

# An analysis of the factors influencing pro-environmental behavioural intentions on climate change in the university community

Israel-Javier Juma-Michilena, María Eugenia Ruiz-Molina, Irene Gil-Saura & Sergio Belda-Miquel

To cite this article: Israel-Javier Juma-Michilena, María Eugenia Ruiz-Molina, Irene Gil-Saura & Sergio Belda-Miquel (2023) An analysis of the factors influencing pro-environmental behavioural intentions on climate change in the university community, Economic Research-Ekonomiska Istraživanja, 36:3, 2264373, DOI: [10.1080/1331677X.2023.2264373](https://doi.org/10.1080/1331677X.2023.2264373)

To link to this article: <https://doi.org/10.1080/1331677X.2023.2264373>



© 2023 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.



Published online: 09 Oct 2023.



Submit your article to this journal [↗](#)



Article views: 783



View related articles [↗](#)



View Crossmark data [↗](#)

# An analysis of the factors influencing pro-environmental behavioural intentions on climate change in the university community

Israel-Javier Juma-Michilena<sup>a</sup>, María Eugenia Ruiz-Molina<sup>a</sup>, Irene Gil-Saura<sup>a</sup> and Sergio Belda-Miquel<sup>b</sup>

<sup>a</sup>Polibienestar, University of Valencia, Valencia, Spain; <sup>b</sup>Social Work and Social Services Department, University of Valencia, Valencia, Spain

## ABSTRACT

Universities play an essential role in promoting economic prosperity, social welfare and environmental protection through education and research. However, discrepancies have been pointed out between what consumers express about their environmental concerns and their environmental behaviour is, thus posing a challenge for the effective adaptation and mitigation of climate change. The purpose of this study is to analyse the sequence 'beliefs-attitudes-behaviours' applying the Theory of Planned Behaviour to the context of the university community. To achieve this objective, the hypothesised relations are tested using Partial Least Squares structural equation modeling in a sample of 1991 responses from students and staff at nine Latin American universities. Results show that beliefs and attitudes positively influence intrinsic motivation towards participation in actions related to climate change, and this, together with attitude, influences the pro-environmental behaviour of the university community. Neither extrinsic motivations or individual pro-environmental behaviour do not influence conduct as a member of the community. Affiliation (student vs. employee) moderates some of these relationships. A series of implications for university administrators (e.g., actions oriented towards raising awareness, identification of suitable incentives) are inferred to promote the participation of the community members in pro-environmental actions.

## ARTICLE HISTORY

Received 7 July 2022  
Accepted 18 September 2023

## KEYWORDS

Pro-environmental behaviour; theory of planned behaviour (TPB); university community; beliefs; attitudes; motivations

## SUBJECT

**CLASSIFICATION CODES**  
M14; M21; M31

## 1. Introduction

The United Nations' Brundtland Report defined sustainable development as 'development that meets the needs of the present without compromising the ability of future generations to meet their own needs' (Brundtland et al., 1987, p. 41). The pursuit of sustainable development for individuals, societies, and nations is important for

**CONTACT** Sergio Belda-Miquel  [Sergio.Belda@uv.es](mailto:Sergio.Belda@uv.es)

© 2023 The Author(s). Published by Informa UK Limited, trading as Taylor & Francis Group.

This is an Open Access article distributed under the terms of the Creative Commons Attribution License (<http://creativecommons.org/licenses/by/4.0/>), which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited. The terms on which this article has been published allow the posting of the Accepted Manuscript in a repository by the author(s) or with their consent.

the global community given its emphasis on pursuing a harmonious balance between societal, economic, and environmental imperatives (Ferguson et al., 2021). In particular, climate change and its environmental implications is a major issue nowadays, as the fate of the planet literally depends on how society responds to the climate catastrophe (IPCC, 2021).

In educating citizens about climate change and promoting pro-environment behaviour, higher education institutions play a vital role (Prasad & Mkumbachi, 2021). Indeed, they have long been agents of change in society, not only because they educate the majority of the world's leaders, managers, teachers and professionals specialising in their respective fields, but also because they play an important role in economic, social and environmental spheres (Flórez-Parra et al., 2021; Osmond et al., 2013). For some years now, universities have been launching various initiatives focused on playing a leading role in education for sustainable development and responding to present global challenges, i.e., formal, informal, and non-formal learning and teaching approaches, including nature-immersive field projects (Leal Filho et al., 2021). Through these various formats, education should be centred on training responsible individuals who participate in a sustainable society and who help provide solutions to the current environmental problems (Sousa et al., 2021).

Previous studies have focused on university students as a key group for research since 'they will be the consumers and the intellectual vanguard of the future and, therefore, a reference group for other consumers' (Izagirre-Olaizola et al., 2015, p. 25). Notwithstanding, it has been observed that even though university students have extensive knowledge of environmental issues, they make little commitment to developing pro-environmental behaviours (Mkumbachi et al., 2020). Wide research has been conducted on the sequence 'beliefs-attitudes-behaviours' based on the Theory of Planned Behaviour (TPB) proposed by Ajzen (1991). However, behaviour is also guided (or constrained) by intuitive, automatic decisions, routines and similar habitual behaviours (Walawalkar et al., 2023). Several studies have called the TPB into question when it relates to sustainability issues, as it is thought that attitudes are not an adequate indicator for describing behaviour when it comes to environmental issues. Moraes et al. (2012) state that although consumers may have ethical concerns, their conduct and actions may contradict the approach required to respond to these concerns. This discrepancy between what consumers express about their environmental concerns and their environmental behaviour is what has been called the 'green gap phenomenon' and poses a challenge from a marketing perspective. That said, the antecedents of the lack of involvement of the members of the university community when it comes to environmental issues have not been clearly identified, and in this sense, we understand that shedding light on this issue is highly important in view of the role of members of the university community as agents of society who can contribute to getting more people involved in actions fighting against climate change, not only in the university environment, but also in the business, family and social spheres.

Therefore, the research conducted proposes an innovative model partially based on the Theory of Planned Behaviour (TPB) proposed by Ajzen (1991), to fill the gap of previous studies which, to our knowledge, have not considered the sequence beliefs-

attitudes-motivations-behaviours as antecedents for predicting the pro-environmental behaviour of members of the university community. In this sense, this research aims to contribute to the literature through the identification of factors that explain that favourable attitudes towards caring for the environment and the fight against climate change do not always involve a consistent pro-environmental behaviour. Additionally, the moderating role that the type of the link to the university (student or employee) can have on the relationships between these variables is analysed.

After this introduction, the present work will be divided into four main parts. First, we define the theoretical framework of the present research. Second, we propose a model to be tested and we develop and support the research hypotheses. Third, we establish the methodology used in the empirical research and evaluate the results. Finally, we report the most relevant conclusions that can be drawn from this study and the possible managerial implications, as well as potential future lines of research.

## 2. Theoretical background

Climate change is one of the greatest threats facing humanity due to the repercussions it can have. Human beings live, produce and consume in a world of finite and vulnerable natural resources in which the global ecosystem has changed radically in recent years (IPCC, 2021). Some of the main consequences of climate change include droughts and floods, rising sea levels, heatwaves, increased health problems and a decline in flora and fauna, among others. To respond to these challenges, previous literature states that governmentality mechanisms in cities create two new identities: the ‘good citizen’, who aims at reducing his impact on climate change, and the ‘model city’, a laboratory that may orientate further actions to adapt and mitigate climate change at the city level (Berquier & Gibassier, 2019). Nowadays, universities have considered sustainability strategy as a part of their responsibility and even though higher education plays a crucial role in sustainable development, its contribution to sustainable society and economic growth has been underestimated (Lam-Huu-Phuoc et al., 2022). In an analogous fashion, it has been argued that the only way to curb the damage caused by climate change is through continuous awareness-raising of the issue and in behavioural changes throughout the university community (Van den Berg & Cando-Noordhuizen, 2017).

The Theory of Planned Behaviour (hereinafter referred to as TPB), developed by Ajzen (1991), provides a model for understanding an individual’s behaviour and commitment. This theory studies individual behaviour from the perspective of psychology, and a central factor in the theory is the intention of an individual to perform a given behaviour (Ma et al., 2022). In this context, TPB places the origin of behaviour in an individual’s beliefs, the latter being formed through a sequence of constructs (beliefs, attitude, intention, behaviour). This theory maintains that an individual’s attitudes are beliefs that direct behaviour. Therefore, it centres on the idea that human beings, prior to acting, make systematic use of the information they possess about the implications of carrying out a behaviour, i.e., it focuses on the rationality of behaviour. In this sense, it is assumed that most behaviour is under the individual’s control and, consequently, that the fundamental factor for predicting behaviour is a wilful intention or motivation

to act (Ajzen, 1991). TPB provides a useful framework for understanding how attitudes may influence both planned and realised behaviour (Bansal & Taylor, 1999). According to the TPB, a 'behavioural intention' indicates how willing an individual is to engage in a particular behaviour, such that it likewise constitutes the most accurate factor of that individual's actual behaviour (Lin et al., 2021).

In the literature, it has been claimed that the TPB makes it possible to identify the drivers of an individual's pro-environmental behaviour. In fact, a number of studies focusing on environmental protection have applied this theoretical framework in both domestic and institutional contexts (e.g., Ferdous, 2010; Rex et al., 2015; Si et al., 2020; Tommasetti et al., 2018; Yazdanpanah & Forouzani, 2015; Yuriev et al., 2020). For this reason, we believe that the TPB can help us to understand the attitudes and intentions of the university community regarding actions relating to the fight against climate change.

