



What's with the Attitude? Unravelling the Dynamics of Pro-Environmental Action in India

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Authors' contributions

This work was carried out in collaboration between both authors. Both authors read and approved the final manuscript.

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ABSTRACT

Environmental degradation has become one of the most significant threats for humanity. Insights on individual's pro-environmental actions remain insufficiently investigated in India. The study aims to explore the effect of attitude, injunctive and descriptive norms, self-efficacy, controllability and behavioural intentions on individual's pro-environmental action. Drawing on a sample of individuals from India ($n = 308$), the study conducts multilinear regression and correlation analysis to explore the association between the variables. The results indicate that individual pro-environmental action is significantly affected by behavioural intentions, descriptive and injunctive norms. In contrast, attitude show a close-to-significant impact, while self-efficacy and controllability show negligible effects. Overall, these factors explain 35.6% of the variance in individual pro-environmental action. The present analysis provides an important overview of pro-environmental actions in India, essential in addressing environmental degradation. The study end by highlighting the necessity of localised research, and advancement of research in pro-environmental action in India.

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1. INTRODUCTION

Environmental degradation has become one of the most pressing issues in the world. The environment's worsening conditions pose significant challenges across the globe. Along with the unprecedented environmental degradation, a growing body of scientific evidence has also emerged, leading to a global consensus among scientists that human activities are accelerating environmental degradation [1-3]. Human activities impact natural systems, including forests, oceans, wetlands, permafrost, through different changes in land-use and consumption patterns. While these systems naturally undergo changes in a self-balancing manner, anthropogenic activities have added extra pressure to these natural systems [4]. Environmental crises resulting from disturbances in natural systems are evident in the extreme events, such as landslides triggered by heavy rains [5], heatwaves in many parts of India [6], claiming and impacting hundreds of lives annually. These incidences have become 30 times more likely due to climate change [7]. These are just a fraction of the many natural catastrophes gaining momentum due to the interconnected decline in the environment. While these calamities may seem physical in nature, their causes and solutions are deeply rooted in human attitude, norms, intentions, and behaviour. Environmental degradation is a human problem influenced by social practices [8], and, therefore, it intrinsically embodies actions of every individual in shaping the consequences within a short time frame [9,10].

The IPCC's sixth assessment report strongly emphasizes the need to encourage behavioural change for environmental protection [11]. Understanding individual pro-environmental behaviour becomes fundamental, as it is a driving force for societal change [12]. Individuals are crucial stakeholders shaping the environment through their pro-environmental actions. Notably, individuals are also the ones who bear the negative consequences of behavioural negligence towards the environment. While the majority of the research on individual behaviours concentrates in developed countries, there is little attention given to the context of developing countries such as India. With the world's highest population, investigating individual pro-environmental behaviour in India will provide significant insights. Gaining understanding of

pro-environmental behaviours with various lenses is essential for positive developments in the environment.

Understanding individual pro-environment attitude is crucial for grasping pro-environmental behaviour [13,14]. It is suggested that behaviour emerges from the concerned attitude [14]. While positive attitude are necessary for a behaviour to take place, previous studies have also shown that having a positive attitude may not necessarily translate into pro-environmental actions [15-18]. Researchers have further highlighted the importance of identifying subjective norms concerning the behaviour [19,20]. To explore the effect of subjective norms on behaviour in a localized manner, it was further split into descriptive norms (what others do) and injunctive norms (what others approve/disapprove of). This distinction in norms has been utilized to study various behaviours; for instance, descriptive norms successfully impacted transport choices [46], while injunctive norms influenced littering behaviour [21], and stealing behaviour [22]. For household energy usage, it was observed that both descriptive and injunctive norms played their roles [23]. While descriptive and injunctive norms offer the potential to influence individual actions, they remain underutilized. As previous research suggests that individuals shape their behaviour by imitation of others, exploring norms in determining pro-environmental behaviour is imperative.

Several theories, such as the Triandis Attitude-behaviour Theory, Value-Belief-Norm Theory, Norm Activation Model, have highlighted the importance of normative influence, attitude towards action, and intentions to perform a behaviour. It is argued that intentions serve as the origin of behaviour [24]. The Theory of Reasoned Action [25] later modified to the Theory of Planned Behaviour [26,27], and the Protection Motivation Theory [28], states that the intention to perform a behaviour is a crucial predictor of behaviour. Previous research suggests that intentions are highly capable of driving the intended behaviour [29,30]. Contrastingly, in certain cases, behavioural intentions have failed to translate into behaviour [31]. While the mechanisms of behavioural intentions should be considered as antecedents for behaviour, their ability to influence individual action in isolation may be limited. Thus, a deeper

understanding of the intention-behaviour association is still needed to effectively understand individual pro-environmental behaviour.

