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The Determinants of Pro-Environmental Behavior Toward Goal Setting in Indonesian Cement Industry

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Abstract

The role of leaders in supporting pro-environmental behavior is an essential factor in encouraging sustainable practices in organizations, as global environmental challenges increase. Therefore, this study tries to analyze the effect of transformational leadership on pro-environmental behavior mediated by employee work motivation, organizational commitment, and moderation of goal setting in Indonesia. Data was collected from 276 employees across various work units in the cement industry and analyzed using partial least square-structural equation modeling (PLS-SEM). The results showed that transformational leadership positively affects work motivation ($\beta = .63, p = .00$), organizational commitment ($\beta = .62, p = .00$), and pro-environmental behavior ($\beta = .30, p = .00$). Furthermore, organizational commitment positively affected pro-environmental behavior ($\beta = .37, p = .00$), while work motivation did not affect pro-environmental behavior ($\beta = 0.00, p = .94$). Organizational commitment fully mediated the effect of transformational leadership on pro-environmental behavior ($\beta = .23; p = .00$), and goal setting had a moderate effect ($\beta = .09, p = .00$). It was also discovered that employee motivation was not able to mediate the effect of transformational leadership on pro-environmental behavior ($\beta = 0.00, p = .94$). These results showed the effect leadership plays in creating an organizational setting capable of fostering employee habits, motivation, and commitment to support pro-environmental behavior in the workplace.

Cement manufacturing industry is widely recognized for its substantial environmental impact due to the production activities in managing resources for product manufacturing. This environmental impact spans various business processes, starting from resource extraction, and the factory production process, to products manufacturing and distribution to end-users (Hu et al., 2020). The use of energy resources, particularly fossil fuels, is the main cause of climate change, creating many pollution hazards. Globally, two-thirds of greenhouse gas emissions are caused by burning fossil fuels used as energy for heating, electricity, transportation, and industry (Akpan & Akpan, 2012). Several studies have been carried out to understand and minimize the use of fossil energy, reducing environmental impacts in the form of greenhouse gas emissions and other pollution effects. The strategy for reducing the use of fossil energy includes increasing efficiency, structural changes, and variations in behavior (Hu et al., 2020). Efficiency gains and structural changes require long transition times, and modification of infrastructure. However, behavior change presents a cost-effective and rapid solution, with an immediate impact on energy conservation as well as the management of climate change and pollution (Abrahamse et al., 2005). According to social identity theory, employees who are concerned about environmental conservation are

more supportive of implementing management efforts (Afsar et al., 2020). Behavior concerns of employees include a proactive desire to learn about the environment, developing, and implementing ideas to reduce environmental impact, process recycling of defective products, optimizing resource usage efficiently, and questioning hazardous practices. All these behavior concerns about the environment, are called pro-environmental behavior (Graves et al., 2013). As previous study revealed that human resource management is a company's leverage for better environmental management, especially eco-friendly behavior by Ly (2023). The result showed that effective human resource management served as an opportunity to improve the environment, positively affecting the eco-friendly behavior of employees.

Singh et al. (2020) suggested that HR performance is dependent on environmentally friendly transformational leadership, influencing including HR management and innovation in company. Furthermore, Graves et al. (2013) examined how transformational leadership related to environmental issues, showing a relationship between autonomous and external motivation of employees as well as pro-environmental behavior. A significant relationship has also been identified, where improved employee work motivation, resulted in an enhanced correlation between leadership and pro-environmental behavior (Aitken et al., 2016; Handy et al., 2021; Sharpe et al., 2021). According to Chong (2014), Deichmann and Stam (2015), and Eliyana et al. (2019), there is a correlation between transformational leadership and organizational commitment. This showed that an improved organizational commitment enhances the relationship between transformational leadership and pro-environmental behavior (Devece et al., 2016; Hu et al., 2020; Paillé & Boiral, 2013). Shinkle et al. (2021) showed that government policy would affect setting of organizational goal and behavior changes. The relationship between goal setting, leadership, and behavior, can also improve transformational leadership and pro-environmental behavior (Kanay et al., 2021; Shinkle et al., 2021).