Beliefs are judgements or evaluations that people make on the basis of prior knowledge; they are acquired through learning and represent descriptive thinking about something in particular (Fishbein & Ajzen, 1975). Basically, beliefs derive from knowledge that emerges from the interaction of individuals with society through their cognitive processes (Durr et al., 2017). Attitudes are a set of beliefs that form an enduring predisposition on how to think, feel, perceive and behave towards an object or event (Mainieri et al., 1997). In the context of attitudes towards the environment, Ugulu et al. (2013) argue that it is important to study and influence attitudes, especially in students, as individuals with negative attitudes towards the environment underestimate environmental problems and do not adopt pro-environmental behaviours. Attitude towards behaviour refers to the extent to which an individual has a favourable or unfavourable evaluation of a certain behaviour, thus, it seeks to understand why individuals are attracted to certain behaviours, and empirical research suggests that TPB can effectively predict individuals' intentions (Chang et al., 2022). In the context of our research, we understand that beliefs may play a fundamental role in predicting the behaviour of the university community because if individuals have an ideological judgement about the causes and actions that affect climate change, this might strongly influence the way they behave.

Motivation can be described as a driving force that arises from hidden sources within each human being, and it is closely related to emotions because it reflects the extent to which a person is prepared to act physically and mentally in a focused way (Guay et al., 2000). Motivation is the reason upon which one acts, being an important antecedent to behaviour (Graafland & de Bakker, 2021). In particular, we motivation as a driver that may be private (intrinsic motivations) or social (extrinsic motivations).

On one hand, intrinsic motivations refer to internal motivations that are not associated with external rewards or pressures (Wasiuzzaman et al., 2021), this motivation stems from personal interests, enjoyment and the challenges of performing a task (Ma et al., 2023). Therefore, a motivation is considered to be intrinsic if it includes internal elements capable of satisfying basic psychological needs (Ryan & Deci, 2000).

On the other hand, extrinsic motivations are those that come from the external environment and function as an impetus to do something, with the reward being the

outcome of this motivation (Guay et al., 2000). In this sense, a behaviour practiced because it leads to desired outcomes, including verbal praise or monetary rewards (Yang & Thøgersen, 2022). In other words, they require some kind of external incentive such as social or economic recognition in order for them to be carried out. Intrinsic motivation can therefore be defined as the willingness to make an effort and the enjoyment of the work itself, while extrinsic motivation is the willingness to make an effort to obtain results external to the work itself (Grant, 2008).

In this vein, Hamby and Laer (2022) argue that decades of research in psychology and consumer behaviour show that, in general, people who act for intrinsic reasons (i.e., performing an activity for its own sake) experience higher levels of well-being than people who act for extrinsic reasons (i.e., to earn a reward or avoid punishment). More precisely, behaviour elicited by one's own will leads to the complete engagement of the behaviour, whereas a behaviour encouraged by internal or external pressure causes a tepid engagement of the behaviour (Hur et al., 2022). Human behaviour plays a key role in the rise and severity of environmental problems, and drastic changes in human behaviour are needed to mitigate climate change (Jans, 2021).

Pro-environmental behaviour is a way of acting towards the environment that does not harm it but is beneficial to it (Steg & Vlek, 2009). Environmentally friendly behaviours improve the quality of the environment to some degree (Venhoeven et al., 2016). In recent years, even though university students claim to have a high level of environmental knowledge and a positive attitude towards environmental protection, they still demonstrate behaviours that run counter to environmental sustainability, such as a preference for cars over public transport (Sousa et al., 2021). Indeed, previous studies have pointed out the existence of discrepancies in the 'beliefs-attitudes-behaviours' chain so that attitudes towards the environment do not always drive to environmental-friendly behaviour (Moraes et al., 2012) and the literature calls for research to shed light in this 'green gap phenomenon' (El Haffar et al., 2020).

Numerous studies have analysed the types of actions and behaviours that can be considered pro-environmental conduct (Kollmuss & Agyeman, 2002; Wang et al., 2021). However, being such a broad field, we will define it in essence as responsible environmental behaviour. On the other hand, in the context of this research we refer to individual pro-environmental behaviour, which to some extent builds on the same concept, but focuses on what the member of the university community (student or employee) does from the perspective of personal or consumer behaviour. Pro-environmental behaviour, in essence, is a type of behaviour developed by individuals to protect the environment, many authors see it as a behaviour that organisations expect their members to adopt in order to sustain their lives (Donmez-Turan & Kiliclar, 2021).

In relation to the latter, we consider that the pro-environmental behaviour of not only the individual, but also of the community to which the community member belongs, should be analysed. Therefore, we introduce the variable of the pro-environmental response of the university community, in relation to the effort that, in the individual's opinion, the university community (of which the individual is a member) is making or should make to fight against climate change.

### 3. Hypotheses and proposed model

Within the framework of our research, we propose a model that, based on the TPB, attempts to integrate the model proposed by Taberner and Hernández (2012) regarding responsible environmental behaviour. Accordingly, we have developed a revised model in order to understand the way the university community acts in the fight against climate change, considering the sequence beliefs-attitude-behaviour, with the intrinsic and extrinsic motivations of the individual as an additional explanatory factor of behavioural intentions. Specifically, we analyse behaviour from an individual perspective, at the level of the individual as a consumer, and in terms of how the university community, of which the individual is a member, should respond to combat this global emergency.

However, environmental attitudes have been defined as ‘concern for the environment or caring about environmental issues’ (Gifford & Sussman, 2012, p. 65–66). According to the TPB, beliefs about the advantages and disadvantages of engaging in a certain behaviour influence attitudes towards the behaviour and, indirectly, behavioural intentions (Yuriev et al., 2020). On the basis of the fact that beliefs precede attitude, several hypotheses originate that are understood as behavioural indicators. It can thus be stated that beliefs not only generate an attitude, but also a motivation, which may be intrinsic or extrinsic and which subsequently determines the way an individual behaves. Motivation is one of the most important explanatory keys to human behaviour with respect to why we behave the way we do (Deci & Ryan, 1985). Therefore, we present the following hypotheses:

H1: Beliefs about climate change influence attitudes towards it.

H2: Beliefs about climate change influence intrinsic motivation towards actions proposed by the university to address this problem.

H3: Beliefs about climate change influence extrinsic motivation towards actions proposed by the university to address this problem.

Additionally, in this paper we also propose the incorporation of intrinsic and extrinsic motivation variables subsequent to the adoption of an attitude as relevant factors in defining behaviour. Taylor and Todd (1995) indicate that attitudes play a major role in behaviour when other factors prevent this behaviour from being carried out, especially in consumption behaviour and environmental participation.

According to some earlier studies, attitude is a factor that directly influences motivation (Tian et al., 2020). However, several studies look at the relationship the other way around (motivation as a determinant of attitude). For example, Giefer et al. (2019) confirm the relationship between motivation and attitude in a study on pro-environmental behaviour. In the context of our research, we understand that even if the beliefs and attitudes the university community has about climate change can generate pro-environmental behaviour, however, it may also be that many of them do not take any action towards the environment, which is why motivation must be taken into account as a connecting link that drives behaviour. In particular, it may be inferred that, if a member of the university community has an intrinsic motivation about climate change, this might influence his or her behaviour, as human beings

tend to perform actions that generate pleasure regardless of external factors that may affect them. Alternatively, human beings are not only moved by activities that generate pleasure, but also by external issues that, although not pleasurable, help them to achieve an objective. Therefore, we assume that the university community can be involved in the fight against climate change without the need for this to represent a personal delight, due to external incentives. Thus, the following hypotheses are put forward:

H4: Attitude towards climate change influences intrinsic motivation towards actions proposed by the university to address this problem.

H5: Attitude towards climate change influences extrinsic motivation towards actions proposed by the university to address this problem.

Similarly, it has been highlighted that people who are concerned about the environment are more likely to protect it (Bamberg & Möser, 2007). While some studies support this statement (Huang & Yore, 2005; Wang et al., 2021), other research has demonstrated that pro-environmental attitudes do not always lead to environmentally sustainable behaviour (Missimer et al., 2017; Oskamp et al., 1991; Vicente-Molina et al., 2013). From this perspective, it should be noted that favourable attitudes towards environmentally sustainable products do not always lead to behaviour consistent with these attitudes (Moraes et al., 2012).

The relationship between attitude and pro-environmental behaviour is a controversial issue. Even though the TPB approach proposed by Ajzen (1991) indicates a relationship between attitude and behaviour, in the field of sustainability, favourable attitudes towards environmental protection do not always influence pro-environmental behaviour, which can also be affected by other factors (El Haffar et al., 2020).

Furthermore, it is also important to mention the role played by universities in pro-environmental behaviour. Currently, several initiatives have been launched to respond to the global challenges of today's society (Osmond et al., 2013). However, there is still little research on whether such initiatives generate a favourable attitude in the members of the university community, or whether they lead to pro-environmental behaviour. By way of example, Wee et al. (2017) claim that university students' awareness and attitudes towards sustainable development lead to a greater intention to adopt pro-environmental behaviours. They argue for the role of higher education institutions globally in forming a generation that is not only sensitive to sustainability issues but also contributes effectively to achieving the United Nations Sustainable Development Goals (UN, 2015). On the basis of these criteria, the following hypotheses arise.

H6: Attitudes towards climate change influence individual pro-environmental behaviour.

H7: Attitudes towards climate change influence the pro-environmental response of the university community.

In this vein, Tableirnero and Hernández (2012) suggest that people with high intrinsic and extrinsic motivation engage in more environmentally friendly behaviours than any other individuals in comparison. Some of the models designed to try to explain, describe and predict the performance of environmentally responsible behaviour posit that individuals only engage in such behaviour when they are informed



about environmental problems and motivated to solve them. Nevertheless, the influence of motivation emanating from altruistic and social values may be counteracted by other more immediate motivations, such as convenience and saving time and money (Kollmuss & Agyeman, 2002). Motivation has been identified as a determinant of pro-environmental behaviour in a number of consumer studies (Zoll et al., 2018). Based on these deductions, we consider the possibility that an individual may have an internal motivation to care for the environment and try to contribute individually, but if they observe in their social environment that effective actions are not implemented and their contribution does not represent a significant impact, the individual's group behaviour may change.

