Promoting Ecological Performance Through Ecological Leadership- The Mediating Role of Organizational Citizenship Behavior for the Environment

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Submission : 10.02.2022
Revision : 20.02.2023
Acceptance : 17.10.2023

Abstract

Grounding the notions of upper echelon theory (UET) and social learning theory (SLT), the paper intends to evaluate the impact of ecological leadership (EL) on the ecological performance of firms (EP) through inspiring employees to engage in organizational citizenship behavior for the environment (OCBE). Following the deductive reasoning approach, a self-administered questionnaire comprising a five-point Likert scale was employed to collect data among 300 operational and functional level employees serving in diverse industrial settings in Bangladesh. The convenience sampling method was applied to select the participants, and the partial least square–structural equation modeling (PLS-SEM) was used to analyze the data and to test the proposed hypothesis. The findings of the study unveil that EL is depicting an insignificant direct influence on EP, yet such leadership flair indirectly influences EP through the modeling role of OCBE as a mediator. To conclude, theoretical and empirical significances, limitations, and notes for future research are also stated in the paper.

Key Words: Ecological Performance, Ecological Leadership, Organizational Citizenship Behavior for the Environment, Environmental Sustainability.

The Chittagong University
Journal of Business Administration
Volume 35, 2021, pp. 47 - 66

ISSN : 2231 - 4843

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1. Introduction

Environmental degradation in the form of deforestation, desertification, and deprivation of ecosystems posits one of the major challenges and threats to nature, civilization, and the existence of future generations, and such dilapidation of ecology is considered a critical issue not only in the civic life but also in the business domain (Adomako et al., 2021; Nisar at al., 2021; Safari et al., 2018). Over a few decades, erudite environmental scholars emphasized that numerous stakeholders of business enterprises are getting exceedingly concerned about the counter-productive impacts of business practices on the natural environment that stands on the verge due to continuous degradation (Adomako et al., 2021; Pham et al., 2020; Ren et al., 2020; Tariq et al., 2020). The 2021 Environmental Performance Index (EPI) published by Yale University ranked Bangladesh 162nd among 180 nations, reflecting the abysmal condition of environmental health and ecosystem vitality (Index, 2020). Just recently, at COP26, governments from all over the world urged business organizations to exercise more eco-friendly business practices to encourage ecological leadership and behaviors (Biswas et al., 2022; United Nations, 2021). Such inexorable appeals from national and international entities compel organizations to function sustainably, and crafting and executing such ecological practices demands a convergence of appropriate ecological leadership and their followers (Biswas et al., 2022).

In recent years, researchers have concentrated on understanding the organizational-level variables that facilitate achieving ecological performance (EP), and leadership has been labeled as an imperative antecedent (Afsar et al., 2020; Robertson & Carleton, 2018). In this context, academics showed that myriad leadership flairs such as responsible leadership (Zhang et al., 2021), ethical leadership (Dey et al., 2022; Kim & Vandenberghe, 2020), and spiritual leadership (Anser et al., 2021) have a significant influence on organizational citizenship behaviors for the environment (OCBE) and EP. However, there is a dearth of research attention on how ecological leadership (EL) can encourage workers to engage in organizational citizenship behavior for the environment in the workplace, which in turn promotes EP (Singh et al., 2020; Uddin et al., 2021). EL involves the adroitness to articulate and implement a persuasive eco-vision, exhibit and stimulate environmental behaviors and own personal