Another important mechanism influencing behaviour is perceived behavioural control. Perceived behavioural control is the degree of control one has over performing a behaviour. Scholars accounted for the gap between intentions, attitude, norms, and behaviour by considering the controllability of action and self-efficacy [32]. Previous research found positive impacts of perceived control on behaviour, such as predicting health behaviours [33,34] and recycling behaviours [35]. Research also suggests direct and positive impacts of perceived control on behaviour [32,36,37,33]. In most of the past research, self-efficacy and controllability have been treated as a single construct, largely remaining overlapped.

The primary aim of the current study is to gain insights into individual pro-environmental behaviour in India. Given the backdrop of rapid environmental degradation in various parts of India, understanding the strength of influence of factors such as attitude, intentions, norms and control becomes urgent. The objective of the study is to provide insights to the field, particularly within a socially-plural and diverse context as India, promoting the expansion and advancement of existing knowledge. Individual behaviour manifests richness and flexibility that vary across contexts, resulting in a more complex behavioural landscape in developing countries compared to developed ones. Thus, there is a pressing need to advance local studies. Specifically, the current study examines how factors, including attitude, behavioural intentions, descriptive and injunctive norms, self-efficacy, and controllability, influence individual pro-environmental actions on a sample based on the Indian population.

2. METHODS

2.1 Participants

The study employed 308 participants from India, specifically individuals aged 18 to 44. This age group represents a substantial portion of India's population, approximately 48% (i.e., 59 crore/590 million). Understanding pro-environmental behaviours of this demographic is crucial, given that they may experience the current and future adverse effects of environmental degradation.

Moreover, they also hold significant potential to positively impact the environment through their actions. This targeted approach may help in controlling for potential confounding effects of age. The study also collected socio-economic information from participants, including details of their income, region, and occupation.

The data collection was conducted using PsyToolkit, a web-based resource to design and conduct online questionnaires and cognitive psychological experiments [38]. In a research setting with limited resources, the platform's user-friendly design ensured accessibility for researchers as well as participants.

Convenience sampling was used, requesting participants to share the survey link widely. It is important to note that this method introduces potential biases due to non-random selection of participants. However, this method proves valuable in cost-effective research. Owing to the COVID-19, researchers ensured the collection of high-quality data through the online survey. The data was analysed using the statistical software package SPSS version 25.0. Regression analysis was conducted to explore the relationships between variables, whereas correlation analysis was conducted to understand the degree of association between variables.

2.2 Measures

The study employed seven questionnaires. The questionnaires were administered to measure individual pro-environmental behaviours, attitude, behavioural intentions, injunctive subjective norms, descriptive subjective norms, self-efficacy, controllability towards action.

2.2.1 Pro-environmental behaviour scale

The scale on "pro-environmental behaviour" was developed by Huang [39]. The scale had two divisions, namely direct pro-environmental behaviour and indirect pro-environmental behaviour. The scale on direct pro-environmental behaviour consisted of 7 items (e.g., "I turn off or unplug electronic devices when not needed", "I reduce air conditioning"), whereas the scale on indirect pro-environmental behaviour consisted of 3 items (e.g., "I persuade others to change behaviour to mitigate global warming"). Each item contained a 7-point Likert scale which ranged from 1 ("never")-to-7 ("always"). Participants were asked to indicate how frequent

it is for them on the scale. The alpha of the pro-environmental behaviour scale was 0.78, thereby indicating an internally reliable scale.

2.2.2 Behavioural intentions scale

The behavioural intentions scale [40] consisted of 7 items (e.g., “I intent to reduce car use”, “I intent to reduce cooling and heating use”). Each item contained a 5-point Likert scale which ranged from 1 (“strongly disagree”)-to-5 (“strongly agree”). Participants were asked to indicate their agreement to each statement on the scale. The alpha of behavioural intentions scale was 0.75, thereby indicating an internally reliable scale.

