



Investigating the Cascading Effect of Leaders' OCBE: A Moderated Mediation Model

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Abstract

Scholars and practitioners have extensively emphasized the importance and urgency of corporate environmental sustainability. As such, today's organizations are more concerned about their environmental performance and are exploring ways to encourage and facilitate employees' pro-environmental behaviours. In recent years, research attention has been directed to the management of employee pro-environmental behaviours in the workplace. Organizational citizenship behaviour for the environment (OCBE) is defined as employee voluntary behaviours that can help facilitate the effective environmental management of the organization. Drawing upon social learning theory (SLT) and social exchange theory (SET), this conceptual paper aims to delineate the cascading effect from leaders' OCBE to followers' OCBE and explore its underlying process while explaining the impact of organizational culture on employee behaviour. Furthermore, it discusses how and why a personality trait (i.e., openness to experience) can increase employees' tendencies to engage in high-intensity OCBE (i.e., OCBE with short-term costs and long-term benefits). By proposing a moderated mediation model that depicts a cascading effect, this paper will be of value to both academics and management practitioners. It will assist organizations in hiring and developing employees who are concerned about environmental sustainability. Leadership is also emphasized relating to hiring and promoting those with expertise in and passion for environmental sustainability.

Keywords: Employee Green Behaviour; Human Resources; Leadership; Organizational Green Culture (OGC); Personality Traits

1. Introduction

A report recently released by the United Nations Environment Programme (UNEP) indicates that the continuation of the current emission reduction policies and efforts will result in 56 gigatons of CO₂ equivalent (GtCO₂e) greenhouse gas (GHG) emissions by 2035. However, reaching the 2°C, or preferably 1.5°C, goal set by the Paris Agreement requires the world to bring its GHG emissions down to the levels of 36 GtCO₂e or 25 GtCO₂e respectively. The failure to reduce the emissions to such levels would mean society must take radical and rapid actions to cut emissions (UNEP, 2023) a path that would dramatically impact the economy. In recent decades, as change has been urged globally, organizations are making remarkable efforts toward sustainability (Lamm et al., 2013). The importance of sustainability has been increasingly recognized by top management, leaders, and employees (Ones & Dilchert, 2012). Given the urgency of minimizing the environmental footprint, scholars have posited and found that employee individual-level pro-environmental behaviour is a critical component of corporate greening and environmental sustainability (Boiral & Paille, 2012; Zacher et al., 2023). Building on Organ et al.'s (2006) conceptualization of organizational citizenship behaviour (OCB), Daily et al. (2009) suggest that employees can also engage in extra-role discretionary intended to protect the environment, i.e., organizational citizenship behaviour for the environment (OCBE). Since OCBE was introduced, a growing body of literature has discussed its nature, antecedents, and consequences (e.g. Lamm et al., 2013; Lu et al., 2023; Su et al., 2023; Tosti-Kharas et al., 2017). Most of the previous studies have focused on examining employees' OCBE at the individual level, however, scant attention has been paid to explore the link between leader OCBE and employee OCBE, or the influence between leader OCBE and organizational culture. This has resulted in a limited understanding of the impact of leaders' OCBE on individual employees and the organization. In addition, current studies have adopted contingency variables such as organizational commitment (Ostertag, 2023) and personal environmental beliefs (Boiral et al., 2018) to explain why individuals engage in OCBE, but it is unclear whether personality traits can moderate behaviour. The purpose of this study is threefold. Firstly, we seek to explain why leaders' OCBE can act as a focal predictor that can encourage and trigger employee OCBE. We elaborate on this process through social learning and social exchange perspectives. Secondly, we also highlight the mediating role of a robust and active organizational green culture in guiding employees' OCBE. Finally, we propose that individual differences can affect employees' propensity to engage in high-intensity OCBE. Given the severity of the climate crisis humanity faces, it will become imperative that organizations set bolder and bolder goals to better respond and adapt to this crisis. Thus, in the future, it will be even more important for environmental organizationalism researchers to study high-intensity OCBEs, as opposed to low-intensity OCBEs. As stated above, personality traits are neglected by the majority of current OCBE studies, and we address this gap by including openness to experience as a personality trait in the model outlining the cascading effect of leaders' OCBE on employee OCBE and organizational culture.

2. Theoretical framework

2.1. Organizational citizenship behaviour for the environment (OCBE)

The recent decade has witnessed the proliferation of literature on employee workplace green

behaviours (or pro-environmental behaviours) (Farooq & Yusliza, 2023). Boiral and Paillé (2012) posit that employee participation and green initiatives are salient to the success of the organization's environmental performance for four major reasons. Firstly, challenging the status quo and promoting voluntary employee environmental behaviour are key drivers of the transition to an environmentally responsible organization. Secondly, the firm's environmental practices are often derived from individuals' suggestions and ideas. Following through with such suggestions is key to employee engagement and organizational success as they can empower employees and strengthen their loyalty. Thirdly, reducing pollution and waste requires employees' collective effort. Finally, the successful implementation of environmental management (e.g. ISO 14001) requires active participation of employees.

Boiral (2009) defines OCBE as "*individual and discretionary social behaviors not explicitly recognized by the formal reward system and contributing to improve the effectiveness of environmental management of organizations*" (p. 223). Similarly, Daily et al. (2009) define OCBE as employees' discretionary behaviours that are not rewarded and that aim to improve the environment. Ciocirlan (2017) further clarifies that OCBEs only apply to situations where employee and organizational environmental values are aligned. In such cases, employees' voluntary pro-environment behaviours will not only protect the environment but also create value for the organization, which is consistent with the key characteristics of OCB.

The existing literature on OCBE encompasses three major streams of research (Boiral et al., 2015; Boiral et al., 2018). The first research stream aims to conceptualize and refine the nature and scope of these behaviours. Based on the definitions offered by scholars (e.g. Boiral, 2009; Daily et al., 2009), several aspects of OCBE were identified (Lamm et al., 2013; Robertson and Barling, 2017): OCBE benefits the environment by reducing resource consumption, it is not explicitly required by the job description, and it is driven by employees' intention to improve the environment.

