table1. Variable Measurements

N	Variable	Operational definition of variable	Measurement Indicators	Questionnaire Items	Source
1	Empowering Leadership	The ability of leaders to empower employees by encouraging meaningful involvement, participation, and autonomy while building confidence in their abilities.	1. Enhancing Meaningfulness of Work (EMW)	My boss shows the meaningfulness of work	(Humborstad et al., 2014; Kundu et al., 2019)
			2. Fostering Participation in Decision Making (FPDM)	My boss involves me in decision making	
			3. Expressing Confidence in High Performance (ECHP)	My boss believes that I can get the job done well	
			4. Providing Autonomy from Bureaucratic Constraints (PABC)	My boss allows me to work the way I want to	
2	Creative Behavior	The proactive employee behaviors exhibited in thinking and generating novel ideas, exploring unique approaches, and applying creative solutions in their work activities.	1. Generating New Ideas	I can generate new ideas at work	(De Clercq & Belausteguigoitia, 2019)
			2. Finding New Methods or Techniques in Work	I can produce new methods/techniques/instruments/ways of working	
			3. Finding New Solutions to Problems	I can find new solutions for problem-solving at work	
3	Collaborative Behavior	The cooperative employee behavior is designed to work effectively with others within and across teams or organizations, aiming to achieve shared goals and optimize collective outcomes.	1. Target Collaboration	We (my colleagues and I) work together to achieve organizational targets	(K. Liu et al., 2024)
			2. Information Collaboration	We share information on work	
			3. Inter-Organizational Collaboration	We share resources needed for our work	
			4. Resource Collaboration	We coordinate with each other in completing tasks	
			5. Task Process Coordination	To complete my work, I try new ideas, methods, techniques, instruments, or processes	
4	Innovative Behavior	The behavioral of employees to actively transform creative ideas into actionable and practical solutions, leading to improvements in work processes, products, or service.	1. Looking for Ways to Implement New Ideas	I promote my ideas to coworkers/superiors/teams	(Mutonyi et al., 2020)
			2. Developing Plans to Implement New Ideas	I look for ways to implement the new idea in my work	
			3. Implementing New Ideas	I develop a plan to implement the new idea at work	
5	Work Productivity	The ability of employees to deliver high-quality work outcomes efficiently and competently.	1. Effectivity	I work effectively	(Shin, 2024)
			2. Efficiency	I work efficiently	
			3. Competency	I am competent at work	

4. Result and Discussion

4.1. Result

4.1.1 Measurement Model Assessment

Table 2 shows the list of items, outer loadings and Cronbach's alpha values, composite reliability ρc, and exact reliability coefficient ρA. The output results show all outer loadings >0.70, thus confirming the reliability of the indicators. Regarding internal consistency reliability, the values of Cronbach's alpha (considered the lower limit) and composite reliability ρc (upper limit), as well as the exact reliability coefficient ρA, are in the range of 0.70-0.95, indicating the reliability of internal consistency is assessed (Hair et al., 2019). The average variance (AVE) is > 0.50 for each construct, indicating that convergent validity is met (Hair et al., 2019).

Table 2. Measurement Validity and Reliability Test

Construct	Item	Outer Loadings	Cronbach's alpha	rho_c	Composite reliability (rho_c)	Average variance extracted (AVE)
Work Productivity	WP1	0.884	0.889	0.891	0.931	0.819
	WP2	0.931				
	WP3	0.899				
Empowering Leadership	EL1	0.791	0.796	0.809	0.865	0.616
	EL2	0.810				
	EL3	0.802				
	EL4	0.904				
Creative Behavior	Cre1	0.917	0.897	0.898	0.935	0.829
	Cre2	0.910				
	Cre3	0.860				
Collaborative Behavior	Coll1	0.860	0.900	0.904	0.930	0.769
	Coll2	0.899				
	Coll3	0.832				
	Coll4	0.914				
Innovative Behavior	Inno1	0.829	0.924	0.925	0.943	0.769
	Inno2	0.821				
	Inno3	0.902				
	Inno4	0.922				
	Inno5	0.905				

Source: Smart-PLS results, 2024

Discriminant validity, which measures how well a construct can be distinguished from other constructs, was assessed using multiple methods, including the heterotrait-monotrait ratio (HTMT) and the Fornell-Larcker criterion. The HTMT values, all of which were below 0.90, indicate acceptable discriminant validity, confirming that the constructs in the study can be adequately differentiated from one another. The Fornell-Larcker criterion analysis showed that the average variance extracted (AVE) values were greater than the correlations between constructs, further supporting the robustness of discriminant validity. These findings, validated through both HTMT and AVE comparisons, demonstrate that the constructs possess strong discriminating power, ensuring their reliability in explaining the phenomenon under investigation.

