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Analysing the Influence of Companies' Green Communication in College Students' Green Purchase Behaviour: An Application of the Extended Theory of Planned Behaviour Model

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Abstract: In recent years, there has been a growing concern about the environmental impacts of consumers' behaviour. As this environmental awareness increases, consumers tend to focus more on green products and how purchasing these products represents an effective way to protect the environment. Through the application of the theory of planned behaviour (TPB), in this research, we studied the influence of some key variables on college students' green purchasing behaviour, namely perceived behavioural control, subjective norms, green attitudes, and green purchase intentions. The TPB model was extended to the analysis of the influence of the companies' green communication on students' green purchase behaviour. To achieve the proposed goal, from March to April of 2021, a survey was conducted among the students of a higher education institution (HEI) in Portugal, allowing us to gather 432 valid responses. The findings suggested that all the variables, except the subjective norms, had a positive influence on the students' green purchase intentions. Moreover, it was observed that students' intentions had a positive influence on their green purchase behaviour. This research provides important results not only for policymakers to promote more sustainable behaviours among consumers but also for companies to be more aware of the importance of green communication.

Keywords: green purchase behaviour; theory of planned behaviour; green communication; college students; Portugal



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1. Introduction

Nature is progressively degrading at unprecedented rates in human history, with the consequent extinction of countless species and serious impacts on human well-being, with a significant increase in mortality and morbidity rates, generating a heavy medical burden (Chen et al. 2018; Day et al. 2018; IPBES 2019; UNEP 2015; Adom and Amoani 2021; Demoury et al. 2022). Aware of this reality, individuals, not only consumers but also producers, are making efforts to adopt more environmentally friendly behaviours (UNEP 2015). Consumers' recognition of the importance of caring for the environment is reflected in the change in values, attitudes, the structure of needs, and the conditions and methods of satisfying them, as well as in transforming purchasing behaviour with the growing demand for green products (Witek and Kuźniar 2021). The consumption of green products represents a valuable environmentally responsible behaviour, capable of mitigating and solve many of the current environmental problems (Ritter et al. 2015; Ting et al. 2019; Sheng et al. 2019; Kamalanon et al. 2022). As stressed by (Hojnik et al. 2019, p. 2), "consumers are

active players, which can heavily affect and participate in transitioning to sustainability by changing their purchasing habits, behaviors, and mindset". Moreover, by becoming greener, consumers also demand a more pro-environmental posture from companies. These do have, in fact, key roles as promoters of products and, hence, contributors to shaping the demand and its associated environmental impacts. According to (Padilla 2018, p. 10), "over the last few decades, the role of sustainability in business has gradually increased and several companies have significantly contributed to the promotion of sustainable consumption". Furthermore, companies with a green positioning strategy have displayed higher customer satisfaction, increased profitability, market shares, and a general performance index (Moser 2015). Considering all these arguments, underlining the importance of green consumption for both the environment and businesses, it is critical that marketers efficiently manage all the factors affecting green purchasing behaviour, including communication.

The present research study proposes to understand the main determinants of college students' green purchase behaviour with the application of the theory of planned behaviour (TPB). According to this theoretical model, individuals' behavioural decisions are directly influenced by their intentions, which, in turn, may be influenced by attitudes, subjective norms, and perceived behavioural control (Ajzen 1985). The TPB has been widely used in the environmental research area, resulting, particularly in the last two decades, in an increasing number of scientific research studies all over the world (Si et al. 2019). This research paper proposes to complement the existing literature on green purchase behaviour, with the application of an extended TPB model with the inclusion of an additional variable: the influence of companies' green communication.