Each company has a different environmental impact, which is routinely identified and managed. Compliance with regulations set by the Ministry of Environment and Forestry of the Republic of Indonesia is mandatory for every manufacturing management. The ISO 14001 is a globally recognized environmental management system and is a key certification that company should possess for efficient performance. However, Daddi et al. (2022) showed a controversy regarding the relationship between the role of managers in internalizing environmental management systems and improving corporate performance. The results showed that a good internalization process with certification is only a label and symbol in behaving in environmental management.

Previous study on the cement industry, including the issue of compliance with environmental management regulations and impacts, is also important to consider increasingly limited resources, particularly electricity, fuel, and raw material resources. The most company are considered environmental impacts such as pollution, efficiently and effectively using energy resources and raw materials for sustainable maintenance. However, in observed company, employees have limited pro-environmentally behavior, failing to maintain a clean workplace and dispose of trash properly. A lack of awareness has also been identified regarding sustainable resource usage such as using alternative fuels for production, electric vehicles to reduce carbon pollution, solar energy for office lighting, reducing materials made of plastic and others (Hu et al., 2020). Despite of having ISO 14001 environmental management system certification, several companies still lack full implementation, with top management not mandating a comprehensive program. Current strategies focus on complying with government regulations regarding the management of hazardous and toxic materials (B3) waste and controlling factory chimney dust emissions. Leaders and employees have not yet cultivated pro-environmental behavior as a work culture (Graves et al., 2019). Behavior concerns of employees include a proactive desire to learn about environment, developing, and implementing ideas to reduce environmental impact, process recycling of defective products, optimizing resource usage efficiently, and questioning hazardous practices (Graves & Sarkis, 2018). All these behavior concerns about the environment are called pro-environmental behavior (Graves et al., 2013). Based on the background information provided above, this study aimed to examine

the effect of transformational leadership on pro-environmental behavior at one of the biggest cement companies in Indonesia. This research proposed to study the mediating effect of employee work motivation, organizational commitment, and goal setting, based in the context of pro-environmental behavior.

Literature Review

The literature review section describes the relevant topics, theories, concepts, and previous studies to support the relationship between transformational leadership on pro-environmental behavior mediated by employee work motivation, organizational commitment, and moderation of goal setting and study hypotheses.

The Social Identity Theory and Pro-Environmental Behavior Research

The social identity theory (SIT) developed by Tajfel (1978) has become a cornerstone in the understanding of how individuals perceive themselves in relation to social groups. Tajfel's work initially focused on intergroup relations and how people categorize themselves and others into social categories. SIT posits that individuals derive a significant part of their identity and self-esteem from their group memberships. SIT has interesting implications when applied to the realms of transformational leadership and pro-environmental behavior. Transformational leaders, by emphasizing shared values and a collective vision, can effectively channel group identity toward environmentally conscious actions. The alignment of pro-environmental behavior with the group's identity fosters a sense of responsibility and commitment among followers. Consequently, individuals under transformational leadership are more likely to engage in sustainable practices, recognizing such actions as consistent with their social identity. The integration of SIT with transformational leadership and pro-environmental behavior sheds light on the potential for positive societal and organizational change. Understanding how individuals define themselves in group contexts allows leaders to leverage this social identity to promote environmentally responsible actions. As we navigate the complexities of leadership and sustainability in the modern world, the synergy between these theories provides a valuable framework for promoting collective well-being and environmental stewardship.

Transformational Leadership and Pro-Environmental Behavior

The achievement of organizational outcomes depends solely on transformational leadership (Mañas-Rodríguez et al., 2020). According to Alsheikh and Sobihah (2019) and Han et al. (2019), transformational leadership is a process that enables a leader to inspire their team members to achieve the highest levels, increasing work satisfaction, organizational commitment, and employee behavior related to pro-environmental aspects. It also inspires subordinates to commit to the vision and goal of the organization, challenging team members to innovate problem-solving methods, and develop leadership capacity through coaching, mentoring, as well as provision of challenges and support. Transformational leadership is divided into four dimensions, namely idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Bass, 1985). Pro-environmental behavior is environmentally responsible activity such as learning more about the environment, developing, and implementing ideas to reduce environmental impact, recycling resources, and questioning hazardous practices (Graves et al., 2013).

