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ORIGINAL SCIENTIFIC PAPER

The Mediating Effect of Authentic Leadership on the Relationship between Self-leadership and Work-related Stress, Moderated by Gender

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A B S T R A C T

Leadership styles, self-leadership, work stress, and gender have received increasing attention in research due to their influence on individual performance; however, their impact on personal development processes has not yet been sufficiently explored. The objective of this study was to evaluate the mediating effect of authentic leadership and the moderating effect of gender on the relationship between self-leadership and work stress. To test the hypotheses, the partial least squares structural equation modeling (PLS-SEM) approach was employed in a sample of participants from a Latin American country (Peru). The results indicated that self-leadership had a significant negative effect on job stress and a significant positive effect on authentic leadership. Likewise, authentic leadership showed a significant negative effect on job stress. Moreover, it was found that authentic leadership partially mediated the relationship between self-leadership and work-related stress. Finally, the moderating role of gender was

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confirmed, revealing that the relationship between self-leadership and work-related stress was stronger among women than among men. These findings expand the literature on leadership and work-related stress by offering practical implications for designing organizational strategies to strengthen self-leadership, taking into account gender differences in their effectiveness.

KEYWORDS: *self-leadership, work-related stress, authentic leadership, gender*

Introduction

The current organizational environment is characterized by a growing demand for identifying elements that drive the achievement of institutional goals. As a result, organizations expect leaders with high levels of integrity, consistent with the values they promote, generating trust and fostering healthier work environments that have a direct impact on individual and organizational well-being (Pandey, 2025). Among these elements, we can identify self-leadership, authentic leadership, work-related stress, and the influence of gender on self-leadership and goal achievement.

In this process through which individuals self-regulate and motivate themselves to direct their behavior, emotions, and decision-making toward achieving goals, we identify self-leadership (Hukla & Shaheen, 2024). This construct goes beyond the traditional conception of leadership, which focuses exclusively on influencing others (Knotts et al., 2022). It is also important to note that self-efficacy is task-specific, with results varying across activities (Koca et al., 2024).

An important factor that emerges in the literature is authentic leadership, which, through an attitude of sincere acknowledgment of one's own weaknesses and mistakes and a pursuit of positive personal development, enhances interaction with members of the organization (Lho et al., 2026). However, employee performance is also influenced by a set of interrelated factors, such as stress, job satisfaction, motivation, leadership, commitment, and organizational culture (Czerw et al., 2025).

The literature indicates that self-leadership contributes to performance and the reduction of work-related stress primarily through the structuring function of goal-setting. Likewise, autonomy acts as a protective factor against stress, improving control over one's own decisions and helping to cope with work demands (Bäcklander et al., 2019). We found a study in Africa, in the academic setting, in which women face structural barriers and

demands that affect their professional development; in this regard, self-leadership emerges as a key resource for strengthening resilience and sustaining productivity in the face of such inequalities (Krampitz et al., 2023; Naveed et al., 2026).

The present study aims to contribute to the literature by conducting an integrated analysis of the mediating effect of authentic leadership on the relationship between self-leadership and work-related stress, and the moderating effect of gender on this relationship, taking into account the differential influence of gender on leadership experiences and behaviors. Grounded in social cognitive theory (Bandura, 1986), resource conservation theory (Hobfoll, 1989), and self-determination theory (Ryan & Deci, 2000a), the study articulates an explanatory framework that integrates cognitive, motivational, and stress management processes. Moreover, from an applied perspective, the research focuses on the Peruvian business context, characterized by specific social and cultural dynamics that shape leadership practices and workplace well-being.

Theoretical Framework and Conceptual Development

Theoretical Framework

The study explores the relationship between three key constructs: authentic leadership, self-leadership, and work-related stress. Self-leadership, through self-reflection and self-control, increases self-efficacy by strengthening self-regulation and intrinsic motivation, facilitating stress management, adaptation to change, and persistence in the face of challenges (Ndiango et al., 2023; Shafique et al., 2023; Khan et al., 2023). This relates to self-determination theory, which explains human motivation by exploring both intrinsic and extrinsic factors and identifying three basic psychological needs: autonomy, competence, and relatedness (Ryan & Deci, 2000b).

Authentic leadership, based on self-awareness, relational transparency, balanced processing, and an internalized moral perspective, contributes to the creation of positive organizational climates that foster employee engagement (Walumbwa et al., 2008). Studies show that authentic leadership and self-leadership foster self-regulation, authenticity, and personal development in educational and workplace contexts (Kringelum et al., 2023; Schoofs et al., 2024). These factors are linked to Bandura’s theory

(1986), which posits that individuals can influence their own motivation and behavior.

