Green intentions under the blue flag: exploring differences in EU consumers' willingness to pay more for environmentally-friendly products

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Abstract

Recent research on consumer social responsibility highlights the need to examine psychological drivers of environmentally-friendly consumption choices in a global context. This paper investigates consumers' willingness to pay more (WTP) for environmentally-friendly products across 28 European Union (EU) countries, using a sample of 21,514 consumers. A Multigroup Structural Equation Modeling analysis reveals significantly different patterns and relationships, in how (a) *subjective knowledge about the product's environmental impact*, (b) *environmental product attitudes* and (c) *the perceived importance of the products' environmental impact* influence consumers' WTP more for environmentally-friendly products across countries. The hypothesized model predicts WTP for 20 out of 28 countries and the findings show that a 'one-fits-all' approach is inadequate in capturing the heterogeneity of EU consumers. Hosfstede's cultural dimensions of uncertainty tolerance and individualism explain differences in WTP for environmentally-friendly products across EU countries. Business, marketing communications, and policy making implications are discussed.

Keywords: European Union consumers; attitudes; environmentally-friendly products; willingness to pay more; cross-country comparison; cultural dimensions

Introduction

Sustainability is an increasing concern for organizations, consumers, governments and policy makers around the world. Therefore, understanding environmentally-friendly consumption and its antecedents have become topical issues across business ethics, marketing and psychology literatures, among others (Aguinis & Glavas 2012; Esperanza Villa Castaño et al. 2016). Despite the growing number and diversity of such studies, most have focused largely on one country or one culture (e.g. France – Ozcaglar-Toulouse et al. 2006; Finland – Uusitalo & Oksanen 2004; US – Roe et al. 2001). Broader ethical issues (e.g. labour rights, fair trade) have been researched across different cultures and countries (Brunton & Eweje 2010), but the majority of these studies have compared countries at the opposite poles of Hofstede's cultural dimensions (1997) or which are located remotely (e.g. Chan & Lau 2002 – Chinese vs. Americans; Squires et al. 2001- Danish vs. New Zealanders). Only a handful of studies (e.g. Williams & Zinkin 2008) have investigated whether ethical consumption and behavior differ between countries located within a close geographical proximity and bound by a common history, laws and free labor and capital movement; as is the case of the European Union (EU). Additionally, previous studies compared mainly 2 to 8 countries and used small-sized samples or used 'narrow data bases' such as student respondents, which have limited generalizability (Sears 1986). This paper aims to fill these gaps in consumer ethics, social responsibility and environmentally-friendly consumption literatures, by providing a comparative investigation of factors that drive environmentally-friendly consumption decisions among 28 EU countries.

Particularly, based on the Knowledge-Attitude-Behavior model (KAB; see review by Schrader & Lawless 2004), we aim to examine factors that affect EU consumers' willingness to pay (WTP) more for environmentally-friendly products, such as (a) *consumer's environmental product attitudes*, (b) *subjective knowledge about the environmental impact of*

products and (c) *the perceived importance of products' environmental impact*. The KAB model assumes that the buildup of knowledge (i.e. *subjective knowledge about the environmental impact of products*) will lead to changes in attitudes (i.e. *consumer's environmental product attitudes*, and in *the perceived importance of products' environmental impact)* and/or behaviors (i.e. *WTP more for environmentally-friendly products),* as per Baranowski et al. (2003). These KAB factors may be shaped by the country-specific influences resulting from a unique combinations of the different institutional, regulatory and cultural settings within each country (Leonidou et al. 2010). Therefore, we explore the role of country as a moderator of how the aforementioned factors affect WTP more for environmentally-friendly products. Additionally, as highlighted by Oyserman and Lee (2008), the role of cultural orientation needs careful consideration in cross-country studies. Hence, we further examine differences in WTP more for environmentally-friendly products based on the seminal work of Hofstede's (1997) cultural dimensions. Thus, in the light of past research and identified research gaps, this paper answers the following three research questions:

RQ1: How does (a) subjective knowledge about the environmental impact of products, (b) environmental product attitudes and (c) the perceived importance of products' environmental impact, affect European consumers' WTP more for environmentally-friendly products?

RQ2: Does WTP more for environmentally-friendly products, its antecedents, and their relationships differ by country (i.e. between the 28 EU countries)? And, if yes, how?

RQ3: Can Hofstede's cultural dimensions explain the differences in WTP more for environmentally-friendly products among EU consumers?

This paper contributes to extant research in three ways: (1) it investigates the drivers of environmentally-friendly consumption among countries located within a close geographical proximity and bound by a common history and laws, free labor and capital movement; (2) it uses general population data from 28 EU countries to enhance generalizability; and (3) it examines whether there is heterogeneity in the drivers of WTP

more for environmentally-friendly products across the 28 EU countries. Several business and policy recommendations are proposed.

Literature review

Numerous terms, such as 'green' (e.g. Prothero 1990), 'environmentally conscious/concerned' (e.g. Berger & Corbin 1992), 'ethical' (e.g. Shaw & Clarke 1999), 'eco-friendly' (Urien & Kilbourne, 2011), and 'pro-environmental' (Kalamas et al. 2014) consumption, have been used to describe the environmentally-friendly consumption of products and services; from organic food (Pivato et al. 2008) to sustainable holidays (Barr et al. 2010). In this paper, the term 'environmentally-friendly' is used consistently to refer to consumption and/or product choices with less negative environmental impacts, as it is the term adopted in the Flash Eurobarometer survey used in this paper. The paper aims to examine factors that affect EU consumers' WTP more for environmentally-friendly products among 28 EU countries. First, definitions of these factors and WTP more are provided along with definitions of Hofstede's cultural dimensions used to examine country differences. Second, the theoretical framework related to the hypothesized model is examined.

Definitions

Subjective knowledge about the environmental impact of products is defined in the present research as how much a consumer thinks or perceives he/she knows about the environmental impact of the used/bought products. Marketing literature often differentiates between 'subjective' (i.e. 'the feeling of knowing') and 'objective' (i.e. 'actual knowledge') measures of knowledge (Raju et al. 1995: 154). The present conceptualization of the term 'subjective knowledge about the environmental impact of products' is aligned with recent environmental knowledge literature, defining objective knowledge as 'the ability to correctly identify symbols, concepts and behavior patterns related to environmental protection'

(Vicente-Molina et al. 2013: 131).

Environmental product attitudes is defined in the present research as consumers' ethical beliefs about using environmentally-friendly products, e.g. whether it is the right thing to do and beliefs on whether such products protect the environment. This is a general measure of environmental product attitudes that assesses consumers' attitudes toward environmentally-friendly products.

Importance of the environmental impact of products is another attitudinal variable but more specific compared to the aforementioned general 'environmental product attitudes' construct. The variable 'importance of the environmental impact of products' particularly measures consumers' own views/opinions about the importance of the impact of the used/purchased products. Our approach to classifying this variable as an attitudinal variable is aligned with Hustvedt and Dickson's (2009) method of measuring attitudes based on outcomes (i.e. environmental impact in this case). In their study about organic cotton apparel, Hustvedt and Dickson (2009) included a measure of attitudes regarding the environmental impact of clothing production. Additionally, our approach is consistent with other researchers' view that the more specific the attitudes, the better predictors of behavioral outcomes they are (e.g. WTP for environmentally-friendly products) (Mainieri et al. 1997). To avoid confusion from here onwards the term 'importance of the environmental impact of products' will be used to refer to this specific attitudinal measure.

Willingness to pay more (WTP) is used as a proxy measure of environmental behavior for environmentally-friendly products and is measured as consumers' declared WTP more money (expressed in percentages) for environmentally-friendly products compared to conventional alternatives. Unlike self-reported behaviors and generic intentions, WTP more is less researched; despite being a more adequate concept to examine environmentally-friendly intentions as the cost of environmentally-friendly products is one of the greatest

barriers to actual purchase (Bray et al. 2011; Carrington et al. 2014). Additionally, since the present study considers 28 different EU countries, where the standards and cost of living vary, focusing on the *willingness to pay more for environmentally-friendly products* offers a clearer basis for comparison.