To achieve this goal, an online survey was carried out among the students of a higher education institution (HEI) in Portugal, with a total of 3209 students attending different degrees and masters in management, business, and accounting areas. The decision to study college students' behaviour is justified by the fact that this population sample brings together a set of particular characteristics regarding environmental protection, namely attending higher education studies and hence being well-informed, including regarding environmental issues; being the present and future consumers; having to face the consequences of the past generation's negligent environmental behaviours and, at the same time, being the future decision makers; and representing potential powerful drivers of environmental behavioural change (De Leeuw et al. 2015; Bozoglu et al. 2016; Ting and Cheng 2017; Massaro et al. 2018; Naz et al. 2020). Moreover, there is a considerable lack of scientific studies focusing on consumers' green purchase behaviour, particularly that of students, in Portugal (e.g., Paço and Raposo 2010; Cardoso and van Schoor 2017; Sousa et al. 2021; Correia et al. 2022). Hence, it is expected that this study contributes to filling this research gap by analysing the importance of attitudes, subjective norms, perceived behavioural control, and companies' green communication in the Portuguese college students' green purchasing intention and behaviour.

The remainder of this paper is organised as follows: After an introduction to the theme, the second section portrays the relevant literature review and research hypotheses. The following section is devoted to the methodology, with a detailed description of the questionnaire design, sample profile, and structural equation modelling (SEM) techniques applied to analyse the data and test the hypotheses. Then, the results are presented and discussed. Finally, the last section is devoted to the main conclusions, limitations, and future research.

2. Literature Review and Research Hypotheses

The TPB is a socio-cognitive model widely applied to explain the individual's behaviour. A key variable in this model is the individual's intention to adopt a specific behaviour, which may be defined as a motivational factor to a certain type of behaviour, and according to the TPB, it is influenced by attitude, subjective norms, and perceived behavioural control (Ajzen 1985, 1991). In a succinct way, attitude may be defined as a positive or negative belief in a particular behaviour; the subjective norm is an individual's

engagement with a specific behaviour due to social pressure; and perceived behavioural control indicates whether an individual's motivation is influenced by how he or she perceives the level of difficulty or simplicity of a specific behaviour (Ajzen 1985, 1991; Conner and Armitage 1998; King and Dennis 2006). In the prior literature, the TPB has extensively been applied in a wide range of fields such as organisational studies, management, leadership, and marketing (Sheppard et al. 1988). More recently, an increasing number of researchers have been using this theoretical framework to predict consumers' intentions and behaviour in different areas of environmental protection, namely regarding attending green hotels and restaurants (Han et al. 2010; Han and Kim 2010; Kim et al. 2013; Chen and Tung 2014; Tommasetti et al. 2018; Liao and Fang 2019); energy saving (Ha and Janda 2012; Clement et al. 2014; Macovei 2015; Gao et al. 2017); and green purchase (Kamalanon et al. 2022; Bhutto et al. 2019; Teo et al. 2016).

Despite its unquestionable validity and important contribution to scientific research development, the supposed predictive effectiveness of the TPB has been the target of harsh criticism, because of the reduced number of explanatory variables (Teo et al. 2016; Wang et al. 2016; Karimy et al. 2015). Hence, many researchers developed extended theoretical models, including additional variables to increase the efficiency of its predictive capacity (Si et al. 2019; Tommasetti et al. 2018). Each newly added construct of the extended TPB framework is undergoing further investigation and categorisation in different research settings and contexts (Jan et al. 2019).

To study the college students' green purchase behaviour, in the present paper, an extended TPB model is applied. The proposed research framework is presented in Figure 1.