Work-related stress arises when job demands exceed the worker's resources and capabilities, and it intensifies in the face of low levels of social support and limited control over work tasks (Goldsby et al., 2020). This argument is supported by Hobfoll's Conservation of Resources (COR) theory, which posits that stress occurs when individuals lack sufficient resources to meet environmental demands, whereas adequate resources help them cope more effectively with work-related challenges (Hobfoll, 1989).

According to Zhao and Wang (2025), self-leadership capabilities differ between men and women. The literature also notes that gender can affect decision-making, emotional regulation, and access to leadership positions, leading to persistent inequalities in the representation of women in senior management roles (Antonijević et al., 2022).

Although these constructs have been extensively analyzed in other contexts, either individually or in relation to other variables, their integrated effect remains insufficiently explored, particularly in Latin American countries. This section analyzes how the interaction between these constructs contributes to individual and organizational outcomes.

Relationships between Constructs and Hypotheses

Self-Leadership and Work Stress

Several studies suggest that self-leadership can help reduce stress levels by shaping how people evaluate stressful situations, though its impact on stress and performance is based on goal attainment (Bäcklander et al., 2019). Evidence suggests that when faced with high-pressure work situations, people may require more complex cognitive self-leadership strategies, and that these techniques may not be usable in such contexts (Goldsby et al., 2020).

According to Van Zyl (2008), when work-related stress reaches high levels, people tend to react more negatively and perceive stressors as threats, which hinders the effective use of their self-leadership skills and strategies. These authors highlight the need to expand research on self-leadership in order to better understand its potential across different professional and cultural contexts, as most research is currently based in the US and the UK.

Self-leadership enables people to orient themselves toward their own objectives through goals they consider meaningful and set for themselves,

helping them tackle necessary tasks even when they are unpleasant (Knotts et al., 2022). Therefore, future theoretical models should recognize the significant role of self-leadership in performance (Furtner, Liegl & Klösel, 2025); consequently, Hypothesis 1 was formulated as follows:

H1: Self-leadership and work stress have a significant negative relationship.

Self-Leadership and Authentic Leadership

As stated by Junça-Silva and Camaz (2023), self-leadership requires high levels of self-discipline for individuals to regulate and maintain their own motivation, which may carry potential risks of isolation or reduced collaboration. Moreover, its impact is shaped by cultural factors that influence its application across different contexts. Furthermore, this approach has gained greater relevance in relation to new leadership models, such as authentic, servant, emotional, participatory, and shared leadership. Authentic leadership, on the other hand, is grounded in transparency, ethical conduct, and alignment between personal values and organizational goals, thereby strengthening trust, commitment, and relationships within teams. However, this approach faces challenges in balancing transparency with strategic discretion and maintaining authenticity in changing environments (Heim et al., 2026).

Although the literature has not clearly defined this relationship, a study in South Africa's public sector found that self-leadership precedes authentic leadership in its four components, which are: self-awareness regarding strengths, weaknesses, and personal impact; relational transparency in expressing genuine emotions and thoughts; balanced processing in evaluating data objectively and considering divergent opinions; and internalized morality in acting according to one's own values in the face of external pressures (Kotze, 2016). This indicates that authentic leadership may not emerge in isolation, but rather as an extension of deeply internalized self-regulatory processes that shape how individuals interpret themselves and their interactions with others in organizational contexts.

Self-leadership fosters self-direction and motivation, which improves both individual and organizational performance. A study in the nursing field in China indicates that self-leadership and authentic leadership among managers are related to organizational culture and organizational silence. It also suggests that a broader review is still needed, considering work-related variables such as experience, work area, and work schedule, along with

personal, managerial, and organizational factors (Lho et al., 2026). From a theoretical perspective, self-leadership can be conceptualized as a higher-order self-regulatory capability that enables individuals to develop consistency among internal values, cognitions, and behaviors, thereby constituting a necessary psychological foundation for the enactment of authentic leadership. Therefore, Hypothesis 1 was formulated as follows:

H2*:* Self-leadership and authentic leadership have a positive and significant relationship.

Authentic Leadership and Work-related Stress

Czerw et al. (2025) argue that organizations that practice authentic leadership, as well as fair rewards as part of their organizational culture, foster an environment of trust across hierarchical levels, such as supervisors and coworkers, which influences job satisfaction and low stress levels among employees. Empirical evidence indicates that authentic leadership contributes to reducing work-related stress and burnout, but that there are also direct or indirect effects on stress and burnout reduction (Adil & Kamal, 2020). Despite advances in the understanding of authentic leadership, further research is still needed on how this style influences the management of work-related stress, and various authors note that this relationship still requires a more comprehensive theoretical and empirical analysis (Allssyah & Buntuang, 2025).