Hofstede's cultural dimensions are also used in this paper to examine further differences between the 28 EU countries in WTP more (beyond RQ2 examining the moderating effects of country). The present study builds on Hosftede's (1997) seminal work on country-based cultural differences across five dimensions i.e. power distance, uncertainty avoidance, individualism/collectivism, masculinity/femininity, long/short term or otherwise called pragmatic/normative orientation; and a recently introduced sixth dimension of indulgence/restraint (Hofstede et al. 2010). *Individualistic* cultures care for the self and the immediate family, while *collectivistic* cultures tend to have unquestioned loyalty to in-groups (Hofstede 2011). The *femininity* dimension refers to countries with values such as caring for others and quality of life (de Mooij and Hofstede 2011). *Uncertainty avoidance* reflects 'the extent to which members of a culture feel threatened by uncertainty or unknown situations' (Hofstede 1997: 113) as well as a society's tolerance for uncertainty and ambiguity. *Power distance* is 'the degree of equality, or inequality, between people as accepted by those not in power' (Osinga & Hofstede 2004: 303). The *restraint* dimension captures the degree to which an individual will try to control his/her hedonic desires and impulses, as opposed to believing that personal hedonism/gratification should be restricted by norms (Hofstede et al. 2010). Lastly, *normative* societies are more inclined to keep traditions and follow tightly embedded norms, and embrace changes more reluctantly and with distrust; while *pragmatic* societies promote frugality and care in preparing for the future (Hofstede et al. 2010).

Theoretical framework

The underpinning theoretical model of the present research study (RQ1) is the Knowledge-

Attitude-Behavior model (KAB; see review by Schrader & Lawless 2004), commonly used in health behavior change (Baranowski et al. 2003) and educational/learning (Schrader & Lawless 2004) contexts. This model has been applied in a few environmentally focused studies (e.g. Kruse & Card 2004 – examining the effects of a conservation education camp program; Levine & Strube 2012 – investigating the environmental attitudes, knowledge, intentions and behaviors among college students; Kozar & Hiller Connell 2013 – examining the socially and environmentally responsible apparel consumption). The KAB model assumes that the buildup of knowledge will lead to changes in attitudes and/or behaviors (Baranowski et al. 2003). In the present paper, WTP more for environmentally-friendly products is seen as a proxy measure of environmental behavior focused on intentions rather than actual behavior and is measured as consumers' declared WTP incrementally more money for such products. This is aligned with Baranowski et al. (2003), who see knowledge as a logical prerequisite to behavioral intentions, which in turn drive the actual behaviors.

Aligned with the Knowledge-Attitude-Behavior (KAB) model and its components, the present research examines the impact of *subjective knowledge about the environmental impact of products* (K of KAB) and *environmental product attitudes* (A of KAB) on European consumers' *WTP more for environmentally-friendly products* (B of KAB). Additionally, beyond the traditional KAB model components and related previous environmental studies (e.g. Kruse & Card 2004; Levine & Strube 2012; Kozar & Hiller Connell 2013), this study also includes a more specific attitudinal measure, which is *the perceived importance of products' environmental impact* (a specific measure of A of KAB), and examines its impact on *WTP more for environmentally-friendly products* (B of KAB).

This inclusion of a more specific attitudinal measure on the importance of the outcome (rather than more generally 'if it is the right thing to do'), is based on prior studies that suggest the link between general attitudes and behaviors are weak in environmental

studies (Wells et al., 2016). Hence, both general and specific attitudes should be measured (Gregory-Smith et al., 2015; Tudor, Barr, & Gilg, 2008). Accordingly, we provide an extended examination of the KAB model, while also examining differences across 28 EU countries via two approaches: i) using country as a moderator variable (RQ2), to assess if WTP more for environmentally-friendly products, its antecedents, and their relationships differ by country, going beyond prior literature comparisons (e.g. Polonsky et al. 2001; Thøgersen 2010; Sudbury Riley et al. 2012); and ii) using Hofstede et al.'s (2010) recent taxonomy of cultural dimensions and their influence on WTP more (RQ3).

The proposed model and support for hypotheses

Past research has shown that subjective knowledge is a critical factor in determining environmental attitudes and environmental decision-making (e.g. Pickett-Baker & Ozaki 2008; Vicente-Molina et al. 2013). Additionally, O'Connor et al. (1999) note that information and knowledge affect risk perceptions (e.g. water pollution from use of chemical cleaners) and, consequently, influence the importance consumers attach to the environmental impact of purchases. Moreover, insufficient information and, hence, inability to distinguish the environmental properties of products (i.e., low subjective knowledge), can limit consumers' perceived importance of the environmental impact of their purchase decisions (Walsh & Mitchell 2010). Thus, low subjective knowledge is expected to lower the perceived importance of the environmental impact of products.

H1: *There is a positive relationship between consumers' subjective knowledge about the environmental impact of products and the perceived importance of the environmental impact of products.*

Studies also have found a positive relationship between environmental knowledge and consumer attitudes toward environmental products (e.g. Yeoh & Paladino 2007; Flamm 2009), as well as between knowledge and environmental concerns (Bedrous 2007). Additionally, Polonsky et al. (2012) note the significant role general and specific measures of

environmental knowledge play in the formation of environmental attitudes. Therefore, subjective knowledge about the environmental impact of products could positively influence environmental product attitudes of consumers.

H2: *There is a positive relationship between consumers' subjective knowledge about the environmental impact of products and the environmental product attitudes of consumers.*

Environmentally-friendly products and purchases can be also defined via their reduced/less negative environmental impact (Mainieri et al. 1997; Ljungberg 2007) and, thus, it is expected that general *environmental product attitudes* will influence *the perceived importance of the environmental impact of products*; which is a more specific attitudinal measure, as noted earlier. We assume that only after consumers have formed *environmental product attitudes*, will they form a specific attitude regarding *the perceived importance of the environmental impact of products,* as a measure of consumers' own views/opinions about the importance of the outcome of the used/bought products. Axelrod and Lehman (1993) showed that general environmental attitudes are positively correlated with the importance individuals attach to environmental issues and, thus, we expect a positive relationship between *environmental product attitudes* and *the perceived importance of the environmental impact of products*; even though this relationship has not been researched much.

H3: *There is a positive relationship between environmental product attitudes and the perceived importance of the environmental impact of products.*

Past environmentally-friendly consumption studies have noted a positive association between consumers' environmental attitudes and various types of self-reported environmental behaviors (e.g. energy conservation – Paladino & Baggiere 2008; ethical product consumption – Yeon Kim & Chung 2011). The proxy measure of environmental behavior in this study is WTP more for environmentally-friendly products. Past literature has shown consumers are willing to pay more for ethically produced goods (Moosmayer 2012) and indicated a positive link between environmental attitudes and WTP for environmentally-

friendly products and services (see Laroche et al. 2001). Kotchen and Reiling (2000) show pro-environmental attitudes are associated with higher levels of WTP, while Husted et al. (2014) note environmental attitudes of Mexican consumers increase their WTP for environmentally certified goods more than proportionately. Therefore, we expect environmental product attitudes and WTP to be positively associated.

H4: *There is a positive relationship between environmental product attitudes and the willingness to pay more for environmentally-friendly products.*

The perceived *importance of products' environmental impact* is an important factor to be examined in relation to *consumers' WTP for environmentally-friendly products*. Firstly, some definitions of environmentally-friendly products focus on the environmental impact aspect (e.g. Commission of the European Communities 2001; Ljungberg 2007) and recent research confirms that consumers' WTP for environmental/eco-friendly products is driven by their low environmental impact (Fuerst & McAllister 2011). Secondly, Laroche et al. (2001: 514) conclude consumers who are willing to pay more for environmentally-friendly products 'are preoccupied by the severity of ecological problems'. Thus, this recognition of impact and its translation to WTP seems to be facilitated by the importance consumers put on the reduced environmental consequences of the products. For example, Follows and Jobber (2000) found environmental consequences of diapers significantly predict purchase intentions, while Royne et al. (2011) showed consumers who perceive waste as highly important are more likely to display a higher WTP for an eco-friendly product. Axelrod and Lehman (1993) also note that the importance individuals attach to environmental issues predicts self-reported environmentally protective behaviors. Thus, we also expect a positive relationship between the perceived *importance of products' environmental impact* and *WTP.*

H5: *There is a positive relationship between the perceived importance of environmental impact of products and willingness to pay more for environmentally-friendly products.*

The environmentally-friendly consumption literature acknowledges that macro

factors, such as the unique economic, political, religious and cultural institutions of a country can also affect individual decision-making processes (Auger et al. 2010; Thøgersen 2010). The majority of multi-country empirical studies have investigated differences between geographically distant countries (e.g. Rawwas et al. 2005) and concluded that differences in environmental behavior are largely due to macro factors such as economic development. Eckhardt et al. (2010) note that environmental concerns are overshadowed by price concerns in developing countries, while Auger et al. (2010) found that social and ethical attributes of products are more appealing for developed country consumers compared to developing country consumers. Additionally, Sudbury Riley et al. (2012) emphasize the importance of nationality and as determinants of ethical beliefs and behavior.