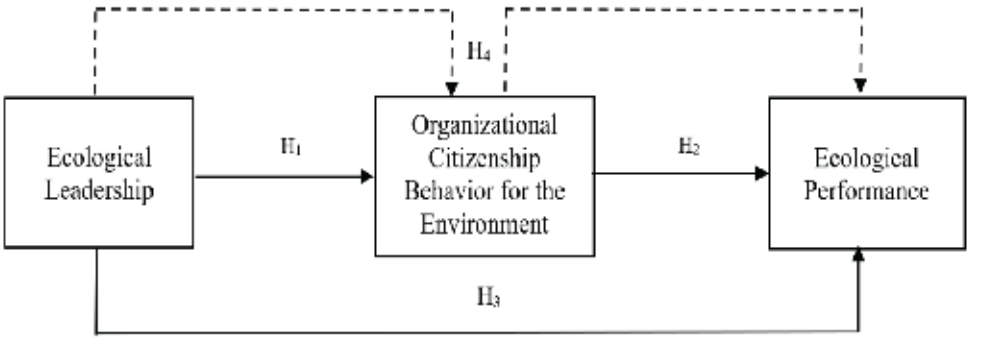
commitment to realizing environmental approaches, i.e. ISO 14001, as well as heighten the psychological green climate of employees (Biswas et al., 2022; Boiral et al., 2009; Kura, 2016; Portugal & Yukl, 1994; Tuan, 2020). Rehman et al. (2023), who exhibited the link between responsible leadership and environmental performance, emphasized unearthing the direct relationship between servant leadership and ecological leadership and followers' pro-environmental behavior. What is supplementary, a clear understanding of the process through which ecological leadership flair bestows an organization's ecological performance is still a conundrum (Su et al., 2020). To address the issues, the research goal of the study is to link ecological leadership with ecological performance through organizational citizenship behavior for the environment.

Considering the achievement of EP as an interplay of combined factors, this study draws on a multi-theoretical approach – upper echelon theory (UET) and social learning theory (SLT) - to investigate the relationship among EL, OCBE, and EP. The understanding of UET contended that top-level managers set the strategic priorities, which in turn shape firm performance (Hambrick & Mason, 1984). In other notion, board directors and senior officials, with their knowledge and skills, considerably affect strategic decisions and consequently upgrade organizational performance (Orazalin & Baydauletov, 2020). Coherent with the arguments, leaders possessing environmental attributions are expected to play a determining role in EP as such leaders took part in formulating and implementing corporate environmental strategies. On the other hand, social learning theory – the most dominant theory explaining organizational behaviors- argues that leaders are viewed as role models by their followers, and whenever a leader conforms to rules and regulations, then these subordinates follow their model reciprocally (Bandura, 1977). Hence, subordinates treat their ecological leaders as environmental role models and try to imitate their behavior, values, and attitudes similarly. Therefore, grounding on the lens of UET and SLT, the study aims to frame the relationship between EL, OCBE, and EP by explaining the following research questions:

a) How does EL influence OCBE?

b) Does OCBE mediate the relationship between EL and EP?

Figure 1: Conceptual research model



2. Literature Review and Research Hypothesis

2.1 Ecological Leadership and OCBE

OCBE stands for the employees' voluntary eco-friendly activities initiated in an organizational setting, which are unrewarded and go beyond the formal job descriptions (Zhao & Zhou, 2021). Stern (2000) propounded that OCBE is one of the four distinct pro-environmental behaviors discretionarily demonstrated by employees. There is a smattering understanding of the mechanism of leadership style to nurture OCBE of the employees (Biswas et al., 2022). As the canons of OCBE are arbitrary, the voluntary participation of workers should be encouraged with the support of leaders in shaping environmentally friendly behaviors (Biswas et al., 2021; Boiral et al., 2018). Among the numerous leadership flairs, scholars regarded ecological leadership as an effective leadership style for engaging and promoting voluntary environmental behavior (Anser et al., 2021; Uddin et al., 2021). Ecological leaders, with their eco-spiritual traits and qualities, instill ideal eco-pride, responsibility, and respect among their followers, preparing them to get engaged in eco-friendly activities (Kim et al., 2019). Thereupon, this study postulated the following hypothesis:

H1: ***EL has a significant positive effect on employees' OCBE.***

2.2 OCBE and Ecological Performance

Environmentally irresponsible behaviors are held responsible for the gradual degradation of the environment and the resultant suffering of the habitats (Tang & Lam, 2017; Han et al., 2019). This rhetoric against the environment calls for substantial changes in behavior (Fischer, J.et al., 2012). OCBE is an integral element of EP that stimulates and improves the holistic performance of organizations (Mousa & Othman, 2020). OCBE can assist us in moving towards more sustainable industries. However, substantial progress will be needed in the pattern and approach of voluntary initiatives to leverage their full potential and ensure economic efficiency (Das et al., 2019; Paton, 2000). OCBEs like waste management, resource management, and energy efficiency have a significant positive impact on the EP of organizations (Ali et al., 2019). Jaaron and Backhouse (2019) confirmed that the behavioral shift toward the environment is instrumental in attaining social and ecological performance. Iqbal et al. (2018) initiated a positive association between employees' eco-friendly behavior and environmental sustainability by providing a coherent framework. From the above discussion, it can be hypothesized that:

H2. OCBE positively influences the EP of an organization.