From a socio-psychological perspective, authentic leadership reduces work-related stress by enhancing psychological safety, reducing role ambiguity, and strengthening employees' perceived control over their work environment. Its emphasis on transparency and balanced processing may also mitigate uncertainty and cognitive overload, which are well-established antecedents of occupational stress. Therefore, Hypothesis 3 was formulated as follows:

H3*:* Authentic leadership and work-related stress have a significant negative relationship.

Mediating Effect of Authentic Leadership between Self-leadership and Work-related Stress

Czerw et al. (2025) noted that, based on a study conducted in the Kingdom of Saudi Arabia, there is a positive relationship between authentic leadership and employee performance, thereby enhancing organizational

performance. Likewise, the literature indicates that in other cultural contexts, such as Europe, China, Nigeria, and Turkey, authentic leadership has a positive and significant mediating effect on the relationship between employee training and performance (Czerw et al., 2025; Mira & Odeh, 2019).

The literature highlights the influence of authentic leadership on self-leadership by fostering environments of trust and empowerment, helping people take responsibility for their actions and self-regulate their behavior (Schoofs et al., 2024). It also notes that self-leadership is linked to various leadership styles, such as authentic, servant, emotional, participatory, and shared leadership. This suggests that self-leadership serves as an antecedent self-regulatory mechanism that shapes how individuals construct their leadership identity, which in turn influences how leadership is enacted in interpersonal and organizational contexts.

Regarding work-related stress, studies demonstrate its mediating effect in relation to leadership styles, such as toxic and ethical leadership, highlighting the distinct influence each style exerts on employee well-being (Uysal, 2019). However, studies on authentic leadership point to the need to expand the analysis of its mediating role to other organizational processes (Mira et al., 2019). What's more, it is evident that the interaction of these three constructs has not yet been explored in Latin American countries

Integrating these perspectives, this study proposes a sequential mediation mechanism grounded in self-regulation and resource-based theories of leadership, whereby self-leadership enhances individuals' capacity for self-awareness, behavioral regulation, and value congruence, which facilitates the emergence of authentic leadership behaviors. In turn, authentic leadership serves as a relational and organizational mechanism that reduces perceived work-related stress by increasing trust, psychological safety, and clarity in workplace interactions. Therefore, Hypothesis 4 was formulated as follows:

H4: Authentic leadership mediates the relationship between self-leadership and work-related stress.

Gender Differences in the Relationship Between Self-Leadership and Work Stress

Studies show that women tend to benefit more from leadership practices that foster empowerment and confidence (Paustian-Underdahl et al., 2024; Teja & Loza, 2025). However, other studies have demonstrated

that women face disadvantages in the labor market, particularly in income, access to employment, and educational opportunities (Abdulla et al., 2024). From a self-regulation and resource-based perspective, self-leadership can be understood as a set of cognitive and behavioral strategies that enhance individuals' ability to manage emotions, cognition, and motivation in response to workplace demands, suggesting that its effectiveness in reducing work-related stress may depend on the extent to which individuals rely on internal regulatory resources versus external structural support.

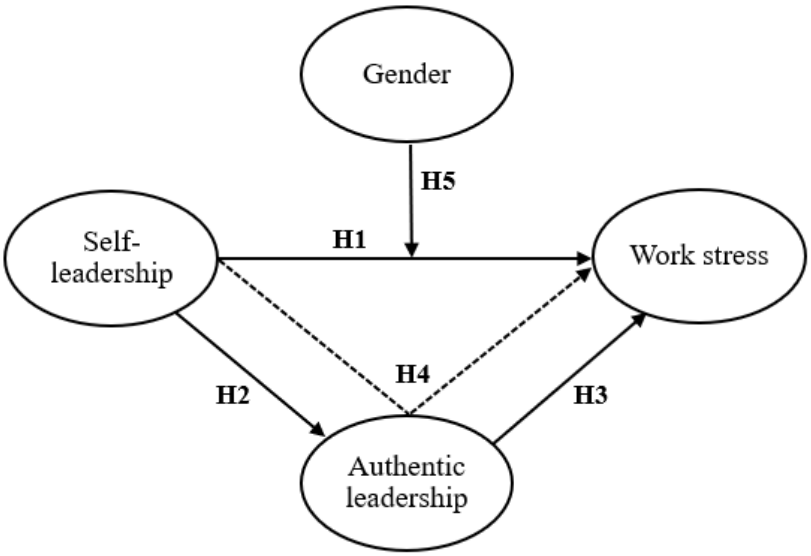
Ndiango (2025) argues that self-leadership capabilities can vary significantly between men and women. Moreover, a study conducted at public universities in Tanzania indicates that gender acts as a mediating factor between self-leadership and research productivity. There is also evidence in the field of education that women in leadership positions are more prone to work-related burnout. Similarly, Teja & Camino (2024) reported that the effects of psychological capital in reducing work stress are higher among women. In this sense, gender may operate as a critical boundary condition because men and women often experience different patterns of occupational stressors, role expectations, and access to organizational resources.