Additionally, typologies and taxonomies of OCBE have been developed, using different perspectives. According to Boiral (2009), each of Organ's (2006) dimensions (i.e., helping, sportsmanship, organizational loyalty, organizational compliance, individual initiative, and self-development) could be applied to the case of OCBE. In Boiral and Paillé's (2012) study, three types of OCBE were identified: eco-initiatives, which are employee-driven environmental behaviours such as recycling in the workplace; eco-civic engagements, which refer to contributing to organizational environmental practices such as participating in environmental events; and eco-helping behaviours, which refer to situations where employees assist others in tackling environmental issues, including providing environmental suggestions or solutions. Drawing on Williams and Anderson's (1991) target-based typology of OCB (i.e., OCB-I and OCB-O), Robertson and Barling (2017) develop a target-based framework of OCBE. The first type, self-enacted OCBE, refers to those workplace discretionary pro-environmental behaviours without a specific beneficiary target but that immediately benefit the natural environment. The second type is the co-worker-focused OCBE, which is consistent with behaviour focused on the individual (OCB-I). This type of OCBE benefits the employees themselves and their co-workers by improving their health and well-being. The third type is the organizationally-focused OCB. Similar to OCB-O, this type of OCBE focuses on benefiting the organization as a whole. Organizationally-focused OCBE can directly improve the organization's environmental performance and indirectly improve the organization's financial

performance. Ciocirlan (2017) classifies OCBEs based on their level of intensity: while low-intensity OCBEs are extensions of domestic green behaviours, high-intensity OCBE have short-term costs and long-term benefits.

The second stream of research in OCBE focuses on developing measurement instruments. The most widely adopted are the ones developed by Boiral and Paillé (2012), and Lamm et al. (2013). The ten-item scale developed by Boiral and Paillé (2012) centres on the above-mentioned three dimensions of OCB (eco-initiatives, eco-civic engagement, and eco-helping), whereas the 12-item scale developed by Lamm et al. (2013) captures some specific behaviours (e.g., using scrap paper for notes instead of fresh paper). In addition, Robertson and Barling (2017) developed a 10-item scale that is based on their target-based framework of OCBE.

The third stream of research considers the main drivers and outcomes of OCBE. The drivers of OCBE were examined from various perspectives. Some studies examine cognitive factors, for example, environmental concerns (Daily et al., 2009). In addition, based on Boiral and Paillé's (2012) framework, Boiral et al. (2018) examine the antecedents of managers' OCBE. Results show that managers' higher stage of consciousness will contribute to their engagement in both eco-helping and eco-initiatives because it increases their commitment to sustainability. Managers' personal environmental beliefs can also predict their eco-helping and eco-civic engagement. Tosti-Kharas et al. (2017) suggest that employees' personal rationale for OCBE can be eco-centric (i.e., believing that sustainability is a moral imperative) or organization-centric (i.e., believing that sustainability can improve the organization's financial performance). Other studies posit that specific leadership styles are positively associated with employees' OCBE. For instance, Gurmani et al. (2021) find that environmental transformational leadership style predicts employees' OCBE. An empirical study with 447 participants in China finds that supervisors' ethical leadership can lead to employees' OCBE through a green psychological climate (Khan et al., 2019). Ethical leadership can also predict OCBE through stronger leader identity and team environmental climate (Su et al., 2023). HR management is also considered a key driver of employee OCBE: in a Vietnamese sample, green HR practices predicted both individual and collective OCBE and green servant leadership can amplify those positive relationships (Luu, 2019b). Overall, empirical evidence suggests that socially responsible human resource management is positively associated with employees' OCBE through increased person-organization fit (Zhao et al., 2021).

Regarding the outcomes of OCBE, some studies suggest that OCBE can improve the organization's environmental performance. For example, Daily et al. (2009) posit that OCBE is positively associated with the organization's environmental performance. Similarly, Boiral et al. (2013) further argue that managers' OCBE has a more profound effect on environmental performance than employees' OCBE because managers are more knowledgeable and have more freedom in the organization. Robertson and Barling (2017) conclude that OCBE directly contributes to an organization's environmental performance, and in turn, indirectly improves its financial performance.

2.2. Social learning theory and OCBE

According to Bandura and Walters (1977), social learning theory (SLT) suggests that individuals learn through their observation of attractive and credible others' behaviours and will then emulate these behaviours. In the workplace context, leaders and supervisors are

usually deemed attractive and credible, therefore, social learning theory has been extensively applied to explain employees' workplace behavioural patterns. For example, Mayer et al. (2009) posit that, because ethical leaders serve as role models for subordinates, their moral and helping behaviours are likely to be imitated by their subordinates. Thus, ethical leadership is positively related to group OCB. In addition, some studies on environmental-focused leadership styles have demonstrated that employees will emulate leaders' behaviours and internalize leaders' environmental values. Through engaging in pro-environmental behaviours, environmentally transformational leaders can facilitate followers' pro-environmental behaviours (Robertson & Carleton, 2018). It is also worth mentioning that, compared with employees' personal rationale, their perceptions of the organizational rationale are stronger predictors of their OCBE (Tosti-Kharas et al., 2017). In other words, even when employees do not believe it is economical or moral to behave in an environmentally friendly manner, as long as they believe that the organization values sustainability, they tend to engage in OCBE. This belief can be derived from observing their superiors' actions. Ying et al. (2020) find that although servant leadership cannot influence employees' voluntary engagement in green behaviours directly, it can indirectly increase those behaviours through psychological empowerment. Luu (2019a) also found support for the indirect relationship between environmentally specific servant leadership and employees' OCBE because those leaders help forge employees' environmental value. Similarly, Faraz et al. (2021) find that, because green servant leadership entails the role-modelling of the leaders as "green servants," it results in stronger employee pro-environmental behaviours.

