

# Understanding employees' voluntary pro-environmental behavior in public organizations – an integrative theory approach

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## Abstract

**Purpose** – This paper aims to investigate the impact of situational factors and internal psychological states on employees' decisions to perform voluntary pro-environmental behavior. This study used a model combining the theory of planned behavior, norm activation model and comprehensive action determination model. This study also explored the moderating role of habit (HAB) on the relationship between intention and actual voluntary pro-environmental behavior.

**Design/methodology/approach** – Data were collected through three waves of time-lagged survey questionnaires from 519 employees of public organizations in Abu Dhabi, United Arab Emirates.

**Findings** – Employees' perceptions of corporate social responsibility (CSR) had a significant impact on intention to perform voluntary pro-environmental behavior, as did all other variables except perceived behavioral control. HABs related to pro-environmental behavior enhanced the relationship between intention and actual behavior.

**Practical implications** – The main factors influencing employees' voluntary pro-environmental behavioral intentions were perceived CSR, personal moral norms, organizational citizenship behaviors toward the environment and attitude. Public organization planners, managers and practitioners can use these findings to improve their organization's environmental performance, leveraging nonmandated actions.

**Social implications** – Employees can achieve a better work-life balance in organizations with flexible CSR policies and which sponsor social activities to improve public well-being and individuals' life quality. Positive sense-making of corporate social activity helps employees develop social interactions with stakeholders, increasing their involvement in society and decreasing work stress.

**Originality/value** – This study sheds light on the factors influencing employees' voluntary pro-environmental behavior. To the best of the authors' knowledge, this is the first study of its kind to combine these three models to explain the variables affecting intent to perform voluntary pro-environmental behavior in the workplace.

**Keywords** Voluntary pro-environmental behavior, Public organizations, Perceived corporate social responsibility (CSR), Organizational citizenship behaviors (OCB) toward the environment

**Paper type** Research paper

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Received 13 April 2022  
Revised 13 September 2022  
Accepted 5 December 2022

The authors would like to thank Melissa Leffler, a freelance language editor, for proofreading a draft of this manuscript.

**Funding:** The authors received no financial support for the research.

**Declaration of conflicting interests:** The authors declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

**Data availability:** The data to replicate all analyses are available from the authors upon request.

## 1. Introduction

The United Nations Development Program (UNDP) seeks a balance between people and the environment. In a survey conducted by UNDP and the University of Oxford in 2020, 64% of the respondents believed that climate change was a worldwide emergency (Steiner, 2020). There was also growing recognition that the climate consensus has shifted from crisis to emergency, and it is time to bridge the gap between ambition and action. Amid growing awareness of environmental sustainability, the Middle East region is undergoing

changes highlighting the importance of changing economic growth and development paradigms (Steiner, 2020). Environmental movements have resulted in national governments adopting more ambitious environmental objectives and increasing global collaboration (Ren *et al.*, 2018). Business and human activities are the primary contributors to global environmental challenges (Singh and Singh, 2017). There is now complete scientific agreement on anthropogenic global warming and that human activities have contributed significantly to the rise of greenhouse gases in the atmosphere (Powell, 2019).

The effectiveness of a corporation in establishing and implementing an environmental policy is heavily reliant on employees' personal beliefs and behavior (Chou, 2014). Pro-environmental behaviors are not constant and might vary greatly depending on the level of discretion involved (Yuriev *et al.*, 2018). In this study, we shed light on individual voluntary pro-environmental behavior that is not prescribed or mandated by the organization, that is, behavior that is not covered in formal job descriptions, role expectations or job criteria. Several studies have investigated the impact of environmental volunteering on people's pro-environmental behaviors (Büchs *et al.*, 2012; Cooper *et al.*, 2015; Mehrajunnisa *et al.*, 2022; Seymour *et al.*, 2018). We attempted to gain a deep understanding of the factors that influence employee intention to perform voluntary pro-environmental behavior (INT), which then, in turn, may influence their actual behavior. Our proposed constructs were driven by three pro-environmental models: the theory of planned behavior (Ajzen, 1991), the norm activation model (Schwartz, 1977) and the comprehensive action determination model (CADM) (Klöckner and Blöbaum, 2010).

Previous studies have attempted to investigate employee pro-environmental behavior using either the theory of planned behavior or the norm activation model (Park and Ha, 2014; Zhang *et al.*, 2017). However, it is now evident that one theory alone is insufficient to explain pro-environmental behavior (Hamzah and Tanwir, 2021; He and Zhan, 2018; Liu *et al.*, 2017; Zhang *et al.*, 2018). The explanatory value of these studies is also limited because they did not account for the probability that employees' pro-environmental behavior may change over time, as the conditions change (Wang *et al.*, 2018). They also did not fully account for all factors. For example, the theory of planned behavior is based on an assumption of rationality. However, environmentally friendly behavior cannot be understood simply as the outcome of rational choice. Unplanned, spontaneous or emotional factors should also be taken into account (Wang *et al.*, 2018). The norm activation model has been criticized for focusing solely on self-interest and not including external considerations such as resources, time and social environment (He and Zhan, 2018; Shi *et al.*, 2017). Research also suggests that environmental behavior is frequently predicted by habit (HAB) (Klöckner and Blöbaum, 2010; Tang *et al.*, 2022; van den Broek *et al.*, 2019). The CADM proposed by Klöckner and Blöbaum (2010) recognized the importance of integrating the assumptions from the theory of planned behavior and the norm activation model with the theoretical concept of HAB (Triandis, 1979), because behavior can become automatic or habitual with regular repetition. They also added the ipsative theory of behavior (Frey and Heggli, 1989), which distinguishes between perceived behavioral barriers and objective conditions that inhibit pro-environmental behaviors. This study was therefore designed to combine three theories: the theory of planned behavior, the norm activation model and the CADM, into one theoretical framework to clarify voluntary pro-environmental behavior in the workplace. These models provide a structural framework to investigate the influence of interpersonal and organizational interaction variables, and individual intention, on employee pro-environmental behavior.

This study proposed four research objectives to address gaps in knowledge about employee voluntary pro-environmental behavior. It aimed first to develop a framework to measure voluntary pro-environmental behavior in public organizations. Second, it examined the factors that influence employees' voluntary pro-environmental behavior in public organizations. Third, it investigated the effect of public sector employees' INT on their actual behavior. Fourth, it assessed the moderating effect of HAB on the relationship between intended and actual voluntary pro-environmental behavior. This study intended to address three research questions and examine seven

hypotheses about the relationship between the attributes that influence employee intended and actual voluntary pro-environmental behavior in public organizations. The research questions were:

- RQ1.* Which factors significantly influence employees' intention to perform voluntary pro-environmental behavior in public organizations?
- RQ2.* To what extent are employees' intended and actual voluntary pro-environmental behavior related in public organizations?
- RQ3.* Does habit moderate the relationship between intended and actual voluntary pro-environmental behavior?

