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The mediating effect of Covid-19 environmental impact perception on green purchase behaviour

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Dissertation report presented as partial requirement for obtaining the Master's degree in Statistics and Information Management

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THE MEDIATING EFFECT OF COVID-19 ENVIRONMENTAL IMPACT PERCEPTION ON GREEN PURCHASE BEHAVIOUR

By

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Dissertation report presented as partial requirement for obtaining the Master's degree in Statistics and Information Management, with a specialization in Marketing Research and CRM.

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ABSTRACT

The Covid-19 pandemic impacted drastically people's lives and we all had to adapt to this new reality. Consumer behaviour and habits have radically changed due to lockdowns and studies confirm that this could have unleashed a more sustainable behaviour for individuals. Using partial least squares structural equation modelling to evaluate a model that combines the Theory of Planned Behaviour and the Theory of Consumption values, we aim to explore the perception of Covid-19 impact on the environment and how this perception mediates the green purchase behaviour of individuals. With data collected from a questionnaire from 390 Portuguese individuals, findings demonstrate that Covid-19 environmental impact perception has a mediating effect on green purchase behaviour and intention. Additionally, we found that attitude is the most important driver for green purchase intention, and, in turn, it is the most important construct to explain green purchase behaviour. On the other hand, all consumption values showed to be significant except for functional value price. The consumption values that had the highest effect were emotional value followed by conditional value. The findings of this study will be useful for marketers in gaining insight into consumers' green purchase behaviour and intention during the Covid-19 outbreak.

KEYWORDS

Covid-19 Pandemic; Green Products; Consumer Behaviour; Theory of Planned Behaviour; Theory of Consumption Values.

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1 Introduction

For some years now, consumer behaviour has gained significant importance, and, for the sake of companies' growth, it is essential for marketers to understand and predict consumers' activities associated with the purchase, use and disposal of goods. Understanding how consumers behave, will lead companies and organizations to success and increase customers satisfaction by giving them what they need and desire at a certain moment (Eger et al., 2021). The direction of consumer behaviour has been changing. Individuals have become more aware of the impact of their consumption habits on the environment, and, for that reason, they seek to purchase environmentally friendly products (Paul et al., 2016) for the benefit of future generations.

According to Eurobarometer data from 2009, 83% of EU-27 citizens considered that a product's environmental impact is fundamental when choosing which products to purchase. Europeans think that the best approach to address environmental issues is by "changing the way we consume" (European_Commission, 2022).

Green products are one type of environmentally friendly products that "strive to protect the natural environment by using energy-conservative resources and reducing the use of toxic agents, pollution, and waste" (Noble et al., 2006). This growth in the usage of green products is due to increased consumer awareness about health and environmental issues (Setyawan et al., 2018). However, it is difficult to predict these kinds of behaviours since many factors may influence them.

On 11th of March 2020, the World Health Organization (WHO) declared Covid-19 as a pandemic and, since then, the uncertainty that we live in is one of the major factors that has been influencing consumer behaviour. Humans tend to behave differently when "surrounded by a sense of fear or anxiety, especially during a disaster or extreme situations" (Dulam et al., 2021) and, inevitably, all individuals had to adapt to this new reality changing their motivations and beliefs.

Due to constant lockdowns and partial shutdowns of factories across the world, global supply chains have been drastically affected leading to serious damage to the global economy (Alexa et al., 2021). At the same time, news, studies and social media showed that the quality of air and water increased since the levels of pollution decreased (Lucarelli et al., 2020). According to studies, the Covid-19 disaster has renewed public enthusiasm for addressing environmental issues. Based on research conducted in the EU, between 66% and 76% of customers plan to purchase more expensive products in 2020 if they are beneficial for the environment (European_Commission, 2022).

Very few studies have proposed theoretical models to explore potential mediating effects derived from the Covid-19 impact perception. For instance, Karadas et al. (2022), analysed the mediating effect of Covid-19 risk perception on the relationship between mindfulness and preventive health behaviour and concluded that Covid-19 positively mediates that relationship. However, there is still a lack of research on the mediating effect of Covid-19 on the eco-friendly field.

This study seeks to contribute to the literature in this respect by exploring individuals' intention to purchase green products during the Covid-19 pandemic. It delves into the person's psychological makeup and perspective on the issue, as well as the various situations that they find themselves in. Therefore, its main contributions are threefold: First, it adds to the current knowledge on consumer behaviour by checking the mediating effect of Covid-19 environmental impact perception between the relationship of green purchase intention and green purchase behaviour. This specific context will lead to a better understanding of how the pandemic influenced individuals' behaviour (Eger et al., 2021). Second, the study proposes a theoretical model that combines the Theory of Planned Behaviour (Ajzen, 1991) with the Theory of Consumption Values (Sheth et al., 1991), which are theories that are rarely used together but both used in consumer behaviour. By doing so, it combines how consumers' motivations (functional value, emotional value, epistemic value and conditional value) influence consumer behaviour, as well as how psychological beliefs (attitude towards the behaviour, subjective norm and perceived behavioural control) influence the green purchase, which to the best of the authors' knowledge, has not yet been done. Third, it seeks to identify what factors in the proposed model differ the most across different individuals. Together, these three contributions will provide innovative ways for organizations and policymakers to contribute to a greener-centred behaviour for consumers (Moser, 2015) while having into consideration the differences among them. Nonetheless, it will also contribute to the psychological field by understanding how individuals behave when inserted in a catastrophic situation (Eger et al., 2021).

The remainder of the paper is structured as follows. First, a theoretical background of the problem is presented, introducing the concepts of green products, the environmental perception impact of Covid-19 on consumers' behaviour and the two used theories: Theory of Planned Behaviour and Theory of Consumption Values. Second, a research model is proposed, and hypotheses are developed. Third, the research model is described, and study results are reported. Finally, a discussion, theoretical and practical implications, and conclusions are presented.

2 Theoretical background

2.1 Green products

The green consumer, as defined by Gonçalves et al. (2016) is "a consumer that takes into account the public consequences of his or her private consumption or who tries to use his or her purchasing power to promote social change". Over the years there has been a significant increase in the purchase of less harmful products, such as green products. Companies should invest in green orientation in order to achieve higher profitability and customer satisfaction (Luo & Bhattacharya, 2013).

The main determinants of green purchase behaviour may be grouped into two main categories: individual and situational factors (Joshi & Rahman, 2015). Individual factors are

related to an individual decision maker: emotions, habits, perceived consumer effectiveness, perceived behavioural control, values and personal norms, trust and knowledge. On the other hand, situational factors are external situational forces that affect the green purchase decision of consumers: price, product availability, subjective or social norm and reference groups, product attributes and quality, brand image and eco-labelling.

In fact, the increased consumer awareness and information about health and environmental issues have improved the consumption of green products and organic food over the last few years (Setyawan et al., 2018). People are joining more easily to pro-environmental behaviours (Gonçalves et al., 2016; Kautish et al., 2019; Tanrikulu, 2021) and purchasing more green products overall (Hameed et al., 2019; Paul et al., 2016; Sreen et al., 2018). Specifically, the most searched green products are green skincare products (Hsu et al., 2017) and natural or organic food (Carfora et al., 2021).

As studies confirmed that environmental concern affects green purchase behaviour (Lin & Huang, 2012), and having in consideration that consumers with higher environmental concern are more likely to purchase environmentally friendly products and show greater readiness to choose them, for the aim of this research, green purchase will be studied in order to understand if this behaviour had any significant effect during the pandemic outbreak.

2.2 Covid-19 environmental impact perception and consumers' behaviour during the Pandemic

This global crisis has affected societies and economics around the world and influenced many sectors in different ways. This atypical situation brought many consequences for individuals and has drastically changed how businesses act and consumers behave (Eger et al., 2021). Due to the measures adopted to mitigate the spread of the virus, many consumers had to move to online shopping, home deliveries or cashless payment, which many of them never considered before (Pantano et al., 2020). With that, managers, marketers and businesses had to understand customers' needs and change their strategies according to them.

Among the many changes in consumer behaviour, studies showed that different generations reacted in distinctive ways to those changes and all their behaviours varied according to their personal success, hobbies, education, friendships, the health of close ones and personal health (Eger et al., 2021). However, there is still a lack of research on the implications that Covid-19 had on individuals, specifically in the intention to behave sustainably.

Many factors may influence individuals' intention to behave in a sustainable way and, even though there has been an exponential growth in individuals' intention to behave friendly, it is hard to do so: friendly products are usually more expensive; it is time consuming; behaving friendly does not have an immediate result; it only shows results when done collectively. All those factors can be demotivating into wanting to behave friendly and "friendly behaviours are costly and often evoke a conflict between what individuals want for themselves and what they should do for the environment"(Meijers, 2014).

Besides the factors that were mentioned, there are also external uncontrollable factors that force us into behaving a certain way, which is the case of Covid-19. Although studies confirm that since the beginning of the pandemic people became more conscious towards their behaviours, this global crisis had such a huge impact that we lost control over many things: many people are still afraid to use public transports, which contributes to higher levels of pollution (Przybylowski et al., 2021); and specially the demands for personal protective equipment increased, which led to the subsequent generation of plastic wastes (Jung et al., 2021).

On a positive note, Tchetchik et al. (2021) suggest that Covid-19 may serve as a turning point for changing behaviour and taking responsible actions and, post-crisis will enable a shift towards eco-friendly behaviour patterns. That study also mentions that the pandemic has strengthened the conviction among pro-environmentalists as well as affected people who engaged in pro-environmental behaviour with low intensity.

Therefore, for the aim of this research, the environmental impact perception of Covid-19 will be crucial to study since the research centres on understanding the changes that it brought to consumers' behaviour, specifically sustainable behaviour, and analysing how different fields can implement strategies for their own benefit as well as improve measures to protect the planet.

2.3 Theory of Planned Behaviour

Theory of Planned Behaviour (TPB) is a psychological theory that links beliefs to behaviour. It is one of the most used theories to explain and predict the relationship between various variables and the purchase intention of individuals in a specific time and place (Ajzen, 2002).

