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

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1 Understanding employees' voluntary pro-environmental behavior in public organizations – 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

An integrative theory approach

Abstract

Purpose: To investigate the impact of situational factors and internal psychological states on employees' decisions to perform voluntary pro-environmental behavior. The study used a model combining the theory of planned behavior, norm activation model, and comprehensive action determination model. It also explored the moderating role of habit 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 had a significant impact on intention to perform voluntary pro-environmental behavior, as did all other variables except perceived behavioral control. Habits 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 corporate social responsibility, 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 non-mandated actions.

Social implications: Employees can achieve a better work–life balance in organizations with flexible corporate social responsibility policies and which sponsor social activities to improve public well-being and individuals' life quality. Positive sense-making of corporate social activity

1 helps employees develop social interactions with stakeholders, increasing their involvement in
2 society and decreasing work stress.

3 **Originality/value:** This study sheds light on the factors influencing employees' voluntary pro-
4 environmental behavior. It is the first study of its kind to combine these three models to explain
5 the variables affecting intent to perform voluntary pro-environmental behavior in the workplace.

6 **Keywords:** voluntary pro-environmental behavior, public organizations, perceived corporate
7 social responsibility (CSR), organizational citizenship behaviors (OCB) toward the environment.

8 **Paper type:** Research paper
9

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, i.e., 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

1 employee intention to perform voluntary pro-environmental behavior, which then, in turn,
2 may influence their actual behavior. Our proposed constructs were driven by three pro-
3 environmental models: the theory of planned behavior (Ajzen, 1991), the norm activation
4 model (Schwartz, 1977) and the comprehensive action determination model (Klößner and
5 Blöbaum, 2010).

6 Previous studies have attempted to investigate employee pro-environmental behavior using either
7 the theory of planned behavior or the norm activation model (Park and Ha, 2014; Zhang *et al.*,
8 2017). However, it is now evident that one theory alone is insufficient to explain pro-
9 environmental behavior (Hamzah and Tanwir, 2021; He and Zhan, 2018; Liu *et al.*, 2017; Zhang
10 *et al.*, 2018). The explanatory value of these studies is also limited because they did not account
11 for the probability that employees' pro-environmental behavior may change over time, as the
12 conditions change (Wang *et al.*, 2018). They also did not fully account for all factors. For example,
13 the theory of planned behavior is based on an assumption of rationality. However, environmentally
14 friendly behavior cannot be understood simply as the outcome of rational choice. Unplanned,
15 spontaneous, or emotional factors should also be taken into account (Wang *et al.*, 2018). The norm
16 activation model has been criticized for focusing solely on self-interest, and not including external
17 considerations such as resources, time, and social environment (He and Zhan, 2018; Shi *et al.*,
18 2017). Research also suggests that environmental behavior is frequently predicted by habit
19 (Klößner and Blöbaum, 2010; Tang *et al.*, 2022; van den Broek *et al.*, 2019). The comprehensive
20 action determination model (CADM) proposed by Klößner and Blöbaum (2010) recognized the
21 importance of integrating the assumptions from the theory of planned behavior and the norm
22 activation model with the theoretical concept of habit (Triandis, 1979), because behavior can
23 become automatic or habitual with regular repetition. They also added the ipsative theory of

1 behavior (Frey and Heggli, 1989), which distinguishes between perceived behavioral barriers and
2 objective conditions that inhibit pro-environmental behaviors. This study was therefore designed
3 to combine three theories: the theory of planned behavior, the norm activation model, and the
4 comprehensive action determination model, into one theoretical framework to clarify voluntary
5 pro-environmental behavior in the workplace. These models provide a structural framework to
6 investigate the influence of interpersonal and organizational interaction variables, and individual
7 intention, on employee pro-environmental behavior.

8 This study proposed four research objectives to address gaps in knowledge about
9 employee voluntary pro-environmental behavior. It aimed first to develop a framework to
10 measure voluntary pro-environmental behavior in public organizations. Second, it examined
11 the factors that influence employees' voluntary pro-environmental behavior in public
12 organizations. Third, it investigated the effect of public sector employees' intention to perform
13 voluntary pro-environmental behavior on their actual behavior. Fourth, it assessed the
14 moderating effect of habit on the relationship between intended and actual voluntary pro-
15 environmental behavior. This study intended to address three research questions and examine
16 seven hypotheses about the relationship between the attributes that influence employee
17 intended and actual voluntary pro-environmental behavior in public organizations. The
18 research questions were:

19 RQ1: Which factors significantly influence employees' intention to perform voluntary pro-
20 environmental behavior in public organizations?

21 RQ2: To what extent are employees' intended and actual voluntary pro-environmental
22 behavior related in public organizations?

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3 1 RQ3: Does habit moderate the relationship between intended and actual voluntary pro-
4
5 2 environmental behavior?
6

7
8 3 This study makes a number of theoretical contributions in the field of voluntary pro-
9
10 4 environmental behavior in the workplace. First, there is a lack of research on employees' pro-
11
12 5 environmental behavior that is not linked to formal procedures or organizational rules (Kim
13
14 6 *et al.*, 2017). Second, the study examined the role of corporate social responsibility and
15
16 7 cultural aspects within the organization, such as organizational citizenship behavior. It
17
18 8 assessed employees' perceptions of these aspects beyond formal procedures or organizational
19
20 9 rules. When employees perceive that the organization supports them to engage in pro-
21
22 10 environmental behavior by giving appropriate resources, they are motivated to make more
23
24 11 effort. Employees are more willing to behave eco-actively in the workplace when
25
26 12 organizations have an environmentally-oriented management strategy and supportive policies
27
28 13 in place (Paillé *et al.*, 2014). Third, the study examined the moderating effect of habit on
29
30 14 the relationship between intended and actual voluntary pro-environmental behavior. It
31
32 15 is hoped that this work will encourage other scholars to compare the significance of the path
33
34 16 in structural equation modeling in voluntary pro-environmental behavior research.
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40 17 From a practical perspective, public organization managers will need to consider
41
42 18 voluntary pro-environmental behavioral factors when establishing the values and knowledge
43
44 19 required to support appropriate initiatives. They may, for example, provide opportunities for
45
46 20 employees to engage in environmental discussions, and involve managers actively and
47
48 21 intentionally in the organization by adopting a strategy that integrates awareness of
49
50 22 environmental practices. This should enable organizations to improve their environmental
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52 23 performance and therefore probably long-term sustainability.
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1 **2. Theoretical framework and literature review**

2 **2.1 Pro-environmental behavior theories and models**

3
4 Pro-environmental behavior, often known as environmentally responsible behavior or green
5 behavior, is a term that has been commonly used to describe behavior that protects the
6 environment (Choong *et al.*, 2020). Every individual activity that reduces the negative
7 environmental impact of human activities or contributes to improved environmental quality
8 is considered pro-environmental behavior (Kim *et al.*, 2018). The broad concept of voluntary
9 environmental behavior at work refers to behavior that is intentionally demonstrated by
10 employees at any organizational level and is aimed at conserving and/or improving the natural
11 environment by minimizing resource consumption, improving energy efficiency, preventing
12 waste production, recycling, and saving water (Ciocirlan, 2017; Norton *et al.*, 2015).