2.2.3 Attitude scale

The attitude scale was developed by Christensen & Knezek [41]. The scale consisted of 5 items (e.g., “Knowing about environmental problems and issues is important to me”, “Things I do have no effect on the quality of the environment”). Each item contained a 5-point Likert scale which ranged from 1 (“strongly disagree”)-to-5 (“strongly agree”). Participants were asked to indicate their agreements to each statement on the scale. The alpha of attitude scale in the current study is 0.77, thereby indicating an internally reliable scale.

2.2.4 Descriptive norms scale

The descriptive norms scale [42] consisted of 3 items (e.g., “My family wants me to do things that are good for the environment”, “My friends want me to do things that are good for the environment”). Each item contained a 5-point Likert scale which ranged from 1 (“never”)-to-5 (“always”). Participants completed the scale by indicating the frequency of the statements. The alpha of the descriptive norms scale for the current study was 0.73, thereby indicating an internally reliable scale.

2.2.5 Injunctive norms scale

The injunctive norms scale [42] consisted of 3 items (e.g., “My family praises what I do for environmental protection”, “My friend praises what I do for environmental protection”). Each item contained a 5-point Likert scale which ranged from 1 (“never”)-to-5 (“always”). Participants completed the scale by indicating the frequency of the statements. The alpha of the injunctive norms scale for the current study was

0.76, thereby indicating an internally reliable scale.

2.2.6 Self-efficacy scale

The self-efficacy scale [43] consisted of 4 items (e.g., “I believe in my ability to reduce environmental degradation around me”, “I believe in my ability to reduce environmental degradation in my city”). Each item contained a 5-point Likert scale which ranged from 1 (“strongly disagree”)-to-5 (“strongly agree”). Participants indicated their agreement with each statement on the scale. The alpha for the self-efficacy scale in the present study was 0.82, indicating an internally reliable scale.

2.2.7 Controllability scale

The controllability scale [44] consisted of 3 items (e.g., “Whether or not I try to mitigate global climate change is completely up to me”, “I am confident that if I want, I can try to mitigate global climate change”). Each item contained a 5-point Likert scale which ranged from 1 (“strongly disagree”)-to-5 (“strongly agree”). Participants indicated their agreement with each statement on the scale. The alpha for the controllability scale in the present study was 0.71, indicating an internally reliable scale.

2.3 Procedure

To assess individual pro-environmental behaviour, behavioural intentions, attitude, subjective norms (injunctive and descriptive), perceived behavioural control (self-efficacy and controllability), a questionnaire with seven scales was prepared on PsyToolkit. The questionnaire link was distributed through direct messaging and email inviting individuals from across India to participate and share the link in their circles. The research objective was clearly outlined in the instructions. The questionnaire took approximately 6 minutes to complete. Participants were instructed to not let their response to one statement influence their answer to another and they were encouraged to respond realistically. Data was downloaded from the PsyToolkit server and stored in a spreadsheet. A total of 360 responses were collected. Data was cleaned based on inconsistencies such as missing values. Following data cleaning, a total of 308 responses were validated. For further analysis, the cleaned dataset was imported to IBM SPSS Statistics v.25.

3. RESULTS

3.1 Demographic Characteristics of the Sample

Table 1 shows the demographic characteristics of the sample (n= 308) of the study. The sample consisted of individuals aged 18 to 44, with slightly more men than women. Across India, 67.5% of the participants resided in urban areas, 24.6% in suburban areas, and 7.7% in rural areas. Regarding occupation, 49.6% of the participants were employed, 36.6% were pursuing education, and 13.9% identified as unemployed. Participants were also asked to categorize their monthly income into three ranges: below average income (29.8%), average income (31.1%), and above average income (38.9%). To avoid misapprehensions from participants, the average monthly wage (USD 437/ INR 32800) was clearly mentioned. Despite these distinguishing factors, none of the socio-economic factors showed significant effect on individual pro-environmental behaviours. As a result, the sample for this study reflected homogeneity.

3.2 Descriptive Statistics of the Sample

The current study measured the effect of attitude (M = 2.66, SD = 0.77), descriptive norm (M = 3.22, SD = 0.83), injunctive norm (M = 2.99, SD = 0.97), self-efficacy (M = 3.76, SD = 0.84), controllability (M = 3.58, SD = 0.90), and behavioural intentions (M = 3.95, SD = 0.61) on pro-environmental behaviour (M = 4.87, SD = 0.90) of individuals (n = 308). Table 2 shows the descriptive statistics, with positive attitude, moderate adherence to subjective norms, high self-efficacy and controllability, and strong behavioural intentions, resulting in high level of reported pro-environmental behaviour.