This theory contains three core frameworks: attitude towards behaviour, subjective norm and perceived behavioural control. Attitude towards behaviour refers to the degree to which a person has a favourable or unfavourable evaluation or appraisal of the behaviour in question (Ajzen, 1991). It can have two outcomes: positive or negative. The positive outcome will lead to a higher probability for the individual to perform a certain behaviour. Subjective norm refers to the pressure of whether most people approve or disapprove of the behaviour (Ajzen, 1991). Finally, perceived behavioural control *"*refers to people's perception of the ease or difficulty of performing the behaviour of interest" (Ajzen, 1991). Perceived behavioural control is actually the additional component that differentiates the Theory of Planned Behaviour from the Theory of Reasoned Action.

The determinants of a person's intention and actions are also based on salient beliefs, which are the specific small number of beliefs that are considered at any given moment (Ajzen, 1991). Three kinds of salient beliefs are distinguished: behavioural beliefs, normative beliefs and control beliefs. The aforementioned beliefs influence the three frameworks mentioned: attitude towards behaviour, subjective norms and perceived behavioural control, respectively.

Theory of Planned Behaviour has been commonly used in studies that aim to predict consumer intention in a wide range of green/pro-environmental areas. For example, Moser (2015)

showed what are the most important drivers of pro-environmental purchasing behaviour toward green products in a German market with the usage of TPB and additional variables, such as personal norms and willingness to pay. Similarly, other authors also showed extended versions of this theory on the buying intention of consumers on green products (Dangelico et al., 2021; Setyawan et al., 2018; Yadav & Pathak, 2016).

This theory has also been widely used on the effect of Covid-19 on pro-environmental behaviours and intention to behave in a more sustainable way (Alexa et al., 2021; Lucarelli et al., 2020; Qi & Ploeger, 2021), demonstrating that consumers from the used samples do intend to purchase more locally and sustainably produced goods. Findings from these studies and similar ones contribute to a better understanding of the significance of sustainability, hence supporting practitioners in creating policies and initiatives that promote a sustainable way of life.

For the aim of this study, all three components will be used to analyse the purchase intention of green products since studies showed that attitude toward these types of products significantly influences their intention of getting them (Yadav & Pathak, 2016). Additionally, subjective norm has also shown to be significant in the intention to acquire green products (Setyawan et al., 2018). Finally, perceived behavioural control also has shown to be a significant variable in that matter (Yadav & Pathak, 2016).

2.4 Theory of Consumption Values

Theory of Consumption Value (TCV) is a marketing theory that demystifies the motivations for consumers' consumption behaviour through consumption values (Tanrikulu, 2021). It explains "why consumers choose to buy or not buy (or use or not use) a specific product, why consumers choose one product type over another, and why consumers choose one brand over another" (Sheth et al., 1991).

The Theory of Consumption Value has been used in a wide range of fields such as economics, marketing, consumer behaviour, sociology and psychology. It is composed by five consumption values: functional value, conditional value, emotional value, social value and epistemic value. Firstly, functional value is the primary driver of consumers' choice. It is characterized as the "perceived utility for consumers relies on an alternative capacity for functional, utilitarian, or physical performance, such as reliability, durability, and price" (Lin & Huang, 2012). Second, social value is related to the tendency for individuals to seek approval and recognition from the purchase of a specific product (Awuni & Du, 2016). Third, emotional value is the perceived utility of an alternative's capacity to arouse feelings or affective states (Sheth et al., 1991). Fourth, epistemic value refers to the perceived utility resulting from a product or service that stimulates the desire for knowledge and offers novelty (Sheth et al., 1991). Finally, conditional value refers to the perceived utility that a product or service has as result of a situation or set of circumstances facing the decision maker, for example, seasonal events (e.g., Christmas cards), emergency situations (e.g., firefighter service) or unique events (e.g., a wedding gown) (Sheth et al., 1991).

This theory has three main axiomatic propositions (Sheth et al., 1991): (1) consumer choice is a function of multiple consumption values; (2) consumption values make different contributions in any given choice situation; (3) consumption values are independent. TCV has demonstrated consistently good predictive validity. In the most known research of TCV "Why We Buy What We Buy: A Theory of Consumption Values", Jagdish Sheth applied this theory in buying decisions (smokers or non-smokers), product decisions (filtered or non-filtered cigarette), and brand decisions (Marlboro or Virginia Slim).

For this research, all five consumption values components will be used except for social value since subjective norm from TPB is relatively similar to this construct, therefore avoiding multicollinearity. Studies show that when consumption values are used simultaneously, they are effective to understand the choice of consumer behaviour, specifically in the purchase intention of green products (Awuni & Du, 2016; Lin & Huang, 2012; Tanrikulu, 2021). However, there is a lack of research in the usage of this theory on the perception of Covid-19's effect on green behaviour.

Table 1 and Table 2 provide a summary of earlier studies on various green purchasing behaviours. It displays the underlying theories and constructs used, the context (where applicable), and the main findings in terms of significant constructs. From the illustrative studies shown in both tables, in the majority of the cases, at least one of the constructs from any of the theories has shown to be significant.

Table 1. Summary of previous research on green purchase behaviour using TPB

Reference	Context	Additional Constructs to TPB	Main Findings
(Dangelico et al., 2021)	Green products	Environmental concern; product unavailability; materialism; creativity; purchase satisfaction; value for money; personal norms	Personal norms, value for money, creativity, materialism are good predictors. Green purchase satisfaction is the strongest predictor
(Moser, 2015)	Green products	Willingness to pay	Willingness to pay showed to be the strongest predictor of green purchasing behaviour.
(Yadav & Pathak, 2016)	Green products	Environmental concern; environmental knowledge	Additional and TPB constructs showed to be useful to predict young consumers' intention towards purchasing green products.
(Setyawan et al., 2018)	Green products	Environmental concern; environmental knowledge; willingness to pay	Attitude and environmental concern did not influence the purchase intention toward green products whereas the other constructs did.
(Hsu et al., 2017)	Green skincare products	Country of origin; price sensitivity	TPB showed to have a significant impact on purchase intention of green skincare products. Country of origin and price sensitivity have a moderating effect.
(Han et al., 2010)	Green hotels		The constructs from TPB showed to positively affect the intention to stay at a green hotel.
(Sreen et al., 2018)	Green products	Collectivism; long-term orientation; man-nature orientation	Findings suggest that collectivism is related to all three predictors from TPB while long-term orientation is insignificantly related to attitude towards green products while examining the direct effects.
(Paul et al., 2016)	Green products	Environmental concern	Attitude and perceived behavioural control significantly predict purchase intention while subjective norm does not.
(Hameed et al., 2019)	Green products	Intrinsic religious orientation; green trust; environmental concern	All relationships are significant except for attitude towards green products and eco-conscious behaviour
(Liobikiene et al., 2016)	Green products	Knowledge of green products; confidence in green products	Subjective norms and interaction of knowledge and confidence in green products significantly determined the green purchase behaviour in all EU countries.
(Kautish et al., 2019)	Green products	Perceived consumer effectiveness; willingness to be environmentally friendly; environmental consciousness; recycling intention	Environmental consciousness and recycling intention significantly moderates the impact of perceived consumer effectiveness and wiliness to be environmentally friendly on green purchase behaviour. Perceived behaviour control has no effect.
(Lucarelli et al., 2020)	Not applicable	Covid-19	Individuals with greater awareness of interdependencies show higher intention and reinforced pro-environmental behaviours.
(Qi & Ploeger, 2021)	Green food	Moral attitude; health consciousness; impact of Covid-19	All associations are significant except for subjective norm and purchase intention since they vary within the TPB and extended TPB models.
(Ruiz-Rosa et al., 2020)	Not applicable	Covid-19	Social entrepreneurial intention is influenced by socioeconomic crises and uncertainty, such as the Covid-19 crisis.
(Alexa et al., 2021)	Sustainable brands		Subjective norms and perceived behavioural control are significant.

Table 2. Summary of previous research on green purchase behaviour using TCV

Reference	Context	Additional Constructs to TCV	Main findings
(Tanrikulu, 2021)	Not applicable		Findings demonstrate that TCV remained up to date in the consumer behaviour literature.
(Awuni & Du, 2016)	Green products		From TCV, social and emotional values are the ones that have a positive effect.
(Lin & Huang, 2012)	Green products	Environmental concern;	Results show that the factors that influence the least are functional values, price and quality. Additionally, consumers with high environmental concern are the ones that support and choose more green products.
(Gonçalves et al., 2016)	Green products		Functional value is almost always necessary but is not sufficient by itself for predicting green buying. It must be individually combined with emotional, conditional and social values.
(Zailani et al., 2019)	Biofuels		Findings suggest that all constructs from TCV showed to be significant except for social values.
(Kushwah et al., 2019)	Organic food	Environmental concern; buying involvement; ethical consumption intention	There is a significant association of social, emotional, and epistemic values with ethical consumption intentions.
(S. N. Khan & Mohsin, 2017)	Green products	Environmental value	Emotional value has a moderating effect on the role of functional, social, conditional, epistemic and environmental values.
(Mohd Suki, 2016)	Green products		Functional (price), emotional and conditional values have no significant effects.
(Ali et al., 2019)	Green IT products	Religious value	All TCV constructs used, and religious values showed to positively impact the consumer intention to adopt green IT products.
(Roh et al., 2022)	Organic food	Theory of Reasoned Action; green perceived values; trust; perceived knowledge	Green perceived values affect consumers' attitudes. Purchase intention was also positively affected by attitude and subjective norm.
(Truong et al., 2021)	Organic food		The importance of consumption values varies between products and individuals' characteristics.
(Majeed et al., 2022)	Natural food	Attitude	Findings suggest that functional (quality), emotional, conditional, and epistemic values have a positive impact on consumers' choice behaviour and their environmental concerns.
(Cao et al., 2021)	Organic food	Anxiety; sustainable consumption attitude	There is a significant association of functional (price), emotional and epistemic values with purchase behaviour. Anxiety had a positive influence on all constructs from TCV. Sustainable consumption attitude had a positive moderating effect on functional value (price) and purchase behaviour.

3 Research model and hypotheses

The research model used in this study combines the Theory of Planned Behaviour and the Theory of Consumption Values. Both theories have shown to predict well human behaviours. TPB is designed to predict and explain human behaviour in specific contexts (Ajzen, 1991) while TCV explains why consumers make the choices they do (Sheth et al., 1991). Adding to that, Covid-19 environmental impact perception will be mediating the relationship between green purchase intention and behaviour. The theoretical constructs and the relationships between them are depicted in Figure 1.