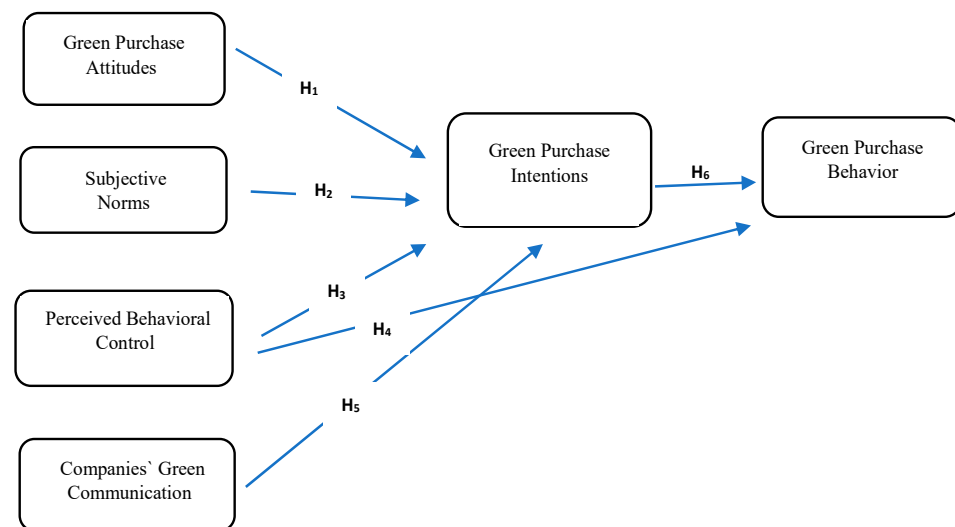


Figure 1. Proposed extended TPB model.

2.1. Green Purchase Attitudes

Attitudes are defined as an individual's positive or negative evaluation of self-performance of a particular behaviour. Green purchase attitudes refer to the degree to which performance of green purchase behaviour is positively or negatively valued (Chen and Deng 2016). According to Sun et al. (2021), consumers' attitudes are recognised as one of the key influence factors to achieving green consumption behavioural intention. Several research studies have shown the existence of a positive relationship between consumers' attitudes and green purchase intentions in different cultures, continents, and product categories (Morris and Venkatesh 2000; Nysveen et al. 2005; Kim and Chung 2011). In this context, the following research hypothesis is proposed:

H1. Green purchase attitudes positively influence green purchase intentions.

2.2. Subjective Norms

Subjective norms represent a key concept for understanding the process of forming people's behavioural intentions, inducing individuals to adopt certain behaviours. It refers to the perceived social pressure that an individual feels to perform or not perform a specific behaviour (Ajzen 1985, 1991). It is assumed that subjective norms are determined by a set of accessible normative beliefs concerning the expectations of important referents, such as family members, relatives, friends, and colleagues. In fact, many researchers observed that individuals' consuming decisions, namely regarding green products, were largely influenced by the attitudes of friends, family members, and other groups that were important to individuals (e.g., 52). Hence, subjective norms can predict behavioural intentions. This study, therefore, proposes to verify the following research hypothesis:

H2. *Subjective norms positively influence green purchase intentions.*

2.3. Perceived Behavioural Control

Ajzen (1985, 1991, 2002) defines perceived behavioural control as the perception of an individual's ability to control or develop a specific behaviour. It has been observed that those who perceive having the resources and opportunities to adopt a certain behaviour reveal a greater intention to adopt it (Ajzen 1985, 1991; Madden et al. 1992). Thus, the present study proposes to test whether the following statement is valid:

H3. *Perceived behavioural control positively influences green purchase intentions.*

Additionally, the perceived behavioural control also directly influences the individual's behaviour, since it has been observed that when individuals perceive having greater control over themselves, they are more likely to adopt certain behaviour. Several arguments support this reasoning: (i) holding intention as a constant, the effort exerted to bring a course of behaviour to a successful conclusion is likely to increase with perceived behavioural control; (ii) considering that an individual's perceptions are accurate, the perceived behavioural control can be used as a measure of actual control, which can be used to predict the probability of a successful behavioural attempt (Ajzen 1985, 1991). In this context, the present study tests the following assumption:

H4. *Perceived behavioural control positively influences green purchase behaviour.*

2.4. Companies' Green Communication

Companies have been communicating the environmentally friendly characteristics of their products, leading to the growing population of a significant segment of well-informed green consumers who criticise producers for the type of communication they deliver (Maniatis 2016). Communication is one of the basic instruments to support organisational change (Kotter and Schlesinger 1979). Communication in green marketing aims to attract consumers' attention to the company's environmental initiatives and environmental responsibility and have positive impacts on consumer behaviour and encourage the purchase of green products (Chen et al. 2006). Communication of green activities deployed by organisations includes advertising, corporate public relations, and visual identifications (Balmer and Greyser 2006).