H8: Intrinsic motivation influences the pro-environmental response of the university community.

Moreover, the motivation to perform an action may depend on the expectation of obtaining direct or indirect results from that action, and external incentives can generate pro-environmental behaviour (Shafiei & Maleksaeidi, 2020). One of the main determinants of an individual's behaviour is the influence of those around them, i.e., their peer group (Burnkrant & Cousineau, 1975). Therefore, the individual may act differently in personal and group settings. Festinger and Carlsmith (1959) proposed the theory of cognitive dissonance, which deals with an individual's behaviour in a group setting, arguing that when a person is faced with another person who thinks differently, he keeps up the appearance that his or her arguments are correct, even though internally he may think that they are not. Additionally, it has been noted that perceived social pressure can influence an individual's pro-environmental behaviours (Qi & Ploeger, 2019). In this way, individual and group decisions or behaviours may vary. Based on this reasoning, the following hypothesis arises.

H9: Extrinsic motivation influences the pro-environmental response of the university community.

Furthermore, our proposal seeks to interlink behavioural determinants with the response that the university should provide in the form of actions that help to combat climate change. This assertion is supported by theories that support the congruence between behaviour at the individual level and as part of a collective and community (Zoll et al., 2018). However, other theoretical approaches claim there is a discrepancy between a person's behaviour in individual and group contexts. One such example is attribution theory, which argues that people show two main causes for their behaviour: an internal one, centred on the person; and an external one, centred on social conditions (Bascoul et al., 2015). When individuals attribute their decisions to others, or to the social context, their personal decisions are quite limited. Therefore, at a global level, people end up not perceiving themselves as the cause of environmental damage, so they believe that their decisions are not part of the solution (Teng et al., 2015).

Another theory that may help explain the relationship between individual pro-environmental behaviour and the pro-environmental response of the university community is the value-belief-norm (VBN) theory proposed by Stern (2000). According to this theory, actions that reduce environmental impacts are determined by awareness of the

consequences of those actions (Gifford & Nilsson, 2014). Therefore, without a value being placed on environmental care in a group context, awareness cannot be generated, and it becomes difficult for the individual to make pro-environmental choices from their perspective as individual consumers. Drawing on these findings, the following hypothesis arises:

H10: Individual pro-environmental behaviour influences the pro-environmental response of the university community.

Finally, it is expected that the type of affiliation to the university community, i.e., student or employee, will play a moderating role in the relationships discussed. Firstly, the employee's link to the university extends over a longer period of time than that of the student. In fact, many employees, whether teaching and/or research staff or administrative service workers, have long-term relationships with the university institution as public servants or through open-ended contracts, while for students the relationship is often limited to the period of their undergraduate or postgraduate studies. This may explain why, in previous studies, employees of the university institution displayed higher levels of pro-environmental behaviours on campus in comparison with students (Durr et al., 2017).

Furthermore, employees and students belong to different generational cohorts, although there is no consensus in the literature on the existence of any differences in pro-environmental beliefs, attitudes and behaviours according to age. Some previous studies have found different patterns of pro-environmental behaviour according to generations, with Millennials being the most sensitive to environmental issues (Smith & Brower, 2012), whereas others argue that Generation Xers are more involved in environmental issues (Cline et al., 2020). In contrast, there are studies that have concluded that there are no differences between younger and older adults when it comes to environmental concerns and the willingness to act to mitigate the risk of climate change (Gray, Raimi et al., 2019). Nonetheless, we formulate the final hypothesis as follows:

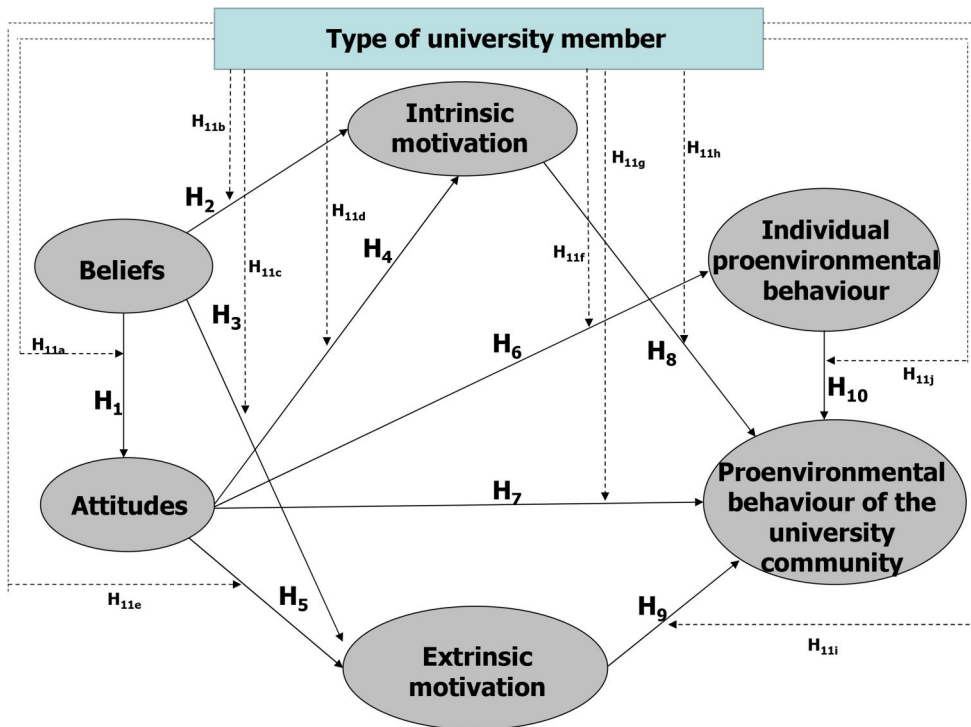
H11: University attachment plays a moderating role in the relationships between the different constructs, being stronger for employees of the educational institution than for university students.

In light of the above and based on a review of the literature, a theoretical model is proposed that includes the variables that may determine pro-environmental behaviour and help in the fight against climate change, and which is based on the hypothesised relationships between them on the part of the university community. This model is represented visually in [Figure 1](#).

## **4. Methodology and sample characteristics**

### **4.1. Measurement of variables**

In order to achieve the proposed objective, a quantitative investigation was carried out, opting for the creation of a structured ad hoc questionnaire for data collection. To contrast our model at the theoretical level, the selection of constructs was primarily based on two theoretical frameworks presented in the literature. On the



**Figure 1.** Proposed model.

Source: Authors' proposal.

one hand, the variables of beliefs, attitudes and behaviours were adopted from the TPB proposed by Ajzen (1991), while the variables of intrinsic and extrinsic motivations and pro-environmental behaviour were included by following the model proposed by Tableirnero and Hernández (2012). In addition, based on theories of psychology concerned with an individual's sense of internal consistency, we introduced a variable on the response the university should make in the fight against climate change. We combine these approaches to explain the factors that influence members of the university community in making the decision to participate in actions related to the fight against climate change and adopting pro-environmental behaviours.

Having selected the constructs relevant to the study, we proceed to the selection of the items for the construction of the scales for measuring the constructs. These items are adapted from two approaches in the literature: first, Maibach et al. (2011) for the variables Beliefs, Attitude, Individual Pro-environmental Behaviour and the Pro-environmental Response of the university community; and second, Guay et al. (2000) for the variables of Intrinsic Motivations and Extrinsic Motivations. Due to the content of the items and the low correlations between the items corresponding to each scale, the constructs Beliefs about climate change and Pro-environmental response of the university community are considered formative; while Attitudes, Intrinsic Motivations, Extrinsic Motivations and Individual Pro-environmental Behaviour are considered to be reflective constructs.

**Table 1.** Research details.

Geographic scope	<ul style="list-style-type: none"> <li>• Corporación Universitaria Minuto de Dios (UNIMINUTO), Bogotá (Colombia)</li> <li>• Instituto Tecnológico de Monterrey (TEC), Monterrey (Mexico)</li> <li>• Pontifícia Universidade Católica do Rio Grande do Sul (PUCRS), Porto Alegre (Brazil)</li> <li>• Universidad de Caldas (UCALDAS), Manizales (Colombia)</li> <li>• Universidad de Guadalajara (UDG), Guadalajara (Mexico)</li> <li>• Universidad de Manizales (UMANIZALES), Manizales (Colombia)</li> <li>• Universidad del Quindío (UNIQUEINDIO), Armenia (Colombia)</li> <li>• Universidad Tecnológica de Pereira (UTP), Pereira (Colombia)</li> <li>• - Universidade Católica de Pernambuco (UNICAP), Recife (Brazil)</li> </ul>
Universe	Members of the university community (staff and students) in Latin American universities
Sampling procedure	Non-probabilistic sampling procedure ("snowball")
Data collection method	Online self-administered questionnaire
Sample size	1991 valid questionnaires (546 staff members y 1445 students)
Data collection period	January–March 2021
Statistical analysis	Principal Component Analysis Estimation of Structural Equation Model through Partial Least Squares (PLS-SEM)
Software	IBM SPSS version 25 SmartPLS 3.0

Source: Authors' proposal.

#### 4.2. Samples and data collection

The information was gathered from members of the university community (staff and students) of nine Latin American universities (five Colombian universities, two Mexican universities and two Brazilian universities) participating in an international project focused on developing actions in the field of climate change adaptation and mitigation. In order to obtain the necessary information, non-probabilistic 'snowball' sampling was used: the teachers directly involved in the project were responsible for disseminating the questionnaire amongst their own students, students from other teaching groups, and personal contacts from their respective institutions, obtaining a final sample of 1991 valid questionnaires between January and March 2021 (both inclusive). Table 1 presents the main characteristics of the research.