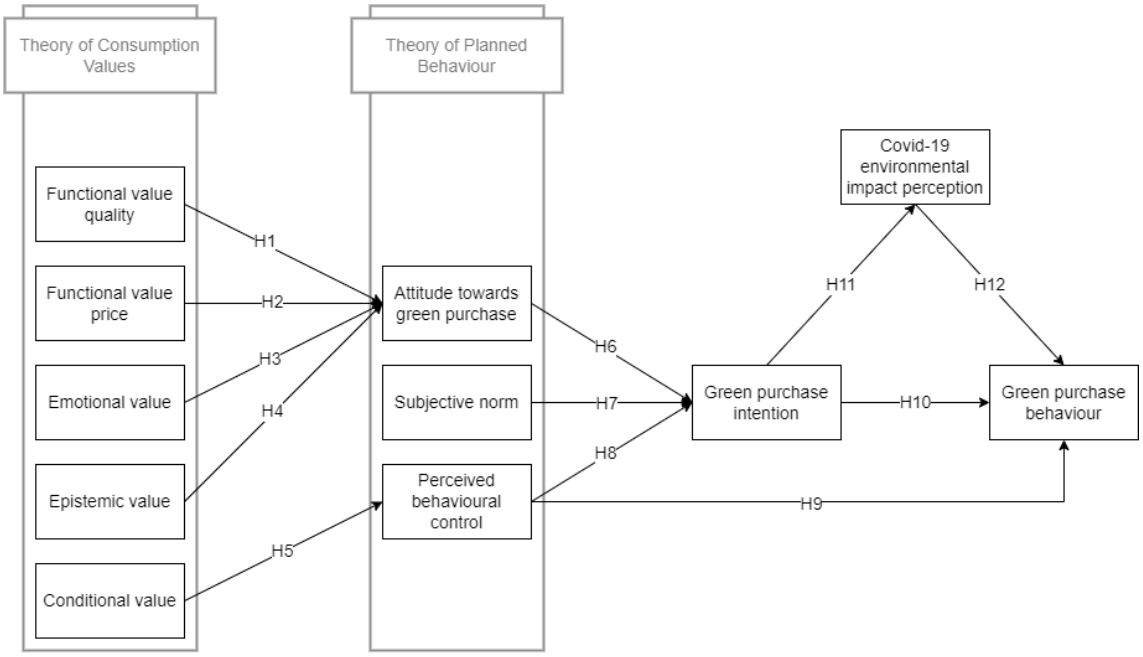

Figure 1. Research model

Functional value

Functional value is the perceived utility acquired from an alternative's capacity for functional, utilitarian, or physical performance (Sheth et al., 1991). It is presumed to be the primary driver of consumers' choice and contains characteristics or attributes such as reliability, durability, quality and price, which are equally important characteristics when choosing green products. Functional value has already been shown to be significant to variables such as frequency of green products purchase (Dangelico et al., 2021) and intention to purchase these types of products (S. N. Khan & Mohsin, 2017). Adding to that, the construct attitude is based on the favourable or unfavourable evaluation of the behaviour in question (Ajzen, 1991). Therefore, we can assume that this perceived favourable or unfavourable attitude comes, in a way, from the functional value previously mentioned, which can be divided into functional value quality and functional value price. Therefore, we hypothesize that:

H1: Functional value quality has a positive effect on attitude towards green purchase.

H2: Functional value price has a positive effect on attitude towards green purchase.

Emotional value

Emotional value refers to "the perceived utility that results from a product or service that provokes feelings or affective states" (Sheth et al., 1991). According to Sheth, this value varies according to subjective and emotional encounters and, those levels may vary based on different consumption situations as well as different circumstances. Consumers' behaviour with regard to the environment is manipulated by emotional value (Lin & Huang, 2012). We suggest that this value could have an impact on the attitude towards green purchase since prior studies on sustainable products already support the role of emotional value in purchase decision (Gonçalves et al., 2016; Lin & Huang, 2012), meaning that it could impact the consumers' positive or negative evaluation of the product. For that reason, we hypothesize:

H3: Emotional value has a positive effect on attitude towards green purchase.

Epistemic value

Epistemic value results from the ability of the product to stimulate interest, infuse newness, or fulfil the need for new knowledge of the matter (Sheth et al., 1991). The amount of information that we have nowadays helps consumers to acknowledge the production methods, impact on the environment and credibility of the products (Mohd Suki, 2016). In the world that we live in today, information is power and individuals desire to know more about everything. Epistemic value showed to have a positive impact on green purchase behaviour in many countries (Gonçalves et al., 2016; S. N. Khan & Mohsin, 2017; Lin & Huang, 2012). Having that in consideration, we can assume that there is a possible connection between epistemic value and attitude since the information disposed could influence the appraisal of the behaviour in question. Therefore, we hypothesize that:

H4: Epistemic value has a positive effect on attitude towards green purchase.

Conditional value

Conditional value depends on the different choices made by the customer in the marketplace due to the situation and circumstances found at the moment (Sheth et al., 1991). Conditional value is dependent on time, place, context and personal situations. Similar findings show that when purchasing green products, information regarding global warming and environmental threat were found to have a substantial effect on consumers' decision (Lin & Huang, 2012). At the same time, perceived behavioural control refers to the perceived ease or difficulty of performing the behaviour. The more resources and opportunities individuals believe they possess, and the fewer obstacles or impediments they anticipate, the greater should be their perceived control over their behaviour (Ajzen, 1991). In line with these arguments, this research proposes:

H5: Conditional value has a positive effect on perceived behavioural control.

Attitude towards green purchase

As it was previously mentioned, attitude towards the behaviour reflects on the favourable or unfavourable evaluation or appraisal of the behaviour in question (Ajzen, 1991). It is a psychological emotion routed through consumers' evaluations: when the opinion on the behaviour is more favourable, the individual is more likely to perform that behaviour. Various empirical studies in the past have supported the claim that there is a positive association between attitude and green purchase intention (Hsu et al., 2017; Yadav & Pathak, 2016). Accordingly, this study also uses this construct from TPB to measure consumers' purchase intention of green products. Thus, we propose that:

H6: Attitude towards green purchase will positively affect green purchase intention.

Subjective norm

Subjective norm is related to individuals' feelings about the social pressure they feel about a given behaviour (Ajzen, 1991). It is highly influenced by the opinion of others that are important and influence one's decision making. However, subjective norm had already been identified as the weakest link in the intention models by earlier researchers that applied the TPB in general (Ajzen, 1991). Past studies have shown a significant impact between subjective norms and purchase intention in the green field (Hsu et al., 2017; Setyawan et al., 2018; Yadav & Pathak, 2016). Therefore, this study intends to check if there is an association between subjective norm and green purchase intention. Thus, we hypothesize:

H7: The impact of subjective norm on green purchase intention will be positive.

Perceived behavioural control

Among the previous antecedents in TPB, perceived behavioural control becomes the most important when considering behaviours. It is based on past experiences and possible obstacles that can be in the way of the actual behaviour (Ajzen, 1991). At the same time, according to Ajzen, those that have a higher degree of control over themselves, have a stronger intention to perform a particular behaviour. Many studies have shown that perceived behavioural control is positively linked with intention in various research contexts of green products (Han et al., 2010; Hsu et al., 2017; Yadav & Pathak, 2016). In light of the above, we propose that:

H8: The impact of perceived behavioural control on green purchase intention will be positive.

Additionally, there is a difference in the intention of purchasing green products and the actual behaviour of purchasing them. This is a relationship that should also be considered and goes according to the model of the author of TPB (Ajzen, 1991) even though this relationship is not commonly discussed in many studies. Therefore:

H9: The impact of perceived behavioural control on green purchase behaviour will be positive.

Green purchase intention

Purchase intention is different from actual behaviour. Ajzen showed with different examples that there is a positive correlation between the individuals' intention towards behaviour and its posterior actual behaviour (Ajzen, 1991). Having that in account and the scope of this research, there may exist a positive correlation between the intention to purchase green products and the actual act of purchasing them, meaning that people who intend to purchase green products are more likely to actually purchase them. Therefore, following the original Ajzen's model, we hypothesize that:

H10: Green purchase intention will positively affect green purchase behaviour.

Mediating effect of Covid-19 environmental impact perception

Consumers' behaviours have changed since the beginning of this crisis and studies show that Covid-19 could have a mediating effect on some relationships (Karadas et al., 2022). Specifically, in this study, Covid-19 increased the relationship between mindfulness and preventive health behaviour. However, there is still a gap of Covid-19's mediating effect on the green field. For instance, individuals that have higher intention to purchase green products can be more likely to be concerned about the environment, but this concern can be stronger if that person thinks that the pandemic had a negative effect on the environment, thus resulting in a higher green purchase behaviour. Therefore, according to the scope of this study, we test if Covid-19 environmental impact perception could have a mediating effect between the relationship of green purchase intention and behaviour. Thus, the mediating effect of Covid-19 environmental impact perception is hypothesized as:

H11: Green purchase intention will positively affect Covid-19 environmental impact perception.

H12: Covid-19 environmental impact perception will positively affect green purchase behaviour

4 Methods

4.1 Measurement items

All items used to measure the model constructs were adapted from the literature with slight modifications to fit the context of the study. TCV constructs were all adopted from Lin & Huang (2012). Regarding the constructs from TPB, attitude, subjective norm, perceived behavioural control and purchase intention were all adopted from Paul et al. (2016). Additionally, green purchase intention and green purchase behaviour were adopted from Yadav & Pathak (2016). Finally, Covid-19 environmental impact perception was adopted from Qi & Ploeger (2021) and Tchetchik et al. (2021).

Most items, were measured using seven-point range scales, ranging from totally disagree (1) to totally agree (7). Green purchase behaviour was measured by asking respondents about their actual behaviour regarding the acquisition of green products, therefore, the scale ranged from never (1) to always (7). Covid-19 environmental impact perception was measured by asking the respondents about their perception of this impact on society and the environment, ranging from worse (1) to better (7). Gender, academic education and occupation were measured on a nominal scale. Age was measured on an interval scale. The measurement items for all constructs are included in Appendix A.

4.2 Data collection

The questionnaire was developed in Portuguese and only administered to the Portuguese population. The survey was delivered online since it was the most appropriate way of "reaching out" to participants and ensuring heightened levels of responses. The online questionnaire was sent via email to Nova IMS students and via social media to other individuals. Participation in the survey was voluntary and satisfied the ethical standards of the lead-University.