Fundamental pro-environmental behavior is characterized by short-term, less challenging, and common actions, while advanced pro-environmental behavior is long-term, difficult, and uncommon. However, organizational efforts to internalize environmental policies, implement environmental management systems, and adopt certified standards tend to be symbolic and remain inefficient without proper employee integration.

The active participation of workers is a principal factor influencing the successful integration of environmental standards and policies, including ISO 14001 (Yuriev et al., 2018). Several studies have also been conducted by Graves et al. (2013, 2019) and Graves and Sarkis (2018) on employee pro-environmental behavior, such as research on the role of employee perceptions of leadership, values and motivation for pro-environmental behavior. This study shows that perceptions of employees about transformational leadership are essential in influencing their pro-environmental behavior, directly or indirectly influencing through employee motivation. Other research by Graves et al. (2019) resulted the role of management commitment to corporate sustainability, environmental leadership from managers, and employee motivation. Therefore, hypothesis 1 was proposed.

H1: Transformational leadership has a positive effect on pro-environmental behavior

Organizational Commitment

Lee et al. (2000) stated organizational commitment is a psychological relationship between a person and organization. Meyer and Allen (1991) identified three dimensions of organizational commitment, including affective, continuance, and normative commitment. Affective commitment reflects a personal connection to the organization, where employees are significantly committed. Continuance commitment arises from a concern about potential job loss, leading employees to remain dedicated. Organizational commitment is an ongoing process in which members of the organization express their concern for the organization which continues successfully and well. Boonyarit et al. (2010), Eliyana et al. (2019), Han et al. (2019), and Novianti (2021) stated that transformational leadership significantly influences organizational commitment. Consequently, establishing human resource management and organizational commitment are crucial to engage employees in practicing environmentally friendly behavior. Hu et al. (2020) found a relationship between individual commitment in organizations through interventions to understand energy conservation awareness. Based the reviewed literature, the following hypotheses were proposed.

H2: Transformational leadership has a positive effect on organizational commitment.

H3: Organizational commitment has a positive effect on pro-environmental behavior.

H4: Organizational commitment mediates the relationship between of transformational leadership and pro-environmental behavior of employees.

Work Motivation

Work motivation is a business process within employees that involves intensity, direction, and persistence to achieve goal (Robbins & Judge, 2018). Furthermore, it determines the activities of employees, performance, and work intensity (Meyer, 2006). Several research have started considering the role of motivation in eliciting employees pro-environmental behavior (Aitken et al., 2016; Graves et al., 2013). Study Graves et al. (2019) stated that transformational leadership is most effective in strengthening internal motivation in employees with strong environmental values. Employees perceptions of leadership have a positive relationship with pro-environmental behavior, motivated by internal and external factors (Kollmuss & Agyeman, 2002; Ryan & Deci, 2000). Internal motivation comes from inside factor, external motivation originates from factors outside employees, such as seeking rewards or approval, or avoiding sanctions (Graves et al., 2013, 2019). Sharpe et al. (2021) said that intrinsic motivation factors have a positive effect on pro-environmental behavior, including the policy of corporate social responsibility through increasing intrinsic motivation. Therefore, the hypotheses proposed in this study were:

H5: Transformational leadership has a positive effect on employee motivation.

H6: Employee motivation has a positive effect on employee pro-environmental behavior.

H7: Employee motivation mediates relationship between transformational leadership and employee pro-environmental behavior.

Goal Setting

Goal achievement is a factor influencing the success rate of individuals, departments, business units, and the organization. Meanwhile, goal setting is the process of motivating employees through effective and