Drawing on SLT, we propose that when leaders engage in OCBE, subordinates will experience two sequential steps. The first step is mimicry. As suggested by Bandura and Walters (1977), individuals' observational learning happens when they know the positive or negative consequences of the model's behaviour. If the observers perceive that the model's certain behaviours create value, they will be motivated to engage in the same behaviours themselves. To extend this logic, as mentioned previously, managers' OCBE can have significant impacts on organization's environmental performance (Boiral et al., 2015). When employees observe leaders' OCBE and the associated favourable outcomes (e.g., higher environmental performance), followers are more likely to emulate leaders' behaviours when in similar situations. The second step is reinforcement. SLT also entails learning from direct experience, which is governed by reward and punishment systems. This would happen after the employees engage in the behaviours modelled by their leaders. Individuals decide how to cope with a certain situation depending on the response to their behaviours (Bandura & Walters, 1977). Some of the behaviours are deemed unsuccessful and as a result, discarded, while other behaviours, if successful, are reinforced. In this vein, we need to note that OCBE is not explicitly required by the contract nor formally rewarded by the organization (Bioral, 2009). However, when the intent is directly protecting the environment and indirectly benefitting the organization or co-workers, employees' OCBE will still generate positive outcomes, such as improved environmental performance (Daily et al., 2009; Robertson & Barling, 2017). This positive feedback is not necessarily extrinsic but can potentially reinforce employees' OCB. For example, recycling in the workplace helps the organization better manage its waste, and participation in the organization's environmental events helps improve the organization's image. These perceived positive outcomes help employees unconsciously retain their OCBE.

As OCBEs lead to favourable results, those behaviours confer positive anticipated consequences to employees and motivate employees to keep behaving in those ways in the future.

2.3. Social Exchange Theory and OCBE

Social exchange theory (SET) can also be applied as a mechanism to explain the top-down effect of leaders' OCBE. Social exchange refers to the long-term exchange of resources between two parties (Cook et al., 2013). Unlike economic exchange, social exchange is not immediate and not formally regulated, it pertains to the long-term, voluntary, and reciprocal exchange relationship. The resources exchanged in such relationships can be either extrinsic (e.g., a free meal) or intrinsic (e.g., feelings of acceptance and respect from others, or mutual value). In the organizational context, if employees perceive that the organization or supervisor values them and cares about their well-being, they will reciprocate toward the organization and their supervisor (Gould-Williams & Davies, 2005). As such, employees' OCB can sometimes derive from social exchange relationships. Ma and Qu (2011) report that social exchange between hotel employees and three entities—leaders, coworkers, and customers—can trigger employees' engagement in OCB with the intent to benefit those entities. Similarly, Xu et al. (2022) find that a higher level of perceived leadership support results in employees performing both OCB-I and OCB-O.

OCBE can also be driven by perceived supervisory support (PSS) (Daily et al., 2009) and perceived organizational support for the environment (POS-E) (Lamm et al., 2015; Paillé et al., 2013). POS-E was defined as the employees' belief of the extent to which the organization values their environmental contributions (Lamm et al., 2015). Thus, those employees who perceive higher organizational support may help the organization either directly (through OCB) or indirectly (through OCBE) (Lamm et al., 2013).

From the SET perspective, we suggest that leaders' OCBE can promote subordinates' OCBE for two reasons. First, leaders demonstrate their support and commitment to environmental goals through engagement in OCBE. Followers who perceive leaders as environmentally committed are more likely to engage in voluntary pro-environmental behaviours themselves, such as providing suggestions to environmental initiatives, as they expect leaders to reciprocate such behaviours in the future in either intrinsic or extrinsic ways. In addition, leaders' OCBE conveys the message that they support those pro-environmental behaviours to the employees. When employees believe that their pro-environmental behaviours will be supported by the organization and the supervisor, they are more willing to help the organization become greener (Gurmani et al., 2021; Paillé & Mejia-Morelos, 2014). Second, based on the target-based framework of OCB (Robertson & Barling, 2017), leaders' OCB can benefit subordinates in certain ways (OCB-I). For example, bringing plants to the workplace can improve subordinates' physical and mental health. As a part of the reciprocal relationship, employees are more likely to engage in OCBE to benefit the leaders and the organization in similar ways that are environmentally friendly.

Based on the SLT and SET perspectives and the research findings supporting these theories, we formulate:

Proposition 1: Leader's OCBE is positively associated with employee's OCBE

2.4. The mediating role of the Organizational Green Culture (OGC)

Culture is a set of shared beliefs, values, and understanding by the members of a society. It provides guidance to individuals' behaviour and decision-making (Hofstede, 2001). In the organizational setting, culture can also be a property of the group and is considered as an accumulated learning process by a certain group of people over time (Schein, 1990). Organizational culture is one of the key success factors that help bridge the gap between the formulation and implementation of the corporate green strategy (Engert & Baumgartner, 2016). Organizational green culture (OGC) is defined as the shared values and beliefs that guide the organization to become environmentally friendly (Al-Swidi et al., 2021). Current literature has established that OGC plays a pivotal role in guiding and influencing employees' behaviours in corporate greening. Wang (2019) finds that OGC improves the organizations' green performance and competitive advantage through enhanced green innovation. Abbas and Khan (2022) point out that when OGC is higher, the link between green knowledge management and green innovation will be strengthened. Al-Swidi et al. (2021) find that green HRM can help forge OGC, and in turn, facilitate employees' green behaviour. In addition, Pham et al. (2018) suggest that OGC has a positive effect on employees' OCBE because top management's green message will be translated by the employees and lead to their increased attention to green activities.