A pilot study was initially conducted to test the measurement instrument. Its purpose was to mainly verify the reliability and validity of the measurement scales and check whether respondents were able to interpret and answer the questions clearly. The pilot study was answered by 30 respondents, confirming preliminary validity and reliability of the measurement instrument. All items were kept, even though some questions were eliminated since they were redundant or did not show to be relevant. Minor linguistic adjustments were made in order to avoid ambiguity and a clearer interpretation of the questions. The data from the pilot study were not included in the main study as a means to ensure maximum levels of data reliability and to reduce potential bias.

Data were collected in Portugal for a month (from April 20th to May 24th). The total number of responses received was 602. After removing all incomplete questionnaires, the final number of valid questionnaires was 390, leading to a response rate of 64.8%, which is a pleasant result.

Table 3 shows sample characteristics for the total sample. Of the 390 respondents 66.7% were female, 33.1% were male and only one respondent identified as other. The largest group of respondents belongs to the 18-23 age group (30.8%). A majority of participants completed high school (41.5%), followed by those with a bachelor's degree (41%). Finally, most of the respondents (52.1%) indicated that they are employed.

Table 3. Sample characteristics (n=390)

Measure	Value	Frequency	%
Gender	Male	129	33.1%
	Female	260	66.7%
	Other	1	0.3%
Age	18-23	120	30.8%
	24-29	39	10%
	30-35	27	6.9%
	36-41	30	7.7%
	42-47	37	9.5%
	48-53	67	17.2%
	53 +	70	17.9%
Education	Middle school	20	5.1%
	High school	162	41.5%
	Bachelor's degree	160	41%
	Master's degree	39	10%
	PhD Scholar	7	1.8%
	Other	2	0.5%
Occupation	Student	79	20.3%
	Student-worker	39	10%
	Self-employed	35	9%
	Employed	203	52.1%
	Unemployed	6	1.5%
	Retired	16	4.1%
	Other	12	3.1%

5 Data Analysis and results

We used partial least squares structural equation modelling (PLS-SEM) to validate the measurement model and test the structural model. PLS is a variance-based structural equation modelling technique. This technique is chosen over the covariance-based structural equation modelling (CB) as it is primarily used to develop theories and is less demanding on the sample size and distribution (Henseler et al., 2015). To assess the measurement and structural model, SmartPLS 4 software was used.

5.1 Measurement model

The conceptual model has only reflective constructs. Reflective measures are analysed for indicator reliability, composite reliability, convergent, and discriminant validity. For the assessment of the reflective measurement model, the evaluation for accepting or rejecting indicators or constructs, was based on the stipulated values of Hair et al. (2017) .

First, to confirm the indicators' reliability outer loadings were analysed. The applied criterion required that all outer loadings should be, preferably, higher than 0.7 and those that are lower than 0.4 should be removed. All indicators met the criterion except CON_VAL_3, PBC_4 and COV_IMP_1 which were dropped since they did not meet the requirements. Consequently, indicator reliability is confirmed.

Second, to evaluate the constructs' reliability we analysed the composite reliability (CR). This value should be higher than 0.7. Therefore, all indicators met the criteria, and we can conclude that composite reliability is ensured.

Third, to assess the convergent validity, the construct should explain more than half of the variance of its indicators, meaning that, the average variance extracted (AVE) should be higher than 0.5. As Table 4 shows, this criterion is verified for all constructs.

To evaluate the discriminant validity, three criteria were used: Fornell-Larcker, cross-loadings and Heterotrait-Monotrait (HTMT). For the Fornell-Larcker criterion, the square root of each construct's AVE should be greater than its correlation with any other construct, which is supported as Table 5 indicates. Next, when analysing the cross-loadings, discriminant validity is also assessed since all indicators' outer loadings on each construct are higher than its cross-loadings (Appendix B). Ultimately, for the HTMT ratio, presented in the Table 6, its values should be below the value of 0.9, which is also verified. Therefore, since all measures satisfy each one of the criteria, we can conclude that discriminant validity is supported.

Table 4. AVE, CR and Loadings

Construct	Item	AVE	CR	Loading	t-statistic
Functional value quality (FV_QUA)	FV_QUA_1	0.754	0.925	0.873	37.244
	FV_QUA_2			0.881	50.991
	FV_QUA_3			0.900	77.111
	FV_QUA_4			0.818	22.904
Functional value price (FV_PRI)	FV_PRI_1	0.716	0.909	0.892	68.238
	FV_PRI_2			0.917	88.465
	FV_PRI_3			0.875	45.909
	FV_PRI_4			0.678	13.219
Emotional value (EMO_VAL)	EMO_VAL_1	0.705	0.877	0.867	41.866
	EMO_VAL_2			0.911	84.160
	EMO_VAL_3			0.731	21.987
Epistemic value (EPI_VAL)	EPI_VAL_1	0.682	0.865	0.841	33.839
	EPI_VAL_2			0.856	39.096
	EPI_VAL_3			0.778	28.102
Conditional value (CON_VAL)	CON_VAL_1	0.653	0.784	0.638	7.981
	CON_VAL_2			0.948	38.221
Attitude towards green purchase (ATI)	ATI_1	0.794	0.920	0.904	62.481
	ATI_2			0.889	48.910
	ATI_3			0.880	43.621
Subjective norm (SN)	SN_1	0.768	0.908	0.927	98.699
	SN_2			0.935	120.148
	SN_3			0.755	20.544
Perceive behavioural control (PBC)	PBC_1	0.619	0.830	0.769	22.732
	PBC_2			0.798	31.538
	PBC_3			0.793	24.602
Covid-19 environmental impact perception (COV_IMP)	COV_IMP_2	0.713	0.881	0.847	48.348
	COV_IMP_3			0.856	36.836
	COV_IMP_4			0.829	32.467
Green purchase intention (INT)	INT_1	0.810	0.945	0.916	82.612
	INT_2			0.911	71.734
	INT_3			0.889	49.969
	INT_4			0.833	54.845
Green purchase behaviour (BEH)	BEH_1	0.655	0.904	0.878	70.319
	BEH_2			0.903	77.464
	BEH_3			0.815	32.079
	BEH_4			0.719	17.992
	BEH_5			0.712	21.589

Table 5. Fornell-Larcker discriminant validity

Construct	1	2	3	4	5	6	7	8	9	10	11
1. ATI	**0.891**										
2. BEH	0.440	**0.809**									
3. CON_VAL	0.477	0.331	**0.808**								
4. COV_IMP	0.319	0.442	0.233	**0.844**							
5. EMO_VAL	0.644	0.366	0.472	0.356	**0.840**						
6. EPI_VAL	0.497	0.511	0.412	0.383	0.417	**0.826**					
7. FV_PRI	0.376	0.376	0.408	0.249	0.406	0.318	**0.846**				
8. FV_QUA	0.503	0.348	0.485	0.354	0.484	0.369	0.520	**0.869**			
9. INT	0.681	0.628	0.485	0.500	0.575	0.522	0.401	0.484	**0.900**		
10. PBC	0.527	0.548	0.424	0.365	0.356	0.436	0.405	0.386	0.652	**0.787**	
11. SN	0.486	0.496	0.334	0.366	0.426	0.368	0.293	0.254	0.586	0.493	**0.877**

Table 6. Heterotrait-Montrait ratio

Construct	1	2	3	4	5	6	7	8	9	10	11
1. ATI											
2. BEH	0.492										
3. CON_VAL	0.735	0.415									
4. COV_IMP	0.375	0.531	0.349								
5. EMO_VAL	0.766	0.447	0.772	0.455							
6. EPI_VAL	0.603	0.622	0.624	0.480	0.537						
7. FV_PRI	0.398	0.430	0.526	0.310	0.482	0.381					
8. FV_QUA	0.570	0.380	0.735	0.414	0.568	0.443	0.564				
9. INT	0.760	0.690	0.674	0.578	0.682	0.612	0.430	0.535			
10. PBC	0.631	0.680	0.590	0.475	0.454	0.568	0.517	0.471	0.778		
11. SN	0.559	0.577	0.465	0.448	0.535	0.452	0.349	0.290	0.662	0.634	

5.2 Structural model

Since the previous results from the measurement model showed to validate each one of indicator reliability, composite reliability, convergent and discriminant validity, we next proceed with the analysis of the structural model. In this section, the bootstrap resampling method is used with 5000 iterations in order to verify the hypotheses and associations between constructs. To accept or reject the values from the structural model, the criteria was used from Hair et al. (2017).

Before running the bootstrap method, on the PLS-Algorithm, we assessed the values for VIF inner model in order to check if there were any collinearity issues. According to Table 7, we concluded that there were no issues since all values for VIF were lower than 5. Additionally, values for R^2, Q^2 and f^2 of endogenous latent constructs were also assessed and they can be found in Table 8 and Table 9.

Table 7. VIF Inner model

Construct	1	2	3	4	5	6	7	8	9	10	11
1. ATI									1.528		
2. BEH											
3. CON_VAL										1.000	
4. COV_IMP		1.338									
5. EMO_VAL	1.472										
6. EPI_VAL	1.281										
7. FV_PRI	1.447										
8. FV_QUA	1.599										

9. INT	2.018	1.000		
10. PBC	1.746		1.541	
11. SN			1.457	

The coefficient of determination (R^2) is the predictive power of the model. The model explains 44.7% of green purchase behaviour and 62% of green purchase intention, which are the two most important variables in order to answer the scope of the study. These values are considered to have substantial and moderate predictive power, respectively (Henseler et al., 2009). Next, the Q^2 values for all endogenous constructs was over 0, hence, predictive relevance was established. Finally, we assessed the values of f^2, which tells us how much an exogenous latent variable contributes to an endogenous latent variable's R^2 value. The values from Table 9 revealed that the effect size (f^2) for green purchase behaviour were small since f^2=0.034; f^2=0.143; and f^2=0.055 are considered that way by Henseler et al. (2009) while in green purchase intention the values were medium, since f^2=0.268; f^2=0.186 are attributed to that category.