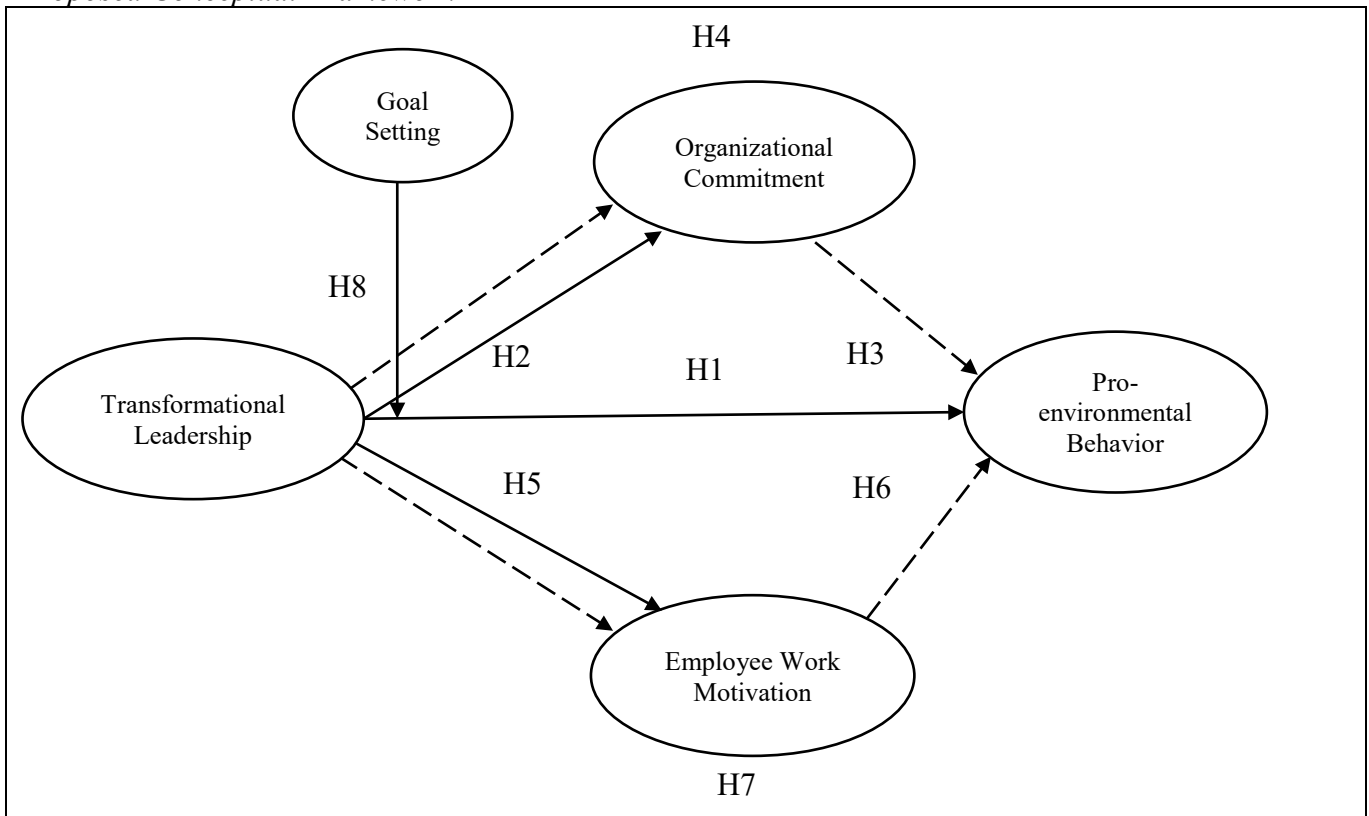
meaningful performance targets. This step is often given as an example of the way organizational behavior must progress from a theoretical foundation to cutting-edge study through a real application in effective management practice. The theory assumes that life is a process of goal-oriented action (Latham & Locke, 1979), showed the desire to work towards goal as the main source of motivation. The results suggested that to achieve optimal outcomes, several steps needed, namely goal setting, accepting commitments, and providing supporting elements (Latham & Locke, 1979). The policies of leaders also influence organizational goal setting, leading to an impact on behavior changes (Shinkle et al., 2021). Consequently, transformational leaders can influence behavior and inspire followers to successfully and efficiently pursue corporate goal through various strategies (Latham & Locke, 1979), such as pro-environmental behavior. First, by showing environmental idealized influence, leaders show their commitment to a more environmentally sustainable earth, serving as role models (Robertson & Barling, 2012). This role models provides a subjective pro-environmental norm, allowing the commitment of members to environmentally sustainable planet, and encouraging the team to understand pro-environmental objectives. Second, by conveying environmental inspirational motivation, leaders construct and communicate a compelling pro-environmental vision to their team members. Thirdly, by employing environmental intellectual stimulation, leaders encourage team members to question existing solutions and develop innovative environmental concerns. Fourth, by providing environmental concern, leaders enhance pro-environmental skills and capacities of team members. Consequently, when team members are confident in the purpose of environmental protection, their workplace behavior correspond with goal, leading to active participation in pro-environmental behavior. Therefore, the following hypothesis is proposed:

H8: Goal setting moderates the effect of transformational leadership on pro-environmental behavior of employees.