2.3 Ecological Leadership and Ecological Performance

The literature on organizational sustainability is not rife in studies about EL and EP. Ecological leaders have a substantial influence on the EP of an organization in numerous ways, covering environmental initiatives (Sun et al., 2022), environmental behavior (Biswas et al., 2022), environmental belief (Kim et al., 2019), sustainable performance (Iqbal, Ahmad, & Halim, 2020), and environmental performance (Sun et al., 2022). Dubey et al. (2015) observed that EL positively influences quality management and supplier relationship management, ultimately promoting the organizational EP. In a concurrent study, in a similar vein, Çop et al. (2021) explored that EL significantly affects EP through green work engagement. Therefore, the following hypothesis is proposed:

H3. EL has a positive influence on the organization's EP.

2.4 The Mediating Role of OCBE

Upper-echelon theory, through provocative empirical studies, established that a leader's managerial discretion has a profound influence on crafting and executing corporate strategic decisions and firm performance (Ren et al., 2020). Likewise, ecological leaders also influence the EP of organizations through inspiring OCBEs. Previous studies have delineated the significant impact of OCBE on organizational EP. In a recent study conducted in Bangladesh, Dey et al. (2022) found that ethical leadership strongly influences organizational sustainable performance through the mediating role of voluntary environmental behavior. Naz et al. (2021) also explored how green human resource management practices intensified EP via OECBs and psychological climate. Grounded in the understanding of social learning theory, the EL style develops a spiritual relationship with the natural ecology by engaging the internal people in a shared environmental perception. Ecological leaders' eco-spiritual awareness and behavior brusquely signal to their employees that benign ecological practices are greatly fostered (Su et al., 2020a). Henceforth, in accordance with the discussion, the final hypothesis is proposed:

H4. OCBE mediates the relationship between EL and EP.

3. Research Methods

3.1 Research Settings

This study applied a self-administered survey containing a structured questionnaire to a wider range of manufacturing concerns in Bangladesh to generate a deeper understanding and wider generalizability of our underlying hypothesized relationships (Zhou et al., 2018). Managerial employees from wide-ranging industrial outlooks - garments, shipbuilding, pharmaceutical, steel re-rolling, tobacco, cement, leather, and food processing - were deployed to outline a prolific insight into how EL and OCBE foster EP in multi-theorized settings. The core reason for choosing these industries is that these firms are Bangladesh's major pollutants of environmental degradation.

3.2 Sampling and Data Collection Procedure

The data were collected from the lower and mid-level managers from a wide range of organizations, namely garments, shipbreaking, food, fertilizer, steel, cement, construction tobacco, and packaging sectors. Of all the sampled organizations, 67% were situated in Chittagong - the commercial capital of Bangladesh, whereas others were in Dhaka. Convenience sampling has been adopted as it engenders a considerable number of responses in a relatively short period (Saunders et al., 2007). A sum of 440 questionnaires was disbursed in paper version through researchers' personal visits and digitally via Google Forms Link over a two-month period - January and February 2020. The responses of the sample populations were discretionary. Out of those 440 questionnaires, 300 responses were received, leading to a response rate of 68.18 percent, which is ideally satisfactory because Malhotra and Grover (1998) said that any response rate less than 20 percent is not acceptable and Goudy (1976) endorsed that response rate in the range of 30-70 percent is acceptable. In the data cleansing process, 25 responses were dropped due to a "straight-lining" problem and improper information, and 275 responses were selected for analysis. Since the study was analyzed using SEM-PLS, the 275 responses surpassed the threshold limit of the strongly recommended observation-to-variable ratio of 1:20 responses (i.e., 12x20=240) per variable (Hair Jr, Hult, Ringle, & Sarstedt, 2016; Memon et al., 2020).