Moreover, Table 2 presents the distribution of the sample according to the classification variables.

#### 4.3. Data analysis

In the first step, an Exploratory Factor Analysis was carried out through Principal Component Analysis for the items of the reflective constructs in order to check how the items were grouped into factors. Subsequently, the measurement instrument was validated and the structural model was estimated, following the steps proposed by Anderson and Gerbing (1988). Both analyses were performed using the partial least squares regression technique (PLS-SEM).

With regard to the validation of the measurement instrument, it was found that the reflective constructs met the psychometric properties of reliability and convergent and discriminant validity; while for the formative constructs, collinearity and weight-load relationship analyses were carried out. Once it had been verified that the constructs of the study were adequate, the structural equation model was estimated using the partial least squares technique. This type of regression has been widely used in recent years by researchers in the field of marketing (Henseler et al., 2015). PLS-SEM

**Table 2.** Sample descriptive statistics.

	UNIMINUTO	TEC	PUCRS	UCALDAS	UDG	UMANIZALES	UQUINDIO	UTP	UNICAP	TOTAL	%
TOTAL	447	143	60	205	288	87	66	283	412	1991	100%
Gender											
Male	97	61	31	97	140	33	39	127	162	787	39.53%
Female	349	79	28	108	140	53	26	155	248	1186	59.57%
NA	1	3	0	0	8	1	1	1	2	17	0.85%
Age											
18–21	95	47	16	50	90	11	27	116	148	600	30.14%
22–25	96	48	15	55	49	10	15	70	102	460	23.10%
26–35	168	12	13	39	61	30	6	37	38	404	20.29%
36–45	64	18	9	20	40	21	6	22	34	234	11.75%
46–60	21	14	5	35	39	14	9	28	65	230	11.55%
>60	3	4	2	6	9	1	3	10	25	63	3.16%
Affiliation											
Student	398	100	49	132	160	57	48	211	290	1445	72.58%
Lecturer	27	40	10	71	125	16	12	62	98	461	23.15%
Administr.staff	16	1	0	0	1	1	3	5	1	28	1.41%
Others	6	2	1	2	2	13	3	5	23	57	2.86%

Source: Authors' proposal.

analysis is a non-parametric statistical procedure that does not require normalisation in the distribution of the data (Hair et al., 2014). Furthermore, using the non-parametric bootstrap procedure, the significance of the loadings and paths obtained from the regression estimation can be tested (Efron & Tibshirani, 1986). Finally, the explanatory and predictive power of the model was analysed.

## 5. Results

In order to carry out the analysis of the results, an exploratory analysis was first performed through Principal Component Analysis with VARIMAX rotation for the items of the scales measuring the reflective constructs and to check the factor structure, taking into consideration the highest loadings of each factor and simplifying the interpretation of the factors (Thompson et al., 2005). As a result of this analysis, having purged items with factor loadings of less than 0.6 in absolute value, four factors were obtained which were identified as the constructs: Attitude towards climate change, Intrinsic motivation and Extrinsic motivation to participate in activities oriented towards the fight against climate change proposed by the university, and Individual pro-environmental behaviour, being reflective constructs. This is followed by the validation of the measurement instrument and the estimation of the structural equation model.

### 5.1. Validation of the measurement instrument

As a result of the confirmatory factor analysis, the values shown in Table 3 were obtained. Regarding the Cronbach's Alpha and composite reliability coefficients to assess the reliability of the reflective variables, the literature indicates that values above 0.7 are acceptable (Nunnally, 1994) and those above 0.8 are ideal (Carmines & Zeller, 1979). In our case, all our reflective constructs (attitudes, intrinsic motivation, extrinsic motivation, and individual pro-environmental behaviour) obtained values for Cronbach's Alpha and composite reliability coefficients between 0.766 and 0.913,

respectively. We can therefore confirm the adequate reliability of the scales used to measure the reflective constructs.

In relation to the analysis of average variance extracted (AVE), the value of this indicator must be greater than 0.5 (Fornell & Larcker, 1981). In our study, the extracted variance values fluctuated between 0.618 and 0.810. This allows us to confirm the reliability and convergent validity of the scales measuring the reflective constructs of the model.

For discriminant validity analysis, two criteria were applied: the extracted variance test (Fornell & Larcker, 1981) and the Heterotrait-Monotrait Ratio (HTMT) criterion (Henseler et al., 2015). The former is based on the principle that a construct should share more variance with its indicators than with other constructs in the model; and the latter is based on the principle that if MT correlations (relationships between indicators of the same construct) are greater than HT correlations (relationships between indicators measuring different constructs) discriminant validity can be confirmed; therefore, all coefficients should be below 0.85 (Clark & Watson, 2016; Kline, 2015). In our case, in view of the results shown in Table 4, the two criteria applied are fulfilled, which enables confirmation of the discriminant validity of the reflective constructs included in the model. Therefore, we affirm that the scales used to measure our variables meet the psychometric properties of reliability and validity and, thus, the measurement model is suitable for measuring the relationships hypothesised.

With regard to the formative constructs, we proceeded to verify that the constructs Beliefs and Pro-environmental responsiveness of the university community did not present problems of collinearity or significant correlations. In this case, we ensured that there was no multicollinearity by verifying the variance inflation factor (VIF) index (Diamantopoulos et al., 2006). It is recommended that the value of the VIF of the formative constructs should be lower than 3.3 (Petter et al., 2007), or alternatively, lower than 5 (Hair et al., 2013). In our study, none of the VIF values exceeded the value of 3.3; thus, we were confident that there were no collinearity problems. In addition, we found the weights of the indicators to be significant (see Table 3), which allowed us to affirm the appropriateness of the items used to measure the formative constructs.

## **5.2. Estimation of the structural equations model**

The calculation of the structural equations model through the partial least squares regression technique (PLS-SEM) and the bootstrapping procedure are presented in Table 5. From the results, we conclude that beliefs have a positive influence on attitude and intrinsic motivations; attitude significantly influences intrinsic motivations, individual pro-environmental behaviour and the pro-environmental response of the university community; and finally, that intrinsic motivation influences the university's behaviour and response to climate change. Therefore, supporting evidence is found for all the hypotheses proposed in the research except for the relationships derived from the variable Extrinsic Motivation and the relationship between individual pro-environmental behaviour and the pro-environmental response of the university

**Table 3.** Confirmatory factor analysis results.

Factor	Item	Stand. loading	Weight	t	CA	CR	AVE
Beliefs	B1. How much do you think global warming will harm you personally?		0.482*	11.35	NA	NA	NA
	B2. How much do you think global warming will harm plant & animal species?		0.156*	3.15			
	B3. When do you think global warming will start to harm people in your country?		0.281*	6.45			
	B4. New technologies can solve global warming, without individuals having to make big changes in their lives.		0.117*	3.16			
	B5. Think back to the energy-saving actions you're already doing and those you'd like to do over the next 12 months. If you did most of these things, how much do you think it would reduce your personal contribution to global warming?		0.278*	6.52			
	B6. If most people in the world did these same actions, how much would it reduce global warming?		0.245*	4.68			
	B7. On a scale from -3 (Very Bad) to +3 (Very Good) do you think global warming is a bad thing or a good thing?		0.266*	6.18			
Attitude	A1. How worried are you about global warming?	0.829*		93.63	0.794	0.866	0.618
	A2. How much had you thought about global warming before today?	0.782*		68.34			
	A3. How important is the issue of global warming to you personally?	0.804*		76.39			
	A4. How often do you discuss global warming with your family and friends?	0.726*		49.01			
Intrinsic motivation	I am motivated to participate in actions of my University to fight against climate change because ... IM <sub>1</sub> . I think these activities are interesting.	0.849*		79.76	0.857	0.903	0.701
	IM <sub>2</sub> . I enjoy these types of activities.	0.906*		168.05			
	IM <sub>3</sub> . These activities are fun.	0.733*		44.30			
	IM <sub>4</sub> . I feel good doing these activities.	0.851*		99.64			
	I am motivated to participate in actions of my University to fight against climate change because ... EM <sub>1</sub> . There is recognition of academic credits for my degree or master's degree for my participation (if I am a student).	0.890*		8.22	0.880	0.913	0.725

*(continued)*

**Table 3.** Continued.

Factor	Item	Stand. loading	Weight	t	CA	CR	AVE
Extrinsic motivation	EM <sub>2</sub> . There is academic recognition of some kind that allows me to improve my CV or employability.	0.875*		9.08			
	EM <sub>3</sub> . It has some type of compensation for the time spent.	0.773*		6.23			
	EM <sub>4</sub> . I have recognition and prestige from my peers.	0.861*		7.40			
	IPB1. Over the past 12 months, how often have you rewarded companies that are taking steps to reduce global warming by buying their products?	0.913*		152.47	0.766	0.895	0.810
Individual pro-environmental behaviour	IPB2 Over the past 12 months, how often have you punished companies that are opposing steps to reduce global warming by NOT buying their products?	0.887*		110.29			
	PRUC1. Do you think global warming should be a low, medium, high, or very high priority for your university/campus?		0.497*	12.13	NA	NA	NA
Pro-environmental response of the university community	PRUC2. Do you think the university community (students and staff) should be doing more or less to address global warming?		0.492*	12.45			
	PRUC3. How big an effort should your university/campus make to reduce global warming?		0.392*	9.91			

CA: Cronbach's alpha; CR: Composite Reliability; AVE: Average Variance Extracted; NA: Non-applicable. \*Significant at  $p < 0.05$ . Source: Authors' proposal.