Building on the underlying dimensions of organizational culture defined by Schein (1990), leaders' display of OCBE can assimilate environmental awareness and concern to the organizational culture in three ways. First, organizational culture helps define the nature of human activity in the organization. Leaders' OCBE, such as active participation in environmental initiatives and sharing environmental knowledge and concerns, can express the message of being environmentally proactive to the followers. Second, organizational culture also explains the nature of reality and truth in the organization. In other words, it determines the definition of truth and the way in which the truth is defined in the organization. Managers' engagement in OCBE demonstrates their commitment and support to the environment and can be translated to both informal, individual-level pro-environment practices (Boiral et al., 2015). Managers' and supervisors' environmental commitment is a key predictor of corporate greening (Paillé et al., 2013). For example, by explaining environmental procedures to the new employees, leaders will be able to convey environmental concerns to those newly embarked employees and define green culture or mindset as the "truth" of the organization. Because organizational culture is a system that can transmit behaviour patterns (Allaire & Firsirotu, 1984), once the "truth" of being environmentally friendly has been established in the organization, OCBE can have contagious effects from leaders to followers, and in turn, among followers. Third, organizational culture defines the nature of human relationships in the organization. According to Schein (1990), this dimension of organizational culture determines the way for people to relate to each other. Leaders' OCBE also plays a key role in this dimension. If leaders promote collective green effort among employees and encourage employees to express their ideas of workplace environmental issues, they will be able to build a culture that is environmentally reciprocal, cooperative, and values employees' environmental ideas or suggestions. As argued by Wang (2019), this culture will in turn stimulate employees' pro-

environmental initiatives and thus improve the organizational green performance. More importantly, this culture also defines the way people interact with each other, an active and robust OGC can improve employees' environmental concerns and make them more proactive to promote sustainability in the workplace. Indeed, a strong and robust OGC can stimulate organization members to engage in more in-role and extra-role green behaviours. Conversely, a non-green culture is one of the major barriers to employees' OCBE (Yuriev et al., 2018). In conclusion, leaders' OCBE can help establish and enhance OGC, and OGC can effectively trigger the cascading effect that transmits leaders' environmental concerns and OCBE to followers' OCBE.

Based on the theoretical and empirical underpinnings of OGC, we formulate:

Proposition 2: Leaders' OCBE is positively related to a strong OGC.

Proposition 3: A strong OGC mediates the positive relationship between leaders' OCBE and followers' OCBE.

2.5. The moderating effect of openness to experience

Ciocirlan (2017) posits that every OCBE, with the exception of sportsmanship (i.e., not complaining about environmental policies and procedures), falls on the continuum ranging from low- to high-intensity. While low-intensity OCBEs are essentially extensions of domestic behaviours, high-intensity OCBEs have short-term costs and long-term benefits. Regarding activism, when the company uses an environmentally harmful practice, an employee may raise the issue with a supervisor but stopping here if the conversation is not successful (low-intensity) or could set up an environmental committee to determine the organization to stop the action (high-intensity). Regarding altruism, an example of low-intensity behaviours is devoting extra time to provide information that helps the organization to better implement its green practices; an example of high-intensity behaviours would be spending a significant amount of time helping the organization implement certain environmental standards.

The "Big-five" framework of personality incorporates five dimensions: Openness to Experience, Extraversion, Neuroticism, Agreeableness, and Conscientiousness. Two broad categories of these dimensions were identified. While neuroticism, agreeableness, and conscientiousness pertain to individuals' desire to be prosocial, openness and extraversion are linked with individuals' proactive tendencies and inclination toward self-actualization and growth (Chiaburu et al., 2011). McCrae and John (1992) suggest that the dimension of openness to experience is associated with traits such as a wide range of interests, unusual thought processes, judges in unconventional terms, and more novel ideas. Individuals with a higher level of openness to experience enjoy developing new ideas and are more interested in novelty (Kumar et al., 2009). Openness conflicts with traits such as conformity, tradition, security, and any other traits that aim to maintain the status quo and avoid new and different things (Roccas et al., 2002).

Research on the link between openness and OCB in general has yielded mixed results. Some studies did not find a link between openness and OCB (Organ, 2006) or between openness and change-oriented OCB (Seppala et al., 2012). However, some more recent studies found that openness has a profound effect on OCB (Chiaburu et al., 2011; Kumar et al., 2009). A meta-analysis concludes that openness plays a prominent role in predicting all three types of OCB, namely, OCB-I, OCB-O, and change-oriented OCB (OCB-CH) (Chiaburu et al., 2011). In

addition, even if we do not take OCB-CH into account, those traits with pro-social tendencies (i.e. agreeableness and conscientiousness) do not predict OCB-I and OCB-O better than openness. Some recent studies have also explored the connection between openness and employees' pro-environmental behaviours. Based on their empirical study with 411 participants, Blok et al. (2015) conclude that openness as an affective factor, can contribute to employees' pro-environmental behaviour because it helps build environmental value. Terrier et al. (2016) find that openness is associated with employees' eco-helping behaviours, in other words, employees with higher openness are more inclined to help and encourage co-workers to be more environmentally concerned. In line with this finding, Szotek (2021) also suggests that employees characterized by higher openness are more likely to engage in indirect OCBE (i.e., influence other organization members to perform OCBE). More importantly, in Katz et al.'s (2022) meta-analysis, openness was found to be an important predictor of employees' OCBE. Wells et al. (2024) also suggest that openness is associated with employees' conserving behaviours in the workplace and stronger ecological values.

We suggest that openness serves as a moderator in the mediated relationship between leaders' OCBE and followers' OCBE such that employees with higher openness are more likely to engage in high-intensity OCBE compared with those with average or low openness. This argument could be underpinned by three points. First, based on Ciocirlan (2017), high-intensity OCBE implies that employees pursue long-term environmental goals at some short-term costs. This requires forward-thinking and proactive personalities, which is consistent with the trait of openness (Roccas et al., 2002). Conversely, employees with lower levels of openness are more conservative, thus they are more hesitant to sacrifice short-term interest for the sake of achieving uncertain long-term environmental goals. Second, similar to change-oriented OCB, some high-intensity OCBE also require changing the status quo. Employees have to recognize the need for action before engaging in such behaviours, and this can only be amplified by a higher level of openness (Chiaburu et al., 2011). For example, after noticing the potential benefit of adopting ISO 14001, those with higher openness will be more willing to devote long-term, substantive, and continuous effort to help the organization meet the ISO 14001 standards. Third, individuals with high openness are considered unconventional, have more novel ideas, and seek novel ways of doing things (Judge et al., 1999; McCrae & John, 1992), which corresponds to some forms of high-intensity OCBE. For example, with more novel ideas, more open employees are more likely to offer suggestions to optimize the products and processes of the organization to improve its environmental performance and actively help promote the implementation of these novel ideas. In addition, based on the empirical evidence in the current studies (e.g., Szotek, 2021; Terrier et al., 2016), more open employees also have higher tendencies to help colleagues and encourage them to perform green behaviours. This behaviour also aligns with the nature of high-intensity OCBE. Therefore, it is logical to infer that employees with higher openness are more inclined to engage in high-intensity OCBE. Thus, we propose:

Proposition 4: Openness moderates the mediated relationship between leaders' OCBE and followers' OCBE such that followers with higher openness are more likely to engage in high-intensity OCBE.