This study makes a number of theoretical contributions in the field of voluntary pro-environmental behavior in the workplace. First, there is a lack of research on employees' pro-environmental behavior that is not linked to formal procedures or organizational rules (Kim *et al.*, 2017). Second, the study examined the role of corporate social responsibility (CSR) and cultural aspects within the organization, such as organizational citizenship behavior (OCB). It assessed employees' perceptions of these aspects beyond formal procedures or organizational rules. When employees perceive that the organization supports them to engage in pro-environmental behavior by giving appropriate resources, they are motivated to make more effort. Employees are more willing to behave eco-actively in the workplace when organizations have an environmentally oriented management strategy and supportive policies in place (Paillé *et al.*, 2014). Third, the study examined the moderating effect of HAB on the relationship between intended and actual voluntary pro-environmental behavior. It is hoped that this work will encourage other scholars to compare the significance of the path in structural equation modeling (SEM) in voluntary pro-environmental behavior research.

From a practical perspective, public organization managers will need to consider voluntary pro-environmental behavioral factors when establishing the values and knowledge required to support appropriate initiatives. They may, for example, provide opportunities for employees to engage in environmental discussions and involve managers actively and intentionally in the organization by adopting a strategy that integrates awareness of environmental practices. This should enable organizations to improve their environmental performance and therefore probably long-term sustainability.

## 2. Theoretical framework and literature review

### 2.1 Pro-environmental behavior theories and models

Pro-environmental behavior, often known as environmentally responsible behavior or green behavior, is a term that has been commonly used to describe behavior that protects the environment (Choong *et al.*, 2020). Every individual activity that reduces the negative environmental impact of human activities or contributes to improved environmental quality is considered pro-environmental behavior (Kim *et al.*, 2018). The broad concept of voluntary environmental behavior at work refers to behavior that is intentionally demonstrated by employees at any organizational level and is aimed at conserving and/or improving the natural environment by minimizing resource consumption, improving energy efficiency, preventing waste production, recycling and saving water (Ciocirlan, 2017; Norton *et al.*, 2015).

The theory of planned behavior, the norm activation model and the ipsative theory (Frey and Heggli, 1989) are the most widely used theories in studying pro-environmental behavior. They are all integrated into the CADM (Klöckner and Blöbaum, 2010). The success of the theory of planned behavior could be attributed to three qualities in its framework: attitude (AT), subjective norms and perceived behavioral control (PBC). These are generally measured using a set of specified and verified statements (Ajzen, 2002). The original model is based on three direct predictors, but researchers occasionally use an expanded theory that includes additional variables, such as past behavior (Richetin *et al.*, 2012), moral norms (Wan *et al.*, 2017) and

self-identity (Mannetti *et al.*, 2004). Sniehotta *et al.* (2014) and Pesseau *et al.* (2013) noted several limitations linked to the use of this theory, including that it is only appropriate for investigating one behavior at a time. It can determine specific factors that influence one action, especially particularly desirable or harmful behaviors, but this approach ignores the complexities of serious debate. The norm activation model consists of three key variables: consequence awareness, responsibility attribution and personal norms (Schwartz, 1977). Previous research has shown that an individual's moral values considerably influence their environmental behavior (Wang *et al.*, 2011; Zibenberg *et al.*, 2018). The theory of planned behavior suggests that environmental behavior is driven by individual expectations and well-being, but the norm activation model emphasizes the role of altruistic behavior and individual moral norms. Internal factors in the two theories influence each other and eventually, an individual's intention to participate in environmental behavior (Zhang *et al.*, 2017).

The CADM suggests that environmental behavior is the result of four types of processes: normative processes (social norms, awareness of consequences, awareness of need and personal norms), habitual processes (HABs), intentional processes (intentions and ATs) and situational processes (objective and subjective constraints). All three theories have been shown empirically to be useful in explaining private pro-environmental behavior [Botetzagias *et al.* (2015) and Greaves *et al.* (2013) for the theory of planned behavior; Onwezen *et al.* (2013) and Tang *et al.* (2019) for the norm activation model; Ceresia *et al.* (2017), Klöckner (2013), Lülfes and Hahn (2014) and van den Broek *et al.* (2019) for the inclusion of HAB; and Tanner (1999) for the ipsative theory of behavior]. The factors in this study were selected from previous work based on their suitability for developing a comprehensive model for studying the voluntary pro-environmental behavior of employees in the public sector. The theory of planned behavior has previously been used to study AT and PBC. Based on previous research on subjective norms and the type of pro-environmental behavior required in this study (voluntary behavior), we excluded the subjective norms aspect to examine personal individual choices, rather than the influence of other people. Instead, we focused on the other two aspects, AT and PBC. Subjective norms have a significant influence on behavioral intention in a mandatory environment, but the effect is insignificant in a voluntary environment (Venkatesh and Davis, 2000; Shih and Fang, 2004). Personal moral norms (PMN) were selected from the norm activation model. Harland *et al.* (2007) investigated how personal norms influence the effect of activators on volunteering. After controlling for the effect of awareness of need, personal norms were significantly related to volunteering. We therefore used personal norms to assess personal characteristics of individuals who voluntarily engage in pro-environmental behavior.

We were examining voluntary pro-environmental behavior of employees at the workplace. It is therefore important to consider the four relevant processes from the CADM. We analyzed the situational processes most closely related to voluntary pro-environmental behavior in the workplace, which were perceived CSR and OCB toward the environment. Previous studies (Farouk and Jabeen, 2018) demonstrated a substantial association between employee perceptions of their employer's CSR and their future responses to actual corporate behaviors. Perceived CSR was therefore included (De Roeck and Maon, 2018; Gond *et al.*, 2017; Rupp *et al.*, 2013). Employee engagement has always been seen as a basic criterion that is positively associated with the effectiveness of a variety of corporate greening practices (Albloushi *et al.*, 2022; ElTayeb *et al.*, 2010; Jiang and Bansal, 2003). Employees are more willing to behave eco-actively in the workplace when organizations have an environmentally oriented management strategy and supportive policies (Khan *et al.*, 2022; Paillé *et al.*, 2014). This therefore suggested that OCB toward the environment might also be important.

Intention generally precedes actual behavior, including for environmental workplace behavior (Razak and Sabri, 2019). In most cases, intention is associated with future

behavior. Understanding the factors related to employees' intended behaviors in the workplace can therefore help organizations to enable pro-environmental behaviors among their employees.

## 2.2 Hypotheses development

**2.2.1 Attitude.** Lülfs and Hahn (2014) defined AT as a person's overall judgment of the advantages and disadvantages of undertaking a specific behavior. Several studies have been conducted on particular positive or negative ATs, including those to conservation and pollution (Aznar-Díaz *et al.*, 2019), recycling (Osman *et al.*, 2015) and key contemporary environmental management issues (Ibáñez *et al.*, 2020). These studies showed that ATs are critical predictors of pro-environmental behavior in business. Environmental ATs may not always reflect pro-environmental behavior or practices, but they often indirectly affect behavior (Janmaimool and Khajohnmanee, 2019). The idea that ATs influence behavioral intentions to engage in pro-environmental behavior across organizations is supported by several studies (Chin *et al.*, 2018; Kim and Yun, 2019; Yu and Yu, 2017; Yuriev *et al.*, 2020). We therefore hypothesized:

*H1.* Attitude is positively associated with intention to perform voluntary pro-environmental behavior.