3.3 Multilinear Regression Analysis

To understand the relationships between these variables, multilinear regression was used to assess the impact of attitude, injunctive and descriptive norm, self-efficacy, controllability, and behavioural intentions on individual pro-environmental behaviour. The results revealed a significant regression equation ($F(6, 301) = 27.737, p < 0.000$), with an R^2 of 0.356 (please see Table 3). F-statistic highlights the significance of the model as a whole, contributing to explaining the variance in pro-environmental behaviour. Overall, 35.6% of the variability in individual pro-environmental behaviour can be

explained by the collective influence of attitude, injunctive and descriptive norms, self-efficacy, controllability, and behavioural intentions.

The predicted pro-environmental behaviour of participant's is equal to $0.840 + 0.115$ (attitude) + 0.163 (injunctive norm) + 0.149 (descriptive norm) + 0.47 (self-efficacy) + 0.47 (controllability) + 0.610 (behavioural intentions). Looking at the unique individual contributors, it was found that behavioural intentions ($\beta = 0.414, t = 6.788, p < 0.000$) significantly predicted pro-environmental behaviour, along with descriptive norms ($\beta = 0.137, t = 2.132, p < 0.05$) and injunctive norms ($\beta = 0.175, t = 2.788, p < 0.05$). While attitude ($\beta = 0.098, t = 1.794, p > 0.05$), self-efficacy ($\beta = 0.043, t = 0.684, p > 0.05$) and controllability ($\beta = 0.047, t = 0.799, p > 0.05$) had no statistically significant effect on pro-environmental behaviour.

3.4 Correlation Analysis

Pearson's r data analysis was conducted to measure the level of correlation between attitude, norms (injunctive and descriptive), perceived control (self-efficacy and controllability) and pro-environmental behaviour (please see Table 4). The analysis revealed that pro-environmental behaviour had a moderate positive correlation with behavioural intention ($r = 0.487$), injunctive norms ($r = 0.385$), descriptive norms ($r = 0.386$), self-efficacy ($r = 0.372$) and controllability ($r = 0.335$). However, between attitude and pro-environmental behaviour, the correlation was found to be weak.

4. DISCUSSION

Understanding an individual's pro-environmental behaviour is clearly complex and multifaceted. The primary aim of the study was to assess how attitude, subjective norms (injunctive and descriptive) and perceptions of behavioural control (self-efficacy and controllability) and intentions to act in an environment-friendly way, contribute to the understanding of individual's pro-environmental behaviour in India. Multiple linear regression was applied to tap these relationships. The findings indicate a significant impact of behavioural intentions, injunctive and descriptive norms on pro-environmental behaviour. However, the association between attitude concerning pro-environmental behaviour was close to significant ($p=0.074$). The finding aligns with previous research, suggesting that a positive attitude towards the environment may not necessarily translate into positive environmental actions [15-17,16]. To this,

empirical research has indicated conflicting evidence on the relation between attitude and behaviour. The current study presents a close-to-significant effect of attitude on pro-environmental behaviour. The study was conducted during an unprecedented COVID-19 pandemic, erupting a sense of helplessness. Specifically, India faced the brunt of the pandemic during the data collection period, where individuals were experiencing loss of freedom in their daily lives. The pandemic posed a significant challenge on

individuals' controllability and self-efficacy. While correlation analysis showed a moderate association between self-efficacy, controllability, and pro-environmental action, regression analysis suggests that an increase in the association between perceptions of control and action may be less likely. These results emphasize that the association of pro-environmental behaviour with attitude, self-efficacy, and controllability may not always be straightforward and can show unpredictability.

Table 1. Characteristics of the sample (n=308)

Characteristics	n	%
Gender		
Male	168	54.5
Female	140	45.5
Region		
City	208	67.5
Suburban	76	24.6
Rural	24	7.7
Occupation		
Unemployed	43	13.9
Student	112	36.3
Employed	153	49.6
Income		
Below average income	92	29.8
Average income	96	31.1
Above average	120	38.9

Table 2. Descriptive statistics and Cronbach's alpha (n=308)

Factors	M	σ	α
Attitude	2.66	0.77	0.77
Injunctive Norm	2.99	0.97	0.76
Descriptive Norm	3.22	0.83	0.73
Self-efficacy	3.76	0.84	0.82
Controllability	3.58	0.90	0.71
Behavioural Intentions	3.95	0.61	0.75
Pro-environmental Behaviour	4.87	0.90	0.78