**Table 4.** Discriminant validity.

	F1	F2	F3	F4	F5	F6
F1. Beliefs	NA	NA	NA	NA	NA	NA
F2. Attitudes	0.518	0.618	0.498	0.043	NA	0.505
F3. Intrinsic motivation	0.324	0.424	0.701	0.269	NA	0.263
F4. Extrinsic motivation	0.019	-0.011	0.225	0.725	NA	0.037
F5. Pro-environmental response of the university community	0.414	0.454	0.385	0.039	NA	NA
F6. Individual pro-environmental behaviour	0.193	0.389	0.217	-0.018	0.204	0.810

Diagonal: square root of average variance extracted (AVE).

Below the diagonal: correlations between factors.

Above the diagonal: HTMT criterion.

NA: Non-applicable. Source: Authors' proposal.

community. Thus, to get the members of the university engaged with pro-environmental behaviour, it is important to tap the factors that intrinsically motivate them. Furthermore, attitudes positively influence pro-environmental behaviour, both privately and as a member the university community through intrinsic motivation, in contrast to the 'green gap phenomenon' discussed in previous research (El Haffar et al., 2020).

The values of the coefficients of determination of the variables of the attitudes and pro-environmental response of the university community are above 0.2, which is



**Table 5.** Structural equations model results.

Hypothesis	Standardized beta	Bootstrapping t	Decision
H1: Belief → Attitude	0.518	27.703*	Supported
H2: Belief → Intrinsic Motivation	0.143	4.427*	Supported
H3: Belief → Extrinsic Motivation	0.034	1.007	Not supported
H4: Attitude → Intrinsic Motivation	0.350	13.501*	Supported
H5: Attitude → Extrinsic Motivation	-0.029	1.014	Not supported
H6: Attitude → Individual pro-environmental behaviour	0.389	20.734*	Supported
H7: Attitude → Pro-environmental response of the university community	0.347	14.281*	Supported
H8: Intrinsic Motivation → Pro-environmental response of the university community	0.236	8.944*	Supported
H9: Extrinsic Motivation → Pro-environmental response of the university community	-0.010	0.445	Not supported
H10: Individual pro-environmental behaviour → Pro-environmental response of the university community	0.018	0.838	Not supported

R2 (Attitude) = 0.268; R2 (Intrinsic motivation) = 0.194; R2 (Extrinsic motivation) = 0.001; R2 (Individual pro-environmental behaviour) = 0.151; R2 (Pro-environmental response of the university community) = 0.251.

Q2 (Attitude) = 0.154; Q2 (Intrinsic motivation) = 0, 127; Q2 (Intrinsic motivation) = 0.000; Q2 (Individual pro-environmental behaviour) = 0.117; Q2 (Pro-environmental response of the university community) = 0.124.

\*Significant at  $p < 0.01$ .

Source: Authors' proposal.

considered acceptable in Social Science research and, specifically, in behavioural research standards (Hair et al., 2014). However, for motivations and individual pro-environmental behaviour, this reference value is not reached. This leads to the inference that other variables that had not been included in the model may have been contributing, which would largely explain the variability presented by these constructs.

### 5.3. Multigroup analysis

In order to test Hypothesis 11 concerning the moderating role played by the type of link to the institution, a multi-group analysis was carried out, dividing the members of the university community into two groups, students and employees, involving 1445 and 546 observations, respectively. Given that the current study aims to compare a model over two groups *via* PLS-SEM, the measurement invariance of composites (MICOM) has been performed, as suggested by Henseler et al. (2015). MICOM is a three-step process involving (1) configural invariance assessment; (2) the establishment of compositional invariance assessment; and (3) an assessment of equal means and variances. Both the configural invariance and the compositional invariance requirements have been met for all the constructs. Regarding the assessment of equal means and variances, full measurement invariance has been established for Intrinsic Motivation, whereas partial measurement invariance requirements have been met for the rest of constructs, thus allowing to comparing and interpreting the MGA group-specific differences of PLS-SEM results.

Once the invariance of the constructs had been verified, we proceeded to the analysis of the results of the multi-group analysis presented in Table 6. The methods implemented for interpretation were the Welch-Satterthwaite test and Henseler's MGA method. The former is a parametric test that performs the analysis with unequal variances (Welch, 1947), and the latter method is a non-parametric test that

**Table 6.** Results of hypotheses testing.

Relationships	Path Coefficient			Confidence Interval (95%)			P-Value Difference (One-Tailed)		
	Students	Employees	Students	Students	Employees	Employees	Path Coefficient Difference	Welch-Satterthwait Test	Henseler's MGA
H1: Belief → Attitude	0.519	0.506	(0.470; 0.558)	(0.427; 0.563)	0.012	0.765	0.386	No/No	
H2: Belief → Intrinsic Motivation	0.106	0.241	(0.023; 0.185)	(0.118; 0.339)	0.135	0.053	0.972	No/Yes	
H3: Belief → Extrinsic Motivation	0.010	0.102	(-0.093; 0.099)	(-0.046; 0.193)	0.092	0.229	0.890	No/No	
H4: Attitude → Intrinsic Motivation	0.381	0.270	(0.322; 0.439)	(0.180; 0.365)	0.111	0.048	0.024	Yes/Yes	
H5: Attitude → Extrinsic Motivation	0.016	-0.044	(-0.059; 0.079)	(-0.141; 0.065)	0.061	0.343	0.172	No/No	
H6: Attitude → Individual pro-environmental behaviour	0.340	0.342	(0.281; 0.391)	(0.249; 0.423)	0.002	0.965	0.520	Yes/No	
H7: Attitude → Pro-environmental response of the university community	0.385	0.339	(0.340; 0.427)	(0.262; 0.413)	0.046	0.305	0.153	No/No	
H8: Intrinsic Motivation → Pro-environmental response of the university community	0.266	0.153	(0.205; 0.328)	(0.052; 0.254)	0.113	0.061	0.031	No/Yes	
H9: Extrinsic Motivation → Pro-environmental response of the university community	-0.024	0.036	(-0.091; 0.024)	(-0.050; 0.108)	0.060	0.218	0.894	No/No	
H10: Individual pro-environmental behaviour → Pro-environmental response of the university community	0.009	0.035	(-0.035; 0.057)	(-0.055; 0.126)	0.026	0.620	0.690	No/No	

Note: In Henseler's MGA and Welch-Satterthwait method, the pvalue lower than 0.05 or higher than 0.95 indicates at the 5% level significant differences between specific path coefficients across two groups.

\* $p < 0.05$ , \*\* $p < 0.01$ . Source: Authors' proposal.

directly compares subsamples created from randomly exchanged observations from the original data set (Henseler et al., 2009). The reason we decided to run both types of tests was because we detected through the MICOM analysis that the variances were not equal in some of our variables.

Depending on the methods used, *p*value of differences between path coefficients of less than 0.05 or greater than 0.95 indicate a 5% level of significant differences between specific path coefficients in two groups (Henseler et al., 2009). Therefore, we found that there were significant differences between students and employees in several of the hypotheses we raised. Specifically, the link between attitude and intrinsic motivation is significantly stronger for students in comparison with employees, both in the Welch-Satterthwait test and Henseler's MGA analysis, which guarantees the robustness of this finding. It was also observed that the influence of intrinsic motivation on the pro-environmental responsiveness of the university community was stronger for students compared with other members of the university community. On the other hand, the relationships between beliefs and intrinsic motivation and individual pro-environmental attitude and behaviour were stronger for employees. These stronger relations may be explained by the usually longer permanence of employees as members of the university community, or their relatively higher maturity, that would lead them to act more consistently in comparison to students.

## **6. Conclusions and discussions**

This paper examines the pro-environmental behaviour of the University community contributing to a better understanding of the behaviour of the university community in matters related to caring for the environment and the fight against climate change. The findings make a significant contribution to previous theories and research on consumer behaviour, given that, in general, the results obtained indicate that, as the university community increases its knowledge on issues related to climate change, beliefs are constructed and attitudes are elicited, which leads to the development of intrinsic motivation to engage in climate change mitigation actions and subsequently determines pro-environmental behaviour. This behaviour will vary according to what the individual does individually and what he does in a group setting. Therefore, we can deduce that when it comes to issues related to climate change or sustainability; beliefs, attitudes, motivations and behaviours are good predictors of human behaviour. All these findings make it possible to make substantial progress in the knowledge of how individual behaviour develops, as well as the generation of the response that the university community as a collective should give, as judged by the individual.

### **6.1. Theoretical implications**

The present study thereby supports the relationship between beliefs-attitudes-motivations-behaviours in the individual and social spheres in the context of the actions undertaken by the university to adapt to and mitigate climate change that are aimed at the university community (students and employees). From this research, it can be highlighted that beliefs are a key factor in order for members of the university

community to adopt attitudes that will subsequently lead to pro-environmental behaviour. In other words, in order for an individual to have a positive or negative attitude towards environmental protection, he must first have prior knowledge that allows him or her to develop an accurate assessment in a variety of situations. We recognise beliefs as being points of view which, even if not consciously formulated by the individual, act as self-evident assumptions, without which what one does would be meaningless (Braun, 2012). Therefore, we conclude that beliefs have a significant influence on the development of an attitude and also determine the degree of a person's internal motivation. In this regard, beliefs have a significant influence on intrinsic motivations, but not on extrinsic motivations. These results may be explained by the fact that the latter type of motivation is linked to other external factors (academic recognition, financial remuneration, prestige), which do not depend on the individual's beliefs.

On the other hand, empirical evidence was found to demonstrate that when members of the university community adopt an attitude, they subsequently develop an internal motivation to participate in university actions oriented towards climate change, pro-environmental behaviour in the private sphere and a critical judgement about the response that the university community should make regarding issues related to climate change.