13 The theory of planned behavior, the norm activation model, and the ipsative theory (Frey
14 and Heggli, 1989) are the most widely used theories in studying pro-environmental behavior.
15 They are all integrated into the comprehensive action determination model (Klößner and
16 Blöbaum, 2010). The success of the theory of planned behavior could be attributed to three
17 qualities in its framework: attitude, subjective norms, and perceived behavioral control. These
18 are generally measured using a set of specified and verified statements (Ajzen, 2002). The
19 original model is based on three direct predictors, but researchers occasionally use an
20 expanded theory that includes additional variables, such as past behavior (Richetin *et al.*,
21 2012), moral norms (Wan *et al.*, 2017), and self-identity (Mannetti *et al.*, 2004). Sniehotta *et*
22 *al.* (2014) and Presseau *et al.* (2013) noted several limitations linked to the use of this theory,
23 including that it is only appropriate for investigating one behavior at a time. It can determine
24 specific factors that influence one action, especially particularly desirable or harmful

1 behaviors, but this approach ignores the complexities of serious debate. The norm activation
2 model consists of three key variables: consequence awareness, responsibility attribution, and
3 personal norms (Schwartz, 1977). Previous research has shown that an individual's moral
4 values considerably influence their environmental behavior (Wang *et al.*, 2011; Zibenberg *et*
5 *al.*, 2018). The theory of planned behavior suggests that environmental behavior is driven by
6 individual expectations and wellbeing, but the norm activation model emphasizes the role of
7 altruistic behavior and individual moral norms. Internal factors in the two theories influence
8 each other, and eventually, an individual's intention to participate in environmental behavior
9 (Zhang *et al.*, 2017).

10 The comprehensive action determination model suggests that environmental behavior
11 is the result of four types of processes: normative processes (social norms, awareness of
12 consequences, awareness of need, and personal norms), habitual processes (habits),
13 intentional processes (intentions and attitudes), and situational processes (objective and
14 subjective constraints). All three theories have been shown empirically to be useful in
15 explaining private pro-environmental behavior (e.g., Botetzagias *et al.*, 2015; Greaves *et al.*,
16 2013 for the theory of planned behavior; Onwezen *et al.*, 2013; Tang *et al.*, 2019 for the norm
17 activation model; Ceresia *et al.*, 2017; Klöckner, 2013; Lülfs and Hahn, 2014; van den Broek
18 *et al.*, 2019 for the inclusion of habit; and Tanner, 1999 for the ipsative theory of behavior).
19 The factors in this study were selected from previous work based on their suitability for
20 developing a comprehensive model for studying the voluntary pro-environmental behavior of
21 employees in the public sector. The theory of planned behavior has previously been used to
22 study attitude and perceived behavioral control. Based on previous research on subjective
23 norms and the type of pro-environmental behavior required in this study (voluntary behavior),

1 we excluded the subjective norms aspect to examine personal individual choices, rather than
2 the influence of other people. Instead, we focused on the other two aspects, attitude and
3 perceived behavioral control. Subjective norms have a significant influence on behavioral
4 intention in a mandatory environment, but the effect is insignificant in a voluntary
5 environment (Venkatesh and Davis, 2000; Shih and Fang, 2004). Personal moral norms were
6 selected from the norm activation model. Harland *et al.* (2007) investigated how personal
7 norms influence the effect of activators on volunteering. After controlling for the effect of
8 awareness of need, personal norms were significantly related to volunteering. We therefore
9 used personal norms to assess personal characteristics of individuals who voluntarily engage
10 in pro-environmental behavior.

11 We were examining voluntary pro-environmental behavior of employees at the
12 workplace. It is therefore important to consider the four relevant processes from the
13 comprehensive action determination model. We analyzed the situational processes most
14 closely related to voluntary pro-environmental behavior in the workplace, which were
15 perceived corporate social responsibility (CSR) and organizational citizenship behavior
16 towards the environment. Previous studies (Farouk and Jabeen, 2018) demonstrated a
17 substantial association between employee perceptions of their employer's CSR and their
18 future responses to actual corporate behaviors. Perceived CSR was therefore included (De
19 Roeck and Maon, 2018; Gond *et al.*, 2017; Rupp *et al.*, 2013). Employee engagement has
20 always been seen as a basic criterion that is positively associated with the effectiveness of a
21 variety of corporate greening practices (Albloushi *et al.*, 2022; ElTayeb *et al.*, 2010; Jiang and
22 Bansal, 2003). Employees are more willing to behave eco-actively in the workplace when
23 organizations have an environmentally-oriented management strategy and supportive policies

1 (Khan *et al.*, 2022; Paillé *et al.*, 2014). This therefore suggested that organizational citizenship
2 behavior toward the environment might also be important.

3 Intention generally precedes actual behavior, including for environmental workplace
4 behavior (Razak and Sabri, 2019). In most cases, intention is associated with future behavior.
5 Understanding the factors related to employees' intended behaviors in the workplace can
6 therefore help organizations to enable pro-environmental behaviors among their employees.

