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The Role of Organizational Culture as a Mediating Variable between Transformational Leadership and Green Innovative Behavior

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A B S T R A C T
This study examines the relationship between transformational leadership (TL), organizational culture (OC) and green innovative behaviours (GIB) in the mediation model. Collected data from 128 ASN Respondents of the Pariaman City Government who work across 28 regional apparatus organizations. The findings confirm the positive relationship of TL to OC and GIB. In other words, OC does not affect GIB, nor is it a mediator for TL relationships with GIB. The results provide valuable recommendations for government leadership and stakeholders.

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INTRODUCTION

Economic and social development is the cause of the decline in environmental quality. Environmental sustainability is a homework for the government (Khan et al., 2022). Green innovation behaviour (GIB) is knowledge-based relevant to developing societies, such as sustainable products and services (Schaefer et al., 2023). he study of innovation is widely researched and associated with sustainable development (Sultana & Turkina, 2023). Green innovation can overcome environmental problems and increase company productivity (Malik et al., 2024). The Sustainable Development Goals are world regulations that must concern all (Hernawati & Tajib, 2024). As a regulator and implementer of development, the government must align all development plans with sustainable development goals to prevent environmental degradation that impacts the world's climate. According to previous research, employees at all functions and levels influence the organization (Singh et al., 2020). With a strong awareness of maintaining environmental sustainability, employees will actively improve the quality of the environment (Liu & Yu, 2023).

Many factors, including leadership and organizational culture, influence innovative behaviour. Leaders will have a certain impact on their members (Liu & Yu, 2023). Leadership also plays a role in predicting green innovation in the organization (Singh et al., 2020). Transformational leadership also promotes green innovation practices in manufacturing companies in China (Liu et al., 2022). In addition, organizational culture can also encourage the improvement of innovative behaviours that lead to eco-friendliness. The ability to innovate results from a strong and well-established organizational culture in information technology companies in Vietnam (Lam et al., 2021). reen organizational culture also strengthens the relationship of leadership style to the organization'sorganization's ability to innovate (Wang et al., 2022). However, research by Jaskyte (2004) found no correlation between leadership, organisational culture, and organisational innovation. Green organizational culture has no significant effect on innovative behaviour in Turkish companies (Küçükoğlu, 2018).

This research is vital because innovative behaviour research that is environmentally friendly is necessary in the context of government institutions to achieve sustainable goals on the world agenda. Based on the limitations of research on GIB and the gaps in previous research results, this study systematically describes the relationship of TL to GIB mediated by OC in the context of local governments in developing countries such as Indonesia. This study highlights the behaviour of civil servants to innovate for sustainability, suggesting the promotion of green innovative behaviours for leaders in the regions, ASN, and upcoming research. This research also aims to introduce a theoretical framework of GIB influenced by TL and OC in a proposed new model. So that researchers can provide an overview of the factors that influence environmentally friendly innovative behaviour in the context of government organizations in developing countries.

LITERATURE REVIEW

AMO Theory

We are guided by Ability-Motivation-Opportunity (AMO) Theory to explain the relationship between transformational leadership, organisational culture, and green innovative behaviours in the context of local government. AMO theory assumes that individual and organisational performance are influenced by three main elements: ability, motivation, and opportunity (Thomas Bailey, 1993). The AMO theory explains that organisational culture and leaders, in addition to playing a role in defining the organisation's vision, also serve to inspire individuals to take actions that lead to sustainability.

Transformational leadership

Transformational leadership is a leadership style developed by (Bass & Avolio, 1995). It emphasises that transformational leadership is based on four dimensions: Ideal influence, inspirational motivation, intellectual stimulation, and individual consideration. Effective leadership can create a conducive work environment to shape creativity (Malik et al., 2024). Leadership substantially affects green innovation (Begum et al., 2021).