**2.2.2 Perceived behavioral control.** Ajzen (1991) distinguished between internal and external dimensions of PBC. Individual dispositional aspects such as the amount of information employees possess and their skills or abilities are internal control factors. External behavioral control factors exist outside the individual and either support or interfere with the performance of the behavior (Mehrajunnisa *et al.*, 2020). Research has so far focused on internal control factors like self-efficacy, the knowledge, skills and abilities required to make decisions (Vamvaka *et al.*, 2020). Self-efficacy can be seen as an internal component that is associated with a person's perception of behavioral control (Khatimah and Halim, 2016). Identifying the organization as environmentally friendly is a form of external PBC for employees who want to engage in environmentally friendly behavior. We therefore hypothesized:

*H2.* Perceived behavioral control is positively associated with intention to perform voluntary pro-environmental behavior.

**2.2.3 Personal moral norms.** Personal norms are set when three key requirements are met (Schwartz, 1977). Individuals must be aware that action to resolve an issue is required in a given situation (awareness of need); aware that their own actions are linked to the problem (awareness of consequences); and aware of their ability to participate in effective action (PBC). Harland *et al.* (2007) investigated how personal norms influence the effect of activators on volunteering by controlling for the influence of awareness of need. They found that personal norms were significantly related to volunteering. We therefore used personal norms to measure personal attributes of individuals who voluntarily engage in pro-environmental behavior. Several studies suggest that moral norms help to explain pro-environmental behavior like energy conservation (Yeboah and Kaplowitz, 2016), recycling (Huber *et al.*, 2020) and pro-environmental buying (Schlegelmilch *et al.*, 2015). Personal predispositions substantially influence voluntary and discretionary behavior (Yuriev *et al.*, 2018). We assumed that individuals who have a personal predisposition for pro-environmental behavior will probably transfer that behavior to their workplace and engage in voluntary pro-environmental behavior (Chiang *et al.*, 2019). This behavior is usually not supported by organized formal programs, and therefore these personal predispositions play an even stronger role in voluntary behaviors in the corporate context. We therefore hypothesized:

*H3.* Personal moral norms are positively associated with intention to perform voluntary pro-environmental behavior.

**2.2.4 Perceived corporate social responsibility.** Perceived CSR is an employee's perception of their employer's discretionary activities aimed at improving the welfare of internal and

external stakeholders (Glavas and Godwin, 2013; Vlachos *et al.*, 2014). It influences employees' willingness to engage in pro-environmental behavior. CSR perceptions have been shown to influence both in-role and extra-role workplace behaviors of employees, including job performance (Korschun *et al.*, 2014) and OCB (Al Hosani *et al.*, 2020; Farooq *et al.*, 2017). Vlachos *et al.* (2014) expanded on the idea that employees respond positively to CSR by claiming that perceived CSR influences their participation in extra-role CSR-specific behavior. They concluded that when workers perceive their organization to be socially and environmentally responsible, they are more motivated to contribute to and participate in the implementation of their company's overall CSR program. We suggest that employees' voluntary pro-environmental behavior represents a type of extra-role behavior that is related to CSR activity and hypothesized:

H4. Perceived corporate social responsibility is positively associated with intention to perform voluntary pro-environmental behavior.

*2.2.5 Organizational citizenship behavior toward the environment.* OCB toward the environment is individual discretionary social behaviors that are not explicitly identified by the formal incentive system and contribute to more effective organizational environmental management (Boiral, 2009). Several studies have examined how these behaviors might have environmental consequences (Erdogan *et al.*, 2015; Stritch and Christensen, 2016; Testa *et al.*, 2020). It is uncommon for this type of behavior to be included in individual employee job descriptions or formally rewarded (Lamm *et al.*, 2013). However, it has a positive effect on the organization overall, and it is logical to assume that it is conceptually similar to other OCBs (Lamm *et al.*, 2013). Individuals make sustainability decisions based on their perception about the organization's support for these behaviors. We suggest that when employees perceive that their employer values their contributions to sustainability, they are more likely to undertake OCBs toward the environment. We therefore hypothesized:

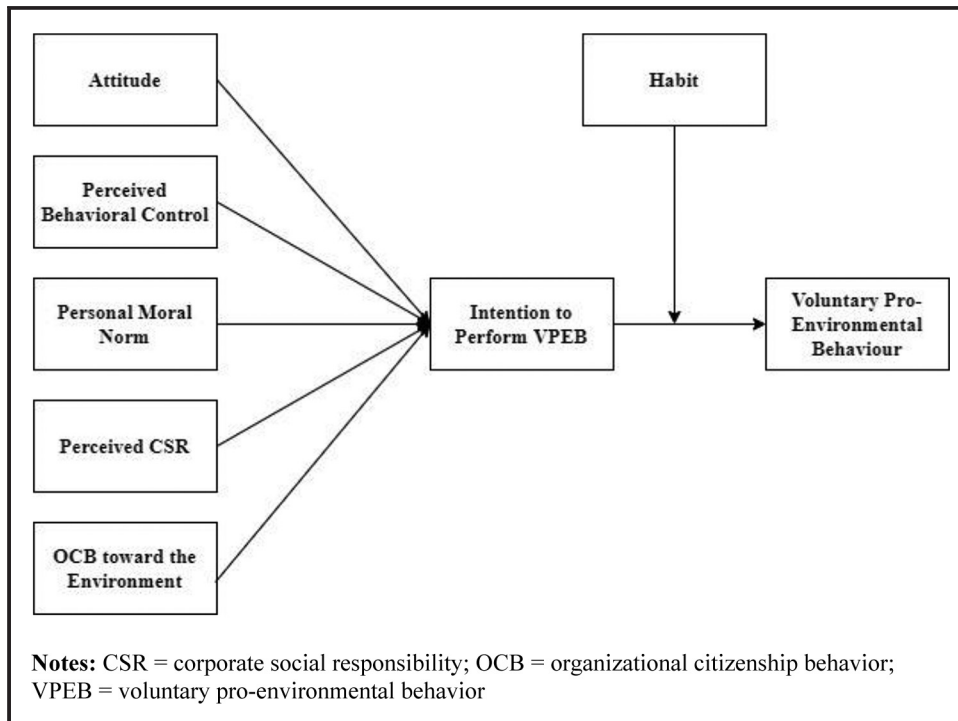
H5. Organizational citizenship behavior toward the environment is positively associated with intention to perform voluntary pro-environmental behavior.