7 **2.2. Hypothesis development**

8 **2.2.1 Attitude (AT)**

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

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

21 **2.2.2 Perceived behavioral control (PBC)**

22 Ajzen (1991) distinguished between internal and external dimensions of perceived behavioral
23 control. Individual dispositional aspects such as the amount of information employees possess,

1 and their skills or abilities, are internal control factors. External behavioral control factors exist
2 outside the individual and either support or interfere with the performance of the behavior
3 (Mehrajunnisa *et al.*, 2020). Research has so far focused on internal control factors like self-
4 efficacy, and the knowledge, skills, and abilities required to make decisions (Vamvaka *et al.*,
5 2020). Self-efficacy can be seen as an internal component that is associated with a person's
6 perception of behavioral control (Khatimah and Halim, 2016). Identifying the organization as
7 environmentally friendly is a form of external perceived behavioral control for employees who
8 want to engage in environmentally friendly behavior. We therefore hypothesized:

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

11 **2.2.3 Personal moral norms (PMN)**

12 Personal norms are set when three key requirements are met (Schwartz, 1977). Individuals must
13 be aware that action to resolve an issue is required in a given situation (awareness of need); aware
14 that their own actions are linked to the problem (awareness of consequences); and aware of their
15 ability to participate in effective action (perceived behavioral control). Harland *et al.* (2007)
16 investigated how personal norms influence the effect of activators on volunteering by controlling
17 for the influence of awareness of need. They found that personal norms were significantly related
18 to volunteering. We therefore used personal norms to measure personal attributes of individuals
19 who voluntarily engage in pro-environmental behavior. Several studies suggest that moral norms
20 help to explain pro-environmental behavior like energy conservation (Yeboah and Kaplowitz,
21 2016), recycling (Huber *et al.*, 2020), and pro-environmental buying (Schlegelmilch *et al.*, 2015).
22 Personal predispositions substantially influence voluntary and discretionary behavior (Yuriev *et*
23 *al.*, 2018). We assumed that individuals who have a personal predisposition for pro-environmental

1 behavior will probably transfer that behavior to their workplace and engage in voluntary pro-
2 environmental behavior (Chiang *et al.*, 2019). This behavior is usually not supported by organized
3 formal programs, and therefore these personal predispositions play an even stronger role in
4 voluntary behaviors in the corporate context. We therefore hypothesized:

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

7 **2.2.4 Perceived corporate social responsibility (Perceived CSR)**

8 Perceived CSR is an employee's perception of their employer's discretionary activities aimed at
9 improving the welfare of internal and external stakeholders (Glavas and Godwin, 2013; Vlachos
10 *et al.*, 2014). It influences employees' willingness to engage in pro-environmental behavior. CSR
11 perceptions have been shown to influence both in-role and extra-role workplace behaviors of
12 employees, including job performance (Korschun *et al.*, 2014) and organizational citizenship
13 behavior (Al Hosani *et al.*, 2020; Farooq *et al.*, 2017). Vlachos *et al.* (2014) expanded on the idea
14 that employees respond positively to CSR by claiming that perceived CSR influences their
15 participation in extra-role CSR-specific behavior. They concluded that when workers perceive
16 their organization to be socially and environmentally responsible, they are more motivated to
17 contribute to and participate in the implementation of their company's overall CSR program. We
18 suggest that employees' voluntary pro-environmental behavior represents a type of extra-role
19 behavior that is related to CSR activity, and hypothesized:

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

22 **2.2.5 Organizational citizenship behavior toward the environment (OCB toward the 23 environment)**

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2
3 1 Organizational citizenship behavior towards the environment is individual discretionary social
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5 2 behaviors that are not explicitly identified by the formal incentive system and contribute to more
6
7 3 effective organizational environmental management (Boiral, 2009). Several studies have
8
9 4 examined how these behaviors might have environmental consequences (Erdogan *et al.*, 2015;
10
11 5 Stritch and Christensen, 2016; Testa *et al.*, 2020). It is uncommon for this type of behavior to be
12
13 6 included in individual employee job descriptions or formally rewarded (Lamm *et al.*, 2013).
14
15 7 However, it has a positive effect on the organization overall, and it is logical to assume that it is
16
17 8 conceptually similar to other organizational citizenship behaviors (Lamm *et al.*, 2013). Individuals
18
19 9 make sustainability decisions based on their perception about the organization's support for these
20
21 10 behaviors. We suggest that when employees perceive that their employer values their contributions
22
23 11 to sustainability, they are more likely to undertake organizational citizenship behaviors toward the
24
25 12 environment. We therefore hypothesized:

30
31 13 H5. Organizational citizenship behavior toward the environment is positively associated
32
33 14 with intention to perform voluntary pro-environmental behavior.

35 15 ***2.2.6 Intention to perform voluntary pro-environmental behavior (INT)***

36
37 16 Studies on the link between intention and behavior have provided mixed findings. Recent research
38
39 17 on ethical decision-making supports the idea that intention is a significant indicator of behavior
40
41 18 (Aziz *et al.*, 2021; Jafarkarimi *et al.*, 2016). Several meta-analyses (Bird *et al.*, 2015; Hagger *et*
42
43 19 *al.*, 2016; Vesely *et al.*, 2021) have also shown that intentions are strongly linked to behavior.
44
45 20 Bergquist (2020) found that the connection between intention and behavior for pro-environmental
46
47 21 action is higher than the average for other types of behavior. We therefore assumed that intentions
48
49 22 are a direct predictor of pro-environmental behavior, and hypothesized:

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

3 ***2.2.7 Moderating role of habit (HAB)***

4 This study focuses on pro-environmental behavior that is practiced regularly enough to become a
5 daily, habitual practice. There are three primary viewpoints on the relationship between habit and
6 intention (Soror *et al.*, 2015). The first sees habit as a predictor of intention. The second sees habit
7 as a direct predictor of behavior, and the third sees habit as a moderator between intention and
8 behavior. The literature on environmental psychology strongly supports the third point of view
9 (Amoroso and Lim, 2017; Chou and Hsu, 2016). Empirical research (Agag and El-Masry, 2016;
10 Chiu and Huang, 2015) also supports the conclusion that habit acts as a moderator in the link
11 between intention and behavior. **It is now clear that the concept of habit offers a distinct perspective
12 on explaining, predicting, and directing repeated actions. Habits are implicit linkages formed
13 between contexts and responses as a result of repeated reward-based learning (Wood and Runger,
14 2016). When people act out of habit, the reaction is prompted automatically by awareness of
15 relevant context signals. This suggests that habit has a moderating role between behavior and
16 predictor,** and we therefore hypothesized:

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

19 -----
20 Insert Figure 1 here
21 -----

22 **3. Methodology**

23 **3.1 Participants and procedure**

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2
3 1 The study was exploratory in nature, using an online survey-based questionnaire. To achieve the
4
5 2 objectives of this study, we targeted public entities **in different sectors including education,**
6
7 **environment, oil and gas, energy, and agriculture** in the United Arab Emirates (Abu Dhabi city) to
8
9 3 disseminate the survey. The Abu Dhabi government has implemented several environmental
10
11 4 programs and projects that have enhanced the quality of the environment, including a series of
12
13 5 studies and research on the effects of climate change at the local, national, and regional levels
14
15 6 undertaken by the Abu Dhabi Global Environmental Data Initiative (AGEDI). The involvement
16
17 7 of public organization employees is therefore essential to achieving the ultimate goal of
18
19 8 environmental sustainability (UAE Government Portal, 2022).
20
21 9

22
23
24 10 **The survey web-link was emailed to people at all career levels with at least one year of work**
25
26 11 **experience, starting on May 17, 2021, with a cover letter explaining the purpose of the study and**
27
28 12 **stating that participation in the survey was entirely voluntary. Respondents' identities were kept**
29
30 13 **anonymous to maintain confidentiality.** The time-lagged method was used to collect data in this
31
32 14 study at three time intervals. Respondents were asked to provide demographic information and
33
34 15 responses to three sets of questions that were distributed over a period. The second and third sets
35
36 16 of questions were distributed two weeks and four weeks later, to employees who responded to the
37
38 17 previous wave. The first wave (T1) questionnaire asked about attitudes, perceived behavioral
39
40 18 control, personal moral norms, perceived CSR, organizational citizenship behavior toward the
41
42 19 environment, and intention to perform voluntary pro-environmental behavior. The second wave
43
44 20 (T2) questionnaire asked about habits. Finally, the third wave (T3) questionnaire asked about
45
46 21 voluntary pro-environmental behavior. The data collection period lasted 12 weeks in total, from
47
48 22 May 17 to August 17, 2021.
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1 The time-lag technique is widely used in research because it allows researchers to conduct
2 several surveys for a specific topic (Mehmood *et al.*, 2020; Yu *et al.*, 2021). In this method,
3 researchers may collect data from several sources, eliminating the likelihood of common source
4 bias. The method also allows for data gathering at multiple time periods, reducing the possibility
5 of common method bias. Finally, it allows participants to assess and improve their behavior before
6 giving their final response (Detert and Edmondson, 2011). To eliminate usual technique bias, three
7 waves of data collection were undertaken at 2-week intervals (Podsakoff *et al.*, 2003).

8 The first survey was distributed to 700 respondents (T1), and 637 completed surveys were
9 returned (91% response rate). The second-wave survey (T2) was conducted two weeks later, with
10 the survey sent to all 637 respondents of the first survey. The total number of valid responses
11 returned was 559 (87.75% response rate). The third wave (T3) was sent to 559 respondents from
12 T2, and 519 valid responses were collected. The study sample included 310 (59.7%) men and 209
13 (40.3%) women. The average age of the respondents was in the range of 35 to 44 years old, with
14 44.1% holding a bachelor's degree and 41.0% holding a master's degree. Participants had a
15 minimum of one year of work experience, and 42.8% had more than 15 years of experience.

16 **3.2 Measures**

17 The questionnaires used scales adapted from previous studies to measure key constructs and
18 demographic features. The questionnaires were originally developed in English. However, the
19 study was conducted in the United Arab Emirates, where Arabic is the first language, and the
20 questionnaire was therefore translated into Arabic to avoid language-related errors in the analysis.
21 Consistency was confirmed between the Arabic and English versions of the questionnaire. The
22 respondents were asked to rate their degree of agreement with each statement on a five-point scale
23 (1 = strongly disagree; 5 = strongly agree). To assess employees' attitude ($\alpha = 0.881$), a five-item

1 scale was drawn from Wesselink *et al.* (2017), and included items such as “I’m in favor of
2 behaving pro-environmentally in the workplace”. To measure employees’ perceived behavioral
3 control ($\alpha = 0.736$), we used a two-item scale also developed by Wesselink *et al.* (2017). This
4 included items such as “Whether I perform pro-environmentally is entirely up to me”. We used a
5 four-item scale to measure personal moral norms ($\alpha = 0.936$), developed by Steg and de Groot
6 (2010). It included items such as: “I feel morally obliged to act pro-environmentally at work”. A
7 five-item scale was used to measure perceived CSR ($\alpha = 0.902$), adapted from Rupp *et al.* (2018).
8 Items included: “Our business gives adequate contributions to charities”. A seven-item scale was
9 adapted from Raineri and Paillé (2016) to measure organizational citizenship behaviors toward the
10 environment ($\alpha = 0.905$). Items included: “I encourage my colleagues to adopt more
11 environmentally conscious behaviors”. We used a three-item scale to measure intention to perform
12 voluntary pro-environmental behavior ($\alpha = 0.880$), developed by Yuriev *et al.* (2020). This
13 included items such as: “I will try to behave more pro-environmentally in the coming months”. To
14 assess habits ($\alpha = 0.942$), we used a twelve-item scale drawn from Verplanken and Orbel (2003),
15 including items such as: “Voluntary pro-environmental behavior is something I do frequently”.
16 Finally, to measure voluntary pro-environmental behavior itself ($\alpha = 0.896$), we used a nine-item
17 scale developed by Wesselink *et al.* (2017). This included items such as: “I turn off all my
18 electronic devices at the end of the day”. Cronbach’s alpha was more than 0.75 in all parameters.

19 **4. Results**

20 **4.1 Descriptive statistics**

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

 Insert Table 1 here

4.2 Confirmatory factor analysis

We dropped two of the 12 items of habit, 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 (λ : cut-off 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 cut-off criteria of Hu and Bentler (1999) (i.e., χ^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 (AVE; cut-off criteria > 0.5) and composite reliability (CR; cut-off 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).