Table 8. R^2, Q^2 values

Variables	R^2 Value	Q^2 predict
Attitude towards green purchase	0.507	0.494
Green purchase behaviour	0.447	0.238
Covid-19 environmental impact perception	0.250	0.170
Green purchase intention	0.620	0.496
Perceived behavioural control	0.180	0.165

Table 9. f^2 values

Construct	1	2	3	4	5	6	7	8	9	10	11
1. ATI									0.268		
2. BEH											
3. CON_VAL										0.219	
4. COV_IMP		0.034									
5. EMO_VAL	0.275										
6. EPI_VAL	0.087										
7. FV_PRI	0.001										
8. FV_QUA	0.045										
9. INT		0.143		0.333							
10. PBC		0.055							0.186		
11. SN									0.097		

Next, to assess the values of the path coefficients, we run the bootstrap resampling method and we conclude that eleven hypotheses were supported (H1, H3, H4, H5, H6, H7, H8, H9, H10, H11 and H12) and only one was rejected (H2). All paths are positive. Presented Table 10 and Figure 2 show all hypotheses and their coefficients and, the association that has the highest effect is hypothesis H11, which is between green purchase intention and Covid-19 environmental impact perception (β =0.500).

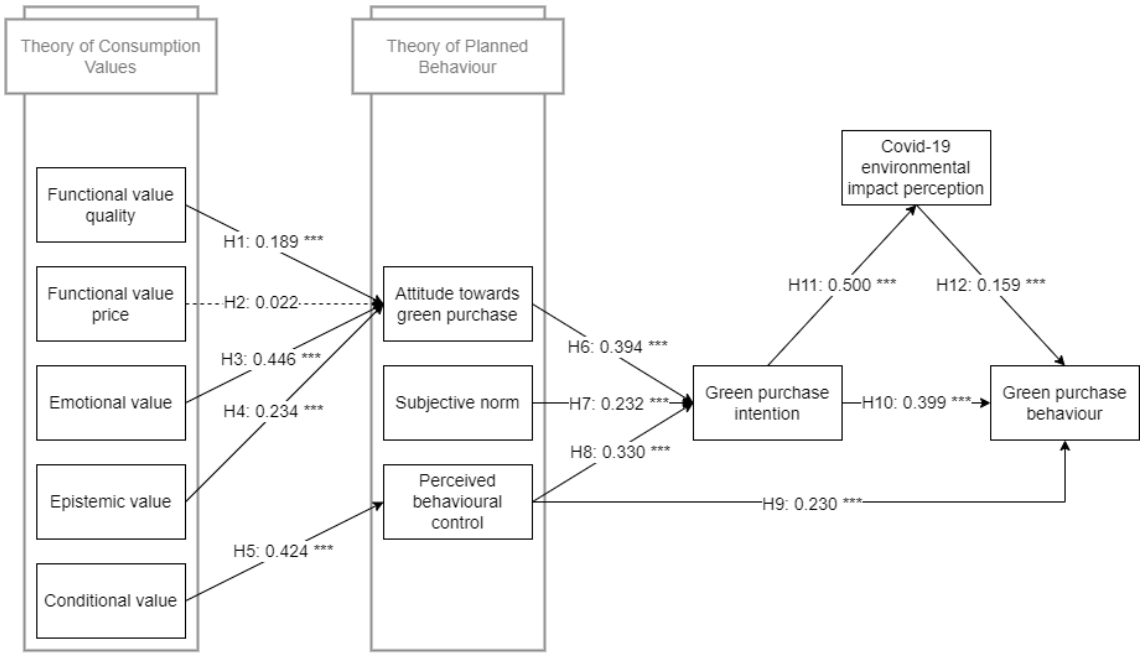

Figure 2. Structural model. Note: significant at *p<0.1; **p<0.05; ***p<0.01

Covid-19 environmental impact perception is evaluated as a mediator between green purchase intention and green purchase behaviour. Mediation occurs when a third variable intervenes between two other related constructs, meaning that, a change in the exogenous construct causes a change in the mediator variable, which, in turn, results in a change in the endogenous construct (Hair et al., 2017). We test the indirect effect (Table 11) and results show that green purchase intention has a statistically significant effect on green purchase behaviour and is mediated by Covid-19 environmental impact perception.

Table 10. Summary of the results

Hypotheses	Coefficient (β)	p-Value	Supported or rejected
H1. Function value quality -> Attitude towards green purchase	0.189 ***	0.000	Supported
H2. Functional value price -> Attitude towards green purchase	0.022	0.630	Not supported
H3. Emotional value Attitude towards green purchase	0.446 ***	0.000	Supported
H4. Epistemic value -> Attitude towards green purchase	0.234***	0.000	Supported
H5. Conditional value -> Perceived behavioural control	0.424***	0.000	Supported
H6. Attitude towards green purchase -> Green purchase intention	0.394***	0.000	Supported
H7. Subjective norm -> Green purchase intention	0.232 ***	0.000	Supported
H8. Perceived behavioural control -> Green purchase intention	0.330 ***	0.000	Supported
H9. Perceived behavioural control -> Green purchase behaviour	0.230 ***	0.001	Supported
H10. Green purchase intention -> Green purchase behaviour	0.399 ***	0.000	Supported
H11. Green purchase intention -> Covid-19 impact perception	0.500***	0.000	Supported
H12. Covid-19 impact perception -> Green purchase behaviour	0.159 ***	0.001	Supported

Table 11. Specific indirect effect

Path	Indirect effect	p-Value
Green purchase intention -> Covid-19 environmental impact perception -> green purchase behaviour	0.079	0.002

5.3 Multi-group analysis

Individual variations among respondents, such as demographic factors, will provide different statistical results. The multi-group analysis tests whether there are significant differences in group-specific parameter estimates. The multi-groups that were chosen to be analysed were gender (male and female) and occupation (self-employed and employed) because, out of all possible multi-groups, these were the ones that had more relevant statistical differences.

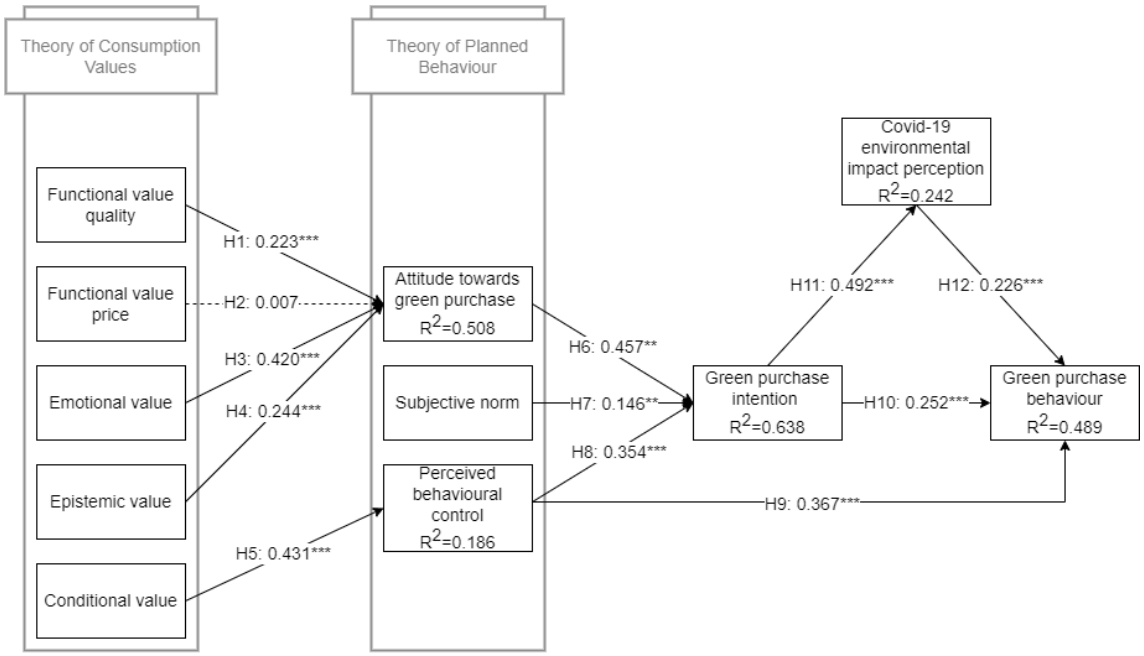

Figure 3. Multi-group analysis for female group

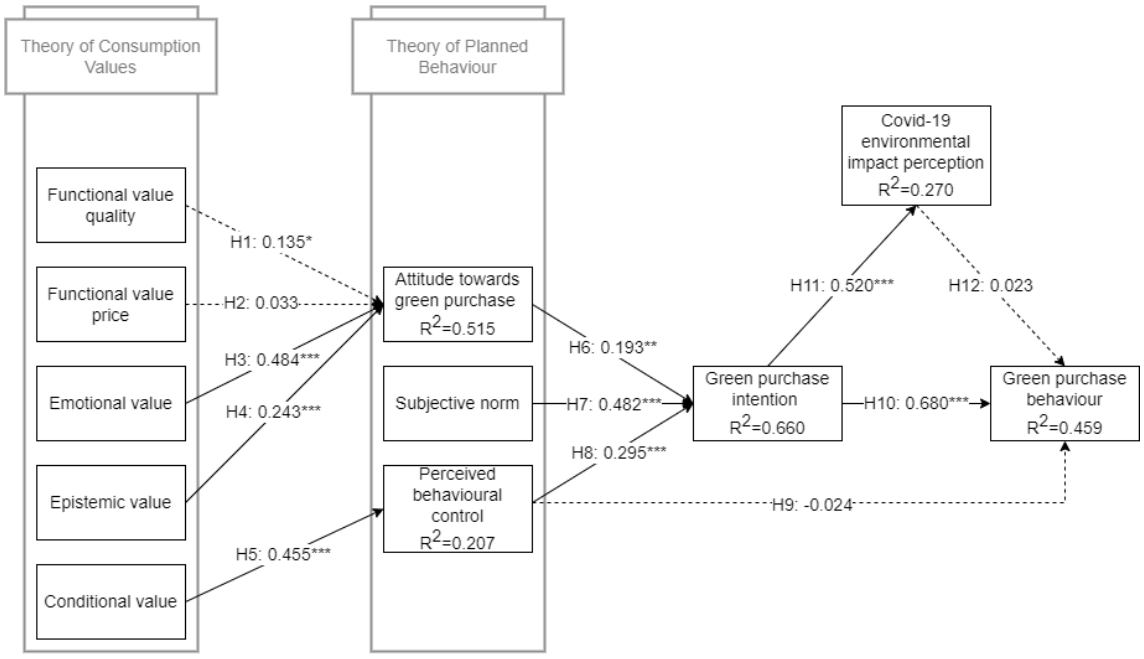

Figure 4. Multi-group analysis for male group

Regarding the female group (Table 12 and Figure 3) there is only one relationship that showed to be not significant, which was between functional value price and attitude towards green purchase. This relationship already showed to be not supported in the original model. On the other hand, the male group (Table 12 and Figure 4) has four relationships that are not supported: functional value quality and attitude towards green purchase; functional value price and attitude towards green purchase; perceived behavioural control and green purchase behaviour; and Covid-19 environmental impact perception and green purchase behaviour.