Companies' green communication is directed to all consumers, with the aim that they become increasingly green and value the attitude of companies as environmentally friendly, choosing to decide to buy their products. Currently, there are several companies in Portugal that produce, sell, and/or distribute green products, developing marketing strategies to show consumers their concern for the environment. The present study extends the TPB model to the analysis of the importance of this variable in the students' intention to purchase green products and, as such, intends to verify the following hypothesis:

H5. *Companies' green communication positively influences green purchase intentions.*

2.5. Green Purchase Intentions

Intentions are a central concept in the TPB framework. It may be defined as a conscious plan to carry out a particular behaviour and the motivation to perform it (Patch et al. 2005). Chen and Chang (2012) believe that green purchase intentions represent the possibility of consumers wishing to purchase environmentally friendly products. Consumers are buying green products to protect or not damage the environment (Brian et al. 2001). Green purchase intentions are among the key variables to measure consumers' current and future purchase decisions for green products. They also help to estimate the green demand of consumers (Zhuang et al. 2021). Hence, the present study proposes to explore the following assumption:

H6. *Green purchase intentions positively influence green purchase behaviour.*

2.6. Green Purchase Behaviour

Purchasing green products may be defined as the act of purchasing products which are environmentally friendly and evading those products which are harmful to the environment. In addition to not polluting the earth and not depleting natural resources, green products can also be recycled, reused, or conserved (Shamdasani et al. 1993). These products fulfil consumers' needs without damaging the environment and, therefore, contribute towards a more sustainable world (Soomro et al. 2020). According to Chen and Chai (2010), green products consume materials which are safer for the environment, are also recyclable, and need less packaging. Following all these complementary definitions, in this study, the products of interest are green cosmetic and hygiene products; green detergents and other cleaning products; clothes produced with natural and/or recycled materials; food from organic farming without using any pesticides; products made from recycled materials such as glass and paper; electrical appliances with high energy efficiency; sustainable building materials and furniture; recycled mobile phones; electric/hybrid vehicles whose use emits less carbon dioxide; and eco-hotels.

3. Materials and Methods

3.1. Participants and Procedures

During the months of March and April 2021, a representative online survey was conducted among the students at the Portuguese HEI Coimbra Business School | ISCAC, using the non-probabilistic convenience sampling method, which resulted in a sample of 432 valid responses. To check the understandability and validity of the questionnaire, a pilot study was performed before the data collection. The sampling design ensured the representativeness of the data according to the following criteria: gender, age, and residence area.

At the beginning of data collection, the participants, all of them volunteers, gave their consent for the collection of information. The questionnaire was organised into two main sections: in the first, participants answered a set of questions about their sociodemographic characteristics, and in the second, participants answered a series of questions about each of the variables under analysis in the extended TPB model.

3.2. Measures

For the purpose of testing the hypotheses, in this study, we used the following latent factors: the five measures of the TPB (green purchase attitudes (GPA), subjective norms (SN), perceived behavioural control (PBC), green purchase intentions (GPI), and green purchase behaviour (GPB)) plus companies' green communication (CGC). In all these measures, adapted from the literature, we used a 5-point Likert scale (1—strongly disagree, 2—disagree, 3—neutral, 4—agree, and 5—strongly agree). Table 1 shows the survey statements contained in the questionnaire and the standardised factor loading for each item. The Cronbach alpha values for all measures are also presented (see Table 2) to perceive if multiple-question Likert scale surveys are reliable.

Table 1. Variables and their measuring statements included in the questionnaire.