The Figure 1 shows the conceptual framework of this study.

Figure 1

Proposed Conceptual Framework



Method

Study Design

This study adopted a quantitative approach to examine the hypothesized relationships between the variables, that is transformational leadership on pro-environmental behavior. The study further investigated the mediating role of employee work motivation and organizational commitment, regulated by goal setting.

Participants

The population of this study comprises 893 employees in one of the biggest cement companies in South Sumatra, Indonesia. A total of 276 respondents was selected using the Slovin's formula (Hair et al, 2014) and proportional stratified random sampling at every managerial position level, fulfilling the minimum requirements of sample requirements.

Instruments

Data was collected using a questionnaire consisting of 25 questions, which were divided into two components. The first section focused on respondent demographics, while the second part evaluated study variables such as transformational leadership, organizational commitment, work motivation, goal setting, and pro-environmental behavior. The questionnaire was translated to Indonesian language. Transformational leadership was measured using 4 items by Bass (1985), which included "My leader emphasizes the importance of a strong sense of purpose" and "My leader explains the desires to be achieved in the future". The translated scale showed a good level of reliability with Cronbach's alpha of .94. Work motivation was measured using six items developed by Graves et al. (2019) such as "I am motivated to work because I get paid to do this job" and "I am motivated because this work provides an opportunity to achieve my goal". The scale showed a good level of reliability with Cronbach's alpha of .95. Meanwhile, an organizational commitment was measured using three items developed by Meyer and Allen (1991), including "I feel happy working in this company because I have similar values to myself" and "I continue to work at this company because risks associated with signing out". The scale showed a good level of reliability with Cronbach's alpha of .97. Goal Setting was measured with three items by Latham & Locke (1979), such as "I clearly understand goal setting of this company". The scale showed a good level of reliability with Cronbach's alpha of .95. Pro-environmental behavior was measured using nine items developed by Graves et al. (2013), including "I try to reduce energy use" and "I encourage others to use tumblers at work". The scale showed a good level of reliability with Cronbach's alpha of .95.

Procedure

This study used an online questionnaire consisting of a five-point Likert scale, with a range of 1 (strongly disagree) to 5 (strongly agree). Data collection was carried out in July 2023 and translated into Indonesian. The Partial Least Squares (PLS) method was used to analyze the data through the SmartPLS Version 3 program. All measurement items were taken from earlier study and minimally adjusted to fit setting for each component to assure validity.

Ethical Considerations

This study has been carefully approved by the Research Ethics Commission team for the Faculty of Economics and Business, University of Brawijaya, Indonesia, reference number 1722/UN10.F02.11.31/KM.00.00.1/2023, dated 14 July 2023.

Results

Table 1 shows the demographic data of the respondents, with 221 out of the 276 (80.10%) being predominantly men. The majority of respondents 146 (52.90%) worked between 5 and 10 years. The distribution of company tenure was similar to the employee population, with the majority 439 (49.20%) working between 5 and 10 years. The results showed that the main directorate had 62 (22.50%) respondents, while operational, including the finance and HR directorate, had 137 (49.60%), and 77 (27.90%), respectively.

Table 1
Demographic Data

Profile	Items	Frequency (n=276)	Percentage
Gender	Male	221	80.10%
	Female	55	19.90%
Tenure (years)	0 – 5 years	56	20.30%
	> 5 – 10 years	146	52.90%
	> 10 – 15 years	36	13.00%
	> 15 years	38	13.80%
Position	Board of Directors -1	5	1.80%
	Board of Directors – 2	21	7.60%
	Board of Directors – 3	51	18.50%
	Board of Directors – 4/Staff	199	72.10%
Work Division	Main Directorate	62	22.50%
	Operation Directorate	137	49.60%
	Finance and HR Directorate	77	27.90%