A much smaller number of studies have compared countries within close geographical proximity. These studies pointed to the existence of differences in ethical values and behavior between countries that otherwise share many similarities (see Forsyth et al. (2008) for a meta-analysis of the literature comparing ethical values across countries located within the same region). For instance, Al-Khatib et al. (2005) show that ethical orientation and behavior of Arab consumers varies within the Middle Eastern region. Even though the EU has some of the most stringent consumer and environmental regulatory frameworks in the world (Vogel 2003), only a handful of studies investigated environmentally-friendly consumption differences in the EU. These studies largely suggest European countries should not be treated as a homogenous group with respect to ethical values and behavior despite their close proximity. Polonsky et al. (2001) found a significant divide between Southern and Northern EU countries within Western Europe, attributed to differences in business environments; and found more salient ethical value systems among Northern European consumers. Furthermore, Clark Williams and Seguí-Mas (2010) compared the ethical settings in 27 European countries and found that most countries have adapted the ethical requirements mandated by the EU to

their local contexts. Likewise, Thøgersen (2010) noted within-EU policy differences, despite common regulations (e.g. subsidies to organic farmers, organic eco-labeling schemes). In turn, this heterogeneity can influence consumers' environmentally-friendly consumption decisions, more than individual-level attitudinal variables.

Therefore, the present study explores the extent to which the aforementioned factors (i.e. subjective knowledge, environmental attitudes, and the perceived importance of the environmental impact of goods) predict consumers' WTP more for environmentally-friendly products, as per the KAB model. This study examines all 28 EU countries and as well as differences by EU country, by treating country as a moderator of KAB relationships.

H6: *The extent to which the aforementioned factors (subjective knowledge, environmental attitudes, and the perceived importance of the environmental impact of goods) predict consumers' WTP more for environmentally-friendly products will differ by EU country.*

Additionally, differences within WTP more are examined based on Hofstede's cultural dimensions. Cultural differences can be a source of different attitudes and behaviors in the context of environmentally-friendly consumption (Williams & Zinkin 2008). Despite some studies that relate these cultural dimensions to environmentally-friendly purchasing (e.g. Fischer & Frewer 2009; Govindasamy & Italia 1999; Husted 2005; Katz et al. 2001; Kale 1995), the empirical evidence is limited, mixed and lacks comprehensive coverage.

Maignan (2001) found consumers in countries dominated by communitarian ideologies (i.e. France and Germany) are more likely to incorporate the societal considerations into their purchase decisions, compared to consumers in the USA where dominant values of individualism and self-interest drive consumption decisions. Alternatively, in societies dominated by high individualism (i.e. low collectivism), environmental groups are common (Husted 2005; Katz et al. 2001) and these countries will respond better to environmental issues because they 'have a greater social and institutional capacity' (Husted 2005: 353). Therefore:

H7: *Consumers from countries with lower levels of individualism (i.e. higher levels of collectivism) will be more willing to pay more for environmentally-friendly products than consumers from countries with higher levels of individualism (i.e. lower levels of collectivism).*

Vitell et al. (1993) consider *masculine* societies, i.e. more preoccupation for economic growth and less altruism and preoccupation for others or the environment, to be less favorable to ethical decision-making. Only Kale (1995) researched this dimension and found consumers from the EU countries with low masculinity scores (i.e. high in femininity; Denmark, Sweden, Norway, Netherlands) have high regard for environmentally-friendly conscious firms. Therefore:

H8: *Consumers from countries with higher levels of femininity (i.e. lower levels of masculinity) will be more willing to pay more for environmentally-friendly products than consumers from countries with lower levels of femininity (i.e. higher levels of masculinity).*

Kale's (1995) Euroconsumers study concluded that consumers in countries with strong uncertainty avoidance (e.g. Belgium, France, Portugal, Greece, Spain) are inclined to reduce their product purchase perceived risk. Given the niche market position of environmentally-friendly products and the high levels of novelty they introduce, consumers would be less familiar with them compared to their mainstream less green alternatives. This implies higher perceived risk for most environmentally-friendly product categories (Fischer & Frewer 2009) and, thus, lower willingness to try or to pay more for such products (Govindasamy & Italia 1999). Therefore:

H9: *Consumers from countries with higher levels of uncertainty avoidance will be less willing to pay more for environmentally-friendly products than consumers from countries with lower levels of uncertainty avoidance*.

Even though power distance has not been investigated for environmentally-friendly products, general literature notes a positive association between small power distance and openness to change and innovation. Singh's (2006) research on cultural differences found that cultures characterized by small power distance demonstrate higher levels of innovativeness; alternatively, societies with large power distance respond better to normative influences in adopting new products. Assuming environmental purchasing requires a

significant departure from the established purchasing behavior, an association between low levels of power distance and a high willingness to switch to consuming environmentally-friendly products is expected. Katz et al. (2001) suggest a different, yet related, interpretation of this relationship i.e., in high power distance countries, the individuals' engagement with social or environmental issues will be reduced because of the respect to top authorities holding the decisional power. Therefore:

H10: *Consumers from countries with lower levels of power distance will be more willing to pay more for environmentally-friendly products than consumers from countries with higher levels of power distance.*

Though the restraint/indulgence dimension has been researched very little in the environmental context, it is included in the present study because environmentally-friendly consumption assumes responsible consumption that prioritizes social/environmental concerns over personal interests/goals (Roberts 1996). Examples are the 'voluntary simplifiers' (defined by reduced material consumption and simplified lifestyles with lower environmental impact) and 'beginner voluntary simplifiers' consumers (supporting some sustainability aspects without necessarily embracing an environmentally-friendly lifestyle) (Craig-Lees & Hill 2002). These consumers display characteristics of the 'restraint' cultural dimension. Therefore:

H11: *Consumers from countries with higher levels of restraint (i.e. lower levels of indulgence) will be more willing to pay more for environmentally-friendly products than consumers from countries with lower levels of restraint (i.e. higher levels of indulgence).*

The pragmatic/normative dimension is less researched in the environmentally-friendly consumption literature. More pragmatic societies are more likely to take environmentally-friendly decisions and demonstrate environmentally-friendly behavior as they are more open to changes and consider the future of the natural environment and their society. Thus:

H12: *Consumers from countries with higher levels of pragmatism (i.e. from less normative countries) will be more willing to pay more for environmentally-friendly products than consumers from countries with lower levels of pragmatism (i.e. from more normative countries).*

In summary, the above hypotheses involving the extended KAB variables and country as a moderator are illustrated in Figure 1, while Hofstede's cultural dimensions (not visually depicted in Figure 1) are used to examine country differences in WTP more.

[Insert Figure 1 here]

Methodology

This study uses a dataset drawn from 28 EU member states, during December 2012 via the Flash Eurobarometer 367 questionnaire. This was commissioned by the European Commission as part of the study on 'Building the Single Market for Green Products'. A total of 26,573 respondents from different social and demographic backgrounds participated via landline and mobile telephone in the local language of the country. A Random Digit Dial (RDD) sampling technique was used in each country.

Recent studies have used secondary data from large-scale surveys, despite these not being initially designed for academic purposes. Such datasets are considered to provide rich opportunities and good insights in business disciplines, despite some of their weaknesses (Gras et al. 2014). Recent examples of research, in the field of business, marketing and ethics, based on such datasets include those of Williams and Zinkin (2008) and Manika et al. (2015). After cleaning the dataset, the resulting sample included 21,514 participants, with balanced sample sizes for most countries (see Table 1).

[Insert Table 1 here]

Environmental product attitudes were measured on a 4-point Likert scale, ranging from 'strongly agree' to 'strongly disagree', using the following items: 'You feel that using environmentally-friendly products is 'the right thing to do''; 'Buying environmentally-friendly products sets a good example'; 'Buying environmentally-friendly products can make a real difference to the environment'; 'Your family or friends will think it's a good thing if you use environmentally-friendly products'. In the overall sample, the Cronbach's alpha was

.72. Within each country (see Table 2), most countries had Cronbach's alphas equal or above .70, while there were some countries with values between .50 and .69, but none were unacceptable as per George and Mallery (2003). Since this general environmental product attitudes scale is not drawn from established literature nor was it created for academic investigation, it was unlikely to be reliable across 28 countries. Moreover, Cronbach alpha values are also dependent on the number of items in a scale. In the present study, there is a small number of items in the specific scale (much fewer than 10), which can lower Cronbach alpha values. In such situations, Cronbach alphas may not be the best approach to evaluate reliability (Pallant, 2013), while other researchers criticize the use of Cronbach's alpha overall (Lance et al., 2006). Thus, given the valuable contribution of this large dataset, the attitudes scale is still used for the analyses discussed next in this paper, while we also acknowledge the low Cronbach alpha for some countries as a limitation. In the analyses we use the composite score of the general environmental product attitudes construct.

Subjective knowledge ('In general, how much do you know about the environmental impact of the products you buy and use?') was measured on a 4-point scale ranging from 'you know a lot' to 'you know nothing'. The perceived importance of impact ('The product's impact on the environment is…') was measured on a 5-point Likert scale ranging from 'very important' to 'not at all important'. Willingness to pay more (WTP) ('How much more, if anything, would you be willing to pay for products if you were confident that they were more environmentally-friendly?') was measured on a 5-point Likert scale, ranging from 'you would not be willing to pay more' to 'you would be willing to pay more than 20%'. Where required, scores were reverse-coded prior to data analysis.