Additionally, in Table 13, when comparing the numerical differences between the two groups, there are five relationships that are shown to be significant: attitude towards green purchase and green purchase intention; Covid-19 environmental impact perception and green purchase behaviour; green purchase intention and green purchase behaviour; perceived behavioural control and green purchase behaviour; and subjective norm and green purchase intention.

Table 12. Summary of hypotheses results for female and male group

	Supported or rejected	
Hypotheses	Female (N=260)	Male (N=129)
H1. Function value quality -> Attitude towards green purchase	Supported	Not supported
H2. Functional value price -> Attitude towards green purchase	Not supported	Not supported
H3. Emotional value Attitude towards green purchase	Supported	Supported
H4. Epistemic value -> Attitude towards green purchase	Supported	Supported
H5. Conditional value -> Perceived behavioural control	Supported	Supported
H6. Attitude towards green purchase -> Green purchase intention	Supported	Supported
H7. Subjective norm -> Green purchase intention	Supported	Supported
H8. Perceived behavioural control -> Green purchase intention	Supported	Supported
H9. Perceived behavioural control -> Green purchase behaviour	Supported	Not supported
H10. Green purchase intention -> Green purchase behaviour	Supported	Supported
H11. Green purchase intention -> Covid-19 environmental impact perception	Supported	Supported
H12. Covid-19 environmental impact perception -> Green purchase behaviour	Supported	Not supported

Table 13. Multi-group analysis results between female and male. Significant differences in bold

	Female (N=129)		Male (N=260)		Female-Male	
Path	β	p-Value	β	p-Value	β	p-Value
Attitude towards green purchase -> Green purchase intention	**0.457**	**0.000**	**0.193**	**0.015**	**0.264**	**0.007**
Conditional value -> Perceived behavioural control	0.431	0.000	0.455	0.000	-0.023	0.806
Covid-19 environmental impact perception -> Green purchase behaviour	**0.226**	**0.000**	**0.023**	**0.762**	**0.203**	**0.031**
Emotional value -> Attitude towards green purchase	0.420	0.000	0.484	0.000	-0.063	0.493
Epistemic value -> Attitude towards green purchase	0.244	0.000	0.243	0.001	0.001	0.984
Functional value price -> Attitude towards green purchase	0.007	0.899	0.033	0.661	-0.026	0.788
Functional value quality-> Attitude towards green purchase	0.223	0.000	0.135	0.188	0.088	0.462
Green purchase intention -> Green purchase behaviour	**0.252**	**0.003**	**0.680**	**0.000**	**-0.427**	**0.000**
Green purchase intention -> Covid-19 environmental impact perception	0.492	0.000	0.520	0.000	-0.028	0.749
Perceived behavioural control-> Green purchase behaviour	**0.367**	**0.000**	**-0.024**	**0.829**	**0.391**	**0.003**

Perceived behavioural control -> Green purchase intention	0.354	0.000	0.295	0.000	0.059	0.500
Subjective norm -> Green purchase intention	**0.146**	**0.018**	**0.482**	**0.000**	**-0.335**	**0.003**

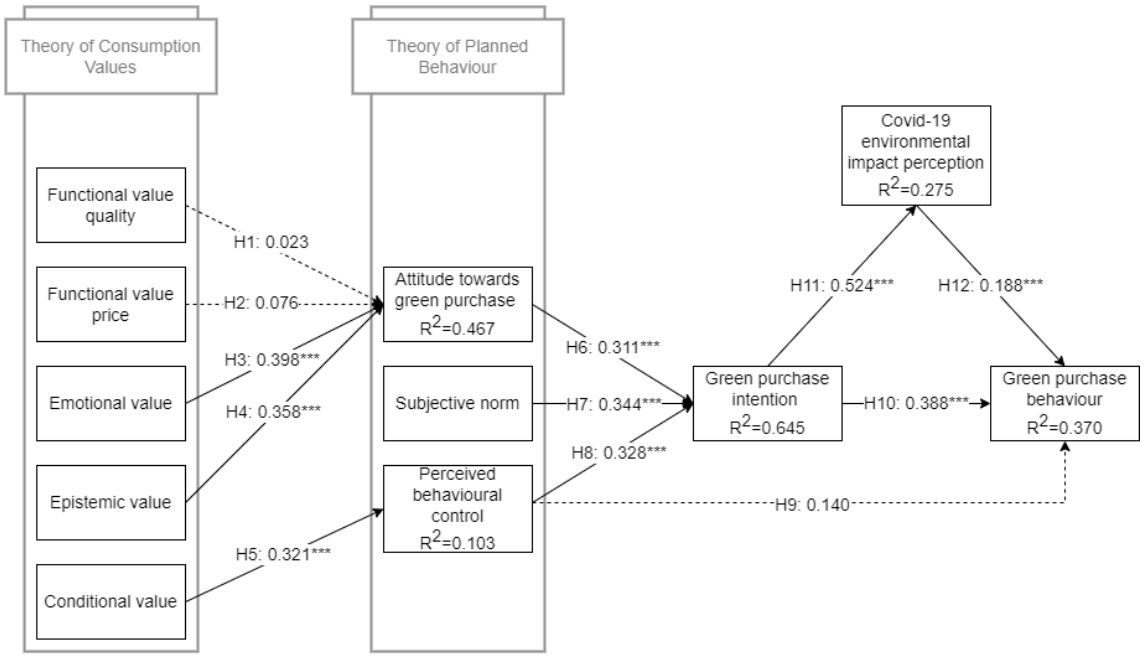

Figure 5. Multi-group analysis for employed group

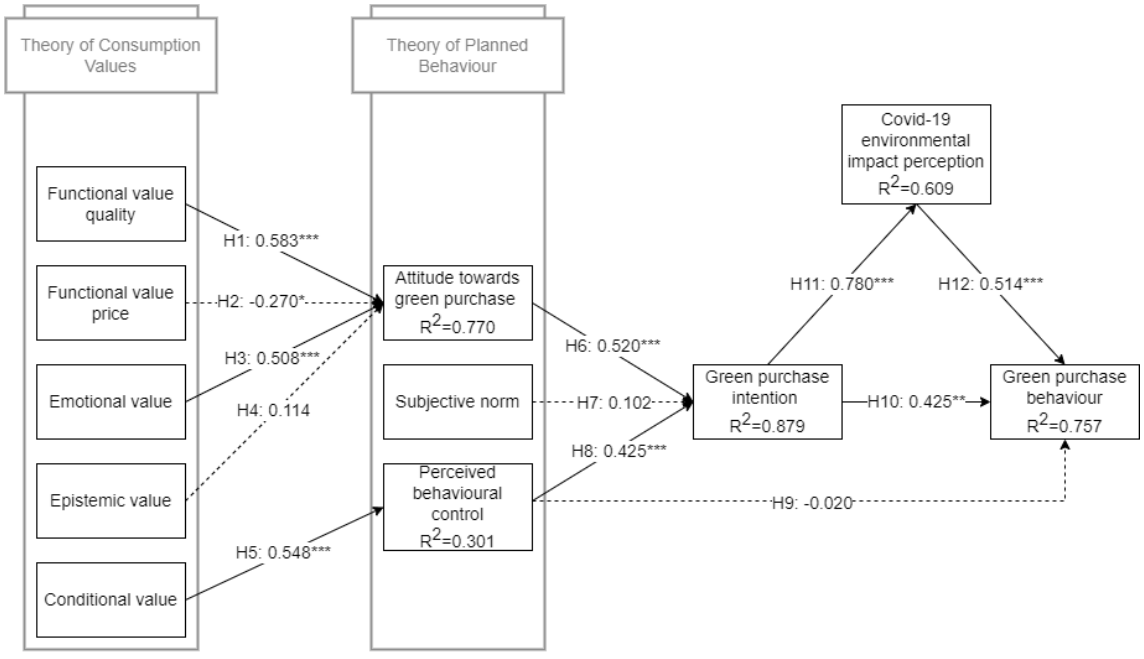

Figure 6. Multi-group analysis for self-employed group

In Table 14 and Figure 5, for the employed group, there are three relationships that are not supported: functional value quality and attitude towards green purchase; functional value price and attitude towards green purchase; and perceived behavioural control and green purchase behaviour. For the self-employed (Table 14 and Figure 6), there are four relationships that are not supported: functional value price and attitude towards green purchase; epistemic

value and attitude towards green purchase; subjective norm and green purchase intention; and perceived behavioural control and green purchase behaviour.

Finally, in Table 15, the numerical disparities between the two groups are compared. There are four relationships that are shown to be significant: Covid-19 environmental impact perception and green purchase behaviour; functional value price and attitude towards green purchase; functional value quality and attitude towards green purchase; and green purchase intention and Covid-19 environmental impact perception.