 Insert Table 2 here

 Insert Table 3 here

4.3 Hypothesis testing

1 We examined the conceptual model using structural equation modeling (SEM), which has been
2 extensively used in previous studies (Shang *et al.*, 2021, 2022). The fit indices showed that the
3 proposed model had an adequate fit ($\chi^2 = 766.170$, $df = 460$, $\chi^2/df = 1.666$, TLI = 0.966, CFI =
4 0.970, RMSEA = 0.036). H1 proposed that attitude significantly influences intention to perform
5 voluntary pro-environmental behavior. The path analysis (Figure 2) showed that this was the case
6 among our sample ($\beta = 0.166$, $p < 0.01$), supporting H1. H2 proposed that perceived behavioral
7 control significantly influences intention to perform voluntary pro-environmental behavior.
8 However, the path analysis showed that there was no significant relationship between these two (β
9 = 0.083, $p > 0.01$), and H2 was therefore unsupported. H3 proposed that personal moral norms
10 significantly influenced intention to perform voluntary pro-environmental behavior. This was
11 again supported by the findings ($\beta = 0.228$, $p < 0.01$). We also found that perceived CSR
12 significantly influenced intention to perform voluntary pro-environmental behavior ($\beta = 0.346$, p
13 < 0.001), which supported H4. Similarly, organizational citizenship behavior toward the
14 environment significantly influenced intention to perform voluntary pro-environmental behavior
15 ($\beta = 0.171$, $p < 0.01$), which supported H5. Finally, intention to perform voluntary pro-
16 environmental behavior significantly influenced actual behavior of this kind ($\beta = 0.312$, $p <$
17 0.0001), supporting H6.

18 H7 set out that habit would enhance the positive effect of intention to perform voluntary pro-
19 environmental behavior on actual behavior, such that this relationship would be stronger for
20 employees with stronger habits. Figure 2 shows that there was a significant interaction between
21 intention to perform voluntary pro-environmental behavior and habit on actual behavior of this
22 kind among employees ($\beta = 0.258$, $t = 5.586$, $p = 0.001$). This supported H7. We also assessed the
23 pattern of the moderating effect visually, following Aiken *et al.* (1991) to plot the interaction.

1 Figure 3 shows that the relationship between intention and actual voluntary pro-environmental
2 behavior of employees becomes stronger at higher levels of habit, supporting H7.

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4 Insert Figure 2 here
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9 **5. Discussion**

10 To reflect the increasing importance of voluntary pro-environmental behavior, this study
11 investigated the factors influencing this behavior and explored how habits affect employees'
12 intentions to perform this behavior. We used a questionnaire, then applied confirmatory factor
13 analysis and structural equation modeling to test hypotheses. The results of the time-lagged designs
14 show that the intention to perform voluntary pro-environmental behavior mediates the relationship
15 between factors that influence intention, and voluntary pro-environmental behavior itself (Bird *et*
16 *al.*, 2015; Hagger *et al.*, 2016; Vesely *et al.*, 2021). Six of the seven proposed hypotheses on
17 relationships were verified.

18 Several studies have shown that employee attitude, a factor drawn from the theory of planned
19 behavior, has a significant impact on employees' voluntary pro-environmental behavior. Our
20 findings support previous research on the positive relationship between attitude and intention to
21 perform environmental behavior (Chin *et al.*, 2018; Kim and Yun, 2019; Yu and Yu, 2017; Yuriev
22 *et al.*, 2020).

23 The second hypothesis proposed that perceived behavioral control would be positively
24 associated with the intention to perform voluntary pro-environmental behavior. However, this was
25 not found in practice. This contradicts previous research findings (Khatimah and Halim, 2016;
26 Vamvaka *et al.*, 2020). This may be because of the factors used in this study. Ajzen (1991)

1 distinguished between internal (skills or abilities) and external (individual characteristics that
2 support or inhibit behavior performance) components of perceived behavioral control. Factors can
3 also either help or hinder the performance of the behavior. Control factors include required skills
4 and abilities, the availability or lack of time, money, other resources, and other people's
5 cooperation. Control beliefs are the subjective judgement of the likelihood that a given facilitating
6 or inhibiting factor will be present. Each control belief contributes to perceived behavioral control
7 in interaction with the factor's perceived ability to facilitate or obstruct behavioral performance.

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

16 The findings on the third hypothesis support previous studies. The factor on personal moral
17 norms drawn from the norm activation model showed a substantial association with intention to
18 perform voluntary pro-environmental behavior. Participants who have a personal tendency
19 towards pro-environmental behavior would probably transfer that behavior to their job and
20 therefore engage in voluntary pro-environmental behavior (Chiang *et al.*, 2019). Personal
21 predispositions have a significant impact on voluntary and discretionary behavior (Yuriev *et al.*,
22 2018). Voluntary pro-environmental behavior is usually not supported by structured formal

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3 1 programs, and therefore personal predispositions play an even greater role in voluntary behaviors
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5 2 in the corporate environment.
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8 3 The fourth hypothesis was about the effect of perceived CSR on employees' intentions to
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10 4 perform voluntary pro-environmental behavior. We found a strong influence, which supports
11
12 5 earlier studies (Farooq *et al.*, 2017; Glavas and Godwin, 2013; Korschun *et al.*, 2014; Vlachos *et*
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14 6 *al.*, 2014). Our findings therefore extend the concept that employees respond positively to
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16 7 perceptions of CSR. They suggest that when employees perceive their organization to be socially
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18 8 and environmentally responsible, they are more engaged and committed.
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22 9 The fifth hypothesis was supported by a positive association between organizational
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24 10 citizenship behaviors towards the environment and the intention to perform voluntary pro-
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26 11 environmental behavior. Individuals make sustainability decisions based on their perception of the
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28 12 institution's support for the behaviors. The sixth hypothesis was supported by a significant positive
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30 13 association between the intention to perform voluntary pro-environmental behavior and the
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32 14 behavior itself, which is consistent with previous research (Bird *et al.*, 2015; Hagger *et al.*, 2016;
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34 15 Vesely *et al.*, 2021) on the strong link between intentions and behavior. In line with the seventh
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36 16 hypothesis, we also found that habit strengthens the link between intention to perform voluntary
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38 17 pro-environmental behavior and the behavior itself: the relationship was stronger with stronger
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40 18 habits connected with these behaviors. These findings are consistent with previous empirical
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42 19 studies (Agag and El-Masry, 2016; Chiu and Huang, 2015), which concluded that habit acts as a
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44 20 moderator in the relationship between intention and behavior. This therefore provides a deeper
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46 21 knowledge of the factors that influence voluntary pro-environmental behavior in the workplace.
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51 22 In conclusion, this study found that perceived CSR, personal moral norms, organizational
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53 23 citizenship behaviors toward the environment, and attitude are the primary factors that influence
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1 employees' pro-environmental behavior at work, with habit having a moderating effect. In Abu
2 Dhabi at present, public organizations' pro-environmental behavior is not mandated. We
3 recommend that departments should increase the frequency of employee voluntary involvement in
4 CSR initiatives and activities. When more volunteering is encouraged, more employees will tend
5 to adopt this behavior and make it a habit at work, promoting the volunteering culture in the
6 organization.