Although not common in social sciences research, scales using one or two items have been used more widely in recent business ethics and marketing studies (e.g. Manika et al. 2015). Past research has also measured WTP and its various related dimensions using single-

item scales (e.g. attitude toward paying; awareness of responsibility for paying; subjective obligation to pay; see Liebe et al. 2011). The benefits of this approach include simplicity, cost reduction, ease of interpretation (Bowling 2005), and reduction of 'fatigue, frustration, and boredom associated with answering highly similar questions repeatedly' (Robins et al. 2001: 152). These are all particularly relevant for large-scale field research intercepting consumers in public places, like the Flash Eurobarometer 367 questionnaire used here.

Table 2 illustrates the means and standard deviations of all aforementioned constructs in each country; plus mean values/scores for each cultural dimension of each country, as drawn from Hofstede's website (http://geert-hofstede.com/countries.html) to examine H7 to H12. Consistent with Husted (2005) and Williams and Zinkin's (2008: 219) 'using averages across time and between countries helps to mitigate country- or time-specific outliers'. Hofstede's model is used in this study given the relevance and suitability of its scores, and its usefulness for explaining macro-economic variables, such as WTP for environmentally-friendly products (Taras et al. 2010).

[Insert Table 2 here]

Results

The adequacy of variable-to-sample ratio was checked for the whole sample (N=21,514) and each country. Total sample inter-correlations among variables were examined to assess whether or not any of them were equal to or surpassed the .85 threshold (Dijkstra, et al., 1998). None of the correlations were above .57, indicating discriminant validity. Correlations, means and standard deviations for the total sample can be seen in Table 3.

[Insert Table 3 here]

Structural equation modeling results (H1-H5)

To address RQ1, a structural equation model (SEM) using the total sample (N=21,514) was run in Mplus 7 based on H1 to H5 (see Figure 1). At this stage, the variable 'country' was not

added as a moderator (H6). A SEM methodology was preferable to correlations (which only allow the examination of one relationship at a time) and regressions (which assume all independent variables load directly on the dependent variable) as it allowed the estimation of multiple and interrelated dependence relationships incorporated in the theoretical model (Malhotra, 2010: 724), while comprehensively and simultaneously, considering all possible information (Hair et al., 2010: 629). A similar SEM approach with observed variables has also been used in past (e.g. Bigne et al., 2001 – consumer behaviour in tourism; Manika et al., 2015 – environmentally-friendly research). The SEM model results indicated a theoretically and statistically good overall model fit (x^2=142.41, df=1, p=.00; CFI=.97; TLI=.81; SRMR=.02). The independent variables predicted 3.4% of the variance in WTP. H1 to H5 were all positive and significant, thus, supported (see Table 4).

[Insert Table 4 here]

Differences based on H6

To examine whether or not the model presented in Figure 1 varies across countries, a multigroup SEM analysis was run on Mplus 7, with country as the grouping/moderator variable (addressing RQ2 and examining H6). A chi-square difference test between the SEM model where all parameters (coefficients) between variables were allowed to vary by country and a model where parameters were constrained to be equal across countries, indicated that significant differences exist ($\Delta\chi^2$=481.66-127.01=354.65, df=2163-28=135), p< .01). This implies that H1 to H5 do vary across the 28 countries. Thus, the EU countries should not be treated the same with regards to how the researched antecedents predict WTP.

The model where H1 to H5 were allowed to vary by country had a statistically acceptable model fit across countries (χ^2=127.01, df=28, p=.00; CFI=.98; TLI=.87; SRMR=.02). However, the model fitted the data for Lithuania (χ^2=0) better than any other country and the worst fit was for Ireland (χ^2=13.82). Chi-square values for each country in

between Lithuania and Ireland are reported in Table 5 (third column) along with the R^2 for each country (second column), and standard loadings for all paths of the model. Thus, the proposed model seems to fit some countries (e.g. Denmark, Netherlands, Finland, UK) better than others (e.g. Bulgaria, Hungary, Slovenia). However, eight countries out of 28 (Italy, Spain, Cyprus, Latvia, Malta, Poland, Slovenia and Romania) did not have a significant R^2, implying that this model (H1 to H5) did not significantly predict consumers' WTP for environmentally-friendly products in these countries.

[Insert Table 5 here]

These findings support the proposition that country is an important moderator of the hypothesized relationships (H1 to H5) and that the proposed model varies by country, as hypothesized in H6. Particularly, the findings suggest the presence of two distinct country groups: Southern and Eastern EU versus Northern and Western EU countries. This divide (S-E versus N-W) was based on the comparison of the R^2 values of the SEM model in each country. From Table 5, it can be seen that out of the 14 countries in the S-E group, 7 countries had non-significant R^2 (2 Eastern countries and 5 Southern countries). On the other hand, out of the 14 countries in the N-W group, only 1 Northern country (Latvia) did not have a significant R^2. Moreover, overall R^2 values of the N-W countries were higher than those of the S-E countries. This indicates the SEM model works better at predicting WTP for consumers in N-W countries than for consumers in S-E countries. It should be noted that this divide was also evidenced by significant differences found between S-E and N-W countries, in WTP and its drivers, as discussed next.

In addition to the degree of fit and predicted R^2 values of the SEM model examining country differences, the standard loadings for hypothesized relationships H1 to H5 indicated that not all relationships are supported for each country. The only exception was the relationship between subjective knowledge and the perceived importance of the products'

environmental impact, which was significant across all countries. The relationship between environmental product attitudes and the importance of the products' environmental impact was positive and significant for all countries except for Malta, which also had a non-significant R^2 for WTP. The relationship between subjective knowledge and environmental product attitudes was positive and significant for all countries except for Italy, Spain, Estonia, Hungary and Malta. Similarly, the relationship between attitudes and WTP was not significant for Spain, Malta and Romania. The relationship between the perceived importance of products' environmental impact and WTP was only positive and significant for France, The Netherlands, Ireland, UK, Greece, Finland, Sweden, Austria, Cyprus, Czech Republic, Malta and Croatia.

To assess whether these differences of the coefficients (loadings) for each hypothesis varied significantly by country, the Chow test was employed (Chow, 1960). The Chow test is typically used to investigate whether statistically significant differences exist between comparable parameters in estimations with different samples (see Aguilar and Cai, 2010 for an application in the context of environmental consumption). Test results indicated that all relationships were statistically different from one country to the other [$F_{(54,21458)\ \text{Chow test}}$ for every hypothesis > critical F value 1.50 at p=.01; full results in footnote of Table 5]. However, the Chow test only allows us to examine one hypothesis at a time (H1 to H5), without controlling other relationships. To further assess which relationships within the model (Figure 1) contribute to the most variation in the model, while controlling for all other relationships, a series of multigroup SEM models were run. In this analysis, one path/coefficient was allowed to vary, while constraining all others and comparing its chi-square value with the one from the fully constrained model. The results indicated all hypothesized relationships (H1 to H5) were significantly different across countries, while

holding all other relationships constant. These results (see last row of Table 5) further indicate statistically different relationships between countries.

This combined methodology of the Chow test and the series of multigroup SEM analysis is a step further than the common methods of investigating moderating effects. Overall, this methodology adds to the evidence on differences across the EU countries and supports H6. These findings indicate the need to explore these differences and their implications further, to better understand the determinants of environmental consumption within each local context.

Given the South-East Europe versus North-West Europe divide, as noted earlier based on the R^2 values of the SEM model in each country, further analysis was conducted to explore this divide based on the antecedents and WTP. A series of t-tests on SPSS were carried out to see how each variable in the model differs between these two groups of EU countries (South-East versus North-West). Consumers from South-East European countries reported higher levels of: subjective knowledge (M_{S-E} = 2.73; SD_{S-E} =.79; M_{N-W} = 2.67; SD_{N-W} = .75; $t_{(21512)=}$ 5.952; p<.000), importance of the products' environmental impact (M_{S-E} = 3.31; SD_{S-E} = .73; M_{N-W} = 3.16; SD_{N-W} = .73; $t_{(21512)=}$ 15.571; p<.000), environmental product attitudes (M_{S-E} = 3.59 ; SD_{S-E} = .45; M_{N-W} = 3.36; SD_{N-W} = .53; $t_{(21512)=}$ 34.133; p<.000) and WTP (M_{S-E} = 2.46; SD_{S-E} = 1.07; M_{N-W} = 2.41; SD_{N-W} = 1.00; $t_{(21512)}$= 4.041; p<.000); compared to consumers in North-West EU countries (country-based means and standard deviations in Table 2). This contradicts the assumptions of a broad literature (e.g. Auger et al. 2010; Rawwas et al. 2005), which predicts the opposite because of the lower levels of income and development in the South/East of Europe. Next, Hofstede's cultural dimensions as a potential explanation for these differences (RQ3) are examined.