However, it is still unclear how gender differences affect the relationship with self-leadership (Ndiango, 2025). There is a need to expand studies on the moderating role of gender in high-stress contexts and other factors, such as geographic distribution. In contexts where women face greater role overload, emotional demands, and structural constraints in the labor market, self-leadership may serve as a more salient psychological coping mechanism that compensates for external resource limitations. Specifically, self-leadership may be more strongly associated with stress reduction among women because it enhances perceived control, self-efficacy, and cognitive reframing abilities, which are particularly relevant in environments characterized by unequal access to organizational support and higher exposure to work–family conflict. In the Peruvian labor context, such structural inequalities in employment conditions, income distribution, and occupational segregation may further intensify these gendered differences, making internal self-regulatory mechanisms such as self-leadership more influential for women's psychological adjustment in the workplace. Based on this evidence, the following hypothesis is proposed:

H5: Gender moderates the relationship between self-leadership and work-related stress.

Finally, Figure 1 shows the research hypotheses.

Figure 1: Theoretical model



Note: Solid arrows denote direct effects, dashed arrows denote mediating effects, and the arrow originating from Gender indicates a moderating effect on the proposed relationship.

Source: Prepared by the author.

Methodology

Data Collection

The study population consisted of 712 large and medium-sized Peruvian service companies identified from official business registries, using a non-probabilistic screening to ensure inclusion of firms meeting size and sector criteria. The sample comprised 101 valid responses, collected from firms that agreed to participate after initial contact via email and telephone invitations, with 53% from the service sector, 22% from manufacturing, and 25% from the commercial sector, reflecting a heterogeneous distribution across key economic sectors of the Peruvian economy. Of the respondents, 58% were men and 42% were women. The final response rate was approximately 14.2%.

To determine the minimum size of the probabilistic sample, two criteria were considered. The first was based on simple random sampling, with a confidence interval of 2.5 standard deviations (95.5%), the most unfavorable possible scenario (p=q=50), and a sampling error of ±5%. The second was determined using PLS-SEM, for which a sample size of 100 to 200 is sufficient (Hoyle, 1995). Therefore, the sample size is sufficient to validate the hypotheses and extrapolate the results. Data were collected through structured questionnaires administered to managers and employees with direct knowledge of organizational practices, who were recruited using a purposive contact strategy and invited to participate voluntarily.

Table 1: Sociodemographic characteristics of the sample

Characteristic	Frequency	Percentage
Gender		
Female	42	42
Male	59	58
Age		
20–30	15	14
31–40	49	49
41–50	29	29
51 and over	8	8
Role in the organization		
Senior management	12	12
Middle management/Supervisor	64	63
Non-managerial (Technician/Professional)	25	25
Sector		
Commercial	25	25
Manufacturing	22	22
Services	54	53
Type		
Private	94	93
Public	7	7
Total	101	100

Source: Prepared by the author

The research instrument consisted of a closed-ended questionnaire with 43 items reflecting individuals' perceptions of the research variables. To measure self-leadership, the nine-item questionnaire proposed by Houghton & Neck (2002) was used. Regarding work-related stress, the questionnaire

proposed by Cohen et al. (1983), consisting of 14 questions, was administered. For authentic leadership, the questionnaire by Walumbwa et al. (2008) was used, which includes four dimensions: self-awareness (5), relational transparency (5), balanced processing (5), and internalized moral perspective (5). All items were measured on a five-point Likert scale (1 = strongly disagree, 5 = strongly agree).

Data Analysis

The study employed structural equation modeling using the partial least squares method (PLS-SEM) to test the research hypotheses. The choice of PLS-SEM, rather than a covariance-based approach (CB-SEM), is primarily based on methodological considerations related to sample size, the presence of formative constructs, and moderation effects (Hair et al., 2018). In particular, PLS-SEM is more suitable for moderate-sized samples, as it does not impose strict assumptions of multivariate normality. Furthermore, this approach is especially relevant when the model includes higher-order constructs and moderating effects, as is the case in the present study with authentic leadership and gender.