Table 3. Regression coefficients attitude, injunctive norm, descriptive norm, self-efficacy, controllability, and behavioural intentions as a function of the pro-environmental behavior

Model	Unstandardised Coefficients		Standardised Coefficients		Significance
	B	Std. Error	Beta	t	
(Constant)	0.84	0.38		2.2.42	0.026
Behavioural Intentions	0.61	0.09	0.414	6.788	0.000
Attitude	0.12	0.06	0.098	1.794	0.074
Descriptive Norm	0.15	0.07	0.137	2.132	0.034
Injunctive Norm	0.16	0.06	0.175	2.788	0.006
Self-Efficacy	0.05	0.07	0.043	0.684	0.495
Controllability	0.05	0.06	0.047	0.799	0.425
R ² = 0.356					

Table 4. Correlation among attitude, norms (injunctive and descriptive), perceived control (self-efficacy and controllability) and pro-environmental behaviour

Variable	1	2	3	4	5	6
Pro-environmental Behaviour						
Behavioural Intention	0.487**					
Attitude	0.027*	-3.33**				
Descriptive Norm	0.386**	0.20**	0.28**			
Injunctive Norm	0.385**	0.17**	0.27**	0.655**		
Self-efficacy	0.372**	0.57**	-0.24**	0.317**	0.278**	
Controllability	0.335**	0.51**	-0.17**	0.23**	0.233**	0.552**

**p < 0.01 (2-tailed); *p > 0.05

In contrast, individual pro-environmental behaviour is significantly influenced by both injunctive and descriptive norms. This phenomena may be attributed to the nature of Indian society to be collectivistic, where normative influence holds considerable weight over an individual's choice. The choices of influential individuals and significant others are highly regarded, and if these individuals were to engage in pro-environmental actions, it could lead to a spillover effect within social networks. Additionally, self-efficacy and controllability did not show statistical significance. Given the COVID-19 pandemic caused loss of thousands of lives each day in the months of mid 2021 in India, triggering widespread feelings of helplessness and hopelessness across the country. Such that, perceptions of control went under compromise. It is important to consider that in such extreme events, individuals may experience a diminished sense of self-efficacy. Thus, as noted in the current study, the relationship between self-efficacy, controllability, and pro-environmental behaviour may be intricate. Notedly, there was no impact of an individual's pro-environmental behaviour due to socio-demographic characteristics.

The findings from the current study highlight the importance of intentions, norms, attitude, and controllability as antecedents to individual pro-environmental action. Given the limited research on behavioural aspects of pro-environmental action in India, findings from the current study may provide evidence-based recommendations for policymakers to encourage sustainable lifestyle at both individual as well as societal levels. As the population in India continues to grow rapidly, further exploration of factors identified in the study may aid the development of targeted and context-specific interventions. While the present study has provided valuable insights into individual pro-environmental

actions in India, more research is needed to advance these findings. For instance, convenience sampling methods may introduce bias by favouring individuals with internet and social accessibility, potentially limiting the generalizability of the study. Furthermore, due to the usage of previously developed constructs, the focus of the study was limited to low-impact pro-environmental behaviour. Future research should target specifically to explore high-impact behaviours [9,10]. Exploring diverse groups, and investigating localized and regional samples could offer significant understanding, particularly in the context of India's widening urban-rural divide. However, results from the current study offer a representation of the existing evidence on the individual pro-environmental actions [45-47].

5. CONCLUSION

Limited attention has been given to antecedents of pro-environmental action in India. Investigating the behavioural intentions, attitude, subjective norms, and factors of controllability, involving a sample of 308 individuals, the present study indicates a significant impact of behavioural intentions, injunctive and descriptive norms on pro-environmental behaviour. In contrast, self-efficacy and controllability showed no statistical significance, while attitude showed a close-to-significant effect on individual pro-environmental behaviour. Taken together, 35.6% of the variance in pro-environmental behaviours can be explained by these factors. The current study provides an overview of individual pro-environmental actions in India and contributes insights into one of the most pressing issues, i.e., human-induced environmental degradation. The overview from the study can serve as a baseline for researchers seeking to advance the knowledge of individual pro-environmental action in India.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