Variable	Statements	Sources	Factor Loading
GPA	Buying green products helps to reduce pollution and protect the environment.	Joshi and Rahman (2019)	0.890
	Buying green products helps to reduce the waste of natural resources.		0.872
	Buying green products contribute to the conservation of the natural environment.		0.937
SN	Most of the people whose opinion I consider prefer that I buy green products.	Yadav and Pathak (2016); Yazdanpanah and Forouzani (2015)	0.876
	Most of the people important to me would like me to buy green products.		0.941
	Most of the people who like me think I should buy green products.		0.949
PBC	Most of the people important to me would like me to buy green products.	Yadav and Pathak (2016); Yazdanpanah and Forouzani (2015)	0.871
	Most of the people who like me think I should buy green products.		0.848
	Most of the people whose opinion I consider prefer that I buy green products.		0.694
CGC	I tend to pay attention to advertising messages about environmental protection.	Lai and Cheng (2016); do Paço et al. (2019)	0.748
	I respond favourably to brands that use messages about environmental protection in their advertising.		0.824
	I pay close attention to product labels and tags with all the information about their environmental impacts.		0.631
	I support ways of promoting products through environmentally friendly instruments (e.g., promotional/advertising actions that do not use plastic/waste paper, etc.).		0.718
	I consider it important that companies provide/disclose more information about the environmental characteristics of their products and production methods.		0.720
GPI	I am willing to buy products that use recycled and/or recyclable packaging.	Lai and Cheng (2016)	0.846
	I am willing to buy products that are not tested on animals.		0.695
	I am willing to buy products with the eco-friendly label.		0.876
	I am willing to buy products without (or with few) chemical ingredients.		0.857
	I am willing to buy products that support fair trade.		0.886
	I am willing to buy recycled products.		0.869
	I am willing to buy organic products without the use of any pesticides.		0.796
	I am willing to buy energy-efficient appliances.		0.645
I am willing to buy products from companies with a sustainable and environmentally friendly stance.	0.791		
GPB	I usually buy products with recycled packaging and/or recyclable.	Cardoso and van Schoor (2017); Zhang and Dong (2020)	0.675
	I usually buy products with natural ingredients or containing fewer ingredients chemicals/pollutants.		0.785
	When I go shopping, I look for products with a certificate/label of environmentally friendly product.		0.761
	I usually buy products that support fair trade.		0.728
	I usually buy products that have not been tested on animals.		0.668
	I usually buy organic products.		0.789
	I usually buy organic farming products.		0.763
	I usually buy products that are made from recycled materials or that incorporate recycled materials.		0.694
I usually buy products from companies with a sustainable and environmentally friendly attitude.	0.744		

Table 2. Convergent validity and internal consistency reliability.

Latent Variables	Composite Reliability	Cronbach's Alpha	AVE
GPA	0.926	0.925	0.806
SN	0.945	0.944	0.852
PBC	0.840	0.841	0.636
CGC	0.847	0.847	0.528
GPI	0.942	0.941	0.644
GPB	0.913	0.912	0.540

3.3. Data Analysis

After data treatment, valid cases were submitted to confirmatory factor analysis (CFA) and structural equation modelling (SEM). CFA was performed in order to verify the dimensionality of constructs and to establish convergent and discriminant validity. Subsequently, the structural model was estimated and validated with the covariance-based SEM (CB-SEM) approach since our study is confirmatory. The estimates of the strengths of the paths in the structural model were obtained, as well as the statistical significance of those path estimates.

Analyses were performed using SPSS 27.0 for descriptive statistics and the R software version 4.0.5 (R Core Team 2021) to analyse the measurement and structural models.

4. Results

In this section, the descriptive statistics and the results associated with the structural equation model are presented.

4.1. Descriptive Statistics

Regarding demographic variables, all the participants were students (341) and worker-students (91), comprising 283 (65.5%) female students and 149 (35.5%) male students. Furthermore, 185 (42.8%) students participating in this study lived in urban areas, whereas 244 (56.5%) students resided in rural areas, and 3 students (0.7%) did not respond to this question. The participants were aged from 18 to 62, and the mean age was 22.6 years old (SD = 6.80).