The application of PLS-SEM followed the procedure and methodological recommendations proposed by Hair et al. (2021), which involved the sequential evaluation of the measurement model and the estimation of the structural model. On the other hand, authentic leadership was conceptualized as a higher-order construct with a reflective-formative specification. For its estimation, the disjoint two-stage approach was applied, following the procedure established by Sarstedt et al. (2019). In analyzing the moderating effect of gender, a two-stage approach was used. This procedure reduces collinearity and improves the stability of the estimates by constructing the interaction term using the latent scores obtained in the first stage. Data analysis was conducted using SmartPLS 4 software.

Results

Evaluation of the Measurement Model

The first stage involved evaluating the measurement model, beginning with the reflective constructs. The initial model estimation, including all indicators, revealed that some indicators had external loadings below the

recommended threshold. In particular, indicators SA5 and IMP5 had loadings below 0.40 and were excluded from the model. Table 2 presents the results for indicator reliability, internal consistency, and convergent validity. In particular, the external loadings of the remaining indicators were above 0.70, meeting the commonly accepted criterion. Only item IMP2 showed a loading slightly below 0.70. However, it was decided to retain it in the model since its removal did not improve convergent validity. Regarding internal consistency reliability, both Cronbach's alpha and composite reliability exceeded the recommended minimum threshold of 0.70 for all constructs.

Finally, the average variance extracted (AVE) was above 0.50 in all cases, confirming the convergent validity of the measurement model.

Table 2: Reliability and Convergent Validity

Construct	Indicator	External loading	Cronbach's alpha	Composite reliability	AVE
Work-related stress	WS1	0.891	0.969	0.972	0.713
	WS2	0.891			
	WS3	0.705			
	WS4	0.870			
	WS5	0.829			
	WS6	0.886			
	WS7	0.835			
	WS8	0.783			
	WS9	0.793			
	WS10	0.882			
	WS11	0.845			
	WS12	0.882			
	WS13	0.863			
	WS14	0.846			
Self-Leadership	SL1	0.860	0.949	0.957	0.710
	SL2	0.844			
	SL3	0.855			
	SL4	0.879			
	SL5	0.752			
	SL6	0.850			
	SL7	0.812			
	SL8	0.873			
	SL9	0.853			
	SA1	0.792	0.785	0.860	0.607

Construct	Indicator	External loading	Cronbach's alpha	Composite reliability	AVE
Self-awareness	SA2	0.703			
	SA3	0.869			
	SA4	0.743			
	SA5	-			
Internalized moral perspective	IMP1	0.767	0.764	0.848	0.584
	IMP2	0.675			
	IMP3	0.760			
	IMP4	0.844			
	IMP5	-			
Balanced processing	BP1	0.773	0.832	0.881	0.597
	BP2	0.772			
	BP3	0.805			
	BP4	0.806			
	BP5	0.701			
Relational transparency	RT1	0.803	0.860	0.899	0.641
	RT2	0.752			
	RT3	0.873			
	RT4	0.716			
	RT5	0.848			

Source: Prepared by the author

Two complementary criteria were used to assess discriminant validity: the Fornell and Larcker criterion (1981) and the HTMT index (Henseler et al., 2019). Table 3 presents the corresponding results. The main diagonal reports the square roots of the AVE for each construct, while the values below the diagonal correspond to the correlations between constructs. The HTMT values are presented above the diagonal. According to Fornell and Larcker's criterion, discriminant validity is established when the square root of the AVE for each construct is greater than its correlations with the other constructs in the model. As shown in Table 3, in all cases, the diagonal values exceed the corresponding correlations. On the other hand, all HTMT values are below the 0.90 threshold. Taken together, the results obtained using both criteria confirm the discriminant validity of the measurement model.

Table 3: Discriminant validity

Construct	WS	SL	SA	IMP	BP	RT
WS	0.844*	0.562[b]	0.395[b]	0.130[b]	0.277[b]	0.380[b]
SL	0.550[a]	0.843*	0.339[b]	0.132[b]	0.151[b]	0.335[b]
SA	0.360[a]	0.306[a]	0.779*	0.542[b]	0.299[b]	0.525[b]
IMP	-0.087[a]	-0.102[a]	0.403[a]	0.764*	0.150[b]	0.343[b]
BP	0.257[a]	0.131[a]	0.230[a]	-0.007[a]	0.773*	0.217[b]
RT	0.367[a]	0.318[a]	0.431[a]	0.258[a]	0.163[a]	0.800*

Note: [a] correlation, [*]square root of AVE, [b] HTMT value.