Differences based on Hofstede's cultural dimensions

RQ3 sought to examine if Hofstede's cultural dimensions can explain the differences in WTP for environmentally-friendly products among EU consumers (H7 to H12). A median split to divide the sample into two groups of equal sample sizes was used, followed by a series of t-tests via SPSS to examine how WTP varies based on cultural dimension (lower versus higher scores countries). In this analysis, Cyprus was not included as its scores were not available on Hofstede's website. The analyses showed H7 and H9 were not rejected; while H8, H10, H11 and H12 were rejected (all p values>.005). Only individualism (M_{lower} = 2.49; SD_{lower} = 1.08; M_{higher} = 2.37; SD_{higher} = . 98; $t_{(21145)}$=8.410; p<.001) and uncertainty avoidance (M_{lower} = 2.49; SD_{lower} = 1.00; M_{higher} = 2.38; SD_{higher} = 1.07.; $t_{(21145)}$ = 7.326; p<.001) were able to explain differences between EU consumers' WTP for environmentally-friendly products, suggesting that consumers from countries with lower individualism and uncertainty avoidance have a higher willing to pay. H7 to H12 results are reported in Table 6, in addition to the post-hoc examination of the other KAB model constructs across Hofstede's scores.

[Insert Table 6 here]

Discussion

Regarding RQ1, interesting findings were uncovered for the determinants of WTP for environmentally-friendly products based on the extended KAB model (Figure 1). Aligned with previous literature, subjective knowledge about the environmental impact of products predicts the perceived importance of environmental impact of products (H1) and environmental product attitudes (H2) (Grob, 1995; Yeoh & Paladino 2007). In turn, environmental product attitudes predict the perceived importance of environmental impact of products (H3) (see Axelrod & Lehman 1993 for similar findings) and WTP (H4; consistent with past research such as Kotchen & Reiling 2000; Laroche et al. 2001). WTP was also predicted by the perceived importance of environmental impact of products (H5) (Royne et

al., 2011). However, it should be noted that the influence of the importance of environmental impact of products on WTP is weaker (even though difference of the loadings are not very high) than the influence of environmental product attitudes on WTP; contradicting expectations that specific attitudes (i.e. the importance of environmental impact of products) predict behavioral outcomes better.

In relation to RQ2, significant differences in the relationships of the core model exist across the 28 EU countries, highlighting that a 'one-fits-all model', which has dominated past multi-country studies, is inadequate in capturing the heterogeneity in the environmentally-friendly consumption patterns of countries even within a close geographical proximity. The aforementioned antecedents significantly predicted WTP across 20 of the 28 EU countries (except Italy, Spain, Cyprus, Latvia, Malta, Poland, Slovenia and Romania); and better for some countries (e.g. Denmark, Netherlands, Finland, UK) than others (e.g. Bulgaria, Hungary, Slovenia). Besides revealing significant inter-country heterogeneity within the EU (consistent with suggested heterogeneity due to different country-level implementation of EU policies – see Thøgersen 2010), the results provide evidence to consider other decisional variables (see future research) when predicting WTP for countries with a current non-significant or low R^2.

A South-East versus North-West divide within the EU was found, contradicting past research which only compared a small number of countries (e.g. Auger et al. 2010) or showed a North-South divide among Western European countries (e.g. Polonsky et al. 2001). Moreover, South-East countries reported higher levels of all the variables including WTP, compared to North-West EU countries; contradicting past literature of higher attitudes and WTP in Western European countries.

Given the deviation from past studies, these findings require further discussion. Differences in GDP and environmental product attitudes of the EU countries are well

documented by official statistics (Eurostat, 2016a; 2016b) revealing that higher levels of GDP in the North-West EU countries are often associated with higher environmental behavior e.g. recycling and waste management. Additionally, the literature confirms the positive correlation between higher levels of income and demand for environmentally-friendly products (Mendelsohn et al., 2006). Hence, our findings on the higher levels of WTP and higher environmental product attitudes in South-East EU countries with lower levels of GDP may appear puzzling. However, this can be explained by the insights from (eco)innovation diffusion literature (Battisti, 2008). This literature states the innovators of environmentally-friendly products can claim premium prices in markets where environmentally-friendly products are not widely diffused (Etsy and Winston, 2009). In such markets, environmentally-friendly products are associated with novelty and higher status in addition to being green, and this justifies higher price premiums (Parry 2012). Yet, as environmentally-friendly products diffuse in the market, price premiums inevitably decline. Hence, our finding about the higher WTP for environmentally-friendly products in South-East EU reflects the more recent entry of environmentally-friendly products into these lower income markets and the ongoing price premiums they receive. In North-West EU countries, the more established positioning of environmentally-friendly products is accompanied by wider diffusion of environmentally-friendly products and higher competition within green product categories; leading to declining price premiums and lower WTP.

Similar dynamics exist in the case of the perceived importance of environmental impact of products as consumers report higher enthusiasm about environmentally-friendly products and their impact in South-East EU markets (where these goods are considered to be more novel and scarce), compared to the Northern and Western EU markets (where they are perceived as the norm). Hence, consumers in the South-East EU countries could have reported higher subjective views on the importance of environmental impact of products.

Regarding RQ3, examining differences based on Hofstede's cultural dimensions, it was found that higher WTP is associated with lower levels of uncertainty avoidance. Environmentally-friendly products could be associated with higher levels of risk and unfamiliarity (Fischer & Frewer 2009), translating into perceptions of risky and uncertain choices. Therefore, only consumers with lower levels of uncertainty avoidance would be willing to pay more for environmentally-friendly products. Higher WTP is also associated with lower levels of individualism, aligned with past literature. Individuals from countries where communal interests are valued above the individuals' interests are more likely to make purchasing decisions that prioritize the environment, a shared resource for the society (McCarty & Shrum 2001).

However, masculinity/femininity, power distance, restraint, and pragmatism dimensions did not result in any differences in WTP, contrary to limited evidence from Kale (1995). While, Kale's (1995) study focused on environmentally-friendly choices in 17 EU countries, the present paper focuses on WTP in 28 EU countries and is based on more recent data (2012). Hence, the different findings may reflect the changes in the masculinity/femininity dimension across Europe between 1995 and 2012. Feminine values from some EU member countries (e.g. Denmark, Sweden) might have diffused to the rest of the EU due to common legislation, free movement of individuals and marketing communications related to environmentally-friendly products, leveling out differences in the femininity dimension. Additionally, the existence of the EU is based on feminine values such as solidarity, equality, consensus seeking and communal concern (Erumban & De Jong 2006), which can explain a leveling of feminine values across the EU countries and the lack of differences in WTP between countries with high and low masculinity/ femininity scores.

A lack of differences in WTP based on the power distance dimension could be explained by the shared EU regulatory frameworks (including equality, citizen rights as

discussed in Jepsen & Pascual 2005). Such frameworks have reduced the higher levels of perceived and experienced power distance in some Eastern European countries (e.g. Bulgaria, Romania, Slovakia, Greece as shown in Hofstede's mean scores). This is aligned with academic views supporting the convergence of EU cultural differences (Meyer, 2005). Moreover, Samuel Craig and Douglas (2006: 322) argue national culture is 'becoming increasingly deterritorialized and penetrated by elements from other cultures' that results 'in cultural contamination, cultural pluralism and hybridization', which can explain the lack of significant differences in WTP for the aforementioned cultural values, including power distance.

Furthermore, the lack of differences in WTP on the restraint dimension could be explained by the fact that despite Hofstede's country scores (which are more generic and do not only focus on the environmental context of this study), EU consumers might not regard environmentally-friendly products as norm-driven choices, but as products that satisfy personal, hedonic and self-gratifying needs (Cervellon & Shammas 2013; Cohen 2016), which could explain the lack of differences on this least researched dimension.

Lastly, higher levels of pragmatism were expected to be associated higher levels of WTP (while normative consumers were expected to be more traditional and less open to environmental innovations). However, the common regulations, legislation supportive of eco-innovations and the movement of green products within the EU might have increased the familiarity of environmentally-friendly innovations and products among all EU consumers. The international diffusion of environmentally-friendly products/innovations is driven by the fact that they offer solutions to consumer problems (Jänicke & Jacob 2006), eventually resulting in more acceptance in more traditional, normative countries. Consequently, this has led to a less clear pragmatic/normative dichotomy for environmentally-friendly products.