*2.2.6 Intention to perform voluntary pro-environmental behavior.* Studies on the link between intention and behavior have provided mixed findings. Recent research on ethical decision-making supports the idea that intention is a significant indicator of behavior (Aziz *et al.*, 2021; Jafarkarimi *et al.*, 2016). Several meta-analyses (Bird *et al.*, 2015; Hagger *et al.*, 2016; Vesely *et al.*, 2021) have also shown that intentions are strongly linked to behavior. Bergquist (2020) found that the connection between intention and behavior for pro-environmental action is higher than the average for other types of behavior. We therefore assumed that intentions are a direct predictor of pro-environmental behavior and hypothesized:

H6. Intention to perform voluntary pro-environmental behavior is positively associated with actual behavior of this kind.

*2.2.7 Moderating role of habit.* This study focuses on pro-environmental behavior that is practiced regularly enough to become a daily, habitual practice. There are three primary viewpoints on the relationship between HAB and intention (Soror *et al.*, 2015). The first sees HAB as a predictor of intention. The second sees HAB as a direct predictor of behavior, and the third sees HAB as a moderator between intention and behavior. The literature on environmental psychology strongly supports the third point of view (Amoroso and Lim, 2017; Chou and Hsu, 2016). Empirical research (Agag and El-Masry, 2016; Chiu and Huang, 2015) also supports the conclusion that HAB acts as a moderator in the link between intention and behavior. It is now clear that the concept of HAB offers a distinct perspective on explaining, predicting and directing repeated actions. HABs are implicit linkages formed between contexts and responses as a result of repeated reward-based learning (Wood and R nger, 2016). When people act out of HAB, the reaction is prompted automatically by awareness of relevant context signals. This suggests that HAB has a moderating role between behavior and predictor, and we therefore hypothesized (Figure 1):

**Figure 1** Conceptual model



H7. Habit moderates the relationship between intention to perform voluntary pro-environmental behavior and actual behavior of this kind.

### 3. Methodology

#### 3.1 Participants and procedure

The study was exploratory in nature, using an online survey-based questionnaire. To achieve the objectives of this study, we targeted public entities in different sectors including education, environment, oil and gas, energy and agriculture in the United Arab Emirates (Abu Dhabi city) to disseminate the survey. The Abu Dhabi Government has implemented several environmental programs and projects that have enhanced the quality of the environment, including a series of studies and research on the effects of climate change at the local, national and regional levels undertaken by the Abu Dhabi Global Environmental Data Initiative. The involvement of public organization employees is therefore essential to achieving the ultimate goal of environmental sustainability ([UAE Government Portal, 2022](#)).

The survey web-link was emailed to people at all career levels with at least one year of work experience, starting on May 17, 2021, with a cover letter explaining the purpose of the study and stating that participation in the survey was entirely voluntary. Respondents' identities were kept anonymous to maintain confidentiality. The time-lagged method was used to collect data in this study at three time intervals. Respondents were asked to provide demographic information and responses to three sets of questions that were distributed over a period. The second and third sets of questions were distributed two weeks and four weeks later, to employees who responded to the previous wave. The first wave (T1) questionnaire asked about ATs, PBC, PMN, perceived CSR, OCB toward the environment and INT. The second wave (T2) questionnaire asked about HABs. Finally, the third wave

(T3) questionnaire asked about voluntary pro-environmental behavior. The data collection period lasted 12 weeks in total, from May 17 to August 17, 2021.

The time-lag technique is widely used in research because it allows researchers to conduct several surveys for a specific topic (Mehmood *et al.*, 2020; Yu *et al.*, 2021). In this method, researchers may collect data from several sources, eliminating the likelihood of common source bias. The method also allows for data gathering at multiple time periods, reducing the possibility of common method bias. Finally, it allows participants to assess and improve their behavior before giving their final response (Detert and Edmondson, 2011). To eliminate usual technique bias, three waves of data collection were undertaken at two-week intervals (Podsakoff *et al.*, 2003).

The first survey was distributed to 700 respondents (T1), and 637 completed surveys were returned (91% response rate). The second-wave survey (T2) was conducted two weeks later, with the survey sent to all 637 respondents of the first survey. The total number of valid responses returned was 559 (87.75% response rate). The third wave (T3) was sent to 559 respondents from T2, and 519 valid responses were collected. The study sample included 310 (59.7%) men and 209 (40.3%) women. The average age of the respondents was in the range of 35–44 years, with 44.1% holding a bachelor's degree and 41.0% holding a master's degree. Participants had a minimum of one year of work experience, and 42.8% had more than 15 years of experience.

### 3.2 Measures

The questionnaires used scales adapted from previous studies to measure key constructs and demographic features. The questionnaires were originally developed in English. However, the study was conducted in the United Arab Emirates, where Arabic is the first language, and the questionnaire was therefore translated into Arabic to avoid language-related errors in the analysis. Consistency was confirmed between the Arabic and English versions of the questionnaire. The respondents were asked to rate their degree of agreement with each statement on a five-point scale (1 = strongly disagree; 5 = strongly agree). To assess employees' AT ( $\alpha = 0.881$ ), a five-item scale was drawn from Wesselink *et al.* (2017) and included items such as "I'm in favor of behaving pro-environmentally in the workplace." To measure employees' PBC ( $\alpha = 0.736$ ), we used a two-item scale also developed by Wesselink *et al.* (2017). This included items such as "Whether I perform pro-environmentally is entirely up to me." We used a four-item scale to measure PMN ( $\alpha = 0.936$ ), developed by Steg and de Groot (2010). It included items such as: "I feel morally obliged to act pro-environmentally at work." A five-item scale was used to measure perceived CSR ( $\alpha = 0.902$ ), adapted from Rupp *et al.* (2018). Items included: "Our business gives adequate contributions to charities." A seven-item scale was adapted from Raineri and Paillé (2016) to measure OCBs toward the environment ( $\alpha = 0.905$ ). Items included: "I encourage my colleagues to adopt more environmentally conscious behaviors." We used a three-item scale to measure INT ( $\alpha = 0.880$ ), developed by Yuriev *et al.* (2020). This included items such as: "I will try to behave more pro-environmentally in the coming months." To assess HABs ( $\alpha = 0.942$ ), we used a 12-item scale drawn from Verplanken and Orbel (2003), including items such as: "Voluntary pro-environmental behavior is something I do frequently." Finally, to measure voluntary pro-environmental behavior itself ( $\alpha = 0.896$ ), we used a nine-item scale developed by Wesselink *et al.* (2017). This included items such as: "I turn off all my electronic devices at the end of the day." Cronbach's alpha was more than 0.75 in all parameters.

## 4. Results

### 4.1 Descriptive statistics

Table 1 shows the correlation matrix, standard deviations, means and reliabilities of the study variables. Correlations between research variables provided preliminary evidence for hypothesis testing.