3.3 Demographic Information

While investigating the demographic profile, we found that the sample consisted of 180 (65.45%) males and 95 (34.55%) females. Regarding the age category, most of the respondents (157 57.09%) come from 20-30 years, followed by 77 (28.01 %) respondents from 30-40 years, 41 (14.90%) respondents from above 40 years old. Regarding education, the greater share of the sample, 191 (69.45%), are highly educated with a master's degree, and 54 (19.63%) completed bachelor's degrees, while only 30 (10.90%) hold other degrees. The tenure experience manifested that 128 (46.54%) worked less than 10 years, 105 (38.18%) worked for more than 10 years, and 42 respondents (15.27%) had the highest tenure experience of more than 20 years. Finally, regarding organizational size, 101 (36.72%) came from small firms, 144

(52.30%) came from medium enterprises, and the remaining 30 (10.90%) comprised large firms.

3.4 Measurement Tools

For all three variables studied, measurement tools from previous studies have been employed with a 5-point Likert scale. A six-item measurement scale was adapted from Chen and Chang (2013) to measure EL. A sample item was "My leader involves employees in solving environmental problems". OCBE was measured by using the three-item scale of Frese et al. (1997). Sample items include "I take the initiative to act in environmentally friendly ways at work." Finally, EP was rated with the instrument of Lee and Ha-Brookshire (2017), a sample item includes "I am aware that my company has the initiative to reduce, reuse, and recycle."

4. Results

4.1 Measurement Model

Partial least square–structural equation modeling (PLS-SEM) was applied to confirm the all-inclusive investigation of the presumed relationships - direct and mediating mechanisms. The measurement model is tested by applying confirmatory factor analysis (CFA), composite reliability (CR), average variance extracted (AVE) and convergent validity for confirming estimates representing the variables. Table 1 (discriminant validity) and Table 2 (convergent validity) realized that all the constructs were commensurate with the threshold limit (CR=0.70, AVE=0.50, and Factor Loading=0.50). The test of discriminant validity reveals a decent result as the square root of all construct's AVE (EL=0.590, OCBE=0.548, EP= 0.596) is higher than its correlation with other variables. Regarding convergent validity, table 2 displayed that factor loading of each item is above 0.70. Hence, both analyses – discriminant and convergent- mentioned that constructed used in this study are valid and reliable (Hair et al., 2017) .

Table 1: Estimates for the measurement model

Variables	1	2	3	4	5	6	7	8
1. Age	1							
2. Year	.880**	1						
3. Size	-.100	-.062	1					
4. Education	.252**	.210**	-.003	1				
5. Gender	-.118	-.177**	-.078	.123*	1			
EL	-.192**	-.123*	.078	-.131*	-.183**	0.768		
OCBE	-.250**	-.164**	.186**	-.195**	-.032	.459**	0.740	
EP	-.158**	-.100	.115	-.040	-.037	.328**	.343**	0.772
Mean						2.24	1.95	1.85
Standard Deviation						0.633	0.577	0.626

*, **. Correlation is significant at the 0.05 level (2-tailed) and 0.01 level (2-tailed) correspondingly.

Table 2: Convergent validity

Latent Variable	Items	Factor Loading	Composite Reliability (CR)	Average Variance Extracted (AVE)

Ecological Leadership	EL1	0.780	0.718	0.590
	EL2	0.829		
	EL3	0.801		
	EL4	0.789		
	EL5	0.800		
	EL6	0.753		
Organizational Citizenship Behavior for the Environment	OCBE1	0.794	0.889	0.548
	OCBE2	0.819		
	OCBE3	0.726		
Ecological Performance	EP1	0.866	0.723	0.596
	EP2	0.872		
	EP3	0.709		
Minimum Threshold Limit		>0.70	>0.70	>0.50

4.2 Structural Model and Hypothesis Testing

Table 3 demonstrates the estimates of the hypothesized relationships. In H1, it is presumed that EL has a significant positive influence on OCBE, which is attested by the estimates (β=0.451, p=0.000), resulting in support H1. In H2, we postulated that OCBE positively influences EP. The estimates in Table 3 proved that the influence is significant (β=0.224, p=0.001), suggesting accepting H2. Finally, it is predicted in H3 that EL positively influences EP. This proposition is rejected (β=0.157, p=0.063), thus indicating not to accept H3.