From Table 3, it can be seen that the mean values of attitude and intention were relatively high (out of 5), and the mean values of the other variables were also relatively favourable.

Table 3. Descriptive findings and correlations between latent variables.

	1	2	3	4	5	6	Mean	SD
1. GPA	0.898						4.374	0.742
2. SN	0.349 *	0.923					3.388	0.978
3. PBC	0.165 *	0.351 *	0.797				3.625	0.956
4. CGC	0.454 *	0.305 *	0.084	0.727			3.849	0.745
5. GPI	0.529 *	0.203 *	0.222 *	0.491 *	0.802		4.539	0.589
6. GPB	0.308 *	0.433 *	0.273 *	0.622 *	0.430 *	0.710	3.571	0.710

Note: Bold numbers on diagonal are the square roots of AVE. Below the diagonal elements are the correlations between the constructs (* p -value < 0.001).

4.2. Validity of Measurement Model

The measurement model includes six latent factors indicating attitude, subjective norm, perceived behavioural control, intention, behaviour, and attention to companies' green marketing advertisements. To assess the measurement model's validity, CFA was performed using the covariance-based SEM approach (CB-SEM). The measurement model demonstrated acceptable goodness of fit for the empirical data. The fit indices commonly reported for CFA were calculated and met recommended guidelines (Gana and Broc 2019; Hair et al. 2019). The following values were obtained for the model: CFI = 0.919, TLI = 0.911, RMSEA = 0.064. Moreover, accordingly to Bentler (2006), the chi-square normalised by degrees of freedom should be less than five, and in this case, it was equal to 2.02.

As described by Gefen et al. (2011), the assessment of the constructs involves determining internal consistency reliability, convergent validity, and discriminant validity. To analyse convergent validity, the values of factor loadings and the average variance extracted (AVE) were determined. From Table 1, it can be seen that the factor loadings values of all items were above 0.6 (with a minimum value of 0.631). Regarding the AVE, it is recommended that it exceeds 0.5 (Fornell and Larcker 1981). All the values of AVE verified this condition, as shown in Table 2. These results indicated convergent validity. To assess internal consistency, the composite reliability and Cronbach alpha values were calculated. Table 2 shows that all of the measures were above the recommended value of 0.7, suggesting the high reliability of the scales (Hair et al. 2019).

According to Hair et al. (2019), a rigorous test to assess discriminant validity is to compare the AVE values for any of the constructs with the square of the correlation estimate between these two constructs. This criterion requires that the diagonal value in bold be higher than the values in its row and column. As depicted in Table 3, this criterion was accomplished for all constructs; therefore, it could be confirmed as the discriminant validity.

4.3. Structural Model

The results of the structural model assessment are shown in Table 4.

Table 4. Structural path estimates.

Path	Coefficient	t-Statistics	p-Value
GPA -> GPI	0.269	4.283	0.000
SN -> GPI	-0.058	-1.672	0.095
PBC -> GPI	0.099	2.835	0.005
CGC -> GPI	0.281	5.413	0.000
PBC -> GPB	0.182	3.892	0.000
GPI -> GPB	0.450	6.360	0.000

Table 4 outlines the hypothesis testing. We conclude that green purchase attitudes, perceived behavioural control, and companies' green communication had a positive influence on green purchase intentions at the 5% level of significance. The relationship between each of these independent variables and intention was positive and significant, supporting H1, H3, and H5, respectively. We highlight that the strongest impact was obtained by companies' green communication (coefficient = 0.281; t-statistics = 5.413), followed by green purchase attitudes (coefficient = 0.269; t-statistics = 4.283), and perceived behavioural control (coefficient = 0.099; t-statistics = 2.835). Hypothesis H2 was not supported since subjective norms had no significant impact on green purchase intentions at the 5% level of significance.