Table 14. Summary of hypotheses results for employed and self-employed group

	Supported or rejected	
Hypotheses	Employed (N=203)	Self-employed (N=35)
H1. Function value quality -> Attitude towards green purchase	Not supported	Supported
H2. Functional value price -> Attitude towards green purchase	Not supported	Not supported
H3. Emotional value Attitude towards green purchase	Supported	Supported
H4. Epistemic value -> Attitude towards green purchase	Supported	Not supported
H5. Conditional value -> Perceived behavioural control	Supported	Supported
H6. Attitude towards green purchase -> Green purchase intention	Supported	Supported
H7. Subjective norm -> Green purchase intention	Supported	Not supported
H8. Perceived behavioural control -> Green purchase intention	Supported	Supported
H9. Perceived behavioural control -> Green purchase behaviour	Not supported	Not supported
H10. Green purchase intention -> Green purchase behaviour	Supported	Supported
H11. Green purchase intention -> Covid-19 environmental impact perception	Supported	Supported
H12. Covid-19 environmental impact perception -> Green purchase behaviour	Supported	Supported

Table 15. Multi-group analysis between employed and self-employed. Significant differences in bold

	Employed (N=203)		Self-employed (N=35)		Self-employed – Employed	
Path	β	p-Value	β	p-Value	β	p-Value
Attitude towards green purchase -> Green purchase intention	0.311	0.000	0.520	0.000	0.209	0.148
Conditional value -> Perceived behavioural control	0.321	0.000	0.548	0.000	0.228	0.111
Covid-19 environmental impact perception -> Green purchase behaviour	**0.188**	**0.007**	**0.514**	**0.000**	**0.327**	**0.034**
Emotional value -> Attitude towards green purchase	0.398	0.000	0.508	0.000	0.111	0.422
Epistemic value -> Attitude towards green purchase	0.358	0.000	0.114	0.435	-0.243	0.122
Functional value price -> Attitude towards green purchase	**0.076**	**0.234**	**-0.270**	**0.083**	**-0.347**	**0.046**
Functional value quality-> Attitude towards green purchase	**0.023**	**0.766**	**0.583**	**0.003**	**0.559**	**0.017**
Green purchase intention -> Green purchase behaviour	0.388	0.000	0.425	0.033	0.037	0.903
Green purchase intention -> Covid-19 environmental impact perception	**0.524**	**0.000**	**0.780**	**0.000**	**0.256**	**0.005**
Perceived behavioural control-> Green purchase behaviour	0.140	0.152	-0.020	0.937	-0.160	0.551
Perceived behavioural control -> Green purchase intention	0.328	0.000	0.425	0.000	0.097	0.404
Subjective norm -> Green purchase intention	0.344	0.000	0.102	0.401	-0.241	0.087

6 Discussion

6.1 Main findings

The current research aims to study the environmental impact of Covid-19 on consumer green purchase behaviour. When joining the Theory of Planned Behaviour with the Theory of Consumption Values, findings demonstrate that the merge of these theories provided new insights into the motivations behind green purchase intention and behaviour. Additionally, with this research, we can now discuss the relationship between green purchase intention and green purchase behaviour and its mediation effect by Covid-19 environmental impact perception.

The hypotheses of the initial model were tested and most of them are supported. All predictors for green purchase intention showed to have a positive significant effect, similar to previous studies (Maichum et al., 2016; Sun et al., 2022). The strongest predictor of green purchase intention was attitude, showing that individuals that have a more positive position towards attitude of purchasing green products, are more likely to intend to purchase them. Following that, like the majority of research findings (Botetzagias et al., 2015; O. Khan et al., 2020), perceived behavioural control is also a strong predictor of intention, meaning that, the easiness of purchasing green products stimulates the intention of purchasing them. And finally, the weakest relationship towards intention is subjective norm, which goes in line with the original theory of Ajzen (1991); however, it is still a relevant construct to explain intention, since in this study, consumers show to be vulnerable to social pressure and easily influenced by others, implying that it is a driving force behind intention.

The mediating effect of Covid-19 environmental impact perception between green purchase intention and behaviour, is explained by the fact that individuals with higher intention of purchasing green products are more likely to have a higher perception that the pandemic had a negative impact on the environment and, for that reason, individuals' concern for it increased, consequently leading to a positive effect on the actual behaviour of green purchase. In regard to green purchase behaviour, its strongest predictor, as was expected, is intention. This shows that individuals that have higher intention to purchase green products are the ones that are more likely to actually purchase them. At last, the result of perceived behavioural control on behaviour implies that the individuals' effectiveness in purchasing green products results in bigger chances of acquiring them (O. Khan et al., 2020).

Regarding consumption values, the only one that did not show to be significant, and consequently, the only hypothesis that was rejected in the model, was functional value price, meaning that green products' price has no effect on attitude. Contrarily, functional value quality showed to have a positive significant effect on attitude, hence, the higher the products' quality, the more receptive individuals are to the concept of purchasing them. Additionally, emotional value is the predictor that had the highest effect on attitude. Individuals are easily influenced by emotions and, the feeling of purchasing a green product instead of a conventional one, fulfils them in such a positive way that they have a more positive reaction towards the idea and attitude of purchasing green (Sangroya & Nayak, 2017). Finally, the last construct that explains attitude is epistemic value. This goes in line with previous research

(Mohd Suki, 2016) and this relationship exists since individuals that are more informed and interested in knowing products' benefits, differences and impacts, are eager to be more responsive towards green purchase (attitude).

The last relationship to be mentioned is the positive effect that conditional value has on perceived behavioural control. This occurs when the conditions for the consumer are more favourable during the acquisition of a product, for example, when in the presence of discounts, promotions and availability, it is easier for individuals to be more convinced of the purchase of ecological products.

This study also shows that there are differences between the demographic variables gender and occupation, specifically for employed and self-employed individuals. First of all, there are five paths that showed to have statistical differences for female and male groups: attitude towards green purchase and green purchase intention; Covid-19 environmental impact perception and green purchase behaviour; green purchase intention and green purchase behaviour; perceived behavioural control and green purchase behaviour; and subjective norm and green purchase intention. Individually, for males, the quality and price of the products did not have an effect on the attitude towards green purchase, whereas, for females, quality did have a positive impact on attitude. This finding suggests that women are more concerned about the quality of the products than men.

Additionally, green purchase behaviour for females is explained by Covid-19 environmental impact perception, green purchase intention, and perceived behavioural control while for males, green purchase behaviour is only explained by intention. Therefore, findings suggest that there is no mediating effect of Covid-19 environmental impact perception on behaviour for men, which goes according to research, since women are more sensitive to environmental protection and perception (Witek & Kuźniar, 2021). However, when comparing the two groups, the association between intention and behaviour is much higher in the male group. This finding suggests that male individuals that intend to purchase green products are more assertive than females when it touches to acquiring the products, and, for that reason, men are more likely to buy them. This can be due to the fact that men are more impulsive and are willing to take more risks since they have a higher sensation seeking desire than women (Eisler et al., 2003).

Findings of the multi-group analysis of employed and self-employed individuals show that there are four paths that have statistical differences: Covid-19 environmental impact perception and green purchase behaviour; functional value price and attitude towards green purchase; functional value quality and attitude towards green purchase; and green purchase intention and Covid-19 environmental impact perception. For employed individuals, attitude is not explained by quality and price, while for self-employed individuals, price and epistemic value have no effect on attitude. This result suggests that self-employed individuals take into consideration the quality of the products but are not concerned about the information disposed about them. This finding goes according to research (Blanchflower, 2004) where self-employed individuals have higher levels of subjective well-being and overall life satisfaction, meaning that they have a bigger desire to have better quality products.

The mediating effect of Covid-19 environmental impact perception between intention and behaviour is shown to be significant in both groups. However, self-employed individuals have a higher intention and behaviour towards green purchase than employees. This finding can result from the fact that self-employed individuals can be seen as more resilient individuals than regular employees since the first one relies on self-motivation (Crum, 2016). Additionally, for self-employed individuals, subjective norm did not show to be significant to explain green purchase intention whereas it did for employed individuals. This finding can rely on the fact that self-employed individuals are more autonomous, meaning that they rely less on external opinions (Crum, 2016).

Finally, with the aforementioned information, we can conclude that indeed exists a mediating effect of Covid-19 environmental impact perception between green purchase intention and behaviour and this mediation effect varies according to demographic variables. Adding to that, consumption values and beliefs also vary according to individuals' characteristics.

6.2 Theoretical implications

The current study has important theoretical implications in the subject of consumers behaviour studies. This study makes four important academic contributions. First, this study broadens the scope of consumers' behaviour since it combines TPB and TCV that, to the best of the authors' knowledge, has not been done yet. Additionally, for the purpose of this research, these two theories were developed to understand specific consumer behaviour: green purchase behaviour. The investigation of the different consumption values simultaneously with attitude, subjective norm and perceived behavioural control into explaining individuals' intention and behaviour towards green products is a unique contribution to marketing literature as well as consumers behaviour literature.

Second, this study adds knowledge on what consumption values are significant in motivating specific choices in consumer behaviour. Through this research, we concluded that all consumption values, except for functional value price, showed to be significant, which goes accordingly to other studies (Awuni & Du, 2016; Lin & Huang, 2012). Besides that, attitude, subjective norm and perceived behavioural control also showed to be significant, which also goes accordingly to other studies (Hsu et al., 2017; Sreen et al., 2018; Yadav & Pathak, 2016) where all TPB constructs showed to be significant.

Third, it explores Portuguese consumer behaviour, which is a country that is growing environmentally and is focusing on green behaviour. Therefore, this study offers empirical research on individuals' green perception and behaviour when inserted in a country that aims to emerge in the sustainability field.

Finally, this study investigated the mediating effect of Covid-19 environmental impact perception between green purchase intention and behaviour, which is a subject that still has very scarce research. In previous research, Covid-19 have been incorporated with the TPB in green purchase intention and behaviour (Qi & Ploeger, 2021), whereas it has not been

incorporated with TCV. This adds knowledge to the literature on how the pandemic impact perception could have been influenced and, consequently, influence individuals' behaviour.

6.3 Practical implications

From a practical point of view, the study reveals what consumption values influence green purchase behaviour. A better understanding of these consumption values would impact a wide range of practitioners, including psychologists, developers, marketers and policymakers in the field of consumer behaviour. For example, companies could focus on ways to provide good quality products for a more reasonable price, since it is something that the current study shows that is relevant for consumers. Additionally, practitioners should implement strategies that aim to attract more customers such as promotions and loyalty programs. Finally, marketers should provide more relevant information about the product and its benefits, as well as encourage consumers into believing that their behaviour can make a difference.

From a policy-making point of view, it is relevant to raise awareness for products that have a lower environmental impact. It is not enough if companies are the only ones to raise awareness; governments and organizations must also take a part in that. Therefore, policymakers should invest in developing social marketing campaigns and initiatives that educate the public about the importance of opting for green products and promote solutions to reduce human impact on the environment.

Furthermore, psychologists could get insights from how consumers behaviour and mindset have changed due to the pandemic. Since Covid-19 impacted drastically individuals' motives and beliefs, with this study, psychological fields can acknowledge how consumers' mindset was influenced when inserted in an atypical situation like this as well as their subsequent behaviour. Additionally, companies could also benefit from this since it could provide insights into how to make a faster adaptation of the market when similar future crises arise.