Table 3: Estimates of direct effects

Hypothesis	Path Relation	Path Coefficient (β)	T-value	P-value	Decision
H1	EL→OCBE	0.451	9.436	0.000	Supported
H2	OCBE→EP	0.224	3.564	0.001	Supported
H3	EL→EP	0.157	1.827	0.063	Not Supported

4.3. Mediating effect on OCBE

In H4, it is hypothesized that OCBE mediates the influence of EL on EP. To enumerate the mediation effect, researchers recommended determining the difference in results between before and after mediation. The unmediated model- without the mediating variable (OCBE) - as shown in Figure 2, labels that a significant direct effect (c) exists. According to the doctrine of mediation analysis, full mediation exists if the direct effect ($c^{/}$) between the variables disappears, and partial mediation occurs when such effect reduces substantially after adding a mediating variable (Fan et al., 2019; Hair et al., 2017). Consequently, Figure 2 displays the unmediated using the 'c' path and the mediated model using the "$c^{/}$" path, which connects EL with EP through OCBE. The direct effect of EL on EP is significant (β_c=0.288, p=0.000) before adding a mediator. However, such a direct effect turns insignificant (βc/=0.157, p=0.068) as OCBE as a mediator is added. The value of variance accounted for (VAF) is 0.391, which falls in the range of partial mediation (0.20 – 0.80), construing the presence of a partial mediation effect. Therefore, H4 is supported.

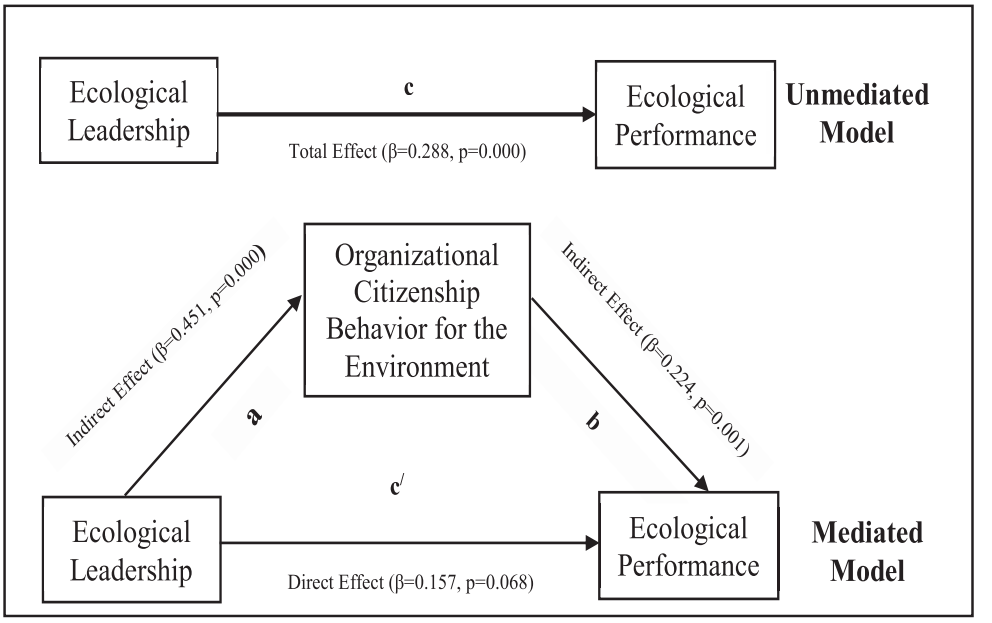


Figure 2: Direct and indirect effects in mediated and unmediated models

5. Discussion:

This research examined the direct and mediated impact to explain EP regarding EL and OCBE. Firstly, in congruence with our presumption, the findings assets that EL has a significant direct impact [β=0.451, $t_{statistics}$=9.436, p<0.000] on OCBE, referring that the eco-centric characteristics of leaders shape the environmental behavior of the followers (Ju, Azlinna, & Thurasamy, 2015; Zhao & Zhou, 2019).

Secondly, this study also corroborates the affirmative linkage between the OCBE and EP [β=0. 0.224, $t_{statistics}$=3.564, p<0.001], which is coherent with the prior studies (Kimet al., 2019; Su et al., 2020). This finding reinforced that discretionary eco-centric activism of employees positively influences the ecological performance of the organization. This happens due to the maxim that employees with an eco-friendly mindset instilled by modeling of ecological leadership find a congenial green atmosphere to undertake impactful environmental activities (Dey et al., 2022).