This data showed that the main business activities of the company, including raw material mining, cement production, product packaging, transportation, and distribution of cement, were predominantly carried out by the male gender. The majority of employees is in the operational directorate because the company is engaged in cement manufacturing industry, requiring the most workers in the operational areas of raw material mining, cement production, maintenance of factory equipment, planning, and technical evaluation. For data validity, when the calculation of the corrected item correlation results is greater than 0, it is categorized as valid. Meanwhile, for the data reliability, Cronbach's alpha calculation results should be greater than .70. All scores of items measured in this study were greater than .30 with the Cronbach's alpha score .95, which were considered valid and reliable for further step.

Testing the convergent validity of the measurement model with reflective indicators was assessed based on the correlation between the item score or component and the construct score calculated by PLS. An indicator is considered to have good validity when the score of loading factor value is greater than .70, while .50 to .60 is sufficient (Ghozali, 2013). The convergent validity test is carried out by examining the loading factor value of each indicator against the construct. For confirmation, this study used a loading factor limit of .07, and item values below .70 were removed, as shown in Table 2.

Table 2
Factor Loading of Study Variables

Item	OC	TL	WM	PB	GS
OC 1	.90				
OC 2	.84				
TL1		.89			
TL 2		.89			
TL 3		.83			
TL 4		.82			
WM 1			.87		
WM 4			.89		
WM 5			.88		
WM 6			.81		
PB 1				.78	
PB 2				.85	
PB 3				.84	

Table 2 (Continued)

Item	OC	TL	WM	PB	GS
PB 4				.83	
PB 5				.81	
PB 6				.80	
PB 7				.81	
PB 8				.81	
PB 9				.85	
GS 1					.90
GS 2					.91
GS 3					.88

Note. Organizational Commitment = OC, Transformational Leadership = TL, Work Motivation = WM, Goal Setting = GS, Pro-Environmental Behavior = PB

To analyze the data, the current study used descriptive statistics and structural equation modelling approaches, as well as the partial least squares (PLS) method. Data processing was performed for the study's outer model analysis, inner model analysis, and hypothesis testing. Convergent validity needs to be assessed from the average variance extracted (AVE) value of each construct. All constructs in the PLS model are declared to have fulfilled convergent validity when the AVE value is greater than .50. (Ghozali, 2013).

Table 3

The Outer Loading and Composite Reliability

Variable	Cronbach's Alpha	AVE	Composite Reliability
Transformational Leadership	.88	.74	.92
Organizational Commitment	.70	.76	.86
Work Motivation	.89	.75	.92
Goal Setting	.88	.81	.92
Pro-Environmental Behavior	.94	.68	.95

In the Table 3, the results of the Cronbach's alpha and composite reliability tests were considered reliable as they had values higher than .70 (Hair et al., 2014). The structural model was tested when the calculated model passed the criteria for convergent and discriminant validity, including composite reliability. The inner model was assessed using R-square, showing that pro-environmental behavior (PB) as the main variable showed a value close to the good or the PLS model in the strong category. Pro-environmental behavior score was .67, showing that 67% comprising transformational leadership, work motivation, organizational commitment, and goal setting, were capable of predicting pro-environmental behavior. The organizational commitment (OC) variable has an R-square value of .39, showing a moderate category of the PLS model, with 38.80% of transformational leadership capable of predicting OC. The endogenous variable work motivation (WM) has an R-square value of .41. This showed that 40.80% of transformational leadership could predict the WM variable, showing a moderate category of the PLS model.

Goodness of Fit Index (GoF) testing is carried out to validate the combined performance of the measurement (outer) and the structural (inner) model. With goodness-of-fit, the structural model testing on PLS can be identified. The value of predictive relevance (Q²) is calculated as follows:

$$\begin{aligned}
 Q^2 &= 1 - (1 - R_1^2) (1 - R_2^2) \\
 Q^2 &= 1 - (1 - 0.163) (1 - 0.477) \\
 Q^2 &= 1 - 0.437 \\
 Q^2 &= 0.56
 \end{aligned}$$