Table 3. Results of discriminant validity using Fornell-Larker and HTMT ratios.

	Collaborative Behavior	Creative Behavior	Empowering Leadership	Innovative Behavior	Work Productivity
Collaborative Behavior	0.877	0.627	0.519	0.589	0.474
Creative Behavior	0.428	0.910	0.420	0.842	0.652
Empowering Leadership	0.573	0.508	0.785	0.653	0.650
Innovative Behavior	0.594	0.768	0.459	0.877	0.507
Work Productivity	0.454	0.584	0.378	0.571	0.905

Source: Smart-PLS results, 2024

4.1.2. Inner Model Evaluation

A commonly used method is the bootstrapping resampling process, which was chosen due to its non-parametric nature, resulting in more reliable estimates of the path coefficients.

4.1.2.1 Multicollinearity

The results of SEM PLS analysis show no multicollinearity problem between exogenous variables (independent variables) that affect endogenous variables (dependent variables). The variance inflation factor (VIF) value for each relationship between variables is 1.000, which indicates the absence of multicollinearity. An inner VIF value of less than 5 is a commonly used criterion to determine whether multicollinearity occurs. Therefore, the results shown in Table 4 confirm that there is no multicollinearity problem between the observed variables in the model, and the relationships between the variables can be interpreted more accurately.

Table 4. Result Multicollinearity (Inner Model Value / VIF)

Relationship between variables	BRIGHT	Criteria
Collaborative Behavior -> Work Productivity	1.550	< 5.000
Creative Behavior -> Work Productivity	2.445	< 5.000
Empowering Leadership -> Collaborative Behavior	1.000	< 5.000
Empowering Leadership -> Creative Behavior	1.000	< 5.000
Empowering Leadership -> Innovative Behavior	1.000	< 5.000
Innovative Behavior -> Work Productivity	3.086	< 5.000

Source: Smart-PLS results, 2024

4.1.3 Hypothesis Testing

The direct effect assesses the relationship between the independent and dependent variables without accounting for any intermediary variables, focusing exclusively on the direct connection between the two. In contrast, the indirect effect examines the mediating influence of variables such as Creative Behavior, Collaborative Behavior, and Innovative Behavior in the relationship between Empowering Leadership and Productivity.