Business and policy implications

Based on the aforementioned results and discussion, important recommendations arise. Firstly, more systematic information on environmentally-friendly products and environmental issues should be provided to EU consumers to increase societal awareness. Since higher levels of subjective knowledge is associated with higher levels of importance put on the product's impact in every EU country, we recommend improved information provision by EU policymakers and businesses to boost environmentally-friendly product consumption. Marketing communications and product packaging should emphasize not only the product attributes (including the 'environmental' attribute) but also clearly specify why and how the product has reduced impact (e.g. in terms of air miles, recyclable packaging, organic growing process etc.). Additionally, businesses should communicate such information more frequently to improve knowledge/familiarity among their consumers. Policy makers at national and European levels should communicate similar information to consumers (i.e. via environmental and governmental social marketing campaigns and public education) and try to increase consumers' familiarity with environmentally-friendly products. Likewise, consistent EU-wide legislation around labeling reflecting the impact of different products is needed a (see also Brécard 2013). These measures are important because the findings showed a positive association between environmental product attitudes and WTP (which was significant for almost half of the EU countries); and that subjective knowledge is a significant predictor of environmental product attitudes. Thus, clearer and more consistent information at the product development and marketing stages, as well as policy level, could result in higher environmental product attitudes and WTP. Marketing communications appealing to ethical values, such as those reflected in the measure of environmental product attitudes used in this study (e.g. 'is the right thing to do'; 'makes a real difference to the environment') must be also considered.

Secondly, information provision can help to boost the environmentally-friendly product consumption by correcting information asymmetries in countries characterized by Hofstede's cultural dimensions of individualism and uncertainty avoidance. In countries with higher levels of uncertainty avoidance, highlighting the range of benefits associated with environmentally-friendly products (e.g. in terms of health, quality, environmental features etc.) carries particular value in reducing consumers' perceived risk and uncertainty (Reinhardt, 1999). Eco-labels endorsed by standardization institutes and the EU can be particularly effective in instilling confidence in consumers by providing information in order to mitigate the negative effects of uncertainty avoidance (Pearce 1999). Alternatively, in countries with higher levels of individualism, where consumers are self-focused, the marketing communications of businesses should emphasize the positive impacts that environmentally-friendly products have for individuals rather than emphasize the ethical side. For example, communicating energy saving light bulbs with a longer lifecycle save also money for consumers.

Besides information provision, this paper calls on EU policy makers to provide support for the producers of environmentally-friendly products particularly in countries where these products are relatively recent. This need has been acknowledged over 10 years ago by the Commission of the European Communities (2001: 9), which declared that 'as economic interests are a main driver [for the adoption of environmental behavior], the instruments probably most effective are those, like taxes and subsidies, that help to 'get the prices right', to internalize external costs'. However, such support is yet to be broadened to a variety of environmentally-friendly products. In 2013, the European Commission (2013: 2) has embarked on 'Building the Single Market for Green Products' as part of the Resource Efficiency Roadmap 2020 milestone. Nevertheless, the current findings show there might be challenges in achieving this because of differences between the EU countries. For this policy

to succeed, further research into the unique determinants of environmentally-friendly purchasing behavior in each country should be accompanied by relevant government interventions (e.g. environmental procurement, environmental standards, environmental subsidies) (Blundel 2013; Moon et al. 2015).

Conclusions, limitations and future research

This paper contributes to the business, ethics and marketing literatures on environmental consumption by investigating consumers' WTP for environmentally-friendly products across 28 EU countries. The paper's contributions are threefold: Firstly it reveals the intricate relationships between different determinants of WTP for environmentally-friendly products as a general contribution to the environmentally-friendly product consumption and business ethics literature. This is achieved by extending the Knowledge-Attitude-Behavior (KAB) model to include both general (i.e. *environmental product attitudes*) and specific (i.e. *perceived importance of environmental impact of products*) attitudinal constructs, aside from *subjective knowledge about the environmental impact of products* (K of KAB), and by investigating their impact on a behavioral proxy i.e. *WTP more for environmentally-friendly products* (B of KAB). The investigation is based on a large sample of 21,514 EU consumers across 28 EU countries. Secondly, it examines whether these relationships between KAB variables differ significantly across the 28 EU countries, which identifies a South-East versus North-West EU divide. This is the first study that examines 28 countries in close geographical proximity, by combining statistical techniques such as the Chow test and a series of multigroup SEM analysis, which added an extra layer to the investigation. Finally, this study explores the role of Hofstede's six cultural dimensions, including the two new and under-researched ones i.e. pragmatic/normative and indulgence/ restraint, in explaining

differences in KAB variables. Based on the results several business and policy recommendations were proposed.

Despite the aforementioned contributions, some limitations must be acknowledged. Given the restricted ability of the tested model to predict WTP across the entire EU market and the non-significant or low R^2 for some individual countries, other relevant decisional variables should be considered – e.g. environmental empathy (Schultz, 2000) and perceptions of risk associated with environmentally-friendly products (Chen & Chang 2012). Additionally, given the complexity of environmental decision making processes and since KAB is not an 'all encompassing' model, other decisional variables such as implicit attitudes that exist at a less consciously accessible level, with independent effects on behavior (Levine & Strube 2012: 309); the role of self concept and its relationship with attitudes of environmental concern (Zelezny and Schultz 2000); formal and informal sources (Vicente-Molina et al. 2013) should be explored as factors that influence subjective and objective environmental knowledge.

Besides the micro level of the individual consumer, future studies could take a more holistic approach by considering meso and macro level determinants of environmentally-friendly purchasing (Abreu et al., 2015; Bradley and Ziniel, 2016). At the meso level, factors related to the household and the city/region are important considerations for environmental consumption patterns (Kenworthy, 2006). Macro-level variables (e.g. state regulations around environmentally-friendly goods and their stringency; country level indicators of economic development such as GDP and income distribution) that account for the different institutional settings of the EU countries could help improve the goodness-of-fit in the estimations and provide insights on important relationships not covered in this study.

The definitions and constructs included in the Flash Eurobarometer survey also pose certain limitations. The use of the broad term environmentally-friendly products in the

survey, can be seen too generic and could have affected consumers' self-reported WTP. Future research should look at specific product categories e.g. FMCG vs. durable goods; utilitarian vs. hedonic products, which are priced differently. Aligning better the survey design with ethical consumption theoretical insights can improve the reliability of the information collected in such surveys. Additionally, the use of single-item measures for the majority of the constructs in Flash Eurobarometer surveys pose challenges for further in-depth quantitative analysis (Bruner and Hensel, 1993), which should be addressed by the European Commission in order to provide researchers more robust multi-item measures. Such changes will aid data analysis and guide better policy making. Continuous data items should also be included in the dataset in order to allow researchers to gain further insights into the environmental purchasing behavior and its determinants (e.g. percentage of monthly income spent on environmentally-friendly products). Related to this, the use of SEM is also considered more appropriate for theoretical models with multiple latent factors; however the advantages of this methodology for this study outweigh its disadvantages as per the methodology section. Additionally, it should be acknowledged that some countries also had Cronbach's alpha lower than .70 for the environmental product attitudes construct as indicated in the methodology section, which may bear limitations in results' interpretation.

Finally, the use of Hosfstede's cultural dimensions' mean values can be a limitation (though a widely-used method) due to cultural heterogeneity in some European countries (Kaasa et al. 2013). Environment studies focusing on culture should consider measuring cultural dimensions using specific survey questions. Nonetheless, the present study offers useful insights in terms of predicting consumers' WTP more for environmentally-friendly products, across the 28 EU countries. Specifically, it provides evidence that a 'one-size-fits-all' model is not suitable, given the identified differences, and offers suggestions and recommendations for future research, business practice and policy making.

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Tables

Table 1 Sample size and breakdown

Country	15-24	25-34	35-44	45-54	55-64	65+	Male	Female	Total
FR – France	70	104	153	169	180	211	358	529	887
BE – Belgium	87	99	132	178	181	171	360	488	848
NL - The Netherlands	41	64	107	189	198	231	358	472	830
DE – Germany	83	80	98	178	152	239	350	480	830
IT – Italy	55	91	167	157	162	143	314	461	775
LU – Luxembourg	57	55	95	108	80	54	222	227	449
DK – Denmark	71	51	89	138	158	204	342	369	711
IE – Ireland	61	73	123	198	199	194	349	499	848
GB - UK	71	98	104	166	152	184	342	433	775
GR – Greece	90	155	211	178	132	90	353	503	856
ES – Spain	94	154	232	210	121	74	399	486	885
PT – Portugal	102	139	176	150	129	136	364	468	832
FI – Finland	60	73	95	130	182	287	394	433	827
SE – Sweden	40	79	125	144	157	293	415	423	838
AT – Austria	80	78	102	181	203	244	374	514	888
CY - Cyprus	51	37	65	80	67	67	173	194	367
CZ - Czech Republic	70	123	138	133	173	171	355	453	808
EE – Estonia	48	56	98	79	70	120	164	307	471
HU – Hungary	62	103	128	136	199	164	285	507	792
LV – Latvia	89	104	134	149	132	203	270	541	811
LT – Lithuania	103	122	124	152	130	127	301	457	758
MT – Malta	33	55	74	63	71	53	127	222	349
PL – Poland	73	103	128	165	210	113	323	469	792
SK – Slovakia	71	113	142	183	230	128	359	508	867
SI – Slovenia	48	85	92	143	212	275	356	499	855
BG – Bulgaria	73	109	145	127	176	209	284	555	839
RO – Romania	126	165	163	135	197	89	411	464	875
HR – Croatia	79	116	127	159	201	169	314	537	851
TOTAL	1988	2684	3567	4178	4454	4643	9016	12498	21514