**Table 1** Descriptive statistics, reliabilities and correlation matrix

|                                 | Mean | SD   | 1       | 2       | 3       | 4     | 5       | 6       | 7       | 8       | 9       | 10      | 11      | 12      |
|---------------------------------|------|------|---------|---------|---------|-------|---------|---------|---------|---------|---------|---------|---------|---------|
| 1. Gender                       | 1.40 | 0.49 |         |         |         |       |         |         |         |         |         |         |         |         |
| 2. Age                          | 2.86 | 0.80 | 0.206** |         |         |       |         |         |         |         |         |         |         |         |
| 3. Education                    | 2.62 | 0.77 | 0.057   | 0.201** |         |       |         |         |         |         |         |         |         |         |
| 4. Experience                   | 2.99 | 1.05 | 0.289** | 0.189** | 0.206** |       |         |         |         |         |         |         |         |         |
| 5. Attitude                     | 3.77 | 0.88 | 0.078   | 0.019   | 0.066   | 0.037 | (0.881) |         |         |         |         |         |         |         |
| 6. Perceived behavioral control | 2.01 | 0.83 | 0.053   | 0.028   | 0.085   | 0.006 | 0.188** | (0.736) |         |         |         |         |         |         |
| 7. Personal moral norm          | 2.89 | 1.37 | 0.060   | 0.030   | 0.003   | 0.019 | 0.140** | 0.247** | (0.936) |         |         |         |         |         |
| 8. Perceived CSR                | 4.02 | 0.74 | 0.105*  | 0.050   | 0.003   | 0.024 | 0.107*  | 0.183** | 0.128*  | (0.902) |         |         |         |         |
| 9. OCB toward the environment   | 2.10 | 0.68 | 0.038   | 0.052   | 0.042   | 0.045 | 0.123** | 0.312** | 0.264** | 0.391** | (0.905) |         |         |         |
| 10. Intention to perform VPEB   | 3.07 | 1.30 | 0.048   | 0.053   | 0.001   | 0.006 | 0.361** | 0.177** | 0.201** | 0.129** | 0.318** | (0.880) |         |         |
| 11. Habit                       | 3.81 | 0.70 | 0.061   | 0.069   | 0.016   | 0.072 | 0.226** | 0.354** | 0.205** | 0.325** | 0.634** | 0.324** | (0.942) |         |
| 12. VPEB                        | 4.02 | 0.78 | 0.031   | 0.092*  | 0.048   | 0.067 | 0.322** | 0.194** | 0.134** | 0.249** | 0.430** | 0.210** | 0.397** | (0.896) |

Notes: \*\* $p < 0.01$ , \* $p < 0.05$ ;  $N = 519$ ; CSR = corporate social responsibility; OCB = organizational citizenship behaviors; VPEB = voluntary pro-environmental behavior

## 4.2 Confirmatory factor analysis

We dropped two of the 12 items of HAB and two of the nine items of voluntary pro-environmental behavior at this stage because of poor factor loadings and/or evidence of cross-loadings. The factor loadings of the remaining items ( $\lambda$ : cutoff criteria greater than 0.6 and  $p < 0.001$ ) were greater than 0.612 (Table 2), and all items examined demonstrated significant loadings on their related factors. We used confirmatory factor analysis (CFA) in SPSS 26 to investigate the convergent and discriminant validity of the variables (Anderson, 1988). We used the cutoff criteria of Hu and Bentler (1999) (i.e.  $\chi^2/df$  less than 2; comparative fit index [CFI] more than 0.9 and root mean squared error of approximation [RMSEA] less than 0.07), as shown in Table 3. We used several item variables for the CFA on individual-level data to ensure data validity. We also investigated the average variance extracted (cutoff criteria  $> 0.5$ ) and composite reliability (cutoff criteria  $> 0.8$ ), which supported the presence of convergent validity. The suggested model was therefore appropriate for hypothesis testing. Table 3 shows the findings of the CFA analysis. When compared to alternative models, the eight-factor model was a good fit with the data ( $\chi^2/df = 982.887/780 = 1.260$ ; CFI = 0.986; Tucker–Lewis index [TLI] = 0.984; and RMSEA = 0.022).

## 4.3 Hypotheses testing

We examined the conceptual model using SEM, which has been extensively used in previous studies (Shang *et al.*, 2021, 2022). The fit indices showed that the proposed model had an adequate fit ( $\chi^2 = 766.170$ ,  $df = 460$ ,  $\chi^2/df = 1.666$ , TLI = 0.966, CFI = 0.970, RMSEA = 0.036). *H1* proposed that AT significantly influences INT. The path analysis (HAB moderates the relationship between INT and actual behavior of Figure 2) showed that this was the case among our sample ( $\beta = 0.166$ ,  $p < 0.01$ ), supporting *H1*. *H2* proposed that PBC significantly influences INT. However, the path analysis showed that there was no significant relationship between these two ( $\beta = 0.083$ ,  $p > 0.01$ ), and *H2* was therefore unsupported. *H3* proposed that PMN significantly influenced INT. This was again supported by the findings ( $\beta = 0.228$ ,  $p < 0.01$ ). We also found that perceived CSR significantly influenced INT ( $\beta = 0.346$ ,  $p < 0.001$ ), which supported *H4*. Similarly, OCB toward the environment significantly influenced INT ( $\beta = 0.171$ ,  $p < 0.01$ ), which supported *H5*. Finally, INT significantly influenced actual behavior of this kind ( $\beta = 0.312$ ,  $p < 0.0001$ ), supporting *H6*.

*H7* set out that HAB would enhance the positive effect of INT on actual behavior, such that this relationship would be stronger for employees with stronger HABs. Figure 2 shows that there was a significant interaction between INT and HAB on actual behavior of this kind among employees ( $\beta = 0.258$ ,  $t = 5.586$ ,  $p = 0.001$ ). This supported *H7*. We also assessed the pattern of the moderating effect visually, following Aiken *et al.* (1991) to plot the interaction. Figure 3 shows that the relationship between intention and actual voluntary pro-environmental behavior of employees becomes stronger at higher levels of HAB, supporting *H7*.

## 5. Discussion

To reflect the increasing importance of voluntary pro-environmental behavior, this study investigated the factors influencing this behavior and explored how HABs affect employees' intentions to perform this behavior. We used a questionnaire, then applied CFA and SEM to test hypotheses. The results of the time-lagged designs show that the INT mediates the relationship between factors that influence intention and voluntary pro-environmental behavior itself (Bird *et al.*, 2015; Hagger *et al.*, 2016; Vesely *et al.*, 2021). Six of the seven proposed hypotheses on relationships were verified.