TL and GIB

The demands of technological developments require leaders to be able to transform and adapt to these developments. Leaders can encourage members to develop creative ideas to build green innovations (Malik et al., 2024). Leaders can motivate employees and create an environment where they can actively participate in sustainable activities (Younis & Hussain, 2023). Transformational leaders also significantly influence eco-friendly innovation in the hospitality context in Saudi Arabia (Sobaih et al., 2022). Based on previous research and relevant theories, the following hypotheses can be formulated:

H1: Transformational Leadership has a positive and significant effect on Green Innovative Behavior

TL and OC

Leadership style has a crucial role in strengthening OC. TL positively correlates with OC in IT organizations in New Delhi, India (Bagga et al., 2023). TL styles influence OC in Pakistan's higher education context (Khan et al., 2020). TL is vital in creating value in the organizational environment (Bagga et al., 2023). Based on previous research and relevant theories, the following hypotheses can be formulated:

H2: Transformational Leadership has a positive and significant effect on Organizational Culture

OC and GIB

A good organisational culture promotes environmentally friendly, innovative behaviors. Green organisational culture strengthens innovation culture in manufacturing companies (Wang et al., 2022). Organisational culture influences innovative behavior IT companies in Viertnam (Lam et al., 2021). Organisational culture greatly influences sustainable product innovation in

manufacturing companies in Indonesia (Mukhtar et al., 2023). Based on previous research on the relationship between organizational culture and innovative behavior that is environmentally friendly, the following hypotheses can be formulated:

H3: Organizational Culture has a positive and significant effect on Green Innovative Behavior.

OC Mediates the Relationship Between TL And GIB

Leadership style certainly cannot single-handedly influence innovative behaviour that is environmentally friendly, so in this study, a new model is proposed where specific organisational culture mediates in relation to it. Organisational culture becomes a potent mediator in the relationship of transformational and transactional leadership styles with innovative work behaviours in the context of universities in Pakistan (Khan et al., 2020). A culture of oranisation becomes a good mediator in the relationship of transformational leadership to the civic behavior of the organization (Arifiani et al., 2020). Based on previous research on organizational culture as a mediator in the relationship between transformational leadership and green innovative behaviour, the following hypothesis can be formulated:

H4: Organizational Culture has a positive and significant effect on Green Innovative Behavior.

METHODOLOGY

This study aims to examine the direct impact of TL and OC on GIB, the indirect impact of TL on GIB through OC. Literature studies are conducted to obtain data and studies in scientific articles related to this research. This research provides a model as can be described as follows:

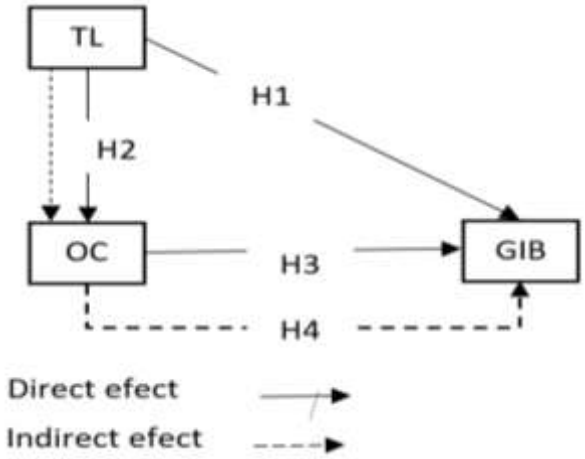

Figure 1. Conceptual Framework

The population is all State Civil Apparatus working in 28 Regional Apparatus in Pariaman City, West Sumatra Province, Indonesia. Based on the government's innovation level assessment result, Pariaman City received the title of Very Innovative. The sampling technique was stratified random sampling, where each personnel could be selected as a research respondent, and as many as 128 State Civil Apparatus responded to the questionnaire. The questionnaire

was distributed online using Google Forms. Male respondents were 72, or 56.3%, and female respondents were 56, or 43.7%. Ther respondents aged 36-45 years dominated, with 61 people (49.6%). The length of employment of the highest respondents was in the range of 16-20 years, at 32%, and based on the level of education, undergraduate graduates became the most respondents by 53.9% The demographics of the respondents can be explained in the following table 1:

Table 1 Demography Respondent

Demography		**f**	%
Gender	Man	72	56.3
	Woman	56	43.7
Age	18-25 Year	0	0
	26-30	6	4,7
	31 35	7	5,5
	36-40	31	24,2
	41-45	30	23,4
	46-50	25	19,5
	>50	29	22,7
Experience	1-5 Year	8	6,3
	6-10	12	9,4
	11-15	28	21,9
	16-20	41	32,0
	21-25	21	16,4
	26-30	6	4,7
	>30	12	9,4
Education	High School	9	7,0
	Diploma	10	7,8
	Bachelor	69	53,9
	Megister	40	31,3
	S3	0	0

Source : Data proses Respondent Questionnaire N=128

The research uses survey techniques through questionnaires in data collection; Questions are prepared to get respondents' answers, and the data collection results are analyzed using SEM-PLS Version 4. Descriptive analysis is performed to get a clear picture of the state of the data being studied, and Inductive analysis is performed to assess the model's validity, reliability, and suitability.