Table 3 Descriptive statistics and correlations

	M (SD)	Correlations									
Power distance	N/A	1									
Individualism	N/A	-.56**	1								
Masculinity	N/A	.18**	.11**	1							
Uncertainty avoidance	N/A	.57**	-.57**	.13**	1						
Pragmatism	N/A	.15**	.18**	.10**	.04**	1					
Indulgence	N/A	-.54**	.41**	-.09**	-.45**	-.37**	1				
SK	2.70 (.78)	-.03**	-.03**	.00	-.00	.00	-.02**	1			
IMP	3.23 (.74)	.06**	-.09**	.08**	.07**	-.02**	-.02**	.19**	1		
ATT	3.48 (.50)	.15**	-.23**	.05**	.16**	-.09**	-.10**	.12**	.34**	1	
WTP	2.43 (1.04)	-.01	-.07**	.01	-.05**	.03**	.00	.11**	.13**	.17**	1

SK = Subjective knowledge about the environmental impact of products (Min-Max=1-4); IMP = Perceived importance of the environmental impact of products (Min-Max=1-4); ATT = Attitudes toward environmentally-friendly products (Min-Max=1-4); WTP = Willingness to pay more for environmentally-friendly products (Min-Max=1-5

Table 2 Means, Standard Deviations, Cronbach's Alphas and Hofstede's Scores

		Alpha	M (SD)				Hofstede's Scores					
		ATT	*ATT*	*SK*	*IMP*	*WTP*	*PD*	*INDI*	*M*	*UA*	*P*	*INDU*
SOUTH-EAST EUROPE												
SOUTH	HR	a=.64	3.47 (.44)	2.66 (.75)	3.31 (.75)	2.94 (1.15)	73	33	40	80	58	33
	GR	a=.71	3.58 (.53)	2.66 (.82)	3.23 (.77)	2.35 (1.05)	60	35	57	100	45	50
	CY	a=.59	3.70 (.39)	2.63 (.87)	3.22 (.84)	2.36 (1.08)	n/a	n/a	n/a	n/a	n/a	n/a
	IT	a=.73	3.38 (.49)	2.87 (.82)	3.50 (.62)	2.27 (.97)	50	76	70	75	61	30
	MT	a=.61	3.72 (.38)	2.61 (.72)	3.37 (.82)	2.32 (.95)	56	59	47	96	47	66
	PT	a=.50	3.77 (.32)	2.78 (.77)	3.39 (.64)	2.01 (.99)	63	27	31	99	28	33
	ES	a=.68	3.55 (.47)	2.75 (.81)	3.12 (.79)	2.07 (.97)	57	51	42	96	48	44
	SI	a=.59	3.72 (.36)	2.92 (.77)	3.40 (.74)	2.61 (1.07)	71	27	19	88	49	48
EAST	BG	a=.63	3.61 (.44)	2.65 (.80)	3.51 (.68)	2.77 (1.13)	70	30	40	85	69	16
	RO	a=.63	3.72 (.43)	2.52 (.91)	3.34 (.75)	2.59 (1.21)	90	30	42	90	52	20
	SK	a=.68	3.56 (.44)	2.79 (.82)	3.30 (.75)	2.57 (1.00)	100	52	100	51	77	28
	PL	a=.74	3.56 (.45)	2.81 (.66)	3.31 (.71)	2.54 (1.01)	68	60	64	93	38	29
	HU	a=.67	3.64 (.40)	2.70 (.70)	3.31 (.67)	2.32 (.98)	46	80	88	82	58	31
	CZ	a=.67	3.41 (.46)	2.80 (.71)	3.07 (.75)	2.62 (.99)	57	58	57	74	70	29
NORTH-WEST EUROPE												
NORTH	DK	a=.72	3.35 (.58)	2.77 (.70)	3.12 (.75)	2.62 (1.10)	18	74	16	23	35	70
	EE	a=.68	3.48 (.48)	2.64 (.76)	2.92 (.75)	2.23 (.98)	40	60	30	60	82	16
	FI	a=.77	3.22 (.48)	2.67 (.68)	2.95 (.69)	2.40 (.90)	33	63	26	59	38	57
	IE	a=.70	3.35 (.47)	2.55 (.76)	3.19 (.74)	2.28 (.93)	28	70	68	35	24	65
	GB	a=.77	3.28 (.55)	2.49 (.80)	3.17 (.75)	2.20 (.94)	35	89	66	35	51	69
	LV	a=.63	3.29 (.52)	2.79 (.75)	2.98 (.81)	2.33 (.96)	44	70	9	63	69	13
	LT	a=.68	3.41 (.50)	2.70 (.72)	3.10 (.79)	2.11 (.98)	42	60	19	65	82	16
	SE	a=.73	3.56 (.48)	2.73 (.72)	3.24 (.67)	2.75 (.99)	31	71	5	29	53	78
WEST	FR	a=.74	3.33 (.57)	2.43 (.78)	3.21 (.77)	2.06 (.91)	68	71	43	86	63	48
	BE	a=.71	3.35 (.53)	2.50 (.77)	3.16 (.73)	2.11 (.91)	65	75	54	94	82	57
	NL	a=.75	3.09 (.58)	2.75 (.67)	3.08 (.65)	2.40 (.92)	38	80	14	53	67	68
	DE	a=.72	3.39 (.52)	2.87 (.74)	3.24 (.67)	2.74 (.99)	35	67	66	65	83	40
	LU	a=.68	3.41 (.48)	2.45 (.82)	3.29 (.69)	2.59 (1.04)	40	60	50	70	64	56
	AT	a=.70	3.48 (.49)	2.95 (.72)	3.45 (.63)	2.85 (1.03)	11	55	79	70	60	63

SK = Subjective knowledge about the environmental impact of products (Min-Max=1-4); IMP = Perceived importance of the environmental impact of products (Min-Max=1-4); ATT = Attitudes toward environmentally-friendly products (Min-Max=1-4); WTP = Willingness to pay more for environmentally-friendly products (Min-Max=1-5); PD=Power Distance; INDI=Individualism; M=Masculinity; UA=Uncertainty Avoidance; P=Pragmatism; INDU=Indulgence.

Table 4 SEM results of the hypothesized model (H1-H5)

	Std. Loadings	S.E.	z-scores	Hypothesis Support
H1: Subjective Knowledge about Environmental Impact of Products (SK)→ Perceived Importance of Environmental Impact of Products (IMP)	.15**	.00	24.50	Yes
H2: Subjective Knowledge about Environmental Impact of Products (SK)→ Environmental Product Attitudes (ATT)	.12**	.01	18.32	Yes
H3: Environmental Product Attitudes (ATT)→ Perceived Importance of Environmental Impact of Products (IMP)	.32**	.00	53.83	Yes
H4: Environmental Product Attitudes (ATT)→ Willingness to Pay More If Confident in Environmental Product Attributes (WTP)	.14**	.02	19.54	Yes
H5: Perceived Importance of Environmental Impact of Products (IMP)→ Willingness to Pay More If Confident in Environmental Product Attributes (WTP)	.08**	.02	11.76	Yes

R^2= 3.4%, p<.01; x^2=142.41, df=1, p=.00; CFI=.97; TLI=.81; SRMR=.02; N=21514; **p<.01