Several studies have shown that employee AT, a factor drawn from the theory of planned behavior, has a significant impact on employees' voluntary pro-environmental behavior. Our

**Table 2** Variables' reliabilities and convergent validity

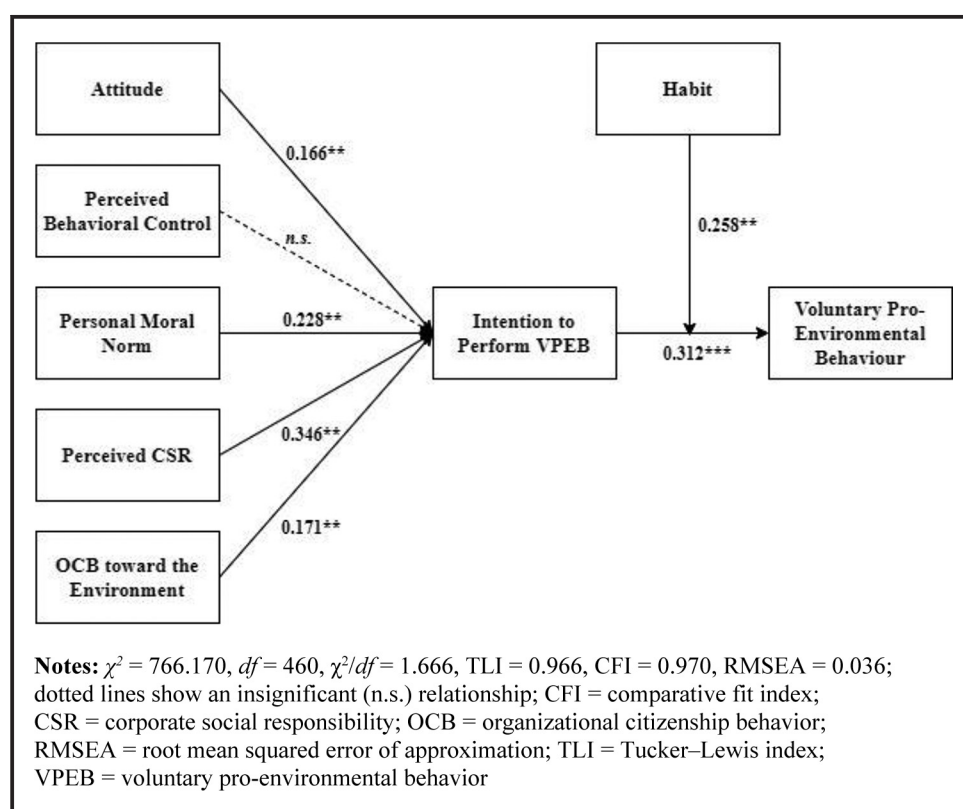
| <i>Variables</i>                                | <i>Item code</i> | $\lambda$ | <i>CR</i> | <i>AVE</i> |
|-------------------------------------------------|------------------|-----------|-----------|------------|
| Attitude (time – 1)                             | AT1              | 0.751     | 0.885     | 0.608      |
|                                                 | AT2              | 0.783     |           |            |
|                                                 | AT3              | 0.891     |           |            |
|                                                 | AT4              | 0.730     |           |            |
|                                                 | AT5              | 0.733     |           |            |
| Perceived behavioral control (time – 1)         | PBC1             | 0.845     | 0.884     | 0.816      |
|                                                 | PBC2             | 0.692     |           |            |
| Personal moral norm (time – 1)                  | PMN1             | 0.849     | 0.937     | 0.787      |
|                                                 | PMN2             | 0.965     |           |            |
|                                                 | PMN3             | 0.850     |           |            |
|                                                 | PMN4             | 0.878     |           |            |
| Perceived CSR (time – 1)                        | PCSR1            | 0.819     | 0.907     | 0.663      |
|                                                 | PCSR2            | 0.776     |           |            |
|                                                 | PCSR3            | 0.846     |           |            |
|                                                 | PCSR4            | 0.852     |           |            |
|                                                 | PCSR5            | 0.738     |           |            |
| OCB toward the environment (time – 1)           | OCBE1            | 0.612     | 0.906     | 0.581      |
|                                                 | OCBE2            | 0.634     |           |            |
|                                                 | OCBE3            | 0.750     |           |            |
|                                                 | OCBE4            | 0.838     |           |            |
|                                                 | OCBE5            | 0.760     |           |            |
|                                                 | OCBE6            | 0.789     |           |            |
|                                                 | OCBE7            | 0.755     |           |            |
| Intention to perform VPEB (time – 1)            | INT1             | 0.891     | 0.881     | 0.713      |
|                                                 | INT2             | 0.797     |           |            |
|                                                 | INT3             | 0.844     |           |            |
| Habit (time – 2)                                | HAB1             | 0.645     | 0.943     | 0.625      |
|                                                 | HAB2             | 0.703     |           |            |
|                                                 | HAB3             | 0.709     |           |            |
|                                                 | HAB4             | 0.816     |           |            |
|                                                 | HAB5             | 0.806     |           |            |
|                                                 | HAB6             | 0.863     |           |            |
|                                                 | HAB7             | 0.788     |           |            |
|                                                 | HAB8             | 0.853     |           |            |
|                                                 | HAB9             | 0.782     |           |            |
|                                                 | HAB10            | 0.780     |           |            |
| Voluntary pro-environmental behavior (time – 3) | VPB1             | 0.672     | 0.898     | 0.559      |
|                                                 | VPB2             | 0.706     |           |            |
|                                                 | VPB3             | 0.876     |           |            |
|                                                 | VPB4             | 0.858     |           |            |
|                                                 | VPB5             | 0.740     |           |            |
|                                                 | VPB6             | 0.614     |           |            |
|                                                 | VPB7             | 0.694     |           |            |

**Notes:** All factor loadings are significant at  $p < 0.001$ ,  $N = 519$ ;  $\lambda$  = factor loadings, AVE = average variance extracted, CR = composite reliabilities, CSR = corporate social responsibility, OCB = organizational citizenship behaviors, VPEB = voluntary pro-environmental behavior

**Table 3** Confirmatory factor analysis

| Model                                                   | $\chi^2$  | df  | $\chi^2/df$ | $\Delta\chi^2 (\Delta df)$ | TLI   | CFI   | RMSEA |
|---------------------------------------------------------|-----------|-----|-------------|----------------------------|-------|-------|-------|
| Eight-factor model: baseline model                      | 982.887   | 780 | 1.260       |                            | 0.984 | 0.986 | 0.022 |
| Seven-factor model: combining INT, HAB and VPEB         | 1,079.211 | 802 | 1.345       | 96.324 (22)                | 0.823 | 0.865 | 0.081 |
| Six-factor model: combining OCBE, INT, HAB and VPEB     | 1,693.569 | 802 | 2.111       | 710.682 (22)               | 0.756 | 0.712 | 0.092 |
| Five-factor model: combining PCSR, INT and VPEB         | 2,129.789 | 802 | 2.655       | 1,146.902 (22)             | 0.633 | 0.687 | 0.101 |
| Four-factor model: combining PMN, OCBE, PCSR and INT    | 2,539.856 | 856 | 2.967       | 1,556.969 (76)             | 0.598 | 0.611 | 0.128 |
| Three-factor model: combining PBC, PMN, OCBE and PCSR   | 3,124.588 | 856 | 3.650       | 2,141.701 (76)             | 0.418 | 0.489 | 0.130 |
| Two-factor model: combining AT, PBC, PMN, OCBE and PCSR | 4,334.542 | 859 | 5.046       | 3,351.655 (79)             | 0.387 | 0.399 | 0.133 |
| One-factor model: combining all into one factor         | 9,512.932 | 860 | 11.061      | 8,530.045 (80)             | 0.311 | 0.325 | 0.139 |