Hypotheses H4 and H6 were also supported since the variables perceived behavioural control and green purchase intentions had significant impacts on green purchase behaviour. The evidence revealed that intention was a highly significant factor (coefficient = 0.450; t-statistics = 6.360).

5. Discussion

Based on the TPB, in this research, we constructed a conceptual model of influencing factors and mechanisms of green purchase behaviour. The conducted analysis showed that all the proposed research hypotheses were confirmed by the results, except for hypothesis H2. A summary of the results of hypothesis verification is presented in Table 5.

Table 5. Hypothesis results for the research.

Hypothesis	Results
H1	√—accepted
H2	X—not accepted
H3	√—accepted
H4	√—accepted
H5	√—accepted
H6	√—accepted

Notably, the results confirmed that green purchase attitudes were a significant predictor of students' green purchase intentions. This finding is consistent with that of earlier research. According to Chen et al. (2022), consumers' attitudes increase customer demand towards green purchase behavioural intention, contributing to the transformation towards a sustainable society. In a study by Nguyen et al. (2019), the authors confirmed the existence of a positive relationship between attitudes and green purchase intentions and concluded that individuals believe that the behavioural intention of green consumption can protect their health. Shimul et al. (2021) reported that consumers' environmental and natural green-product-related knowledge and information can lead to an increase in consumer positive attitudes and purchase of green products behavioural intention.

Surprisingly, although subjective norms were considered imperative indicators of an intention to purchase green products based on the TPB (Liu et al. 2018), the achieved

results revealed that they had no significant impact on students' green purchase intentions, leading to the observation that students might not pay attention to social influence when purchasing green products. As stressed by [Si et al. \(2019, pp. 17–18\)](#), “the empirical results of many TPB based environmental behavior studies are inconsistent, despite having the same topic and background.” As stressed by [McCarty and Shrum \(2001\)](#), relationships are far from simple. It is, however, important to promote the understanding of the research results and explore its root causes. Contrary to our expectations, the results revealed that the students' subjective norms had no significant impact on their green purchase behavioural intentions. Although in most studies, it is observed that social influence is a good starting point to stimulate green purchase behavioural intention, there may be other factors countering this effect, namely, social, economic, and demographic influences, which may affect the individual's green purchase intentions. These external factors were not considered in this research model. [ElHaffar et al. \(2020\)](#) analysed 58 articles, addressing some unexpected results labelled as “green gaps” referring to the inconsistency between what the individual says regarding his/her growing concern about the environmental problems and what he/she does in terms of actions, behaviours, and contributions to lessen the consequences of these problems. The authors ([ElHaffar et al. 2020](#)) underlined the urgent need for more qualitative studies to understand individuals' behaviour and stressed that the research focus should change from the reasons behind the green gaps to implementing solutions to those gaps. [Wijekoon and Sabri \(2021\)](#) performed an extensive review study of green purchasing behaviour from 2015 to 2021, identifying different broad enablers, motives, and obstacles that influence consumers' decision-making process for green products, and provided potential clarification for the contradictions encountered. As a result of the review, the authors identified 212 variables that affect green purchase intent, and, thus, underline the need to complement the simplicity and evident limitation of the explanatory variables of the TPB model. [Kumar et al. \(2017\)](#) found that subjective norms had no significant impact on either consumers' intention to purchase green products or their consumption behaviour in collectivist societies. [Rausch and Kopplin \(2021\)](#) also found an insignificant effect of subjective norms on green purchase intention and behaviour. According to these authors, the factors intervening in the relationship between subjective norms and green purchase intention are still unexplored.