6.4 Limitations and future research

Some limitations must be considered when interpreting the results of the current study. The first limitation is related to the sampling, as all respondents are Portuguese; therefore, the conclusions are limited to that perspective, implying that the findings of this study may not be applicable to other geographical places.

Second, the major limitation of this study is the fact that we do not have a reference of consumers' behaviour when Covid-19 restrictions were at their worst. The data of the current study was collected at a time when the majority of Covid-19 restrictions were already raised, and life was slowly returning back to normal. This could have biased individuals' perception of Covid-19's impact on the environment.

Third, for the current study, no specific green product was used. For this reason, to improve the knowledge of green purchase behaviour, future research is thus encouraged to confirm

our findings among the different green product categories, such as electrical appliances, and organic food and compare the results of general green products and the particular product category.

Future research is also encouraged to confirm our findings among different demographic variables. This study only incorporated gender and occupation (self-employed and employed) differences. For instance, other multi-groups could be analysed for demographic variable occupation. Additionally, age could also have interesting outputs.

7 Conclusion

This study offers a new research model for investigating consumers' intention and behaviour patterns for purchasing green products. This new model joins the Theory of Consumption Values and the Theory of Planned Behaviour. Results suggest that the relationship between green purchase intention and green purchase behaviour is mediated by Covid-19 environmental impact perception. However, this mediation effect varies its significance for female and male individuals. Additionally, consumption values, individuals' beliefs and motivations are not only influenced by gender but by their occupation as well.

The findings of this research shows that attitude towards green purchase, subjective norm and perceived behavioural control are important to explain green purchase intention. Besides that, perceived behavioural control is also important to explain the behaviour of green purchase. At last, functional quality, emotional and epistemic values also showed to be significant when explaining attitude towards green purchase and, conditional value showed to have a significant positive impact on perceived behavioural control.

Our research, based on a country that is growing environmentally, provides unique insights from the combination of these two theories and the addition of Covid-19 environmental impact perception, thereby, contributing with a new perspective about the consumers intention and behaviour.

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Appendix A. Questionnaire Instrument

Table 16. Questionnaire instrument

Construct	Question and item	Code	Source
Functional value quality (FV_QUA)	Regarding green products' quality:		
	They have an acceptable quality	FV_QUA_1	(Lin & Huang, 2012)
	They have a consistent quality	FV_QUA_2	
	They perform consistently	FV_QUA_3	
	Are well manufactured	FV_QUA_4	
Functional value price (FV_PRI)	Regarding green products' price:		
	Their quality corresponds to their price	FV_PRI_1	(Lin & Huang, 2012)
	Offer a good cost-benefit relationship	FV_PRI_2	
	They have a reasonable price	FV_PRI_3	
	They are economic	FV_PRI_4	
Emotional value (EMO_VAL)	When opting for the green products instead of the conventional product:		
	You are making a good personal contribution to the environment	EMO_VAL_1	(Lin & Huang, 2012)
	You are doing the morally right thing	EMO_VAL_2	
	You are a better person	EMO_VAL_3	
Epistemic value (EPI_VAL)	Before purchasing a specific product:		
	You inform yourself about a specific product	EPI_VAL_1	(Lin & Huang, 2012)
	You inform yourself about the different brands and different products	EPI_VAL_2	
	It pleases you the search for different and new products	EPI_VAL_3	
Conditional value (CON_VAL)	You would opt for the green version of a product if:		
	If there are discount rates or promotions	CON_VAL_1	(Lin & Huang, 2012)
	If green products are available	CON_VAL_2	
Attitude (ATI)	Regarding the purchase of green products:		
	You have a positive opinion about purchasing green products	ATI_1	(Paul et al., 2016)
	Purchasing green products is a good idea	ATI_2	
	You have a positive attitude when it turns to purchase the green version of a product	ATI_3	
Subjective norm (SN)	Regarding people's opinion that you value:		
	They want you to opt for green products	SN_1	(Paul et al., 2016)
	They would prefer that you purchase green products	SN_2	
	They influence you to purchase green products	SN_3	
Perceived behavioural control (PBC)	Regarding the purchase of green products:		
	You believe you have all the capacities to purchase green products	PBC_1	(Paul et al., 2016)
	If it were entirely up to you, you are confident that you would purchase green products	PBC_2	
	You have the resources, time and will to purchase green products	PBC_3	
Intention (INT)	Having in consideration your next purchases:		
	You will consider purchase green products	INT_1	(Paul et al., 2016; Yadav & Pathak, 2016)
	You will consider opt for sustainable brands	INT_2	
	You will make the effort to purchase green products	INT_3	

	You definitely want to purchase green products	INT_4	
Covid-19 environmental impact perception (COV_IMP)	Having in account the pandemic's impact on the environment:		
	Your consumption patterns have changed	COV_IMP_2	(Qi & Ploeger, 2021; Tchetchik et al., 2021)
	Your perception of the state of the environment has changed	COV_IMP_3	
	Your concern for climate crisis has changed	COV_IMP_4	
Behaviour (BEH)	Having in account your current behaviour:		
	You purchase green products	BEH_1	(Paul et al., 2016; Yadav & Pathak, 2016)
	You choose sustainable brands	BEH_2	
	You have switched products for ecological reasons	BEH_3	
	Reduced your overconsumption for ecological reasons	BEH_4	
	If you don't find a green product, you look for it in another store instead of purchasing the conventional product	BEH_5	

Appendix B. Loadings and Cross-Loadings

Table 17. Loadings and cross-loadings

	ATI	BEH	CON_ VAL	COV_ IMP	EMO_ VAL	EPI_ VAL	FV_ PRI	FV_ QUA	INT	PBC	SN
ATI_1	**0.904**	0.400	0.424	0.257	0.551	0.482	0.370	0.460	0.602	0.469	0.442
ATI_2	**0.889**	0.298	0.444	0.307	0.618	0.391	0.326	0.450	0.618	0.433	0.425
ATI_3	**0.880**	0.481	0.405	0.288	0.553	0.457	0.308	0.435	0.600	0.508	0.432
BEH_1	0.452	**0.878**	0.384	0.344	0.329	0.455	0.403	0.370	0.606	0.576	0.457
BEH_2	0.423	**0.903**	0.307	0.402	0.377	0.474	0.353	0.369	0.600	0.510	0.471
BEH_3	0.375	**0.815**	0.238	0.325	0.322	0.427	0.207	0.200	0.472	0.417	0.390
BEH_4	0.293	**0.719**	0.220	0.411	0.283	0.370	0.244	0.276	0.460	0.312	0.329
BEH_5	0.176	**0.712**	0.138	0.315	0.126	0.317	0.288	0.134	0.352	0.352	0.332
CON_VAL_1	0.418	0.068	**0.638**	0.164	0.449	0.272	0.217	0.414	0.322	0.182	0.189
CON_VAL_2	0.405	0.374	**0.948**	0.215	0.386	0.387	0.404	0.416	0.455	0.438	0.327
COV_IMP_2	0.289	0.420	0.250	**0.847**	0.319	0.373	0.223	0.363	0.445	0.353	0.288
COV_IMP_3	0.175	0.331	0.166	**0.856**	0.240	0.287	0.187	0.231	0.365	0.292	0.291
COV_IMP_4	0.329	0.359	0.165	**0.829**	0.333	0.301	0.217	0.288	0.445	0.273	0.346
EMO_VAL_1	0.594	0.317	0.428	0.290	**0.867**	0.377	0.389	0.467	0.485	0.286	0.329
EMO_VAL_2	0.592	0.252	0.430	0.282	**0.911**	0.336	0.311	0.427	0.488	0.295	0.333
EMO_VAL_3	0.414	0.385	0.320	0.348	**0.731**	0.347	0.329	0.306	0.492	0.334	0.447
EPI_VAL_1	0.367	0.448	0.352	0.268	0.329	**0.841**	0.253	0.284	0.373	0.339	0.279
EPI_VAL_2	0.402	0.438	0.332	0.350	0.342	**0.856**	0.240	0.295	0.408	0.347	0.300
EPI_VAL_3	0.450	0.381	0.334	0.321	0.356	**0.778**	0.287	0.327	0.494	0.384	0.323
FV_PRI_1	0.381	0.286	0.402	0.202	0.390	0.266	**0.892**	0.508	0.370	0.345	0.236
FV_PRI_2	0.386	0.370	0.354	0.230	0.373	0.304	**0.917**	0.507	0.402	0.384	0.278
FV_PRI_3	0.262	0.348	0.353	0.194	0.333	0.290	**0.875**	0.381	0.304	0.369	0.252
FV_PRI_4	0.149	0.287	0.235	0.258	0.245	0.208	**0.678**	0.293	0.239	0.261	0.244
FV_QUA_1	0.463	0.292	0.363	0.302	0.426	0.292	0.441	**0.873**	0.409	0.347	0.221
FV_QUA_2	0.436	0.338	0.443	0.295	0.425	0.326	0.461	**0.881**	0.466	0.358	0.230
FV_QUA_3	0.449	0.313	0.466	0.324	0.445	0.372	0.450	**0.900**	0.400	0.313	0.202
FV_QUA_4	0.395	0.264	0.417	0.312	0.383	0.292	0.457	**0.818**	0.410	0.322	0.232

INT_1	0.608	0.577	0.496	0.430	0.480	0.491	0.414	0.443	**0.916**	0.648	0.541
INT_2	0.645	0.585	0.429	0.460	0.578	0.503	0.388	0.458	**0.911**	0.581	0.513
INT_3	0.636	0.545	0.416	0.456	0.529	0.433	0.343	0.477	**0.889**	0.575	0.512
INT_4	0.560	0.554	0.403	0.455	0.483	0.450	0.297	0.364	**0.883**	0.541	0.545
PBC_1	0.250	0.348	0.296	0.241	0.136	0.300	0.346	0.265	0.377	**0.769**	0.333
PBC_2	0.621	0.437	0.423	0.321	0.424	0.450	0.308	0.400	0.657	**0.798**	0.411
PBC_3	0.295	0.497	0.254	0.285	0.220	0.246	0.312	0.216	0.449	**0.793**	0.406
SN_1	0.496	0.453	0.328	0.342	0.406	0.352	0.266	0.275	0.562	0.454	**0.927**
SN_2	0.464	0.428	0.294	0.308	0.416	0.325	0.261	0.214	0.541	0.440	**0.935**
SN_3	0.296	0.428	0.252	0.316	0.286	0.287	0.245	0.169	0.428	0.403	**0.755**