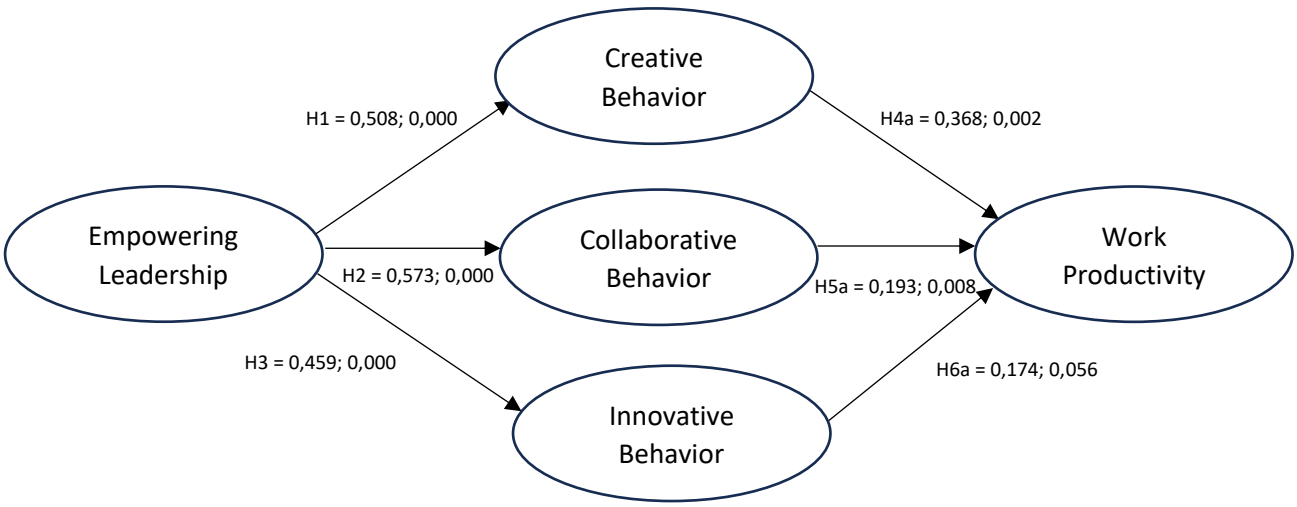

Figure 1. Model Framework

The results of the analysis indicate that Empowering Leadership significantly influences both Creative Behavior (H1: Path Coefficient = 0.508, p-value = 0.000) and Collaborative Behavior (H2: Path Coefficient = 0.573, p-value = 0.000), thereby supporting the acceptance of hypotheses 1 and 2. Furthermore, both Creative Behavior and Collaborative Behavior demonstrate significant positive effects on Work Productivity, as evidenced by the acceptance of H4a (Path Coefficient = 0.368, p-value = 0.002) and H5a (Path Coefficient = 0.193, p-value = 0.008). Additionally, the findings reveal that Empowering Leadership positively influences Innovative Behavior (H3: Path Coefficient = 0.459, p-value = 0.000), confirming the validity of this hypothesis. However, the direct effect of Innovative Behavior on Work Productivity is found to be non-significant (H6a: Path Coefficient = 0.174, p-value = 0.056), leading to its rejection. The mediation analysis further substantiates that both Creative Behavior (H4b: Path Coefficient = 0.186, p-value = 0.002) and Collaborative Behavior (H5b: Path Coefficient = 0.110, p-value = 0.005) significantly mediate the relationship

between Empowering Leadership and Work Productivity, thereby supporting the acceptance of these hypotheses. Conversely, the mediating role of Innovative Behavior in this relationship is found to be non-significant (H6b: Path Coefficient = 0.080, p-value = 0.085), resulting in the rejection of this hypothesis. In conclusion, the findings highlight that empowering leadership enhances work productivity primarily through its influence on creative behavior and collaborative behavior, while the mediating role of innovative behavior is not substantiated.

Table 4. Hypothesis Testing

Hypothesis	Path Coefficient	P values	Hypothesis acceptance
H1: Empowering Leadership -> Creative Behavior	0.508	0.000	Accepted
H2: Empowering Leadership -> Collaborative Behavior	0.573	0.000	Accepted
H3: Empowering Leadership -> Innovative Behavior	0.459	0.000	Accepted
H4a: Creative Behavior -> Work Productivity	0.368	0.002	Accepted
H4b: Empowering Leadership -> Creative Behavior -> Work Productivity	0.186	0.002	Accepted
H5a: Collaborative Behavior -> Work Productivity	0.193	0.008	Accepted
H5b: Empowering Leadership -> Collaborative Behavior -> Work Productivity	0.110	0.005	Accepted
H6a: Innovative Behavior -> Work Productivity	0.174	0.056	Rejected
H6b: Empowering Leadership -> Innovative Behavior -> Work Productivity	0.080	0.085	Rejected

Source: Smart-PLS results, 2024

4.1.4. Effect Size F Square, R Square, and Q Square

F-Square in SMART PLS is an effect size measure that indicates how much influence variables have at the structural level in the model. The F-Square value ranges between 0 and 1, where the higher the value, the more significant the proportion of variability of the endogenous variables that the related exogenous variables can explain. F-Square analysis helps researchers understand the strength of the relationship between variables in the structural model. The results of the F-Square analysis show that the effect of the Collaborative Behavior variable on the Work Productivity variable has an F-Square of 0.040, indicating that about 4% of the variability in the Work Productivity variable can be explained by the Collaborative Behavior variable. The effect of the Creative Behavior variable on the Work Productivity variable has an F-Square of 0.093, indicating that about 9.3% of the variability in the Work Productivity variable can be explained by the Creative Behavior variable. The results also found that Empowering Leadership affects 49% on Collaborative Behavior, 34.7% on Creative Behavior, and 26.7% on Innovative Behavior. Based on the F-Square criteria, the influence of Collaborative and Creative Behavior variables on Work Productivity variables can be considered a low influence. In contrast, the influence of Empowering Leadership variables on Creative, Collaborative, and Innovative Behavior variables can be considered moderate.