The results confirmed that students' perceived behavioural control positively influenced both their intentions and behaviour. As stressed by [Choi and Johnson \(2019\)](#), the effect of perceived behavioural control mainly reflects students' stronger willingness to buy when they are more confident in their purchasing capacity. Hence, companies should provide consumers with reliable information on the benefits of green purchasing, since effective information may increase consumers' confidence in their purchasing ability. Moreover, if students are aware of the environmental protection effects of green purchase behaviour, their green purchase intention will increase ([Zhuang et al. 2021](#)). On the other hand, perceived behavioural control also positively influences students' green purchase behaviour. These conclusions are consistent with those of previous research. For instance, [Vermeir and Verbeke \(2006\)](#) perceived that behavioural control represented how much a person believed it to be easy or difficult to purchase a product made by following environmental, social, and economic sustainability, due to a series of reasons that can make the purchase decision articulated and complex. In a research study focusing on adolescents' green behaviour, [Poškus \(2020\)](#) analysed the explanatory value of this variable and concluded that despite people having different perceived behavioural control regarding green products, individuals' perceived behavioural control is an important determinant of both green intentions and behaviour.

In our extended TPB model, an extra explanatory variable was introduced: the companies' green communication. The purpose was to understand how important companies' communication is in the students' intention to purchase green products, and the results confirmed the existence of a positive relationship. As stressed by previous research (e.g., [Flavián et al. 2005](#); [Ko et al. 2013](#); [Chang 2015](#); [Chen et al. 2020](#); [Ansu-Mensah 2021](#);

Kamalanon et al. 2022), a company's positive green image and its communication tend to increase consumers' purchase intention and have significant impacts on purchase decisions. Based on the TPB, an individual's belief directly translates to actual behaviour; thus, if a consumer trusts a green company, then he or she will continue to purchase its products (Zhuang et al. 2021). According to Kamalanon et al. (2022), marketers should provide more opportunities for consumers to become familiar with green products, which is possible with more effective communication, to enhance the company's positive green image and eventually result in future green purchasing.

Finally, as predicted, students' green purchase intention appeared to be a meaningful predictor of green purchase behaviour. In the literature on green purchase intentions, several authors have proven that green purchase intention is a strong predictor of green purchase behaviour (Yadav and Pathak 2016; Lai and Cheng 2016; Al Mamun et al. 2018). In the study of Fontes et al. (2021), for instance, the authors examined the environment-related antecedent of green purchase behaviour in Portugal and concluded that green purchase intention positively influences green purchase behaviour, enhancing the key role of companies' green communication in consumers' green purchase intention. As stressed by Correia et al. (2022), if properly measured, green behaviour intention explains a considerable part of the actual green behaviour. In some studies (Naz et al. 2020; Tommasetti et al. 2018; Macovei 2015; Godin and Kok 1996; Hausenblas et al. 1997; Niaura 2013; Yang et al. 2019), the correlation coefficient between behavioural intention and behaviour is estimated, assuming significant levels to be above 0.4.

6. Conclusions

Green purchase is an environmentally responsible behaviour characterised by advocating for nature and protecting the environment. It is considered an effective way to mitigate environmental problems and has raised the interest of both companies and consumers in recent years. Hence, in the last few years, consumers have expressed a growing interest in purchasing green products. On the other hand, companies are revealing a growing interest in exploring the impacts of effective green communication in a more balanced environment.

Based on an online survey of 432 students of an HEI in Portugal, this research study analysed, through the application of the TPB, which variables influenced students' green purchasing behaviour. The results showed that all the variables, except the subjective norms, had positive influences on the students' green purchase intentions. Moreover, it was observed that students' intentions had positive influences on their green purchase behaviour. This research provides important results not only for policymakers to promote more sustainable behaviours among consumers but also for companies to be more aware of the importance of green communication.

This research has some limitations which are expected to be explored and overcome in the future, namely the inclusion of more variables and the deepening of the role and available tools of HEI in promoting more environmentally sustainable behaviours among students. Moreover, in order to achieve greater reliability in the results, particularly in the comparison between individuals' intentions and actual behaviours, it would be interesting to develop a longitudinal study, with the data collected over several years in order to verify if respondents' intentions are reflected in their actual behaviours.

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