Based on the TPB proposed by Ajzen (1991), which postulates that behaviour is preceded by beliefs, attitudes and intentions, the model tested in this study also included motivations. Consequently, this variable was found to be a suitable indicator to describe behaviour and to have a significant influence on members of the university community to adopt pro-environmental behaviour to help in the fight against climate change, provided that these motivations were internal.

Finally, this study aimed to measure whether there is a relationship between individual pro-environmental behaviour and the pro-environmental response of the university community. This hypothesis stems from the idea that a person with pro-environmental behaviour would certainly expect universities to be more involved in issues related to climate change. However, we were unable to verify this connection and, therefore, did not observe a relationship between individual behaviour and the expected response of the university community—of which the individual forms part. This finding supports the theories that claim there is a discrepancy between a person's behaviour in individual and group contexts, as outlined in previous sections. Moreover, although some hypotheses had already been confirmed in other contexts, to the best of our knowledge, this is the first analysis of the factors influencing pro-environmental behavioural intentions on climate change in the university community.

## **6.2. Managerial implications**

The results obtained in this study could help the participating universities to understand what really motivates members of the university community to get involved in the fight against climate change and could provide them with a theoretical and practical basis for knowing where to direct their activities. Furthermore, the findings have important organisational implications that require strategic action on the part of the

universities. Members of the university community receive ever more information about the importance of caring for the environment; however, many of the actions that seek to promote pro-environmental behaviour are not effective. This is why, with this study, we have demonstrated that effectiveness not only depends on information but on a structured process that goes beyond knowledge alone.

Based on the results obtained in this study, universities should focus their efforts not only on providing information about caring for the environment but also on generating an emotional bond that will allow all their members to develop a positive attitude, which will motivate them to behave in a pro-environmental manner. Once this gap between simple information and an emotional, motivational and behavioural connection is bridged, many members of the university community will become more involved in the fight against climate change.

To make effective pro-environmental actions, it is essential for society in general to be involved and to feel an increasing sense of participation in the preservation of the planet. At the university level, it is recommended that the board and the management groups analyse the actions carried out more extensively in order to identify and recognise which of them generate a greater emotional bond in the members of this community, segmenting them according to the links the various members have with the university. Specifically, while university communications to increase students' intrinsic motivation should focus more on fostering their attitudes towards environmental protection, in the case of employee-oriented communications, the focus should be on climate change beliefs, given the differences observed between different members of the university community.

Furthermore, we were able to detect that extrinsic motivation does not lead to a pro-environmental response from the university community. This may be explained by the fact that the incentives in academic or financial terms for participating in these actions are perceived as being insufficient. Therefore, the university must identify the right incentives in order to support the relationship between extrinsic motivation and the efforts that should be made by the university.

Finally, we note that individual pro-environmental behaviour does not influence the pro-environmental response of the university community. This may be due to the fact that people develop a tendency to behave differently in individual and group settings. In this regard, universities should strive for effective actions that generate greater involvement and awareness among their members so that they do not feel that their individual efforts are not having an impact on a group level, but instead feel a greater desire for the university to become involved in the problems caused by climate change.

### **6.3. Limitations and future research**

This study considers a model of predictor variables to explain, to some degree, the level of involvement of members of the university community in the fight against climate change, from the perspective of several Latin American universities. However, a number of factors limit the possibility of generalising the results. Firstly, the type of sampling (non-probabilistic snowball sampling) means that in the case of some

universities participating in the study, the final sample is comparatively smaller than in others and has a certain bias that does not guarantee its representativeness with respect to the group from which it is drawn. In addition, the geographical context in which the research was carried out, three Latin American countries, where sensitivity to environmental issues has not yet developed to the level of European countries, limits the generalisability of the findings in a global context.

Furthermore, despite the relevance of the constructs included in this research, the explanatory power of the model, as measured by the coefficient of determination, is relatively low. This suggests that there may be other factors that determine the pro-environmental behaviour of the members of the university community and the perception of the response that should be given by the university to combat climate change. In this regard, other variables could be included, such as the subjective norm, which refers to the importance of people, friends, or authority figures for pro-environmental behaviour.

Alternatively, this relatively low explanatory power of the model may be due to the use of self-reported assessments instead of measures of actual behaviour. Due to the relatively lower accuracy of self-reports and their effect on tests of attitude-behaviour relationships (Manfredo & Shelby, 1988), we would recommend that further research should measure, test and model both self-reports and past behaviour separately in examining attitude-behaviour relationships.

Future lines of research could carry out this same study in other countries and with other universities, in order to verify whether the results obtained are similar or vary for each of the variables considered in this study. In this sense, it may be possible that the cultural dimension influences behaviour positively or negatively.

Moreover, we have posit the chain 'beliefs-intrinsic motivation-proenvironmental behaviour of the university community' based on the Theory of Planned Behaviour. The mediating effect of intrinsic motivation between beliefs and proenvironmental behaviour of the university community, using alternative statistical analysis techniques, is a research line to be explored more in depth.

Last, additional variables could be included to improve the explanatory power of the model. It is thought that variables such as Subjective Norm or Satisfaction could contribute towards explaining pro-environmental behaviour, as the influence of friends, family or peer groups and simple wellbeing or pleasure in caring for the environment may be adequate predictors to describe such behaviour.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

## Funding

This work was supported by MCIN/AEI/10.13039/501100011033 under Grant PID2020-112660RB-I00; Conselleria d'Innovació, Universitats, Ciència i Societat Digital of the Generalitat Valenciana under Grant for consolidated research group AICO/2021/144; Universitat de València under Grant UV-INV-AE-1553911 (Funding for Special Research

Actions) and Erasmus + European Commission, Grant/Award Number: 610032-EPP-1-2019-1-CO-EPPKA2-CBHE-JP(2019 –20).

## References

- Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modelling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103(3), 411–423. <https://doi.org/10.1037/0033-2909.103.3.411>
- Ajzen, I. (1991). The theory of planned behavior. *Organizational behavior and human decision processes*, 50(2), 179–211.
- Bamberg, S., & Möser, G. (2007). Twenty years after Hines, Hungerford, and Tomera: A new meta-analysis of psycho-social determinants of proenvironmental behaviour. *Journal of Environmental Psychology*, 27(1), 14–25. <https://doi.org/10.1016/j.jenvp.2006.12.002>
- Bansal, H. S., & Taylor, S. F. (1999). The service provider switching model (SPSM): A model of consumer switching behavior in the services industry. *Journal of Service Research*, 2(2), 200–218. <https://doi.org/10.1177/109467059922007>
- Bascoul, G., Schmitt, J., & Rasolofoarison, D (2015). Consumers' biased perceptions of the environmental impact of products, and their influence on advertising efficiency. In M. Conway Dato-on (Ed.), *The sustainable global marketplace* (pp. 400–404). Springer International Publishing.
- Berquier, R., & Gibassier, D. (2019). Governing the “good citizen” and shaping the “model city” to tackle climate change: Materiality, economic discourse and exemplarity. *Sustainability Accounting, Management and Policy Journal*, 10(4), 710–744. <https://doi.org/10.1108/SAMPJ-02-2018-0038>
- Braun, N. A. (2012). *Investigating environmentally responsible behavior: A phenomenological study of the personal behaviors of acknowledged leaders in the area of climate change*. The Ohio State University. ProQuest LLC.
- Brundtland, G. H., Khalid, M., Agnelli, S., Al-Athel, S. A., Chidzero, B., & Fadika, L. M. (1987). *Our common future*. Oxford University Press.
- Burnkrant, R. E., & Cousineau, A. (1975). Informational and normative social influence in buyer behavior. *Journal of Consumer Research*, 2(3), 206–215. <https://doi.org/10.1086/208633>
- Carmines, E. G., & Zeller, R. A. (1979). *Reliability and validity assessment*. Sage Publications.
- Chang, Y., Wannamakok, W., & Kao, C. (2022). Entrepreneurship education, academic major, and university students' social entrepreneurial intention: The perspective of planned behavior theory. *Studies in Higher Education*, 47(11), 2204–2223. <https://doi.org/10.1080/03075079.2021.2021875>
- Chin, W. W., & Dibbern, J. (2010). A permutation based procedure for multi-group PLS analysis: Results of tests of differences on simulated data and a cross cultural analysis of the sourcing of information system services between Germany and the USA. In V. Esposito Vinzi, W. W. Chin, J. Henseler, & H. Wang (Eds.), *Handbook of partial least squares. Concepts, methods and applications* (pp. 171–193). Springer.
- Clark, L. A., & Watson, D. (2016). Constructing validity: Basic issues in objective scale development. In A. E. Kazdin (Ed.), *Methodological issues and strategies in clinical research* (pp. 187–203). American Psychological Association.
- Cline, S., Truelove, H. B., & Nicholson, J. (2020). OK, boomers: Generational differences in pro-environmental behavior. In *Paper Presented at the 2020 SOARS Virtual Conference*. Retrieved from: [https://digitalcommons.unf.edu/soars/2020/spring\\_2020/89/](https://digitalcommons.unf.edu/soars/2020/spring_2020/89/).
- Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behaviour*. Plenum.
- Diamantopoulos, A., Reynolds, N. L., & Simintiras, A. C. (2006). The impact of response styles on the stability of cross-national comparisons. *Journal of Business Research*, 59(8), 925–935. <https://doi.org/10.1016/j.jbusres.2006.03.001>