Table 5 Multigroup SEM results based on country: Differences between countries

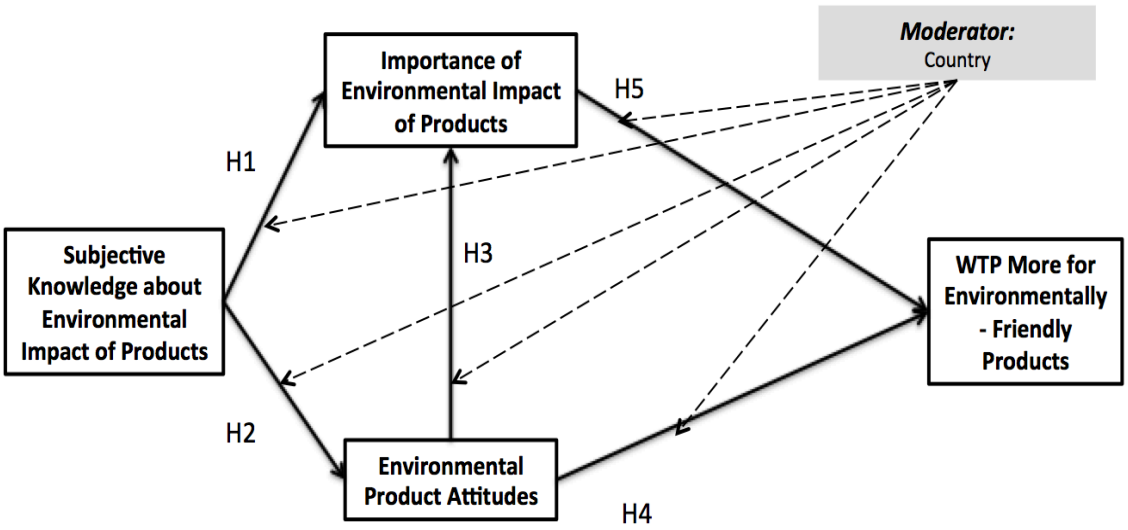
			Std. Loadings				
	R^2	Free Parameters Multigroup SEM $\chi^2_{(df)}$	IMP→WTP	ATT→WTP	ATT→IMP	SK→IMP	SK→ATT
NORTH-WEST EUROPE							
FR	4.6%**	6.85	0.07*	0.18**	0.35**	0.18**	0.15**
BE	3.5%**	4.04	0.04	0.1**	0.35**	0.16**	0.14**
NL	11.6%**	5.34	0.11**	0.28**	0.37**	0.16**	0.13**
DE	4.2%**	7.98	0.04	0.18**	0.38**	0.17**	0.18**
AT	4.0%**	1.95	0.09**	0.15**	0.35**	0.15**	0.18**
LU	4.4%*	0.16	0.02	0.20**	0.33**	0.13**	0.14**
DK	14.2%**	4.69	0.23**	0.21**	0.42**	0.26**	0.17**
IE	5.6%**	13.82	0.16**	0.12**	0.37**	0.18**	0.12**
GB	8.2%**	2.61	0.05	0.26**	0.43**	0.14**	0.13**
EE	3.7%*	1.28	0.05	0.17**	0.29**	0.12**	0.07
LV	1.7%	5.28	0.02	0.12**	0.23**	0.22**	0.13**
LT	2.0%*	0.00	0.04	0.13**	0.22**	0.12**	0.15**
FI	7.9%**	4.38	0.10**	0.23**	0.30**	0.24**	0.20**
SE	7.9%**	4.45	0.13**	0.20**	0.42**	0.18**	0.16**
SOUTH-EAST EUROPE							
IT	1.7%	3.18	-0.03	0.13**	0.25**	0.09**	0.04
GR	2.0%*	4.19	0.07*	0.10**	0.30**	0.14**	0.07*
ES	1.1%	1.35	0.06	0.07	0.29**	0.15**	0.06
CY	2.9%	2.32	0.11*	0.11*	0.13*	0.23**	0.14**
CZ	2.5%*	19.76	0.10**	0.09*	0.38**	0.14**	0.13**
PT	2.1%*	2.79	0.06	0.12**	0.19**	0.14**	0.07*
HU	1.9%*	0.65	0.05	0.12**	0.22**	0.16**	0.05
MT	1.6%	3.59	0.12*	-0.09	0.32	0.10*	0.07
PL	1.6%	0.37	-0.00	0.13**	0.31**	0.17**	0.11**
SK	1.9%*	6.10	0.05	0.11**	0.29**	0.14**	0.13**
SI	1.5%	1.05	0.06	0.09**	0.24**	0.20**	0.10**
BG	2.1%*	12.41	0.05	0.13**	0.18**	0.11**	0.17**
RO	1.0%	5.44	0.07	0.06	0.25**	0.10**	0.09**
HR	5.6%**	0.86	0.08*	0.20**	0.31**	0.09**	0.16**
Difference between fully constrained model and model where one path allows to vary across countries:			$\Delta\chi^2_{(27)} = 73.78$**	$\Delta\chi^2_{(27)} = 80.69$**	$\Delta\chi^2_{(27)} = 92.68$**	$\Delta\chi^2_{(27)} = 69.97$**	$\Delta\chi^2_{(27)} = 69.62$**

SK = Subjective knowledge about the environmental impact of products (Min-Max=1-4); IMP = Perceived importance of the environmental impact of products (Min-Max=1-4); ATT = Attitudes toward environmentally-friendly products (Min-Max=1-4); WTP = Willingness to pay more for environmentally-friendly products (Min-Max=1-5).
Free Parameter Model: χ^2=127.01, df=28, p=.00; CFI=.98; TLI=.87; SRMR=.02; N=21514; **p<.01; *p<.05;
Fully constrained parameter model χ^2=481.66, df=163
Free-Fully Model $\Delta\chi^2_{(135)} = 354.65$, p<.01
Chow test F values: F=47.95 (SK–ATT); F=18.84 (SK–IMP); F=48.3 (ATT–IMP); F=401.47 (IMP–WTP); F=29.06 (ATT–WTP).

Table 6 Differences between high and low scores of Hofstede's dimensions: Examining H7 to H12

Construct	Hofstede's scores (based on median split)	M (SD)	T-test	Hypothesis Supported?
H7: Individualism				
SK	Lower & Higher	2.73 (.79) &2.67 (.76)	t(21145)=5.16, p<.01	n/a
IMP	Lower & Higher	3.28 (.75) &3.18 (.72)	t(21145)=10.26, p<.01	n/a
ATT	Lower & Higher	3.57 (.46) &3.36 (.54)	t(21145)=29.83, p<.01	n/a
WTP	Lower & Higher	2.49 (1.08) &2.37 (.98)	t(21145)=8.41, p<.01	Yes
H8: Masculinity				
SK	Lower & Higher	2.70 (.77) &2.71 (.78)	t(21145)=-1.27, p>.05	n/a
IMP	Lower & Higher	3.20 (.75) &3.27 (.72)	t(21145)=-6.93, p<.01	n/a
ATT	Lower & Higher	3.46 (.52) &3.47 (.49)	t(21145)=.61, p>.05	n/a
WTP	Lower & Higher	2.43 (1.07) &2.45 (1.01)	t(21145)=-1.41, p>.05	No
H9: Uncertainty Avoidance				
SK	Lower & Higher	2.71 (.75) &2.68 (.79)	t(21145)=3.81, p<.01	n/a
IMP	Lower & Higher	3.16 (.74) &3.32 (.73)	t(21145)=-15.71, p<.01	n/a
ATT	Lower & Higher	3.38 (.52) &3.56 (.47)	t(21145)=-26.22, p<.01	n/a
WTP	Lower & Higher	2.49 (1.00) &2.38 (1.07)	t(21145)=7.32, p<.01	Yes
H10: Power Distance				
SK	Lower & Higher	2.72 (.75) &2.68 (.79)	t(21145)=3.54, p<.01	n/a
IMP	Lower & Higher	3.19 (.73) &3.28 (.75)	t(21145)=-9.25, p<.01	n/a
ATT	Lower & Higher	3.39 (.52) &3.55 (.48)	t(21145)=-25.03, p<.01	n/a
WTP	Lower & Higher	2.44 (1.00) &2.43 (1.07)	t(21145)=.89, p>.05	No
H11: Restraint				
SK	Lower & Higher	2.74 (.78) &2.66 (.77)	t(21145)=7.37, p<.01	n/a
IMP	Lower & Higher	3.25 (.74) &3.21 (.73)	t(21145)=3.75, p<.01	n/a
ATT	Lower & Higher	3.52 (.48) &3.41 (.54)	t(21145)=14.97, p<.01	n/a
WTP	Lower & Higher	2.45 (1.07) &2.42 (1.01)	t(21145)=1.46, p>.05	No
H12: Pragmatism				
SK	Lower & Higher	2.69 (.77) &2.72 (.78)	t(21145)=-2.53, p<.05	n/a
IMP	Lower & Higher	3.24 (.74) &3.23 (.74)	t(21145)=1.69, p>.05	n/a
ATT	Lower & Higher	3.53 (.48) &3.40 (.52)	t(21145)=20.09, p<.01	n/a
WTP	Lower & Higher	2.43 (1.06) &2.44 (1.02)	t(21145)=-.48, p>.05	No

SK = Subjective knowledge about the environmental impact of products (Min-Max=1-4); IMP = Perceived importance of the environmental impact of products (Min-Max=1-4); ATT = Attitudes toward environmentally-friendly products (Min-Max=1-4); WTP = Willingness to pay more for environmentally-friendly products (Min-Max=1-5).



Note: Figure does not show relationships linked to RQ3 (i.e. Hofstede's cultural dimensions)

Figure 1 The proposed model for willingness to pay more for environmentally-friendly products