Source: Prepared by the author

The next step in the analysis involved evaluating the second-order formative construct corresponding to authentic leadership. According to the disjoint two-stage approach, in the first stage, the first-order constructs were estimated, and their latent scores were extracted. In the second stage, these scores were incorporated as indicators of the second-order authentic leadership construct, allowing for its estimation under a formative specification.

Subsequently, the multicollinearity among the formative indicators was evaluated, as well as the significance and relevance of their external weights. Table 4 presents the corresponding results. First, the variance inflation factor (VIF) values were below the conservative threshold of 3, indicating no critical multicollinearity. Regarding the evaluation of the external weights, the results indicate that IMP, RT, and SA have positive and statistically significant weights, consistent with theoretical expectations. These findings confirm that these dimensions contribute substantially to the development of authentic leadership. However, the BP dimension had a non-significant external weight, suggesting that its contribution to the construct is not statistically significant. Nevertheless, its VIF values remain within acceptable levels, indicating that its inclusion does not introduce multicollinearity.

Overall, the results support the adequate psychometric quality of the reflective and formative constructs and allow us to proceed with estimating the structural model.

Table 4: Collinearity and significance

Variation	VIF	External weight	Std. Dev.	T-statistic	p-value
BP → AL	1.077	0.161	0.130	1.245	0.213
IMP→ AL	1.225	0.592	0.184	3.218	0.001
RT → AL	1.250	0.547	0.214	2.564	0.010
SA → AL	1.447	0.645	0.284	2.271	0.023

Source: Prepared by the author

Estimation of the Structural Model

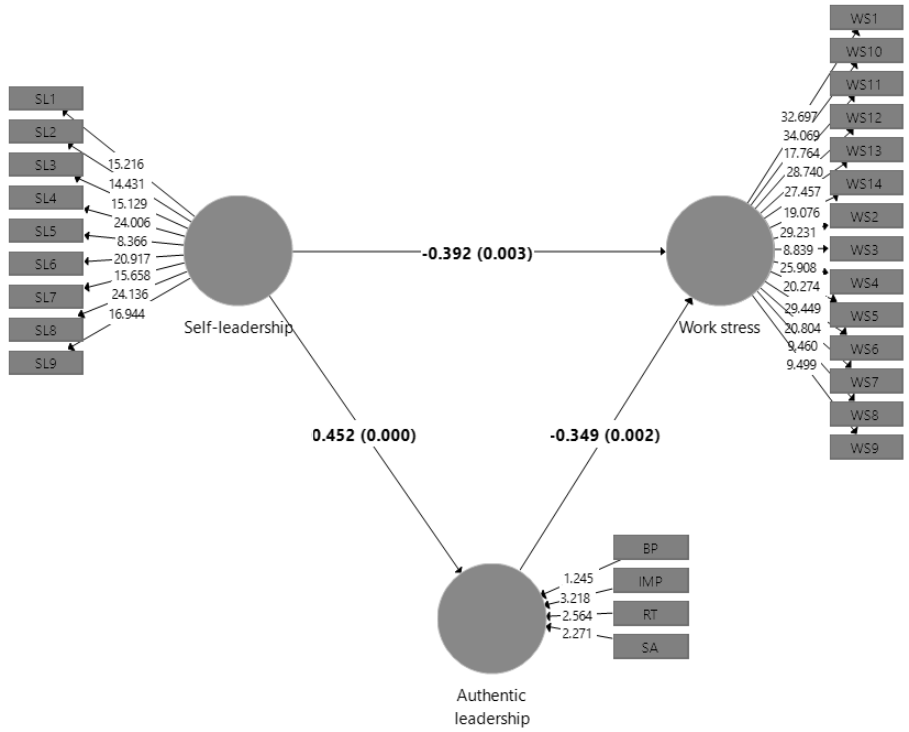
After evaluating the measurement model, we estimated the structural model to test the research hypotheses. We used a bootstrapping procedure with 10,000 repetitions, which yields robust standard error estimates. The results of the structural analysis are presented in Table 5. First, the relationship between self-leadership and work-related stress was negative and statistically significant ($\beta = -0.392$; $p = 0.003$), confirming the first research hypothesis. Second, the relationship between self-leadership and authentic leadership was also positive and significant ($\beta = 0.452$; $p < 0.001$), confirming the second research hypothesis. Likewise, the relationship between authentic leadership and job stress was negative and significant ($\beta = -0.349$; $p = 0.002$), confirming the third research hypothesis. Regarding the mediation analysis, the indirect relationship between self-leadership and job stress through authentic leadership was negative and significant ($\beta = -0.158$; $p = 0.018$), confirming the fourth research hypothesis. This result demonstrates the existence of a mediating mechanism, indicating that part of the relationship between self-leadership and job stress is mediated by authentic leadership. Finally, the gender interaction effect on the relationship between self-leadership and job stress was negative and statistically significant ($\beta = -0.190$; $p = 0.044$), confirming a moderating effect. This finding suggests that the magnitude of the relationship between self-leadership and job stress varies by gender. Figure 2 presents the estimation results obtained in SmartPLS.