- Donmez-Turan, A., & Kiliclar, I. E. (2021). The analysis of pro-environmental behaviour based on ecological worldviews, environmental training/knowledge and goal frames. *Journal of Cleaner Production*, 279, 123518. <https://doi.org/10.1016/j.jclepro.2020.123518>
- Durr, E., Bilecki, J., & Li, E. (. (2017). Are beliefs in the importance of pro-environmental behaviors correlated with pro-environmental behaviors at a college campus? *Sustainability*, 10(3), 204–210. <https://doi.org/10.1089/sus.2017.29105.ed>
- Efron, B., & Tibshirani, R. (1986). Bootstrap methods for standard errors, confidence intervals, and other measures of statistical accuracy. *Statistical Science*, 1(1), 54–75. <https://doi.org/10.1214/ss/1177013815>
- El Haffar, G., Durif, F., & Dubé, L. (2020). Towards closing the attitude-intention-behavior gap in green consumption: A narrative review of the literature and an overview of future research directions. *Journal of Cleaner Production*, 275, 122556. <https://doi.org/10.1016/j.jclepro.2020.122556>
- Ferdous, A. S. (2010). Applying the theory of planned behavior to explain marketing managers' perspectives on sustainable marketing. *Journal of International Consumer Marketing*, 22(4), 313–325. <https://doi.org/10.1080/08961530.2010.505883>
- Ferguson, T., Roofe, C., & Cook, L. (2021). Teachers' perspectives on sustainable development: The implications for education for sustainable development. *Environmental Education Research*, 27(9), 1–17. <https://doi.org/10.1080/13504622.2021.1921113>
- Festinger, L., & Carlsmith, J. M. (1959). Cognitive consequences of forced compliance. *Journal of Abnormal Psychology*, 58(2), 203–210. <https://doi.org/10.1037/h0041593>
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention, and behaviour: An introduction to theory and research*. Addison-Wesley.
- Flórez-Parra, J. M., Lopez-Perez, M. V., Hernández, A. M. L., & Sánchez, R. G. (2021). Analysing and evaluating environmental information disclosure in universities: The role of corporate governance, stakeholders and culture. *International Journal of Sustainability in Higher Education*, 22(4), 931–957. <https://doi.org/10.1108/IJSHE-08-2020-0323>
- Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research*, 18(1), 39–50. <https://doi.org/10.1177/002224378101800104>
- Giefer, M. M., Peterson, M. N., & Chen, X. (2019). Interactions among locus of control, environmental attitudes and pro-environmental behaviour in China. *Environmental Conservation*, 46(3), 234–240. <https://doi.org/10.1017/S0376892919000043>
- Gifford, R., & Nilsson, A. (2014). Personal and social factors that influence pro-environmental concern and behaviour. *International Journal of Psychology*, 49(3), 141–157. <https://doi.org/10.1002/ijop.12034>
- Gifford, R., & Sussman, R. (2012). Environmental attitudes. In S. Clayton (Ed.), *The Oxford Handbook of Environmental and conservation psychology* (pp. 65–80). Oxford University Press.
- Graafland, J., & de Bakker, F. (2021). Crowding in or crowding out? How non-governmental organizations and media influence intrinsic motivations toward corporate social and environmental responsibility. *Journal of Environmental Planning and Management*, 64(13), 2386–2409. <https://doi.org/10.1080/09640568.2021.1873110>
- Grant, A. M. (2008). Does intrinsic motivation fuel the prosocial fire? Motivational synergy in predicting persistence, performance, and productivity. *The Journal of Applied Psychology*, 93(1), 48–58. <https://doi.org/10.1037/0021-9010.93.1.48>
- Gray, S. G., Raimi, K. T., Wilson, R., & Árvai, J. (2019). Will millennials save the world? The effect of age and generational differences on environmental concern. *Journal of Environmental Management*, 242, 394–402. <https://doi.org/10.1016/j.jenvman.2019.04.071>
- Guay, F., Vallerand, R. J., & Blanchard, C. (2000). On the assessment of situational intrinsic and extrinsic motivation: The situational motivation scale (SIMS). *Motivation and Emotion*, 24(3), 175–213. <https://doi.org/10.1023/A:1005614228250>
- Hair, J. F., Jr., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2014). *A primer on partial least squares structural equation modeling (PLS-SEM)*. Sage Publications.



- Hair, J. F., Ringle, C. M., & Sarstedt, M. (2013). Editorial – Partial least squares structural equation modeling: Rigorous applications, better results and higher acceptance. *Long Range Planning*, 46(1–2), 1–12. <https://doi.org/10.1016/j.lrp.2013.01.001>
- Hamby, A., & Van Laer, T. (2022). Not whodunit but whydunit: story characters' motivations influence audience interest in services. *Journal of Service Research*, 25(1), 48–65.
- Henseler, J., Ringle, C., & Sinkovics, R. (2009). The use of partial least squares path modeling in international marketing. *Advances in International Marketing*, 20(1), 277–320.
- Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modelling. *Journal of the Academy of Marketing Science*, 43(1), 115–135. <https://doi.org/10.1007/s11747-014-0403-8>
- Huang, H. P., & Yore, L. D. (2005). A comparative study of Canadian and Taiwanese grade 5 children's environmental behaviors, attitudes, concerns, emotional dispositions, and knowledge. *International Journal of Science and Mathematics Education*, 1(4), 419–448. <https://doi.org/10.1007/s10763-005-1098-6>
- Hur, W.-M., Shin, Y., & Moon, T. W. (2022). Linking motivation, emotional labor, and service performance from a self-determination perspective. *Journal of Service Research*, 25(2), 227–241. <https://doi.org/10.1177/1094670520975204>
- IPCC. (2021). *Climate change 2021: The physical science basis. Contribution of Working Group I to the Sixth Assessment Report of the Intergovernmental Panel on Climate Change*. Cambridge University Press. Retrieved from: [https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC\\_AR6\\_WGI\\_Full\\_Report.pdf](https://www.ipcc.ch/report/ar6/wg1/downloads/report/IPCC_AR6_WGI_Full_Report.pdf).
- Izagirre-Olaizola, J., Fernández-Sainz, A., & Vicente-Molina, M. A. (2015). Internal determinants of recycling behaviour by university students: A cross-country comparative analysis. *International Journal of Consumer Studies*, 39(1), 25–34. <https://doi.org/10.1111/ijcs.12147>
- Jans, L. (2021). Changing environmental behaviour from the bottom up: The formation of pro-environmental social identities. *Journal of Environmental Psychology*, 73, 101531. <https://doi.org/10.1016/j.jenvp.2020.101531>
- Kline, R. B. (2015). *Principles and practice of structural equation modelling*. Guilford Publications.
- Kollmuss, A., & Agyeman, J. (2002). Mind the gap: Why do people act environmentally and what are the barriers to pro-environmental behavior? *Environmental Education Research*, 8(3), 239–260. <https://doi.org/10.1080/13504620220145401>
- Lam-Huu-Phuoc, N., Nguyen-Bich-Thy, B., Thi-Ngoc-Cam, N., & Chin-Fei, H. (2022). An investigation into the perspectives of elementary pre-service teachers on sustainable development. *Sustainability*, 14(16), 9943. (<https://doi.org/10.3390/su14169943>)
- Leal Filho, W., Sima, M., Sharifi, A., Luetz, J. M., Salvia, A. L., Mifsud, M., Olooto, F. M., Djekic, I., Anholon, R., Rampasso, I., Kwabena Donkor, F., Dinis, M. A. P., Klavins, M., Finnveden, G., Chari, M. M., Molthan-Hill, P., Mifsud, A., Sen, S. K., & Lokupitiya, E. (2021). Handling climate change education at universities: An overview. *Environmental Sciences Europe*, 33(1), 109. <https://doi.org/10.1186/s12302-021-00552-5>
- Lin, C., Tseng, Y., Lin, M., & Hou, W. (2021). Factors related to intentions to commit dating violence among Taiwanese university students: Application of the extended theory of planned behavior. *International Journal of Environmental Research and Public Health*, 18(4), 1956. <https://doi.org/10.3390/ijerph18041956>
- Ma, C., Xiao, R., Chang, H., & Song, G. (2022). Founder management and innovation: An empirical analysis based on the theory of planned behavior and fuzzy-set qualitative comparative analysis. *Frontiers in Psychology*, 13, 827448. <https://doi.org/10.3389/fpsyg.2022.827448>
- Ma, X., Bie, Z., Li, C., Gu, C., Li, Q., Tan, Y., Tian, M., & Fan, C. (2023). The effect of intrinsic motivation and environmental cues on social creativity. *Interactive Learning Environments*, 31(4), 2063–2079. <https://doi.org/10.1080/10494820.2021.1874423>
- Maibach, E. W., Leiserowitz, A., Roser-Renouf, C., Mertz, C. K., & Akerlof, K. (2011). *Global warming's six Americas screening tools: Survey instruments; instructions for coding and data treatment; and statistical program scripts*. Yale University and George Mason University.