7 **6. Theoretical implications**

8 **To our knowledge, this is the first study that aims to understand pro-environmental behavior using**
9 **an integrative model that incorporates variables from the theory of planned behavior, norm**
10 **activation model, and comprehensive action determination model, as well as the constructs of**
11 **perceived CSR and organizational citizenship behaviors towards the environment. It therefore**
12 **offers a more comprehensive approach by studying multiple determinants simultaneously. It also**
13 **takes into account the multidimensional nature of environmental behavior and employs measures**
14 **of both intention and behavior at the same time, in contrast to the existing literature's tendency to**
15 **focus solely on intention (Gkargkavouzi *et al.*, 2019). The theoretical contribution of this work is**
16 **the proposal of a new model examining the determinants of environmental behavior in an emerging**
17 **market like the UAE. This extends beyond the most comprehensive model presented thus far (the**
18 **comprehensive action determination model) by empirically confirming the fundamental role of**
19 **intention in the adoption of environmentally responsible behaviors.**

20 **Our study contributes to the growing body of knowledge on voluntary pro-environmental behavior**
21 **in multiple ways. First, previous studies suggested that perceived CSR is an important dimension**
22 **of employees' voluntary pro-environmental behavior, and this was supported by our results (Choi**
23 **and Yu, 2014; Glavas and Kelley, 2014; Ng *et al.*, 2019). In other words, perceived CSR is a**

1 predictor of voluntary pro-environmental behavior. Second, the findings of this study on
2 organizational citizenship behaviors toward the environment were also consistent with previous
3 studies (Chan and Lai, 2017; Paillé *et al.*, 2013; Temminck *et al.*, 2015). Previous research has
4 found that when organizations have an environmentally oriented management strategy and
5 supportive policies in place, employees are more willing to behave eco-actively in the workplace
6 (Paillé *et al.*, 2014). This is referred to as organizational commitment, which improves employees'
7 voluntary pro-environmental behavior. Third, we also found that positive environmental attitudes
8 lead directly to a decision to engage in pro-environmental behaviors (Paul *et al.*, 2016; Polonsky
9 *et al.*, 2012). Environmental concern may therefore promote individuals' engagement in
10 environmental activism and conservation (Kim *et al.*, 2018). Our study also contributes to work
11 on the relationship between intention and actual voluntary pro-environmental behavior of
12 employees, by showing that this relationship becomes stronger at higher levels of habit. This
13 therefore suggests that habit strengthens the link between intention and actual voluntary pro-
14 environmental behavior: the relationship was stronger in people with stronger habits associated
15 with these behaviors. These results are in line with previous empirical studies which agreed that
16 habit acts as a moderator in the relationship between intention and behavior (Agag and El-Masry,
17 2016; Chiu and Huang, 2015).

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

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

3 **7. Practical implications**

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

13 When employees demonstrate pro-environmental behavior in all settings (e.g., home, and social
14 gatherings, as well as work), there are social implications. Their actions may have a knock-on
15 effect among their friends and families, especially if they involve developing habits that can be
16 repeated anywhere, not just at work (Alzaidi and Iyanna, 2021). This in turn may have wider
17 societal implications for sustainability and improve the quality of life of individuals. Second,
18 employee moral norms are a strong predictor of employee behavior (Mehmood, Jabeen, Iftikhar
19 *et al.*, 2022). This finding emphasizes the importance of organizations establishing policies and
20 initiatives at the highest organizational levels, as well as directly engaging employees to develop
21 personal norms around environmentally friendly behaviors. Organizations can hold meetings,
22 workshops, or seminars to raise awareness about their environmental activities. Several studies
23 have found that moral norms can help explain pro-environmental behavior (Huber *et al.*, 2020;

1 Yeboah and Kaplowitz, 2016; Yuriev *et al.*, 2018). Third, organizational citizenship behaviors
2 towards the environment catalyze employees' voluntary pro-environmental behavior, and should
3 therefore be highlighted. Organizations can implement a variety of management measures, such
4 as declaring their environmental strategy, supporting volunteering for projects or activities that
5 address environmental issues, and creating an incentive program to increase organizational
6 citizenship behaviors towards the environment among employees.
7 Finally, perceived CSR is the primary inductor of pro-environmental behavior intentions,
8 followed by habit strength and personal moral norms. This study may therefore help public
9 organization planners, managers, and practitioners to formulate strategies and develop actions
10 and policies to stimulate their employees' pro-environmental behavioral intention. We
11 recommend that public sector planners and managers should prioritize improving employees'
12 personal norms in this area.

14 8. Limitations and future research

15 This study used time-lagged data to control for common method bias (Podsakoff *et al.*, 2012), so
16 common source and common method bias were not major problems. However, our research still
17 has some limitations. First, the data were gathered from public entities in Abu Dhabi, United Arab
18 Emirates, and are therefore not necessarily applicable to other sectors or countries. Future studies
19 should consider focusing on specific high-carbon-footprint sectors, such as oil and gas companies,
20 which will certainly add to the body of knowledge in that critical sector. Second, our data were
21 obtained from employees. This is an appropriate way to obtain information about employee
22 contributions to environmental performance at work. However, future studies may broaden this
23 focus to include different geographical areas, cultures, or times to increase the model's
24 generalizability. Future cross-cultural studies would be interesting. Cross-cultural studies theories

1 suggest that employees perceive and react differently based on their cultural values (Islam *et al.*,
2 2018; Mehmood, Jabeen, Al Hammadi *et al.*, 2022; Rupp *et al.*, 2013). Third, the study focused
3 on the factors that influence voluntary pro-environmental behavior. It therefore did not consider
4 the potential consequences of this behavior at the individual or corporate levels. According to
5 research on corporate volunteering and organizational citizenship behaviors, potential individual
6 effects of voluntary pro-environmental behavior could include improved job-related skills (Basil
7 *et al.*, 2009). The relationship between voluntary pro-environmental behavior and corporate
8 environmental performance needs to be theoretically and empirically validated further.