REFERENCES

1. Anderegg WR, Prall JW, Harold J, Schneider SH. Expert credibility in climate change. *Proceedings of the National Academy of Sciences*. 2010;107(27):12107-12109.
2. Cook J, Oreskes N, Doran PT, Anderegg WR, Verheggen B, Maibach EW, Rice K. Consensus on consensus: a synthesis of consensus estimates on human-caused global warming. *Environmental Research Letters*. 2016;11(4):048002.
3. De Pryck K. Intergovernmental expert consensus in the making: The case of the summary for policy makers of the IPCC 2014 Synthesis Report. *Global Environmental Politics*. 2021;21(1): 108-129.
4. Yue XL, Gao QX. Contributions of natural systems and human activity to greenhouse gas emissions. *Adv Clim Change Res*. 2018;9:243–252.
5. Patel Shivam. Over 50 killed in Indian Himalayas as rain triggers landslides. *Reuters*; 2023.
6. Nandi Jayashree. East India faced life-threatening heat stress in June, say experts. *Hindustan Times*; 2023.
7. World Weather Attribution. Extreme humid heat in South Asia in April 2023, largely driven by climate change, detrimental to vulnerable and disadvantaged communities; 2023.
8. Klitkou A, Bolwig S, Huber A, Ingeborgrud L, Pluciński P, Rohrer H, Žuk P. The interconnected dynamics of social practices and their implications for transformative change: A review. *Sustainable production and consumption*. 2022;31:603-614.
9. Nielsen KS, Cologna V, Lange F, Brick C, Stern PC. The case for impact focused environmental psychology. *Journal of Environmental Psychology*. 2021;74.
10. Nielsen KS, Clayton S, Stern PC, Dietz T, Capstick S, Whitmarsh L. How psychology can help limit climate change. *American Psychologist*. 2021;76(1):130.
11. IPCC. Climate change 2021: The physical science basis. Contribution of working group I to the sixth assessment report of the intergovernmental panel on climate change. Masson-Delmotte VP, Zhai A, Pirani SL, Connors C, Péan S, Berger N, Caud Y; 2021.
12. Clayton S, Myers G. *Conservation psychology: Understanding and promoting human care for nature*. John Wiley & Sons; 2015.
13. De Leeuw A, Valois P, Ajzen I, Schmidt P. Using the theory of planned behavior to identify key beliefs underlying pro-environmental behavior in high-school students: Implications for educational interventions. *Journal of environmental psychology*. 2015;42:128-138.
14. Bohner G, Dickel N. Attitudes and attitude change. *Annual Review of Psychology*. 2011;62: 391-417.
15. Wallace DS, Paulson RM, Lord CG, Bond Jr CF. Which behaviors do attitudes predict? Meta-analyzing the effects of social pressure and perceived difficulty. *Review of General Psychology*. 2005;9(3):214-227.
16. Barr S, Ford NJ, Gilg AW. Attitudes towards recycling household waste in Exeter, Devon: quantitative and qualitative approaches. *Local Environment*. 2003;8(4):407-421.
17. Bamberg S. How does environmental concern influence specific environmentally related behaviors? A new answer to an old question. *Journal of environmental psychology*. 2003;23(1):21-32.
18. Kothe EJ, Ling M, North M, Klas A, Mullan BA, Novoradovskaya L. Protection motivation theory and pro-environmental behaviour: A systematic mapping review. *Australian Journal of Psychology*. 2019;71(4):411-432.
19. Bamberg S, Möser G. Twenty years after Hines, Hungerford, and Tomera: A new meta-analysis of psycho-social determinants of pro-environmental behaviour. *Journal of Environmental Psychology*. 2007;27(1):14-25.
20. Klöckner CA. A comprehensive model of the psychology of environmental behaviour-A meta-analysis. *Global Environmental Change*. 2013;23(5):1028-1038.
21. Reno RR, Cialdini RB, Kallgren CA. The transsituational influence of social norms. *Journal of personality and social psychology*. 1993;64(1):104.