3. Empirical considerations

To validate our conceptual model and develop a deeper understanding of OCBE, it is highly recommended that researchers test our propositions through empirical studies.

Proposition 1 suggests that leaders' OCBE is positively associated with followers' OCBE. To test *Proposition 1*, researchers could use the scale developed by Boiral and Paillé (2012) or Lamm et al. (2013) to measure the leaders' and followers' OCBE, conduct exploratory factor analysis (EFA) to reduce the dimensions of the behaviours studied and then determine the correlation between those two variables. To meet the condition of temporality in causality research, care should be taken to measure leaders' behaviour at an earlier time than employee behaviour. T-tests could also be conducted to measure whether the two groups, employees and leaders, are different or similar in their engagement in OCBE.

Regarding *Propositions 2-4*, the mediating effect of OGC and the moderating effect of openness in the model can be tested through structural equation modelling (SEM) in PROCESS macro using Model 4 and 7 respectively (Hayes, 2021). A bootstrapping approach could be used to get more accurate parameter estimates of the indirect effect of leaders' OCBE on followers' OCBE. Confirmatory factor analyses can also be performed to test the level of fit for the four-factor model compared with each of the alternative models. To examine the moderating effect of openness on the level of intensity of employees' OCBE, researchers can also perform a cluster analysis where individuals are divided into two groups based on their score in openness and then examine the level of intensity of OCBE for each group. We also encourage researchers to develop and validate a new scale based on Ciocirlan's (2017) theoretical framework. This would also help future research to develop a better understanding of OCBE and its intensity. Based on recent studies on the impact of leadership on employees' OCBE (e.g., Lu et al., 2022; Su et al., 2023), employees' display of OCBE can be influenced by a set of contingency factors (e.g., gender, tenure, education, position, etc.) thus, researchers can choose to control for those factors to rule out their impact.

In addition, future studies must ensure valid and reliable data collection. Current quantitative studies on OCBE mainly adopt a self-reported data collection with a cross-sectional approach (e.g., Biswas et al., 2022; Su et al., 2023), which makes them susceptible to common method bias (Podsakoff et al., 2012). To mitigate the impact of common method bias, we recommend that future quantitative studies on OCBE collect data from multiple sources and through a time-separated survey (Podsakoff et al., 2012). For instance, leaders' engagement in OCBE could be measured through employee observations, instead of self-reported data. In addition, a longitudinal research design can also help researchers to better capture the causal relationship between variables (Al-Swidi et al., 2021).

4. Discussion and future research directions

To advance the literature on employee green behaviours, it is imperative to explore the antecedents and outcomes at multiple levels (Zacher et al., 2023). The overarching objective of this paper is to explain why and how leaders' OCBE will result in followers' OCBE. Although the existing literature has established the impact of leadership on employees' workplace green behaviours (e.g. Robertson & Carleton, 2018; Su et al., 2023; Ying et al., 2020), the way in which leaders' behaviours can influence followers remains unclear. Moreover, the effect of employees' personality traits on the way they engage in OCBE has been largely

neglected by previous studies (Wells et al., 2024). Accordingly, we seek to advance extant literature by developing a model which explains the cross-level effect of leaders' OCBE on employee OCBE.

This study makes three theoretical contributions to the existing literature in OCBE. First, we describe the cascading effect of leaders' OCBE using the social learning and social exchange perspectives, which suggest that leaders should act as role models and facilitate a high-quality exchange relationship with employees. Second, researchers have identified several factors that can moderate individuals' display of OCBE, such as gender (Khan et al., 2019) and OGC (Pham et al., 2018). However, less attention has been paid to investigating the way individual dispositional factors might influence their green behaviours (Wells et al., 2024). This paper contributes to the literature by proposing that a personality trait (openness to experience) will affect the level of intensity of employees' OCBE. Finally, the integrated model we propose incorporates variables at intrapersonal (i.e., personality trait), interpersonal (i.e., leaders' role-modelling and the exchange relationship), and organizational-level (i.e., OGC) variables, and delineates the complex interplay among those variables in predicting employees' OCBE. This multi-level integration allows for a deeper understanding of OCBE from a theoretical perspective.

This study also makes practical contributions to the literature on green HR practices in organizations. First, by highlighting the top-down effect of leaders' OCBE, this study suggests that leaders' engagement in OCBE can not only contribute to the environmental goals but also increase employee engagement in OCBE. One of the major obstacles in the workplace that hinders employees' expression of "green selves" is the lack of green role models to follow (Yuriev et al., 2018). Hence, in pursuing environmental goals as an organization, leaders must act as role models that guide employees' behaviours (Biswas et al., 2022), for example, leaders can actively engage in eco-helping behaviours and facilitate a reciprocal relationship with employees on environmental lines. Second, an active and robust OGC is key to transmitting leaders' green values and sharing guidelines for the employees' green behaviour. Creating a strong OGC will effectively support the alignment of leaders' OCBE and followers' OCBE. Third, the moderating effect of openness reveals that openness can affect the level of intensity of OCBE. If this finding will be confirmed by empirical studies, it would suggest that openness to experience, as an individual difference, can be applied as a criterion for recruiting and selecting the right candidates. Given that organizational environmental goals are expected to become more ambitious in the future, and these goals require high investments in the short-run and yield large potential benefits in the long-run, it is important to select candidates who are willing and able to pursue bold initiatives to help the environment through work. This individual ability is best measured through openness to experience. Finally, our conceptual model shows that leaders' discretionary environmental behaviours can encourage and stimulate employees' propensity to engage in such behaviours. Thus, firms can also design effective training interventions (e.g., leadership development initiatives) to help leaders grow from an environmental perspective and to shape their behaviours in a way that emphasizes environmental stewardship (Biswas et al., 2022; Testa et al., 2020).