9 **Conclusion**

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

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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	.49												
2. Age	2.86	.80	.206**											
3. Education	2.62	.77	.057	.201**										
4. Experience	2.99	1.05	.289**	.189**	.206**									
5. Attitude	3.77	.88	.078	.019	.066	.037	(.881)							
6. Perceived behavioral control	2.01	.83	.053	.028	.085	.006	.188**	(.736)						
7. Personal moral norm	2.89	1.37	.060	.030	.003	.019	.140**	.247**	(.936)					
8. Perceived CSR	4.02	.74	.105*	.050	.003	.024	.107*	.183**	.128*	(.902)				
9. OCB toward the environment	2.10	.68	.038	.052	.042	.045	.123**	.312**	.264**	.391**	(.905)			
10. Intention to perform VPEB	3.07	1.30	.048	.053	.001	.006	.361**	.177**	.201**	.129**	.318**	(.880)		
11. Habit	3.81	.70	.061	.069	.016	.072	.226**	.354**	.205**	.325**	.634**	.324**	(.942)	
12. VPEB	4.02	.78	.031	.092*	.048	.067	.322**	.194**	.134**	.249**	.430**	.210**	.397**	(.896)

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

Table 2. Variables' reliabilities and convergent validity

Variables	Item code	λ	CR	AVE
Attitude (Time-1)	AT1	.751	.885	.608
	AT2	.783		
	AT3	.891		
	AT4	.730		
	AT5	.733		
Perceived behavioral control (Time-1)	PBC1	.845	.884	.816
	PBC2	.692		
Personal moral norm (Time-1)	PMN1	.849	.937	.787
	PMN2	.965		
	PMN3	.850		
	PMN4	.878		
Perceived CSR (Time-1)	PCSR1	.819	.907	.663
	PCSR2	.776		
	PCSR3	.846		
	PCSR4	.852		
	PCSR5	.738		
OCB toward the environment (Time-1)	OCBE1	.612	.906	.581
	OCBE2	.634		
	OCBE3	.750		
	OCBE4	.838		
	OCBE5	.760		
	OCBE6	.789		
	OCBE7	.755		
Intention to perform VPEB (Time-1)	INT1	.891	.881	.713
	INT2	.797		
	INT3	.844		
Habit (Time-2)	HAB1	.645	.943	.625
	HAB2	.703		
	HAB3	.709		
	HAB4	.816		
	HAB5	.806		
	HAB6	.863		
	HAB7	.788		
	HAB8	.853		
	HAB9	.782		
	HAB10	.780		

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Voluntary pro-environmental behavior (Time-3)		.898	.559
	VPB1	.672	
	VPB2	.706	
	VPB3	.876	
	VPB4	.858	
	VPB5	.740	
	VPB6	.614	
	VPB7	.694	

Notes: All factor loadings are significant at $p < .001$, $N = 519$; λ = 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	χ^2	<i>df</i>	χ^2/df	$\Delta\chi^2$ (Δdf)	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 VPB	1079.211	802	1.345	96.324 (22)	0.823	0.865	0.081
Six-factor model: combining OCBE, INT, HAB and VPB	1693.569	802	2.111	710.682 (22)	0.756	0.712	0.092
Five-factor model: combining PCSR, INT, and VPB	2129.789	802	2.655	1146.902 (22)	0.633	0.687	0.101
Four-factor model: combining PMN, OCBE, PCSR, and INT	2539.856	856	2.967	1556.969 (76)	0.598	0.611	0.128
Three-factor model: combining PBC, PMN, OCBE, and PCSR	3124.588	856	3.650	2141.701 (76)	0.418	0.489	0.130
Two-factor model: combining AT, PBC, PMN, OCBE, and PCSR	4334.542	859	5.046	3351.655 (79)	0.387	0.399	0.133
One-factor model: combining all into one factor	9512.932	860	11.061	8530.045 (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, VPB = Voluntary pro-environmental behavior, Tucker–Lewis index = TLI; Comparative fit index = CFI, Root mean square error of approximation = RMSEA