Table 5: Bootstrapping results

Relationship	VIF	Path Coefficient	Std. Dev.	T-statistic	p-value
SL → WS	1.213	-0.392	0.133	2.961	0.003
SL→ AL	1.000	0.452	0.105	4.306	0.000
AL → WS	1.213	-0.349	0.111	3.154	0.002
SL→ AL → WS	-	-0.158	0.066	2.386	0.017
SL→ Gender→ WS	1.044	-0.190	0.095	2.011	0.044

Source: Prepared by the author

Figure 2: SmartPLS results

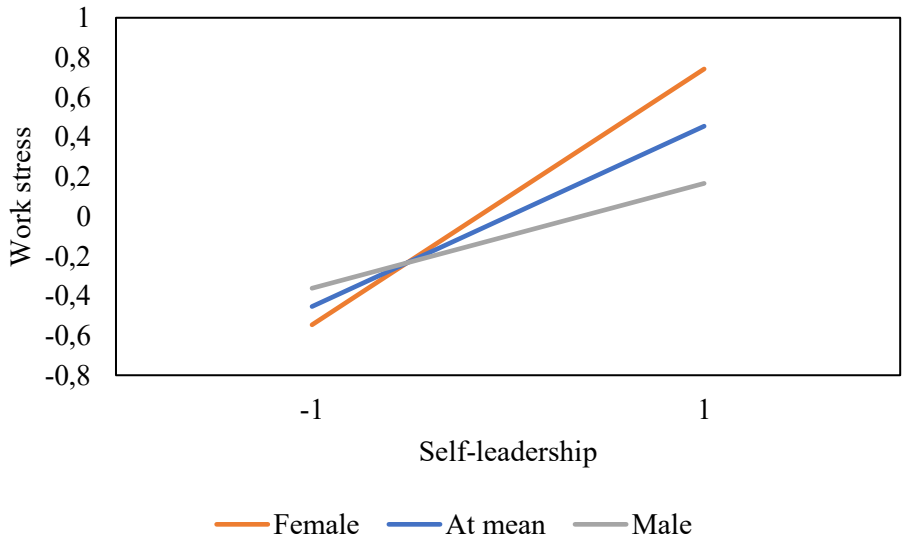


Source: Prepared by the author

Once the presence of the gender moderating effect has been established, the next step is to interpret the nature of this moderation. In the analysis of models with interaction effects, this evaluation is commonly performed using a simple slope plot, such as the one presented in Figure 3. Figure 3 shows the relationship between self-leadership and work-related

stress, differentiated by gender, with estimated slopes for each group. The horizontal axis shows the levels of self-leadership, while the vertical axis shows the levels of work-related stress. The lines corresponding to each group allow us to visualize how the strength of the relationship between the variables varies by gender. Upon analyzing the graph, it is observed that the slope for the group of women is steeper than that for men. This indicates that the relationship between self-leadership and work-related stress is stronger in women than in men. Therefore, these results confirm the fifth research hypothesis, demonstrating that the association between self-leadership and work-related stress is significantly greater among women. Overall, the results of the structural model empirically support the proposed hypotheses and confirm both the direct effects and the indirect and moderating effects proposed in the theoretical model.

Figure 3: Slope plot



Source: Prepared by the author

The final step of the analysis involved evaluating the model's explanatory and predictive power. Regarding explanatory power, the coefficient of determination was calculated. Specifically, the WS construct had a coefficient of determination of 0.438. This value can be considered moderate, suggesting that the model captures a significant proportion of the construct's variability. As for the model's predictive power, it was evaluated

using the Q-squared statistic, as well as the RMSE and MAE error metrics. The Q-squared statistic provides evidence of the out-of-sample predictive power of the endogenous constructs, with values greater than zero indicating significant predictive power. Meanwhile, RMSE and MAE are measures of discrepancy between observed and predicted values. Both are calculated using PLS and linear regression (LM). The results obtained are presented in Table 6. It can be seen that all Q-squared values are positive, confirming that the model possesses adequate predictive power for the indicators of work-related stress. Regarding RMSE and MAE, the values calculated for the PLS model are generally lower than those of LM, suggesting that estimation using PLS offers superior predictive power compared to the linear method. In conclusion, the results allow us to affirm that the model not only explains a significant proportion of the variance in work-related stress but also possesses out-of-sample predictive power, reinforcing the validity of the structural model and its utility for interpreting the relationships between the constructs.