TL is measured using a developed concept (Bass & Avolio, 1995), which consists of four indicators: Ideal Influence, Inspirational Motivation, Intellectual Stimulation, and Individual Consideration. The questionnaire questions were compiled using a five-point likert scale from 1 to 5, with one representing "strongly disagree" and five representing "strongly agree".

OC is measured by the concepts developed from core value items ASN BerAKHLAK, an acronym for Service Integrity, Accountable, Competent, Harmonious, Loyal, Adaptive, and Collaborative. The questionnaire questions

were compiled using a five-point likert scale from 1 to 5, with one representing "strongly disagree" and five representing "strongly agree".

GIB is measured using the concept (Chen, 2008) using three indicators: Eco-friendly idea generation, eco-friendly idea promotion and eco-friendly implementation. The questionnaire questions were compiled using a five-point likert scale from 1 to 5, with one representing "strongly disagree" and five representing "strongly agree".

RESEARCH RESULT

Respondent Characteristics

The descriptive analysis of the respondents' answers for each variable can be explained as follows:

Table 2 Descriptive Statistical Results

Variable	Mean	Med	Exc. kurtosis	Skew ness	Std. dev
TL	3.328 s.d 3.680	4	-0.604 s. d -0.338	-0.188 s.d -0.710	0.893 s.d 1.056
OC	3.562 s.d 4.164	4	-0.266 s.d 1.901	-1.529 s.d -0.509	0.956 s.d 1.097
GIB	3.506 s.d 3.742	4	-0.009 s.d 0.402	-0.535 s.d -0.702	0.956 s.d 1.042

TL= Transformational Leadership, OC =Organization Culture, GIB= Green Innovative Behavior N=128

The results of the respondents' answers were carried out descriptive analysis for answers to the items of the TL Mean variable, ranging from 3,328 to 3,680. The average for the TL variable was 3,54, which tended to be positive in the medium category. The median was in the range of 3 to 4, exeess kurtosis -0.604 to -0.338, skewness -0.188 to -0.710, and standard deviation 0.893 to 1.056.

Convergent Validity Test

Two methods can be used to conduct convergent validity tests to ensure the indicators measure the same concept. First, we look at the loading factor, and second, we look at the average variance extracted (AVE) value. With a kriteria loading factor above 0.70 or AVE ≥ 0.5 (Hair et al., 2019). From the results of phase 1 testing, two questionnaire items have a loading factor below 0.70, based on guidelines from Hair et al. (2019). Remove measurement items from the model before proceeding to the following analysis. After revisions to the model, further analysis is carried out by looking at the loading factor results of each questionnaire item that has exceeded the limit of 0.70. Moreover, AVE values above 0.5, as presented in Table 2, and all variables are declared valid by the convergent validity test.

Table 3 Construct Validity and Reliability

Variable	Average variance extracted (AVE)	Information
GIB	0,804	Valid
OC	0,865	Valid
GIB	0,715	Valid

TL= Transformational Leadership, OC =Organization Culture, GIB= Green Innovative Behavior N=128

Discriminating Validity Test differential validity test is carried out to ensure that each construct is unique. This test can be done in three ways: first with the Fornell-Larcker Criteria, Second with HTMT, and Third with cross-loading value. By. Based on the fornel lecker criteria, all constructs meet the requirements for the validity of the trial, as shown in Table 3, where the root of AVE 0 of each construct is greater than the correlation between the constructs (Hair et al., 2019).

Table 4 Discriminant validity fornell-Larcker

	GIB	OC	TL
GIB	0.897		
OC	0.711	0.930	
TL	0.590	0.639	0.845

TL= Transformational Leadership, OC =Organization Culture, GIB= Green Innovative Behavior N=128

The Heterotrait-Monotrait Ratio (HTMT) is calculated with a threshold of <0.90 to ensure that there is no overlap between constructs (Hair et al., 2019). In the study of all HTMT ratios of the relationship between variables below 0.90, the highest ratio between OC and GIB is 0.720, which needs to be a special concern. And the third is to use cross-loading in this study; all the loading values in the measured construct are compared to other constructs.