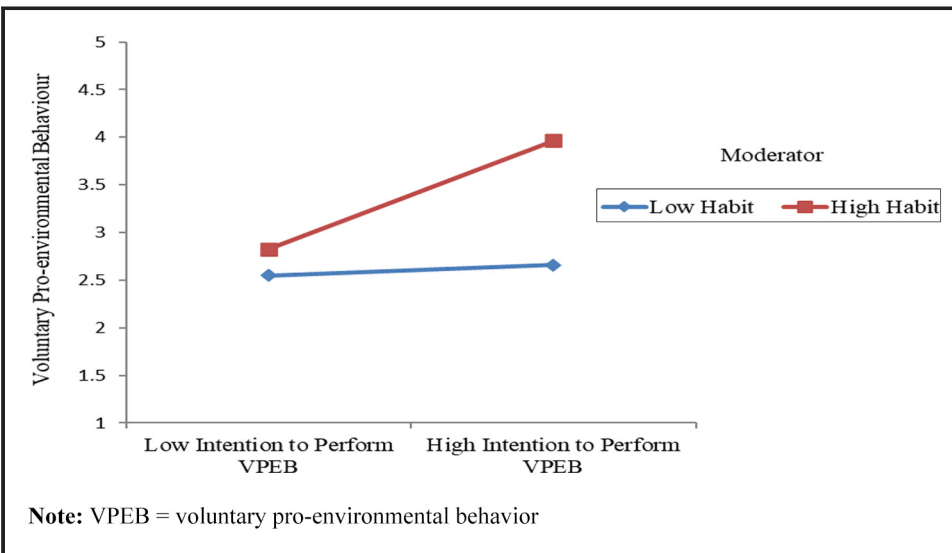
**Notes:** AT = Attitude, PBC = Perceived behavioral control, PMN = Personal moral norm, PCSR = Perceived corporate social responsibility, OCBE = Organizational citizenship behaviors toward the environment, INT = Intention to perform voluntary pro-environmental behavior, HAB = Habit, VPEB = Voluntary pro-environmental behavior, TLI = Tucker–Lewis index; CFI = Comparative fit index, RMSEA = Root mean square error of approximation

**Figure 2** Path analysis

findings support previous research on the positive relationship between AT and intention to perform environmental behavior (Chin *et al.*, 2018; Kim and Yun, 2019; Yu and Yu, 2017; Yuriev *et al.*, 2020).

H2 proposed that PBC would be positively associated with the INT. However, this was not found in practice. This contradicts previous research findings (Khatimah and Halim, 2016; Vamvaka *et al.*, 2020). This may be because of the factors used in this study. Ajzen (1991) distinguished between internal (skills or abilities) and external (individual characteristics that support or inhibit behavior performance) components of PBC. Factors can also either help or hinder the performance of the behavior. Control factors include required skills and

**Figure 3** Interactive effects of intention to perform voluntary pro-environmental behavior and habit on actual voluntary pro-environmental behavior



abilities, the availability or lack of time, money and other resources and other people's cooperation. Control beliefs are the subjective judgment of the likelihood that a given facilitating or inhibiting factor will be present. Each control belief contributes to PBC in interaction with the factor's perceived ability to facilitate or obstruct behavioral performance.

PBC is measured by the total scores calculated by adding the items of control belief strength and perceived power over all available control factors. Employees are expected to be able to act on their intentions to the extent that they have control over how the behavior is performed. When knowledge about actual behavioral control is limited, PBC can be used as a substitute to assist in behavior prediction, assuming that perceived control reflects actual control reasonably well (Ajzen, 2020). It is possible that in this study, perceived control does not reflect actual control. Further work would be needed to verify this.

The findings on *H3* support previous studies. The factor on PMN drawn from the norm activation model showed a substantial association with INT. Participants who have a personal tendency toward pro-environmental behavior would probably transfer that behavior to their job and therefore engage in voluntary pro-environmental behavior (Chiang *et al.*, 2019). Personal predispositions have a significant impact on voluntary and discretionary behavior (Yuriev *et al.*, 2018). Voluntary pro-environmental behavior is usually not supported by structured formal programs, and therefore personal predispositions play an even greater role in voluntary behaviors in the corporate environment.

*H4* was about the effect of perceived CSR on employees' intentions to perform voluntary pro-environmental behavior. We found a strong influence, which supports earlier studies (Farooq *et al.*, 2017; Glavas and Godwin, 2013; Korschun *et al.*, 2014; Vlachos *et al.*, 2014). Our findings therefore extend the concept that employees respond positively to perceptions of CSR. They suggest that when employees perceive their organization to be socially and environmentally responsible, they are more engaged and committed.

*H5* was supported by a positive association between OCBs toward the environment and the INT. Individuals make sustainability decisions based on their perception of the institution's support for the behaviors. *H6* was supported by a significant positive association between the INT and the behavior itself, which is consistent with previous research (Bird *et al.*, 2015; Hagger *et al.*, 2016; Vesely *et al.*, 2021) on the strong link between intentions and behavior.

In line with *H7*, we also found that HAB strengthens the link between INT and the behavior itself: the relationship was stronger with stronger HABs connected with these behaviors. These findings are consistent with previous empirical studies ([Agag and El-Masry, 2016](#); [Chiu and Huang, 2015](#)), which concluded that HAB acts as a moderator in the relationship between intention and behavior. This therefore provides a deeper knowledge of the factors that influence voluntary pro-environmental behavior in the workplace.

In conclusion, this study found that perceived CSR, PMN, OCBs toward the environment and AT are the primary factors that influence employees' pro-environmental behavior at work, with HAB having a moderating effect. In Abu Dhabi at present, public organizations' pro-environmental behavior is not mandated. We recommend that departments should increase the frequency of employee voluntary involvement in CSR initiatives and activities. When more volunteering is encouraged, more employees will tend to adopt this behavior and make it a HAB at work, promoting the volunteering culture in the organization.

## 6. Theoretical implications

To our knowledge, this is the first study that aims to understand pro-environmental behavior using an integrative model that incorporates variables from the theory of planned behavior, norm activation model and CADM, as well as the constructs of perceived CSR and OCBs toward the environment. It therefore offers a more comprehensive approach by studying multiple determinants simultaneously. It also takes into account the multidimensional nature of environmental behavior and uses measures of both intention and behavior at the same time, in contrast to the existing literature's tendency to focus solely on intention ([Gkargkavouzi et al., 2019](#)). The theoretical contribution of this work is the proposal of a new model examining the determinants of environmental behavior in an emerging market like the UAE. This extends beyond the most comprehensive model presented thus far (the CADM) by empirically confirming the fundamental role of intention in the adoption of environmentally responsible behaviors.