Table 5. F-square Result

Relationship between influences	f-square
Collaborative Behavior -> Work Productivity	0.040
Creative Behavior -> Work Productivity	0.093
Empowering_Leadership -> Collaborative Behavior	0.490
Empowering_Leadership -> Creative Behavior	0.347
Empowering_Leadership -> Innovative Behavior	0.267

Source: Smart-PLS results, 2024

The R-square and Q-square analyses in the SEM-PLS model demonstrate both the explanatory and predictive performance of the model. The R-square values show moderate explanatory power for collaborative behavior (0.329), creative behavior (0.258), and innovative behavior (0.211), with work productivity exhibiting the highest explanatory power at 0.402. These values indicate that the model explains a moderate level of variation in the dependent variables, though some variation remains unexplained, suggesting that additional factors may contribute to the variability. The Q-square values further reflect the model's predictive capabilities. Collaborative behavior shows the strongest predictive ability with a Q^2predict value of 0.310, indicating that the model can explain approximately 31% of its variation. Creative behavior and innovative behavior follow with predictive abilities of 23.1% and 19.1%, respectively, while work productivity shows the lowest predictive power at 12.9%. These results confirm the model's ability to predict the endogenous variables, though the predictive performance varies across the constructs.

Table 6. R Square and Q Square

Research Variables	R-Square	Adj. R-Square	Q^2predict	RMSE	AAE
Collaborative Behavior	0.329	0.326	0.310	0.849	0.591
Creative Behavior	0.258	0.255	0.231	0.892	0.673
Innovative Behavior	0.211	0.208	0.191	0.914	0.669
Work Productivity	0.402	0.395	0.129	0.943	0.724

Source: Smart-PLS results, 2024

4.1.5 Model Fit

The standardized root mean square residual (SRMR) measures the goodness-of-fit between the theoretical model and observed data, with values below 0.08 indicating a good fit. In this study, the SRMR value of 0.070 for the saturated model demonstrates alignment with empirical data. Other fit indices, including d_ULS, d_G, Chi-square, and NFI, also favor the saturated model over the estimated model. These results collectively confirm the robustness of the proposed theoretical framework, indicating a superior fit of the saturated model to the data.

Table 7. Model Fit Test

Criteria	Saturated model	Estimated model
SRMR	0.070	0.175
d_ULS	0.931	5.813
d_G	0.394	0.616
Chi-square	635.072	812.160
NFI	0.842	0.798

Source: Smart-PLS results, 2024

4.2 Result

4.2.1 Empowering Leadership Toward Positive Worker Behavior

The results showed that empowering leadership positively affects creative, collaborative, and innovative behavior. This research proves empowering leadership can produce positive employee behavior (Fraboni et al., 2023). Empowering leadership provides a sense of trust, collaboration, and a focus on improving the skills of organizational members (Joo et al., 2023; Kim & Beehr, 2021). This kind of leadership can also strengthen employee innovation and creation because employees are encouraged to explore outside the conventional paradigm and take calculated risks (Alam et al., 2023; Cooper, 2021). Based on its characteristics, empowering leadership can facilitate collaboration among followers, which also affects how they work by encouraging supportive behaviors toward colleagues, which helps workers stay more focused and reduce distractions and errors at work (Edelmann et al., 2020; Han, 2022). Empowering leadership often encourages subordinates to collaborate with coworkers and seek opportunities to learn and grow (Mutonyi et al., 2020; Slåtten et al., 2020). Employees are encouraged to support each other by giving them authority and overcoming difficulties cooperatively. Employees are more likely to help and cooperate with their coworkers when they believe leaders collectively empower them (Arshad et al., 2021; Slåtten et al., 2020). Empowering leadership can foster a climate of cooperation and encourage them to solve existing problems by collaborating with others, which increases employees' feelings that they are supported (Hayat Bhatti et al., 2021; Roberge & Boudrias, 2021; Salas-Vallina et al., 2021).

Giving autonomy to employees allows them to explore new ideas without fear of failure (Manuoglu, 2023). This can encourage them to take risks and think critically (Guo & Zhang, 2024). The trust provided by empowering leaders can increase employees' confidence in their ability to generate creative ideas and encourage employees to continue learning and developing themselves (Anwar & Humayun, 2023; Zhang et al., 2018). Empowering leadership creates an inclusive environment where all employees feel valued and listened to (Appelbaum et al., 1999; Randel et al., 2018). This can encourage them to actively contribute to the collaboration process and encourage open and transparent communication between employees, which can help them understand each other's ideas and work together more effectively (Beck et al., 2022).