Table 6: Predictive power

Indicator	Q-square	PLS		LM	
		RMSE	MAE	RMSE	MAE
WS1	0.189	0.858	0.708	0.895	0.723
WS2	0.166	0.825	0.691	0.860	0.727
WS3	0.188	0.785	0.657	0.815	0.681
WS4	0.245	0.806	0.658	0.831	0.673
WS5	0.208	0.855	0.678	0.937	0.736
WS6	0.177	0.800	0.688	0.779	0.656
WS7	0.193	0.818	0.676	0.852	0.693
WS8	0.138	0.884	0.713	0.912	0.736
WS9	0.153	0.900	0.712	0.907	0.702
WS10	0.160	0.887	0.726	0.873	0.694
WS11	0.253	0.815	0.679	0.810	0.683
WS12	0.141	0.790	0.654	0.768	0.634
WS13	0.145	0.831	0.689	0.831	0.675
WS14	0.150	0.834	0.697	0.870	0.705

Source: Prepared by the author

Discussion

The results from PLS-SEM provide relevant theoretical and empirical contributions to the literature on leadership and workplace well-being.

First, the findings reveal a significant negative relationship between self-leadership and work-related stress, which reinforces previous research highlighting self-leadership as a protective resource against stress (Bäcklander et al., 2019; Knotts et al., 2022) and linking it to self-determination theory (Ryan & Deci, 2000b). Second, the positive and significant relationship between self-leadership and authentic leadership is confirmed, supporting the notion that the processes of self-direction, self-awareness, and self-regulation constitute a fundamental basis for employee motivation and behavior modification, thereby strengthening their development and commitment (Kringelum et al., 2023; Schoofs et al., 2024), a finding that aligns with social cognitive theory (Bandura, 1986). Furthermore, the results show a significant negative relationship between authentic leadership and work-related stress, reinforcing previous studies on the negative effects of authentic leadership on stress and work-related burnout (Adil & Kamal, 2020). This result relates to resource conservation theory (Hobfoll, 1989) and highlights the need for further studies on the effect of authentic leadership (Allssyah & Buntuang, 2025).

A key contribution of the study is confirming the partial mediating effect of authentic leadership on the relationship between self-leadership and work-related stress. This finding indicates that self-leadership not only has a direct effect on stress but also influences it indirectly through the development of authentic leadership practices, expanding the role of authentic leadership as a mediator in other organizational processes (Mira et al., 2019).

Finally, the study confirms the moderating effect of gender on the relationship between self-leadership and work-related stress, showing that this relationship is stronger among women than among men. This finding aligns with research indicating that, due to limiting contexts, women may experience an intensified impact of self-leadership on stress (Antonijević et al., 2022; Ndiango, 2025) and highlights the need for further studies in other contexts.

Conclusion

The results offer relevant practical guidance for managing leadership and workplace well-being in organizations. The development of self-leadership competencies such as self-management, self-direction, and self-regulation can help reduce stress levels among employees, provided it is implemented in a structured manner. Organizations should foster environments that reinforce healthy practices of authentic leadership to reduce the impact of workplace stress and strengthen employee engagement. Finally, the moderating effect of gender highlights the importance of developing more inclusive and gender-sensitive leadership practices to enhance organizational effectiveness. The results indicate that the relationship between self-leadership and work stress is stronger for women than for men, suggesting potential gender differences in how self-leadership is associated with stress outcomes.

The study has some limitations stemming from the research design, sample selection, and inferential methods used, which entailed unavoidable methodological compromises. Moreover, the relatively small sample size may limit the generalizability of the findings, although it remains adequate for PLS-SEM analysis. Additionally, the use of retrospective measures based on managers' perceptions may have introduced bias in the responses, a common limitation in similar research. However, these limitations do not affect the achievement of the stated objectives, as the results obtained allow for a more comprehensive understanding of the relationships among the constructs analyzed. Future research should continue to incorporate gender as a relevant analytical variable, given its influence on employee performance, and expand the analysis to include other leadership styles across different organizational and cultural contexts.

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