Table 4
Hypotheses Testing Results

Hypotheses	Path	β	t	p -value	Results
H1	TL→PB	.30	4.71	.00	Significant positive effect
H2	TL→OC	.62	12.80	.00	Significant positive effect
H3	OC→PB	.37	4.18	.00	Significant positive effect
H4	TL→OC→PB	.23	3.77	.00	Mediation effect
H5	TL→WM	.63	13.04	.00	Significant positive effect
H6	WM→PB	.00	0.07	.94	Not Significant effect
H7	TL→WM→PB	.00	0.07	.94	No Mediation effect
H8	TL x GS x PB	.09	3.11	.00	Moderation effect

Note. Organizational Commitment = OC, Transformational Leadership = TL, Work Motivation = WM, Goal Setting = GS, Pro-Environmental Behavior = PB

The calculation showed a high value of .56, showing that the model deserves to be declared as a predictive relevance value. The result of 56% describes the diversity of data that can be explained by the PLS model or the information contained, while 44% is described by other variables. The last step in this study is hypothesis testing, which is critical for determining the relationship between each component. When the t -statistic is greater than 1.96 and the p -value is less than .05, the correlation is considered significant. A coefficient could also be used to determine the direction of the link. The hypotheses testing was described in Table 4.

From the PLS analysis, it was found that transformational leadership affected pro-environmental behavior ($\beta = .30$; $p = .00$) followed by organizational commitment ($\beta = .62$; $p = .00$) with statistics significant ($\beta = .37$; $p = .00$). The result showed a relationship between transformational leadership on pro-environmental behavior mediated by organizational commitment ($\beta = .23$; $p = .00$) showing that H4 is supported. Transformational leadership also affected work motivation ($\beta = .63$; $p = .00$) with significant statistics, while work motivation had insignificant effect ($\beta = .00$; $p = .94$). It was also discovered that work motivation cannot mediate the effect of transformational leadership on pro-environmental behavior ($\beta = 0.00$; $p = .94$), showing that H7 was rejected. Moreover, the result showed a significant relationship between transformational leadership on pro-environmental behavior moderated by goal setting ($\beta = .09$; $p = .00$) showing that H8 is supported.

Discussion and Conclusion

This study aimed to analyze the effect of transformational leadership on pro-environmental behavior, assessing work motivation and organizational commitment in mediating roles and moderated by goal setting. The results showed that transformational leadership significantly affected pro-environmental behavior. This showed that the hypothesis proposed was accepted and supported previous studies conducted by Farrukh et al. (2016), Graves and Sarkis (2018), and Mi et al. (2019). Furthermore, previous study conducted by Boonyarit et al. (2010) and Eliyana et al. (2019) found a significant and positive relationship between transformational leadership and employee organizational commitment to the company. Chong (2014) also found a significant relationship between several leader tactics and employee organizational commitment to the company.

Organizational commitment has a significant effect on pro-environmental behavior. Based on social identity theory and previous investigations, employee's strong organizational commitment can lead to high levels of pro-environmental behavior. This is because employees are more emotionally attached to their organizations due to higher commitment and corporate goal shown to support pro-environmental behavior, as equivalent to their aspirations (Afsar et al., 2020).

Moreover, the effects of transformational leadership on pro-environmental behavior of employees are mediated by organizational commitment. Similarly, Afsar et al. (2020) found that responsible and transformational leadership was critical to promoting sustainability issues-related behavior among employees in Pakistan. This will improve employee organizational commitment to sustainable values and priorities, leading to active engagement in pro-environmental behavior.

Transformational leadership has a significant effect on employee motivation. According to Purwanto et al. (2019), transformational leadership encourages employee motivation to achieve performance. Deichmann and Stam (2015) also reported that transformational leadership encouraged employee motivation to generate ideas for company progress.