4.2.2. Positive Worker Behavior Toward Work Productivity

This study shows that creative behavior has a positive effect on work productivity. Previous studies indicate that creative behavior can significantly improve performance. Work done with a high level of creativity positively impacts work productivity (Baum et al., 1995). In addition, creative work behaviors improve the performance of knowledge workers, thereby increasing the organization's overall work productivity (Davenport, 2005; Muñoz-Pascual & Galende, 2020). This indicates that employee creativity has become essential for organizational survival. The research results also

found that collaborative behavior positively affects work productivity. A collaborative organizational culture is a crucial element that increases work productivity and job satisfaction (Sulastri, 2023). To improve a culture of collaboration, organizations must set clear goals, ensure open communication, provide honest feedback, and recognize individual and team contributions. Training in collaboration skills such as listening, negotiating, and resolving conflicts is also essential to encourage positive collaborative behaviors and improve work productivity (Boryshkevych & Yakubiv, 2023). Collaboration can help quickly solve problems in an organization because it is resolved from many perspectives (Bennett & Gadlin, 2012; Huxham & Vangen, 2004) and increase work productivity (G. Tang et al., 2020).

This study found different results from previous research on the effect of innovative behavior on work productivity. Innovative behavior does not necessarily have a positive impact on employee work productivity. In the context of workers in Indonesia, employees who innovate will be given excessive workloads because they are considered capable of being the primary foundation for the organization. In addition, generating new ideas and implementing them in the world of work requires higher adaptation and effort, which will drain the energy of an employee. Furthermore, seniority in the work environment hinders innovation and increased work productivity. Seniority can be interpreted as an employee with higher income, age, work experience, and length of work in a company. Employees are reluctant to innovate and increase work productivity because of seniority, which will cause social jealousy. Another thing that inhibits employees' innovative behavior in increasing their work productivity is the need for more appreciation for the employees concerned when they have innovated. This will result in a decrease in enthusiasm and motivation to work. The employee is reluctant to improve performance because superiors need to appreciate their new ideas. So, in the end, the employee's innovation decreases, and work productivity does not increase. Therefore, it is necessary to reward employees who have innovated and found new ideas to solve problems or improve the quality of a company. Rewards given to employees will create a supportive work culture that will increase creativity and innovative behavior for employees (Mdhlalose, 2024).

5. Conclusion

5.1 Theoretical Implications

This study provides significant theoretical contributions to by offering deeper insights into the relationship between Empowering Leadership and Work Productivity through the mediating roles of Creative Behavior, Collaborative Behavior, and Innovative Behavior. The findings confirm that Empowering Leadership enhances Creative Behavior and Collaborative Behavior, both of which positively influence work productivity, while Innovative Behavior does not exhibit a significant direct effect on productivity. These results align with previous studies highlighting the importance of leadership styles in fostering behaviors that drive organizational success (Hassi et al., 2022; Hoang et al., 2021).

Moreover, this study integrates the Stimulus-Organism-Response (S-O-R) framework, extending its application to the domain of leadership and employee productivity. This theoretical perspective enriches the understanding of how leadership functions as a stimulus, employee behaviors as organisms, and productivity as the response. These contributions provide a robust foundation for future research exploring variables such as organizational identification, psychological empowerment, and affective commitment as part of the dynamic interplay between leadership and employee outcomes (Al Harbi et al., 2019; Roberge & Boudrias, 2021; Srimulyani et al., 2023).

To address contributions to the human resource literature, this study also provides valuable insights into the mediating factors between Empowering leadership and work productivity. By identifying and examining the roles of creative behavior, collaborative behavior, and innovative behavior, this research clarifies the pathways through which empowering leadership influences work productivity. The analysis demonstrates that creative and collaborative behaviors mediate the relationship, indicating that leadership practices designed to empower employees are most effective when they encourage these behaviors. However, the absence of a significant direct effect from innovative behavior on productivity suggests that innovation may require additional contextual or organizational factors to be fully realized. These findings underscore the importance of understanding not only the direct effects of empowering leadership but also the indirect influences that emerge through employee behaviors, offering a more nuanced view of how leadership strategies can be designed to enhance productivity in diverse organizational settings. This contribution enriches the human resource literature by emphasizing the mediating mechanisms that underpin the empowering leadership-productivity link, which has been underexplored in prior studies.