Our study contributes to the growing body of knowledge on voluntary pro-environmental behavior in multiple ways. First, previous studies suggested that perceived CSR is an important dimension of employees' voluntary pro-environmental behavior, and this was supported by our results ([Choi and Yu, 2014](#); [Glavas and Kelley, 2014](#); [Ng et al., 2019](#)). In other words, perceived CSR is a predictor of voluntary pro-environmental behavior. Second, the findings of this study on OCBs toward the environment were also consistent with previous studies ([Chan and Lai, 2017](#); [Paillé et al., 2013](#); [Temminck et al., 2015](#)). Previous research has found that when organizations have an environmentally oriented management strategy and supportive policies in place, employees are more willing to behave eco-actively in the workplace ([Paillé et al., 2014](#)). This is referred to as organizational commitment, which improves employees' voluntary pro-environmental behavior. Third, we also found that positive environmental ATs lead directly to a decision to engage in pro-environmental behaviors ([Paul et al., 2016](#); [Polonsky et al., 2012](#)). Environmental concern may therefore promote individuals' engagement in environmental activism and conservation ([Kim et al., 2018](#)). Our study also contributes to work on the relationship between intention and actual voluntary pro-environmental behavior of employees, by showing that this relationship becomes stronger at higher levels of HAB. This therefore suggests that HAB strengthens the link between intention and actual voluntary pro-environmental behavior: the relationship was stronger in people with stronger HABs associated with these behaviors. These results are in line with previous empirical studies which agreed that HAB acts as a moderator in the relationship between intention and behavior ([Agag and El-Masry, 2016](#); [Chiu and Huang, 2015](#)).

This study has therefore both shed new light on voluntary pro-environmental behavior in the Middle East region and offered new directions for academics to investigate in future. Finally, this study focuses on public organizations in a developing country and therefore contributes to and broadens existing knowledge on voluntary pro-environmental behavior from a relative perspective. The majority of previous studies in this field have been carried out in developed

countries. Cultural differences mean that findings from one country may not apply to another with different preferences, expectations and cultural or socioeconomic norms.

## 7. Practical implications

The study's findings provide policymakers, managers and practitioners with valuable managerial recommendations to help them to improve sustainability initiatives in public organizations. First, organizations should consider flexible CSR policies and sponsorship of social activities that improve public well-being. These enable employees to better balance work and personal life (Asante Boadi *et al.*, 2020; Tarigan *et al.*, 2020). Organizations that are concerned with respecting and protecting the natural environment will encourage employees to make efficient use of resources such as electricity, water and waste, promoting voluntary pro-environmental behavior. Our findings also have economic implications, because a huge amount of money can be saved by using resources wisely and raising environmental awareness.

When employees demonstrate pro-environmental behavior in all settings (e.g. home and social gatherings, as well as work), there are social implications. Their actions may have a knock-on effect among their friends and families, especially if they involve developing HABs that can be repeated anywhere, not just at work (Alzaidi and Iyanna, 2021). This in turn may have wider societal implications for sustainability and improve the quality of life of individuals. Second, employee moral norms are a strong predictor of employee behavior (Mehmood *et al.*, 2022b). This finding emphasizes the importance of organizations establishing policies and initiatives at the highest organizational levels, as well as directly engaging employees to develop personal norms around environmentally friendly behaviors. Organizations can hold meetings, workshops or seminars to raise awareness about their environmental activities. Several studies have found that moral norms can help explain pro-environmental behavior (Huber *et al.*, 2020; Yeboah and Kaplowitz, 2016; Yuriev *et al.*, 2018). Third, OCBs toward the environment catalyze employees' voluntary pro-environmental behavior and should therefore be highlighted. Organizations can implement a variety of management measures, such as declaring their environmental strategy, supporting volunteering for projects or activities that address environmental issues and creating an incentive program to increase OCBs toward the environment among employees.

Finally, perceived CSR is the primary inductor of pro-environmental behavior intentions, followed by HAB strength and PMN. This study may therefore help public organization planners, managers and practitioners to formulate strategies and develop actions and policies to stimulate their employees' pro-environmental behavioral intention. We recommend that public sector planners and managers should prioritize improving employees' personal norms in this area.

## 8. Limitations and future research

This study used time-lagged data to control for common method bias (Podsakoff *et al.*, 2012), so common source and common method bias were not major problems. However, our research still has some limitations. First, the data were gathered from public entities in Abu Dhabi, United Arab Emirates, and are therefore not necessarily applicable to other sectors or countries. Future studies should consider focusing on specific high-carbon-footprint sectors, such as oil and gas companies, which will certainly add to the body of knowledge in that critical sector. Second, our data were obtained from employees. This is an appropriate way to obtain information about employee contributions to environmental performance at work. However, future studies may broaden this focus to include different geographical areas, cultures or times to increase the model's generalizability. Future cross-cultural studies would be interesting. Cross-cultural studies theories suggest that employees perceive and react differently based on their cultural values (Islam *et al.*, 2018; Mehmood *et al.*, 2022a; Rupp *et al.*, 2013). Third, the study focused on the factors that influence voluntary pro-environmental behavior. It therefore did not consider the potential

consequences of this behavior at the individual or corporate levels. According to research on corporate volunteering and OCBs, potential individual effects of voluntary pro-environmental behavior could include improved job-related skills (Basil *et al.*, 2009). The relationship between voluntary pro-environmental behavior and corporate environmental performance needs to be theoretically and empirically validated further.

## 9. Conclusion

This study emphasizes the significance of perceived CSR and OCBs toward the environment in shaping employee extra-role behavior, particularly pro-environmental behavior, in the UAE's public sector. The study highlighted the moderating role of HAB, implying that voluntary pro-environmental behavior can be promoted through organizations without the implementation of formal policies and rules. The study aimed to highlight the role of employees in reducing organizational environmental footprint through their pro-environmental behavior in the workplace. The study particularly confirmed the role of CSR initiatives and activities, emphasizing the importance of encouraging environmental volunteering. This sector therefore has potential to demonstrate better and more environmentally friendly behavior, leading to a more sustainable, climate-friendly future for the country.

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## Further reading

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## Supplemental material

The supplementary material for this article can be found online.

## About the authors

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Fauzia Jabeen is a Professor of management at the College of Business at Abu Dhabi University (AACSB and EQUIS Accredited). She has published in leading journals like *International Journal of Hospitality Management*, *Business Strategy and the Environment*, *Knowledge Management Research & Practice*, *Journal of Cleaner Production*, *Food Quality and Preferences*, *IEEE-TEM*, and *International Journal of Productivity and Performance Management*. She has been honored with the "Outstanding Paper Award" and "Highly Commended Paper" in the 2018 and 2019 Emerald Literati Awards, Abu Dhabi University Research Fellow Award 2018. Fauzia Jabeen is the corresponding author and can be contacted at: [fauzia.jabeen@adu.ac.ae](mailto:fauzia.jabeen@adu.ac.ae)

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