- Retrieved from: [https://www.climatechangecommunication.org/wp-content/uploads/2016/03/2011-Six\\_Americas\\_Screening\\_Tool\\_Manual\\_July2011.pdf](https://www.climatechangecommunication.org/wp-content/uploads/2016/03/2011-Six_Americas_Screening_Tool_Manual_July2011.pdf).
- Mainieri, T., Barnett, E. G., Valdero, T. R., Unipan, J. B., & Oskamp, S. (1997). Green buying: The influence of environmental concern on consumer behavior. *The Journal of Social Psychology*, 137(2), 189–204. <https://doi.org/10.1080/00224549709595430>
- Manfredo, M. J., & Shelby, B. (1988). The effect of using self-report measures in tests of attitude-behavior relationships. *The Journal of Social Psychology*, 128(6), 731–743. <https://doi.org/10.1080/00224545.1988.9924553>
- Moraes, C., Carrigan, M., & Szmigin, I. (2012). The coherence of inconsistencies: Attitude-behaviour gaps and new consumption communities. *Journal of Marketing Management*, 28(1–2), 103–128. <https://doi.org/10.1080/0267257X.2011.615482>
- Missimer, M., Robèrt, K.-H., & Broman, G. (2017). A strategic approach to social sustainability – part 1: Exploring the social system. *Journal of Cleaner Production*, 140, 32–41. <https://doi.org/10.1016/j.jclepro.2016.03.170>
- Mkumbachi, R. L., Astina, I. K., & Handoyo, B. (2020). Environmental awareness and pro-environmental behavior: A case of university students in Malang city. *Jurnal Pendidikan Geografi*, 25(2), 161–169. <https://doi.org/10.17977/um017v25i2020p161>
- Nunnally, J. C. (1994). *Psychometric theory 3E*. Tata McGraw-Hill Education.
- Oskamp, S., Harrington, M. J., Edwards, T. C., Sherwood, D. L., Okuda, S. M., & Swanson, D. C. (1991). Factors influencing household recycling behavior. *Environment and Behavior*, 23(4), 494–519. <https://doi.org/10.1177/0013916591234005>
- Osmond, P., Dave, M., Prasad, L., & Li, F. (2013). *Greening universities toolkit: Transforming universities into green and sustainable campuses*. United Nations Environment Programme. Retrieved from: [https://wedocs.unep.org/bitstream/handle/20.500.11822/11273/Greening\\_unis\\_toolkit\\_Single\\_Page.pdf?sequence=1&isAllowed=y](https://wedocs.unep.org/bitstream/handle/20.500.11822/11273/Greening_unis_toolkit_Single_Page.pdf?sequence=1&isAllowed=y).
- Petter, S., Straub, D., & Rai, A. (2007). Specifying formative constructs in information systems research. *MIS Quarterly*, 31(4), 623–656. <https://doi.org/10.2307/25148814>
- Prasad, R., & Mkumbachi, R. (2021). University students' perceptions of climate change: The case study of the university of the South Pacific-Fiji islands. *International Journal of Climate Change Strategies and Management*, 13(4/5), 416–434. <https://doi.org/10.1108/IJCCSM-12-2020-0126>
- Qi, X., & Ploeger, A. (2019). Explaining consumers' intentions towards purchasing green food in Qingdao, China: The amendment and extension of the theory of planned behavior. *Appetite*, 133, 414–422. <https://doi.org/10.1016/j.appet.2018.12.004>
- Rex, J., Lobo, A., & Leckie, C. (2015). Evaluating the drivers of sustainable behavioral intentions: An application and extension of the theory of planned behaviour. *Journal of Nonprofit & Public Sector Marketing*, 27(3), 263–284. <https://doi.org/10.1080/10495142.2015.1053342>
- Ryan, R. M., & Deci, E. L. (2000). Intrinsic and extrinsic motivations: Classic definitions and new directions. *Contemporary Educational Psychology*, 25(1), 54–67. <https://doi.org/10.1006/ceps.1999.1020>
- Shafiei, A., & Maleksaeidi, H. (2020). Pro-environmental behavior of university students: Application of protection motivation theory. *Global Ecology and Conservation*, 22, e00908. <https://doi.org/10.1016/j.gecco.2020.e00908>
- Si, H., Shi, J. G., Tang, D., Wu, G., & Lan, J. (2020). Understanding intention and behavior toward sustainable usage of bike sharing by extending the theory of planned behaviour. *Resources, Conservation and Recycling*, 152, 104513. <https://doi.org/10.1016/j.resconrec.2019.104513>
- Smith, K. T., & Brower, T. R. (2012). Longitudinal study of green marketing strategies that influence Millennials. *Journal of Strategic Marketing*, 20(6), 535–551. <https://doi.org/10.1080/0965254X.2012.711345>
- Sousa, S., Correia, E., Leite, J., & Viseu, C. (2021). Environmental knowledge, attitudes and behavior of higher education students: A case study in Portugal. *International Research in Geographical and Environmental Education*, 30(4), 348–365. <https://doi.org/10.1080/10382046.2020.1838122>

- Steg, L., & Vlek, C. (2009). Encouraging pro-environmental behaviour: An integrative review and research agenda. *Journal of Environmental Psychology*, 29(3), 309–317. <https://doi.org/10.1016/j.jenvp.2008.10.004>
- Stern, P. (2000). Toward a coherent theory of environmentally significant behavior. *Journal of Social Issues*, 56(3), 407–424. <https://doi.org/10.1111/0022-4537.00175>
- Tabarnero, C., & Hernández, B. (2012). A motivational model for environmentally responsible behavior. *The Spanish Journal of Psychology*, 15(2), 648–658. [https://doi.org/10.5209/rev\\_sjop.2012.v15.n2.38876](https://doi.org/10.5209/rev_sjop.2012.v15.n2.38876)
- Taylor, S., & Todd, P. (1995). An integrated model of waste management behavior: A test of household recycling and composting intentions. *Environment and Behavior*, 27(5), 603–630. <https://doi.org/10.1177/0013916595275001>
- Teng, Y. M., Wu, K. S., & Liu, H. H. (2015). Integrating altruism and the theory of planned behavior to predict patronage intention of a green hotel. *Journal of Hospitality & Tourism Research*, 39(3), 299–315. <https://doi.org/10.1177/1096348012471383>
- Tian, H., Zhang, J., & Li, J. (2020). The relationship between pro-environmental attitude and employee green behavior: The role of motivational states and green work climate perceptions. *Environmental Science and Pollution Research International*, 27(7), 7341–7352. <https://doi.org/10.1007/s11356-019-07393-z>
- Tommasetti, A., Singer, P., Troisi, O., & Maione, G. (2018). Extended theory of planned behavior (ETPB): Investigating customers' perception of restaurants' sustainability by testing a structural equation model. *Sustainability*, 10(7), 2580. <https://doi.org/10.3390/su10072580>
- Ugulu, I., Sahin, M., & Baslar, S. (2013). High school students' environmental attitude: Scale development and validation. *International Journal of Educational Sciences*, 5(4), 415–424. <https://doi.org/10.1080/09751122.2013.11890103>
- UN. (2015). *Transforming Our World: The 2030 Agenda for Sustainable Development*, UN General Assembly. A/RES/70/1. Retrieved from: <https://sustainabledevelopment.un.org/content/documents/21252030%20Agenda%20for%20Sustainable%20Development%20web.pdf>
- Van den Berg, R. D., & Cando-Noordhuizen, L. (2017). Action on climate change: What does it mean and where does it lead to? In J. I. Uitto, J. Puri, & R. D. van den Berg (Eds.), *Evaluating climate change action for sustainable development* (pp.13–34). Springer.
- Venhoeven, L. A., Bolderdijk, J. W., & Steg, L. (2016). Why acting environmentally friendly feels good: Exploring the role of self-image. *Frontiers in Psychology*, 7, 1846. <https://doi.org/10.3389/fpsyg.2016.01846>
- Vicente-Molina, M. A., Fernández-Sáinz, A., & Izagirre-Olaizola, J. (2013). Environmental knowledge and other variables affecting pro-environmental behaviour: Comparison of university students from emerging and advanced countries. *Journal of Cleaner Production*, 61, 130–138. <https://doi.org/10.1016/j.jclepro.2013.05.015>
- Walawalkar, T., Hermans, L. M., & Evers, J. (2023). Evaluating behavioural changes for climate adaptation planning. *Journal of Environmental Planning and Management*, 66(7), 1453–1471. <https://doi.org/10.1080/09640568.2022.2028610>
- Wang, R., Jia, T., Qi, R., Cheng, J., Zhang, K., Wang, E., & Wang, X. (2021). Differentiated impact of politics-and science-oriented education on pro-environmental behavior: A case study of Chinese University Students. *Sustainability*, 13(2), 616, 1–15. <https://doi.org/10.3390/su13020616>
- Wasiuzzaman, S., Lee, C. L., Boon, O. H., & Chelvam, H. P. (2021). Examination of the motivations for equity-based crowdfunding in an emerging market. *Journal of Theoretical and Applied Electronic Commerce Research*, 16(2), 87–103. <https://doi.org/10.4067/S0718-18762021000200106>
- Wee, M. I., Ariffin, F. N., Ng, T. F., & Shabudin, A. F. A. (2017). Awareness and attitudes towards sustainable development amongst higher education students in Penang, Malaysia. In W. Leal Filho, U. M. Azeiteiro, F. Alves, & P. Molthan-Hill (Eds.), *Handbook of theory and practice of sustainable development in higher education* (pp. 49–64). Springer.
- Welch, B. L. (1947). The generalization of students problem when several different population variances are involved. *Biometrika*, 34(1–2), 28–35. <https://doi.org/10.1093/biomet/34.1-2.28>

- Yang, X., & Thøgersen, J. (2022). When people are green and greedy: A new perspective of recycling rewards and crowding-out in Germany, the USA and China. *Journal of Business Research*, 144, 217–235. <https://doi.org/10.1016/j.jbusres.2022.01.086>
- Yazdanpanah, M., & Forouzani, M. (2015). Application of the theory of planned behaviour to predict iranian students' intention to purchase organic food. *Journal of Cleaner Production*, 107, 342–352. <https://doi.org/10.1016/j.jclepro.2015.02.071>
- Yuriev, A., Dahmen, M., Paillé, P., Boiral, O., & Guillaumie, L. (2020). Pro-environmental behaviors through the lens of the theory of planned behavior: A scoping review. *Resources, Conservation and Recycling*, 155, 104660. <https://doi.org/10.1016/j.resconrec.2019.104660>
- Zoll, F., Specht, K., Opitz, I., Siebert, R., Piorr, A., & Zasada, I. (2018). Individual choice or collective action? Exploring consumer motives for participating in alternative food networks. *International Journal of Consumer Studies*, 42(1), 101–110. <https://doi.org/10.1111/ijcs.12405>