Thirdly, discordant with our predisposition, the result implied that [β=0.157, $t_{statistics}$=1.827, p=0.168 (>0.05)] no direct association prevails between EL and EP, suggesting nullifying the
H3 and this result contradicts the earlier research outcome of Liao and Zhang (2020) and Çop et al. (2021). It denotes that the presence of EL only cannot exclusively ensure the achievement of EP. Therefore, it can be contended that leading only as an environmental role model may not be an effectual mechanism to sustain EP.

Finally, In H4, we hypothesized that OCBE mediates the relationship between EL and EP. Accordingly, it is observed that OCBE has a partial mediating effect on EP. This outcome is also compatible with the prior finding of Naz et al. (2021), who coined a mediating role of pro-environmental behavior on environmental performance.

6. Conclusions

Integrating the UET and SLT into a comprehensive framework, this study attempted to develop and empirically validate an inimitable model that demonstrates the mechanism of fostering EP through the direct effect of EL and the mediating role of OCBE. Testing of the hypothesis reveals that the corollary of EL on ensuring organizational performance from an environmental perspective is irrefutable. Furthermore, OCBE also acts as a mediator between EL and EP, indicating the considerate role of employees in augmenting a sustaining environmental performance. To recapitulate, EL possessing environmental stewardship, eco-centric values and attitude, and pro-environmental behaviorism affably stimulate the followers to actively engage in improved voluntary environmental actions.

6.1 Theoretical Contributions

As stated above, EP, one of the components of sustainable performance, has become a remarkable research arena as stakeholders are concerned about protecting and conserving the ecology (Naz et al., 2021). This study contributes to academic knowledge on many fronts. The first theoretical contribution of the current study addresses the relationship between a group-level antecedent - EL style with an organizational-level context- EP that remains unexplored in earlier research. Although concurrent studies uncovered the influence of green HRM (Anwar et al., 2020; Naz et al., 2021), environmental attitude (Tariq et al., 2020), and ethical leadership (Dey et al., 2022) on EP. Addressing this research question, this study revealed that ecological leaders exert a significant positive effect on an organization's eco-related performance, which is seemingly congruent with the findings of (Singh et al., 2020), who attributed that green transformational leadership positively influences environmental performance. From the UET perspective, EL composition navigates corporate environmental strategies and choices and, subsequently, EP. Secondly, this research unveiled how leaders with ecocentrism can galvanize employees to demonstrate additional environmental behavior, supporting the propositions of SLT, thus substantiating the findings of Priyankara, Luo, Saeed, Nubuor, and Jayasuriya (2018). From the viewpoint of SLT, employees acquire new environmental behavior by observing their role model- the ecological leader and become committed to preserving nature and engaging in prolific OCBE. Finally, this

empirical study enlightens the implication of OCBE as a mediating variable between an organization's EL and EP, extending the findings of Anwar et al. (2020).

6.2 Managerial Implications

The findings of the study offer pathways to organizational practitioners and leaders on the mechanism of achieving improved EP. The corollary of practicing EL is critical in that pathway. Firstly, as a harbinger of eco-system conservation, organizational leaders need to uphold eco-values and attitudes and engage in eco-initiatives so that their role-modeling activism will energize their followers to undertake eco-friendly actions. Secondly, ecological leaders should exert essential efforts for crafting and implementing environmental priorities through creating a green organization climate, sustainable decision making and reinforcing pro-environmental behavior to bolster EP. Last but not least, organizations must arrange environmental training on resource conservation and sustainable development goals (SDGs) regularly, form green teams, and engage employees in ecological discussions.

6.3 Limitations and Future Research Directions

Though the this study advocates appreciable contributions to sustainability literature with petty self-containing limitations, future academic endeavors are suggested to address the following issues scrupulously. First, this study only applied the quantitative method to provide an answer to the research question; a combination of qualitative and quantitative approaches can be employed for enhanced triangulation of findings. Second, future studies may extend the current results to other emerging economies, as this study was conducted only in Bangladesh, an emerging economy. Finally, future research could test the mediating role of eco-spirituality, green creativity, and environmental innovation to get new insights into ecological performance.

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