22. Cialdini RB, Demaine LJ, Sagarin BJ, Barrett DW, Rhoads K, Winter PL. Managing social norms for persuasive impact. *Social Influence*. 2006;1(1): 3-15.
23. Schultz PW, Nolan JM, Cialdini RB, Goldstein NJ, Griskevicius V. The constructive, destructive, and reconstructive power of social norms. *Psychological Science*. 2007;18(5):429-434.
24. Lian JW, Yen DC. Online shopping drivers and barriers for older adults: Age and gender differences. *Computers in Human Behaviour*. 2014;37:133-143.
25. Fishbein M, Ajzen I. Belief, attitude, intention and behavior: An introduction to theory and research. 1975;181-202.
26. Ajzen I. From intentions to actions: A theory of planned behavior. In *Action-control* Springer, Berlin, Heidelberg. 1985;11-39.
27. Ajzen I. The theory of planned behavior. *Organizational behavior and human decision processes*. 1991;50(2): 179-211.
28. Maddux JE, Rogers RW. Protection motivation and self-efficacy: A revised theory of fear appeals and attitude change. *Journal of experimental social psychology*. 1983;19(5):469-479.
29. Zailani S, Iranmanesh M, Masron TA, Chan TH. Is the intention to use public transport for different travel purposes determined by different factors?. *Transportation research part D: transport and environment*. 2016;49:18-24.
30. Tuu HH, Olsen SO, Thao DT, Anh NTK. The role of norms in explaining attitudes, intention and consumption of a common food (fish) in Vietnam. *Appetite*. 2008;51(3):546-551.
31. Milner HR, Landsman J, Lewis C. But good intentions are not enough. White teachers/diverse classrooms: Creating inclusive schools, building on students' diversity, and providing true educational equity. 2011;2:56-74.
32. Ajzen I. Perceived behavioral control, self-efficacy, locus of control, and the theory of planned behavior 1. *Journal of applied social psychology*. 2002;32(4):665-683.
33. Nugent LE, Carson M, Zammitt NN, Smith GD, Wallston KA. Health value & perceived control over health: behavioural constructs to support Type 2 diabetes self-management in clinical practice. *Journal of clinical nursing*. 2015; 24(15-16):2201-2210.
34. Mullan B, Henderson J, Kothe E, Allom V, Orbell S, Hamilton K. The role of habit and perceived control on health behavior among pregnant women. *American Journal of Health Behavior*. 2016;40(3):291-301.
35. Kumar A. Exploring young adults' e-waste recycling behaviour using an extended theory of planned behaviour model: A cross-cultural study. *Resources, Conservation and Recycling*. 2019;141: 378-389.
36. Ajzen I. *The theory of planned behaviour: Reactions and reflections*; 2011.
37. Ajzen I. Consumer attitudes and behavior: the theory of planned behavior applied to food consumption decisions. *Italian Review of Agricultural Economics*. 2015;70 (2):121138.
38. Stoet G. PsyToolkit: A novel web-based method for running online questionnaires and reaction-time experiments. *Teaching of Psychology*. 2017;44(1):24-31.
39. Huang H. Media use, environmental beliefs, self-efficacy, and pro-environmental behavior. *Journal of Business Research*. 2016;69(6):2206–2212.
40. Kim S, Jeong SH, Hwang Y. Predictors of pro-environmental behaviors of American and Korean students: The application of the theory of reasoned action and protection motivation theory. *Science Communication*. 2013;35(2):168-188.
41. Christensen R, Knezek G. The Climate Change Attitude Survey: Measuring Middle School Student Beliefs and Intentions to Enact Positive Environmental Change. *International journal of environmental and science education*. 2015;10:773-788.
42. Han R, Cheng Y. The Influence of Norm Perception on Pro-Environmental Behavior: A Comparison between the Moderating Roles of Traditional Media and Social Media. *International Journal of Environmental Research and Public Health*. 2020;17(19):7164.
43. Abraham J, Pane M, Chairiyani R. An investigation on cynicism and environmental self-efficacy as predictors of pro-environmental behavior. *Psychology*. 2015;6:234-242.
44. Chen MF. Extending the theory of planned behavior model to explain people's energy savings and carbon reduction behavioral intentions to mitigate climate change in

- Taiwan–moral obligation matters. Journal of Cleaner Production. 2016;112: 1746-1753.
45. Picodi report; 2020. Available:<https://infogram.com/1pg20z6qx7dkm5f93zjvk2dvwviw7re1zy3>
46. Hopper JR, Nielsen JM. Recycling as altruistic behavior: Normative and behavioral strategies to expand participation in a community recycling program. Environment and Behavior. 1991; 23(2):195-220.
47. Khan A. Prospective Memory performance and emotional regulation during wintering at Bharat Station in Antarctica. Polar Science. 2022;34:100877. DOI:<https://doi.org/10.1016/j.polar.2022.100877>

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