5.2 Managerial Implications

The findings of this study have important practical implications for organizations aiming to enhance productivity through leadership strategies. The results demonstrate that empowering leadership fosters creative behavior, collaborative behavior, and innovative behavior, which collectively contribute to work productivity. Based on these findings, recommendations are proposed. Firstly, related to the improvement of the Develop Leadership Training Programs, we find that empowering leadership enhances employees' creative, collaborative and innovative behavior, which are critical drivers of productivity. Therefore, organizations should implement comprehensive training programs

that focus on developing empowering leadership qualities among managers. These programs should emphasize skills such as delegating authority, fostering employee autonomy, and building trust within teams. Empowering leadership has been shown to enhance employees' creative and collaborative capacities, which are critical drivers of productivity (Ahearne et al., 2005; G. Tang et al., 2020).

Secondly, related to promoting a culture of collaboration and innovation, we find that empowering leadership fosters a climate of collaboration and encourages employees to work together, which in turn enhances work productivity Accordingly, to enhance collaborative and innovative behaviors, organizations should establish systems that encourage open communication, cross-functional teamwork, and the exchange of ideas (Chen et al., 2011; Kim & Beehr, 2021). Examples include creating innovation labs, organizing collaborative workshops, and integrating team-based reward systems that recognize collective achievements.

Thirdly, related to implementing the recognition and incentive mechanisms, our finding reveal that creative and collaborative behavior enhance work productivity Thus, organizations must ensure that creative and collaborative efforts are appropriately recognized and rewarded. Formal mechanisms, such as performance-based bonuses or innovation awards, and informal methods, like verbal recognition and peer nominations, can sustain employee motivation and engagement (Koelewijn et al., 2018; Mdhlalose, 2024; Naz et al., 2020).

Lastly, related to addressing contextual challenges, we find that innovative behavior is not significantly related to work productivity in Indonesian workers. For this reason, leaders should be mindful of contextual factors, such as cultural dynamics and organizational hierarchies, which may influence the effectiveness of empowering leadership. For example, excessive workloads or a lack of recognition for employee contributions can hinder the positive effects of innovative behavior (Khan et al., 2020; Rehman et al., 2019). Organizations should strive to balance workloads and foster an inclusive culture that values employee contributions at all levels. By aligning leadership practices with these recommendations, organizations can enhance work productivity and contribute to achieving Sustainable Development Goal (SDG) 8, which emphasizes inclusive economic growth, decent work, and improved labor productivity.

5.3 Limitations and Future Research

This study is limited by its focus on Indonesian workers and does not differentiate across industries or work institutions. Future research could address this limitation by expanding the scope to include workers from different sectors and cultural backgrounds (Muneer et al., 2025), offering more generalized insights into the effects of empowering leadership across various contexts. Additionally, the use of purposive sampling means that the results may not fully represent the broader population, thus further studies with more representative samples would be beneficial (Andrade, 2021). Moreover, future research could explore the psychological and social mechanisms through which empowering leadership affects employee behavior, particularly examining how variables like self-confidence (Kundu et al., 2019), motivation (O'Donoghue & Van Der Werff, 2022), and perceived organizational support (Pazetto et al., 2023) mediate the relationship between leadership and productivity. Further investigations could also assess the role of honest feedback and reward systems in boosting innovation and morale, which are key to fostering a collaborative work culture (Vemuri, 2024). Finally, given the potential cultural differences in the effectiveness of empowering leadership, future studies could compare the impact of this leadership style in various countries or cultural contexts, with a particular focus on how social norms, hierarchy, and individualism versus collectivism shape the application and outcomes of this leadership approach.

Acknowledgment

We would like to thank the Lembaga Penelitian dan Pengabdian Universitas Siliwangi, for their financial support and all the contributors who helped in this study.

Author Contribution

Author 1: concept conceptualization, theory development, methodology, discussion and conclusion in this paper.
Author 2: research project administration and data analysis.
Author 3: questionnaire development and data tabulation.
Author 4: questionnaire development, proofreading, translating draft and editing manuscript.

Financial Disclosure

This article is unfunded and not associated with any funding agency.

Conflict of Interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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