Future studies in this area can generate fruitful outcomes to advance the literature in several ways. First, as discussed in previous sections, Ciocirlan (2017) offers a clear theoretical framework that differentiates high- and low-intensity OCBE. Given the different nature of

high- and low-intensity OCBE, future researchers can develop a better understanding of this framework by examining antecedents (e.g., certain types of leadership) and contextual factors (e.g., other dispositional factors) that can impact the degree of intensity of OCBE.

Second, given that the top-down effect of leadership or HR practices on employees' OCBE has been extensively discussed by the current literature (Robertson & Barling, 2018; Gurmani et al., 2021; Khan et al., 2019; Su et al., 2023), future studies may examine the bottom-up effects of employees' OCBE. For example, some employees' strong ecological values, coupled with an open to experience nature, can lead them to engage in ambitious eco-initiatives, which, in turn, can influence their organization's greening strategies.

Third, Pham et al. (2023) suggest that different national cultures can influence employees' tendency to engage in OCBE, especially in the context of multinational corporations. This can be further explored by delving deeply into the interactions between the cultures of the host country and the home country, and the way this interaction will affect employees' perceptions of OCBE. Finally, we encourage future researchers to develop and validate a measurement instrument of the level of intensity of OCBE. This will help future studies to empirically test the proposed model as well as to further test other variables in relation to OCBE. To avoid common method variance, researchers may conduct temporally distinct surveys, or augment self-reported data with field observations (Podsakoff et al., 2012).

5. Conclusion

Although an impressive amount of knowledge of environmental leadership has been generated in recent years (e.g., Gurmani et al. 2021; Ullah et al., 2021), gaps exist on the implications of leaders' OCBE at different levels. This paper contributes to the current literature on OCBE by proposing an integrated model that elaborates on the rationale for the cascading effect of leaders' OCBE. In addition, we propose that employees with higher openness will be more likely to engage in high-intensity OCBE. The moderating effect of a personality trait in the proposed model extends the understanding of OCBE by explaining the influence of individual differences. This study also offers some valuable insights to managers and HR practitioners who are actively pursuing environmental goals. Future research on OCBE can develop a deeper understanding of OCBE from various perspectives.

References

- Allaire, Y., & Firsirotu, M. E. (1984). Theories of organizational culture. *Organization studies*, 5(3), 193-226. <https://doi.org/10.1177/017084068400500301>
- Al-Swidi, A. K., Gelaidan, H. M., & Saleh, R. M. (2021). The joint impact of green human resource management, leadership and organizational culture on employees' green behaviour and organisational environmental performance. *Journal of Cleaner Production*, 316, 128112-. <https://doi.org/10.1016/j.jclepro.2021.128112>
- Bandura, A., & Walters, R. H. (1977). *Social learning theory* (Vol. 1). Prentice Hall: Englewood Cliffs.
- Blok, V., Wesselink, R., Studynka, O., & Kemp, R. (2015). Encouraging sustainability in the workplace: a survey on the pro-environmental behaviour of university employees. *Journal of Cleaner Production*, 106, 55–67. <https://doi.org/10.1016/j.jclepro.2014.07.063>
- Biswas, S. R., Uddin, M. A., Bhattacharjee, S., Dey, M., & Rana, T. (2022). Ecocentric leadership and voluntary environmental behavior for promoting sustainability strategy: The role of psychological green climate. *Business Strategy and the Environment*, 31(4), 1705-1718. <https://doi.org/10.1002/bse.2978>
- Boiral, O. (2009). Greening the Corporation through Organizational Citizenship Behaviors. *Journal of Business Ethics*, 87(2), 221–236. <https://doi.org/10.1007/s10551-008-9881-2>
- Boiral, O., & Paillé, P. (2012). Organizational Citizenship Behaviour for the Environment: Measurement and Validation. *Journal of Business Ethics*, 109(4), 431–445. <https://doi.org/10.1007/s10551-011-1138-9>
- Boiral, O., Raineri, N., & Talbot, D. (2018). Managers' citizenship behaviors for the environment: a developmental perspective. *Journal of Business Ethics*, 149, 395-409. <https://doi.org/10.1007/s10551-016-3098-6>
- Boiral, O., Talbot, D., & Paillé, P. (2015). Leading by Example: A Model of Organizational Citizenship Behavior for the Environment. *Business Strategy and the Environment*, 24(6), 532–550. <https://doi.org/10.1002/bse.1835>
- Chiaburu, D. S., Oh, I.-S., Berry, C. M., Li, N., & Gardner, R. G. (2011). The Five-Factor Model of Personality Traits and Organizational Citizenship Behaviors: A Meta-Analysis. *Journal of Applied Psychology*, 96(6), 1140–1166. <https://doi.org/10.1037/a0024004>
- Ciocirlan, C. E. (2017). Environmental Workplace Behaviors: Definition Matters. *Organization & Environment*, 30(1), 51–70. <https://doi.org/10.1177/1086026615628036>
- Cook, K. S., Cheshire, C., Rice, E. R., & Nakagawa, S. (2013). Social exchange theory. *Handbook of social psychology*, 61-88. https://doi.org/10.1007/978-94-007-6772-0_3
- Daily, B. F., Bishop, J. W., & Govindarajulu, N. (2009). A Conceptual Model for Organizational Citizenship Behavior Directed Toward the Environment. *Business & Society*, 48(2), 243–256. <https://doi.org/10.1177/0007650308315439>
- Engert, S., & Baumgartner, R. J. (2016). Corporate sustainability strategy – bridging the gap between formulation and implementation. *Journal of Cleaner Production*, 113, 822–834. <https://doi.org/10.1016/j.jclepro.2015.11.094>
- Faraz, N. A., Ahmed, F., Ying, M., & Mehmood, S. A. (2021). The interplay of green servant leadership, self - efficacy, and intrinsic motivation in predicting employees' pro -