Work motivation has insignificant effect on pro-environmental behavior, leading to the rejection of the study hypothesis. Similarly, Handy et al. (2021) obtained insignificant results between work motivation and pro-environmental behavior, as showed by Graves et al. (2013), where employee external motivation showed a negative correlation due to low transformational leadership in China. Moreover, Graves and Sarkis (2018) also showed that not all work motivation is positively related to the U.S. employee pro-environmental behavior. The results showed that work motivation did not mediate the effect of transformational leadership on employee pro-environmental behavior. Consequently, the hypothesis was rejected, as employee motivation did not mediate the effect of transformational leadership, showed an insignificant effect on pro-environmental behavior. This result is logical because the results of testing the relationship between work motivation and pro-environmental behavior reveal that work motivation has no significant effect on pro-environmental behavior. The results of this study reinforce previous empirical research which states that the relationship between motivation and pro-environmental behavior is not significant. This supports the results of previous empirical research by Handy et al. (2021). The insignificant results between work motivation and pro-environmental behavior also have similarities with the results of empirical research conducted by Graves et al. (2013) which indicates that employee external motivation is negatively related to pro-environmental behavior when transformational leadership is low.

This study showed that pro-environmental behavior was not influenced by employee motivation but was significantly affected by transformational leadership. Based on the results, it can be concluded transformational leadership affects the subjective norm of employees who are aware of environmental behavior and the preferred attitude. This awareness and desire of employees showing the importance of having a strong sense of purpose, articulating future aspirations, seeking diverse perspectives in problem-solving, and providing time to coach subordinates. The effect of this transformational leadership on the intentions of this behavior then produces pro-environmental behavior of employees. This was consistent with Graves et al. (2013) and Handy et al. (2021), who reported an insignificant correlation between work motivation and pro-environmental behavior. Moreover, the result showed that the relationship between transformational leadership and pro-environmental behavior is moderated by goal setting ($\beta = 3.11$; $p < .03$) with statistically significant showing that H8 is supported. Following Shinkle et al. (2021), goal setting has an impact on changing organizational behavior, such as pro-environmental behavior.

Goal setting significantly moderates the effect of transformational leadership variables on employee pro-environmental behavior. Consequently, the hypothesis is accepted, showing that higher goal setting resulted in a stronger relationship between transformational leadership variables and pro-environmental behavior, and vice versa. Similarly, Shinkle et al. (2021) reported that setting organizational goal has an impact on changing behavior, while Kanay et al. (2021) reported significant effect on motivation and behavior. This study also contributes to the discussion of factor influencing pro-environmental behavior conducted by Yuriev et al. (2018), with the additional variable of goal setting. However, there is no previous study on goal setting as a moderating variable in the relationship between transformational leadership and pro-environmental behavior.

Limitations

This study provided a significant contribution to understanding the relationship between transformational leadership and pro-environmental behavior in the context of cement industry in Indonesia with the importance of goal setting. However, several aspects required improvement for a better understanding, as only one biggest cement industries in South Sumatra, Indonesia, was examined and cannot be generalized. The analysis was also conducted in one company, where the business characteristics and organizational culture would be different from others. Therefore, further investigation is recommended using the same study concept framework in different company and industries.

Implications for Behavior Science

The study bolstered the social identity theory (SIT) (Tajfel, 1978) by incorporating transformational leadership and pro-environmental behavior into the study design. In this context, individuals under transformational leadership may identify more strongly with the group and its environmental goals, leading to increased pro-environmental behavior. Therefore, understanding the interplay between SIT, transformational leadership, and pro-environmental behavior can provide valuable insights into fostering sustainable practices within organizations and communities. The results produce several theoretical and practical implications, including an expansion on previous literature by developing a study model of the relationship between variables of transformational leadership, pro-environmental behavior, work motivation, organizational commitment, and goal setting. Furthermore, this study enhances the positive analysis of the influence of the variables to increase pro-environmental behavior applicable in company. The negative results regarding the influence of variables on pro-environmental behavior can be used as evaluation material for future improvement of the company. Finally, the analysis provides an additional exploration related to the implementation of social identity theory, specifically in Indonesian cement industry, which has not been widely discussed and requires further exploration.

Conclusion

In conclusion, this study showed that pro-environmental behavior, organizational commitment, and job motivation was directly impacted by transformational leadership in Indonesian cement industry. Work motivation had no impact on pro-environmental behavior. Goal setting moderated the impact of transformational leadership, organizational commitment served as a mediator, and employee motivation had insignificant effect. This showed that pro-environmental behavior served as a useful habit for employees at work and receiving support from the company environment. Consequently, this research leads to various pro-environmental practices such as energy conservation, reduction of industrial waste, and mitigation of global warming, providing benefits to organizations and their stakeholders.

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