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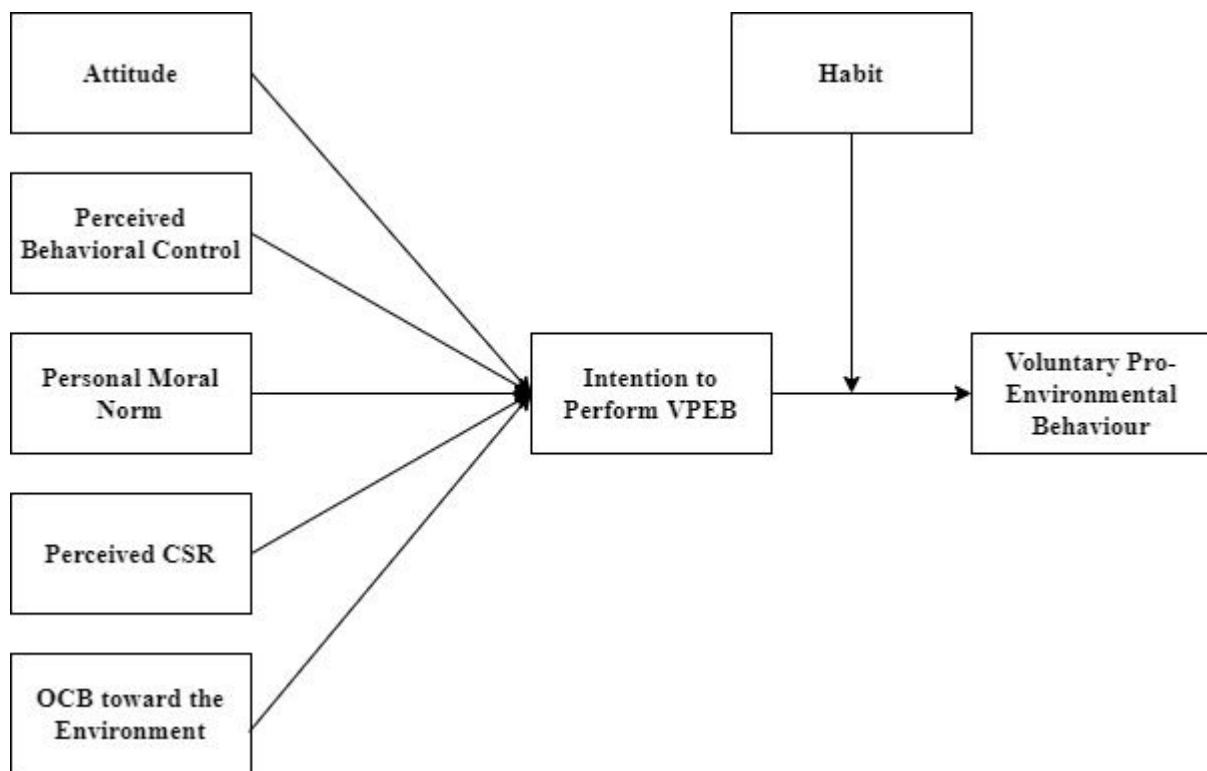
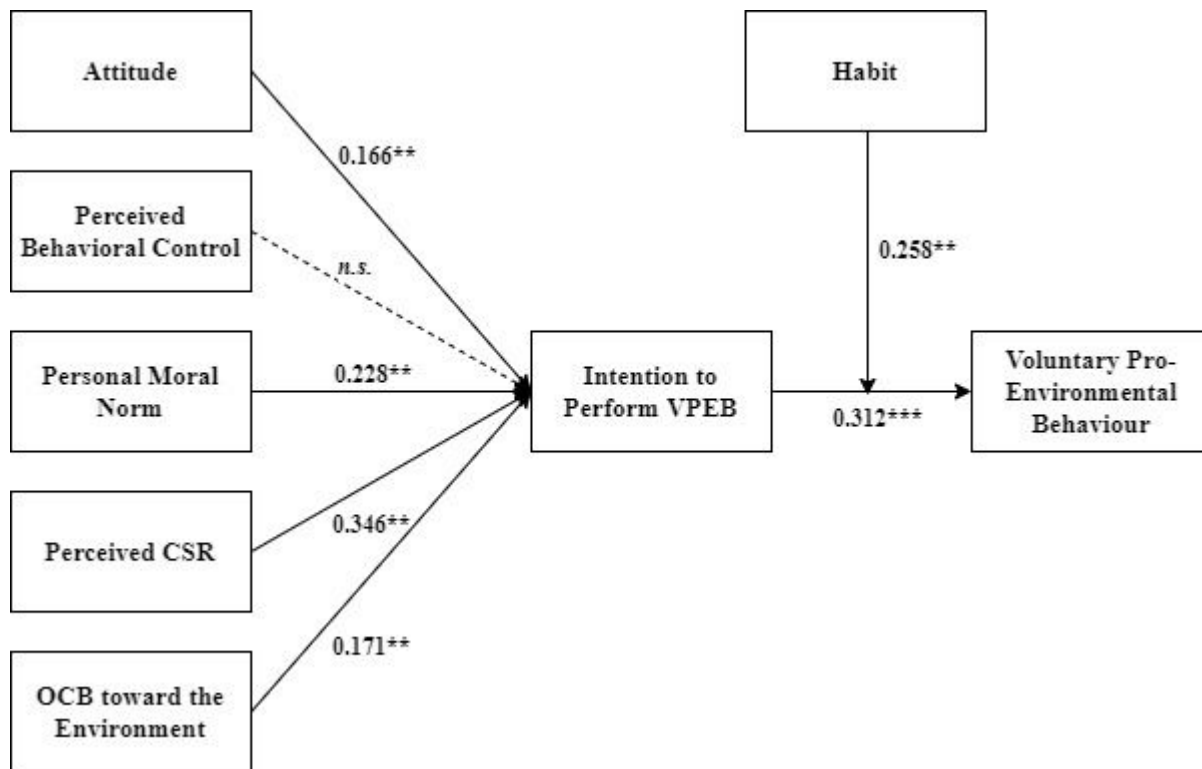


Figure 1. The conceptual model

Notes: CSR = corporate social responsibility; OCB = organizational citizenship behavior; VPEB = voluntary pro-environmental behavior



Notes: $\chi^2 = 766.170$, $df = 460$, $\chi^2/df = 1.666$, $TLI = 0.966$, $CFI = 0.970$, $RMSEA = 0.036$; dotted lines show an insignificant (*n.s.*) relationship; CFI = comparative fit index, CSR = corporate social responsibility; OCB = organizational citizenship behavior; $RMSEA$ = root mean squared error of approximation; TLI = Tucker–Lewis Index; $VPEB$ = voluntary pro-environmental behavior

Figure 2. Path analysis

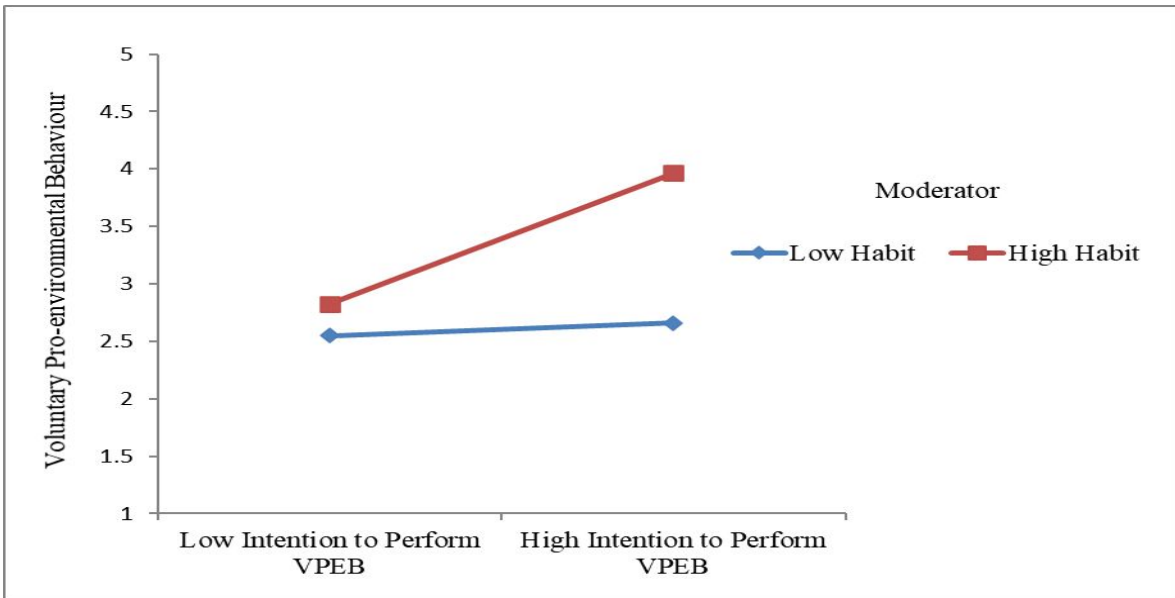


Figure 3. Interactive effects of intention to perform voluntary pro-environmental behavior and habit on actual voluntary pro-environmental behavior.
Note: VPEB = voluntary pro-environmental behavior