Table 5 Discriminant validity HTMT

	GIB	OC	TL
GIB			
OC	0.720		
TL	0.602	0.633	

TL= Transformational Leadership, OC =Organization Culture, GIB= Green Innovative Behavior N=128

Reliability Test

Reliability tests are conducted to ensure each construct's internal consistency and measurement stability. The test was carried out with three criteria: the first was that the Composite Reliability (CR) for all variables was above 0.70. Both Cronbach's Alpha have a value of ≥ 0.70, and Average variance Extracted (AVE) has a value of ≥ 0.50. Based on the reliability test results with SEM PLS version 4, data can be presented as Table 6. All constructs in this study

met the reliability criteria very well, Cronbach's Alpha GIB values = 0.951, OC=0.992, and TL=0.960 exceeded the limit of 0.70, which showed high internal consistency. Composite Reliability (rho_a and rho_c) for all variables was above 0.95. And all three Average Variance Extracted (AVE) values are also eligible with values above 0.50. Thus, this study is valid and reliable. And it is worthy of further analysis in SEM PLS (Hair et al., 2019).

Table 6 Construct reliability and validity

	Cronbach's alpha	**CR (rho_a)**	**CR (rho_c)**	**(AVE)**
GIB	0.951	0.956	0.961	0.804
OC	0.992	0.992	0.992	0.865
TL	0.960	0.968	0.965	0.715

TL= Transformational Leadership, OC =Organization Culture, GIB= Green Innovative Behavior N=128

Hypothesis Inner Model

Variance Inflation Factor (VIF) is a critical stage in ensuring the validity of parameter estimation. VIF measures the inflation rate of variance in the regression coefficient, which results from the high correlation between predictive variables in the model. The VIF value is said to be non-multicollinear if the value is below the critical limit of 5.0. Based on Table 7, all variables have a VIF value below 0.50, meaning multicollinearity does not occur.

Table 7 Collinearity statistic -inner model

	GIB (Y)	**OC (M)**	**TL (X)**
GIB			
OC	4.537		
TL	1.697	1.000	

TL= Transformational Leadership, OC =Organization Culture, GIB= Green Innovative Behavior N=128

Direct Effect Test

The direct effect hypothesis test in SEM-PLS tests the significance and strength of direct influence between variables in the research model. TL had a positive and significant effect on GIB ($\beta = 0.195$; $p = 0.011$), albeit with a negligible impact ($f^2 = 0.067$). In other words, H1 is accepted. This research is in line with (Malik et al., 2024), (Sobaih et al., 2022), (Özgül & Zehir, 2023), and (Khan et al., 2020).

The influence of TL on OC ($\beta = 0.629$; $p < 0.001$; $f^2 = 0.690$) falls into the category of significant effects and is called H2 Acceptable. This research is in line with (Shiva & Suar, 2012), (Jaskyte, 2004), (Wang et al., 2022), dan (Lam et al., 2021). On the other hand, OC has no significant effect on GIB ($\beta = 0.052$; $p = 0.684$), with a CI that includes zero (-0.207 - 0.296) and an effect size of zero. This research is in line with (Jaskyte, 2004), (Demastus, et al.2024), and in contrast to (Lam et al., 2021) and (Mohamad et al., 2020). Results can be described in the following table 8:

Table 8 Direc Effect Hypothesis Test Results

	Path cooef.	P values	**Lower Limit**	**Upper Limit**	f square
OC-GIB	**0.052**	**0.684**	**-0.207**	**0.296**	**0.000**
TL-GIB	**0.195**	**0.011**	**0.045**	**0.346**	**0.067**
TL-OC	**0.629**	**0.000**	**0.508**	**0.730**	**0.690**

TL= Transformational Leadership, OC =Organization Culture, GIB= Green Innovative Behavior N=128

Indirect Effect Test

This study tested the effect of mediation using Structural Equation Modeling based on Partial Least Squares (SEM-PLS). TL and GIB. The value of the indirect effect is 0.032 (p = 0.687) with confidence intervals (CI) 95% between -0.130 and 0.188 (includes zero), indicating that the influence of TL on GIB through OC is not statistically significant. The Upsilon value (v) of 0.101 (< 0.20) reinforces the conclusion that OC is not a relevant mediator in this model. This research aligns with (Rafique et al., 2022) and (Lam et al., 2021). The data can be described in the following table 9:

Table 9 Indirec Efect Hypothesis Test Results

	Path Cooef	**P values**	**Lower Limit**	**Upper Limit**	**Upsilon v**
TL-OC-GIB	**0.032**	**0.687**	**-0.130**	**0.188**	**0.101**

TL= Transformational Leadership, OC =Organization Culture, GIB= Green Innovative Behavior N=128

Goodness of Fit Good

Goodness of Fit Evaluation is an essential stage in analysing Structural Equation Modelling Partial Least Squares (SEM-PLS) to assess how much the structural model fits the observed data. The Standardised Root Mean Square Residual (SRMR) and the Normed Fit Index (NFI) are the goodness-of-fit measures used. Based on the analysis results, the SRMR value for the saturated model was 0.076. This value is below the threshold of 0.08, which indicates that the model has a good fit level or can be categorised as a saturated fit. Next, the NFI value obtained was 0.744. Although this value has not reached the outstanding category (≥ 0.90), it is within a fairly adequate range (≥ 0.70), so the model can be declared quite feasible.

Table 10 Goodness of Fit

Indikator	**Saturated Model**	**Criterion**	**Conclusion**
SRMR	0,076	≤ 0,08	Saturated Fit
NFI	0,744	≥ 0,90 (good), ≥ 0,70 (enough)	Enough Fit

Source: SEM-PLS Analysis Data

The R-squared value can be classified into three categories, namely: a value of 0.75 is considered high, 0.50 is considered moderate, and 0.25 is considered weak. Referring to this classification, the analysis results show that the Environmentally Friendly Innovative Behaviour variable has an R-square value of 0.642, which is in the medium and close to high category. As described in Table 11:

Table 11 R-Square

Variabel	R-square	R-square adjusted
GIB	0,642	0,633
OC	0,408	0,403

OC = Organization Culture, GIB= Green Innovative Behavior N=128

Environmentally friendly innovative behaviours can be explained by about 64.2% transformational leadership and organisational culture, which shows the apparent adequacy of the model's power. Organisational Culture of 0.408, which can explain that organisational culture can be explained by transformational leadership of 40.8% or is included in the medium category.

DISCUSSION

TL positively and significantly affected GIB, and H1 was accepted. This research is in line with(Malik et al., 2024), (Sobaih et al., 2022), (Özgül & Zehir, 2023), and (Khan et al., 2020). TL against OC falls into the category of significant effects and is called H2 Acceptable. This research is in line with (Shiva & Suar, 2012), (Jaskyte, 2004), (Wang et al., 2022), and (Lam et al., 2021). On the other hand, OC has no significant effect on GIB. This research aligns with (Jaskyte, 2004) dan (Demastus, J., Ohsowski, B. M., & Landrum, 2024). This research differs from (Lam et al., 2021) and (Mohamad et al., 2020). he OC does not mediate TL and GIB. Indicates that the influence of TL on GIB through OC is not statistically significant. This research aligns with (Rafique et al., 2022) and (Lam et al., 2021).

CONCLUSIONS AND RECOMMENDATIONS

Based on the research results, the research objectives can be answered as follows: First, transformational leadership shows a positive and significant relationship with environmentally friendly innovative behaviour. The leadership style gives individual attention better. Second, Transformational Leadership affects organizational culture positively and significantly. Leaders who can be role models, provide motivation, and pay attention to the individual needs of their members can strengthen the ethical values of ASN Berakhlak in carrying out their duties. Third, the organization's culture does not affect environmentally friendly innovative behaviour. Variability in the values of ASN Berakhlak in the work environment is not enough to encourage employees in the government sector to implement innovations that lead to sustainability. Fourth, organizational culture is also not a mediator of the relationship between transformational leadership and innovative, environmentally friendly behaviour

of civil servants in Pariaman City. These results show that transformational leadership's significant and positive influence on the green innovation behaviour of ASN in Pariaman City is not through the cultural norms of the ASN organization with Ber-AKHLAK.

ADVANCED RESEARCH

Subsequent research may also consider incorporating other variables, such as employee empowerment or an organisational culture that supports the environment, which may play a role in encouraging the emergence of environmentally friendly innovations. With these suggestions, future research is expected to provide a broader and richer picture of the factors influencing sustainable innovation in the public sector.

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