- environmental behavior. *Corporate Social-Responsibility and Environmental Management*, 28(4), 1171–1184. <https://doi.org/10.1002/csr.2115>
- Farooq, K., & Yusliza, M. Y. (2023). Two decades of workplace ecological behaviour: A systematic literature review. *Benchmarking: An International Journal*, 30(10), 4681–4716. <https://doi.org/10.1108/BIJ-02-2022-0079>
- Gould-Williams, J., & Davies, F. (2005). Using social exchange theory to predict the effects of hr practice on employee outcomes: An analysis of public sector workers. *Public Management Review*, 7(1), 1–24. <https://doi.org/10.1080/1471903042000339392>
- Gurmani, J. K., Khan, N. U., Khalique, M., Yasir, M., Obaid, A., & Sabri, N. A. A. (2021). Do environmental transformational leadership predicts organizational citizenship behavior towards environment in hospitality industry: Using structural equation modelling approach. *Sustainability* (Basel, Switzerland), 13(10), 5594-. <https://doi.org/10.3390/su13105594>
- Hayes, A. F. (2021), *Introduction to mediation, moderation, and conditional process analysis: A regression-based approach* (3rd Ed.), The Guilford Press, New York, NY.
- Hofstede, G. (2001). *Culture's consequences: comparing values, behaviors, institutions, and organizations across nations* (2nd ed.). Sage Publications.
- Judge, T. A., Higgins, C. A., Thoresen, C. J., & Barrick, M. R. (1999). The big five personality traits, general mental ability, and career success across the life span. *Personnel psychology*, 52(3), 621–652. <https://doi.org/10.1111/j.1744-6570.1999.tb00174.x>
- Katz, I. M., Rauvola, R. S., Rudolph, C. W., & Zacher, H. (2022). Employee green behavior: A meta - analysis. *Corporate Social-Responsibility and Environmental Management*, 29(5), 1146–1157. <https://doi.org/10.1002/csr.2260>
- Khan, M. A. S., Jianguo, D., Ali, M., Saleem, S., & Usman, M. (2019). Interrelations between ethical leadership, green psychological climate, and organizational environmental citizenship behavior: A moderated mediation model. *Frontiers in Psychology*, 10, 1977–1977. <https://doi.org/10.3389/fpsyg.2019.01977>
- Kumar, K., Bakhshi, A., & Rani, E. (2009). Linking the'Big Five'personality domains to Organizational citizenship behavior. *International journal of Psychological studies*, 1(2), 73. <https://doi.org/10.5539/ijps.v1n2p73>
- Lamm, E., Tosti-Kharas, J., & King, C. E. (2015). Empowering employee sustainability: Perceived organizational support toward the environment. *Journal of Business Ethics*, 128, 207–220. <https://doi.org/10.1007/s10551-014-2093-z>
- Lamm, E., Tosti-Kharas, J., & Williams, E. G. (2013). Read This Article, but Don't Print It: Organizational Citizenship Behavior Toward the Environment. *Group & Organization Management*, 38(2), 163–197. <https://doi.org/10.1177/1059601112475210>
- Lu, H., Cai, S., Liu, Y., & Chen, H. (2023). How GHRM impacts employee OCBE: the role of emotions and value discrepancy. *International Journal of Manpower*, 44(2), 318–333. <https://doi.org/10.1108/IJM-02-2021-0094>
- Luu, T. T. (2019a). Building employees' organizational citizenship behavior for the environment: The role of environmentally-specific servant leadership and a moderated mediation mechanism. *International Journal of Contemporary Hospitality Management*, 31(1), 406–426. <https://doi.org/10.1108/IJCHM-07-2017-0425>

- Luu, T. T. (2019b). Green human resource practices and organizational citizenship behavior for the environment: the roles of collective green crafting and environmentally specific servant leadership. *Journal of Sustainable Tourism*, 27(8), 1167–1196. <https://doi.org/10.1080/09669582.2019.1601731>
- Ma, E., & Qu, H. (2011). Social exchanges as motivators of hotel employees' organizational citizenship behavior: The proposition and application of a new three-dimensional framework. *International Journal of Hospitality Management*, 30(3), 680–688. <https://doi.org/10.1016/j.ijhm.2010.12.003>
- Mayer, D. M., Kuenzi, M., Greenbaum, R., Bardes, M., & Salvador, R. (Bombie). (2009). How low does ethical leadership flow? Test of a trickle-down model. *Organizational Behavior and Human Decision Processes*, 108(1), 1–13. <https://doi.org/10.1016/j.obhdp.2008.04.002>
- McCrae, R. R., & John, O. P. (1992). An Introduction to the Five-Factor Model and Its Applications. *Journal of Personality*, 60(2), 175–215. <https://doi.org/10.1111/j.1467-6494.1992.tb00970.x>
- Ones, D. S., & Dilchert, S. (2012). Environmental Sustainability at Work: A Call to Action. *Industrial and Organizational Psychology*, 5(4), 444–466. <https://doi.org/10.1111/j.1754-9434.2012.01478.x>
- Organ, D. W., Podsakoff, P. M., & MacKenzie, S. B. (2006). *Organizational citizenship behavior: Its nature, antecedents, and consequences*. Sage publications. <https://doi.org/10.4135/9781452231082>
- Ostertag, F. (2023). Integrating OCBE Literature and Norm Activation Theory: A Moderated Mediation on Proenvironmental Behavior of Employees. *Sustainability*, 15(9), 7605-. <https://doi.org/10.3390/su15097605>
- Paillé, P., & Mejía-Morelos, J. H. (2014). Antecedents of pro-environmental behaviours at work: The moderating influence of psychological contract breach. *Journal of Environmental Psychology*, 38, 124–131. <https://doi.org/10.1016/j.jenvp.2014.01.004>
- Paillé, P., Boiral, O., & Chen, Y. (2013). Linking environmental management practices and organizational citizenship behaviour for the environment: a social exchange perspective. *International Journal of Human Resource Management*, 24(18), 3552–3575. <https://doi.org/10.1080/09585192.2013.777934>
- Pham, N. T., Chiappetta Jabbour, C. J., Vo-Thanh, T., Huynh, T. L. D., & Santos, C. (2023). Greening hotels: does motivating hotel employees promote in-role green performance? The role of culture. *Journal of Sustainable Tourism*, 1-20. <https://doi.org/10.1080/09669582.2023.2259117>
- Pham, N. T., Phan, Q. P. T., Tučková, Z., Vo, N., & Nguyen, L. H. L. (2018). Enhancing the organizational citizenship behavior for the environment: The roles of green training and organizational culture. *Management & Marketing*, 13(4), 1174–1189. <https://doi.org/10.2478/mmcks-2018-0030>
- Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2012). Sources of method bias in social science research and recommendations on how to control it. *Annual review of psychology*, 63(1), 539-569. <https://doi.org/10.1146/annurev-psych-120710-100452>
- Robertson, J. L., & Barling, J. (2017). Toward a new measure of organizational environmental citizenship behavior. *Journal of Business Research*, 75, 57–66.

- <https://doi.org/10.1016/j.jbusres.2017.02.007>
- Robertson, J. L., & Carleton, E. (2018). Uncovering How and When Environmental Leadership Affects Employees' Voluntary Pro-environmental Behavior. *Journal of Leadership & Organizational Studies*, 25(2), 197–210. <https://doi.org/10.1177/1548051817738940>
- Roccas, S., Sagiv, L., Schwartz, S. H., & Knafo, A. (2002). The big five personality factors and personal values. *Personality and social psychology bulletin*, 28(6), 789-801. <https://doi.org/10.1177/0146167202289008>
- Schein, Edgar H. (1990) *Organizational culture*. Vol. 45. No. 2. American Psychological Association. <https://doi.org/10.1037//0003-066X.45.2.109>
- Seppälä, T., Lipponen, J., Bardi, A., & Pirttilä-Backman, A.-M. (2012). Change-oriented organizational citizenship behaviour: An interactive product of openness to change values, work unit identification, and sense of power. *Journal of Occupational and Organizational Psychology*, 85(1), 136–155. <https://doi.org/10.1111/j.2044-8325.2010.02010.x>
- Su, X., Wang, H., & Zhu, Y. (2023). The cross-level influence of ethical leadership on employee's OCBE: a two-wave study based on the social identity approach. *Frontiers in Psychology*, 14, 1270359–1270359. <https://doi.org/10.3389/fpsyg.2023.1270359>
- Szostek, D. (2021). Employee behaviors toward using and saving energy at work. the impact of personality traits. *Energies*, 14(12), 3404. <https://doi.org/10.3390/en14123404>
- Terrier, L., Kim, S., & Fernandez, S. (2016). Who are the good organizational citizens for the environment? An examination of the predictive validity of personality traits. *Journal of Environmental Psychology*, 48, 185–190. <https://doi.org/10.1016/j.jenvp.2016.10.005>
- Testa, F., Todaro, N., Gusmerotti, N. M., & Frey, M. (2020). Embedding corporate sustainability: An empirical analysis of the antecedents of organization citizenship behavior. *Corporate Social Responsibility and Environmental Management*, 27(3), 1198-1212. <https://doi.org/10.1002/csr.1875>
- Tosti-Kharas, J., Lamm, E., & Thomas, T. E. (2017). Organization OR Environment? Disentangling Employees' Rationales Behind Organizational Citizenship Behavior for the Environment. *Organization & Environment*, 30(3), 187–210. <https://doi.org/10.1177/1086026616668381>
- Ullah, I., Wisetsri, W., Wu, H., Shah, S. M. A., Abbas, A., & Manzoor, S. (2021). Leadership Styles and Organizational Citizenship Behavior for the Environment: The Mediating Role of Self-Efficacy and Psychological Ownership. *Frontiers in Psychology*, 12, 683101–683101. <https://doi.org/10.3389/fpsyg.2021.683101>
- United Nations Environment Programme (2023). Emissions Gap Report 2023: Broken Record – Temperatures hit new highs, yet world fails to cut emissions (again). <https://wedocs.unep.org/20.500.11822/43922>
- Wang, C.-H. (2019). How organizational green culture influences green performance and competitive advantage: The mediating role of green innovation. *Journal of Manufacturing Technology Management*, 30(4), 666–683. <https://doi.org/10.1108/JMTM-09-2018-0314>
- Wells, V. K., Ciocirlan, C. E., Manika, D., & Gregory-Smith, D. (2024). Green, keen, and somewhere in between: An employee environmental segmentation study. *Journal of Cleaner Production*, 445, 141296. <https://doi.org/10.1016/j.jclepro.2024.141296>
- Williams, L. J., & Anderson, S. E. (1991). Job Satisfaction and Organizational Commitment as Predictors of Organizational Citizenship and In-Role Behaviors. *Journal of Management*,

17(3), 601–617. <https://doi.org/10.1177/014920639101700305>

- Xu, S. (Tracy), Wang, Y.-C., & Ma, E. (2022). A workplace-driven model on the formation of OCB-C: perspectives of social exchange theory and agency theory. *International Journal of Contemporary Hospitality Management*, 34(7), 2684–2703. <https://doi.org/10.1108/IJCHM-11-2021-1409>
- Ying, M., Faraz, N. A., Ahmed, F., & Raza, A. (2020). How does servant leadership foster employees' voluntary green behavior? A sequential mediation model. *International Journal of Environmental Research and Public Health*, 17(5), 1792-. <https://doi.org/10.3390/ijerph17051792>
- Yuriev, A., Boiral, O., Francoeur, V., & Paillé, P. (2018). Overcoming the barriers to pro-environmental behaviors in the workplace: A systematic review. *Journal of Cleaner Production*, 182, 379–394. <https://doi.org/10.1016/j.jclepro.2018.02.041>
- Zhao, H., Zhou, Q., He, P., & Jiang, C. (2021). How and When Does Socially Responsible HRM Affect Employees' Organizational Citizenship Behaviors Toward the Environment? *Journal of Business Ethics*, 169(2), 371–385. <https://doi.org/10.1007/s10551-019-04285-7>