

Article

Consumer Intention to Purchase Green Consumer Chemicals

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Abstract: The article deals with consumer behaviour when purchasing green products. It develops theoretical knowledge in the field of antecedents to purchase intention with a focus on the currently neglected consumer chemicals (detergents, cleaning agents and cosmetic products). Based on previous studies, antecedents of purchase intention for green consumer chemicals are identified and the significance of their influence is subsequently verified by empirical research. Confirmatory analysis is based on structural equation modelling of data obtained from a questionnaire survey conducted among 250 consumers. The empirical findings show that the main antecedents of green purchase intention are environmental concern, green lifestyle and product knowledge. The influence of promotion and community can be regarded as weak to insignificant. The degree of influence of all investigated antecedents depends on the gender, age and level of education of consumers. Increasing the volume of purchasing green consumer chemicals will in particular require provision of more information to consumers to increase their awareness of environmental protection and green products.

Keywords: consumer behaviour; purchase intention; green purchase antecedents; green consumer chemicals; chemical industry



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1. Introduction

The unsustainable consumption which is occurring around the world at present is leading to serious environmental problems, in particular global warming and climate change [1]. This stimulates not only a general interest in environmental issues [2,3] but also consumer interest in this field. As a result, consumers are becoming increasingly more prudent regarding the environmental impact of their consumption patterns [4], changing their preferences and choosing lifestyles which are more environmentally friendly [5]. A new customer segment has emerged known as environmentally conscious consumers or green consumers [6]. In their desire for a clean and green planet, they are increasingly buying products made from natural resources with a low ecological footprint [3,7]. Companies from various industries are responding to this development on the market. Many of them have adopted environmentally friendly practices and are incorporating green products (recycled and biodegradable products, organic foods, non-toxic cleaning products and energy efficient products) into their product portfolios [5]. Their aim is not only to attract green customers at the moment but also to get them to make repeat purchases and expand their interest in the company's other green products at this current time of consumer resistance to higher prices [8]. The problem, however, is that their efforts are often intuitive, without any deeper understanding of the motives behind the decision-making processes of green consumers. The academic sphere has not yet been of sufficient help to them either, with many studies failing to consider the factors which motivate consumers to buy green products [5]. Even today, there is no consensus in the professional literature on what the main antecedent of purchasing green products is.

Research in this area is usually based on the conventional theory of planned behaviour [9]. However, the majority of this research has revealed only a weak positive

relationship between attitude towards green purchasing and the actual purchase behaviour, which is in direct contradiction to the above-mentioned theory [10]. Simply put, just because a customer perceives the attributes of green products positively does not mean that they will also buy green products. As a result, purchasing behaviour models tend to be supplemented by a number of other cognitive factors (e.g., environmental concern, environmental knowledge, environmental and social consciousness, environmental literacy, perceived consumer effectiveness, self-efficacy, self-construal, equity sensitivity, consumption value perceptions, consideration of future consequences and value orientation). According to the latest studies [4,11–13], environmental concern (or altruistic value) is one of the strongest antecedents of attitude towards green products and/or green purchase intention.

The systematic review of research into relationships between sustainable product attributes and consumer decision making conducted by Bangsa and Schlegelmilch [14] shows that any effort to explain green customer behaviour through individual-centric behavioural models fails to capture the complexity of the customer's decision-making process. Therefore, they recommend adding additional variables for future research in this area (marketing and purchase factors, social and structural context) to go with the standard linear modelling approach. At the same time, they draw attention to the fact that existing research has practically focused only on the sustainable attributes of food products. They therefore recommend that researchers should also focus on other product segments with significant negative environmental impacts [14]. This appears to be clearly beneficial, as according to Rahman [15], consumer intentions are greatly dependent on how important the product they are buying is from the point of view of environmental protection as well as how involved the customer is in the purchase.

This is why in our article, we focus on the antecedents of purchase intention for green consumer chemicals, i.e., detergents, cleaning products and cosmetics. This is a logical choice—similar to food products, these are products which are part of regular everyday shopping, purchased in large quantities and at relatively low prices. Similar to food products, consumer chemicals are typically a fast-moving consumer goods item. However, unlike foodstuffs, consumer chemicals are more important from the point of view of environmental protection, this being mainly due to their composition. Customer involvement may also be different. From a theoretical perspective, investigation into consumer attitudes towards purchasing green consumer chemicals is clearly beneficial, as to the best of our knowledge, the antecedents of these purchase intentions are not sufficiently addressed in the professional literature.

The aim of the article is to identify the following on the basis of literature research and quantitative research among consumers in the Czech Republic:

- The main antecedents to consumer intention to purchase green consumer chemicals;
- The degree of influence of these antecedents among Czech consumers and their selected segments (by gender, age and level of education).

The article is structured as follows. Section 2 includes an overview of current literature and hypotheses development. Section 3 outlines the research methodology. Section 4 presents the results of the empirical research and Section 5 discusses them. Finally, Section 6 presents the theoretical implications, managerial implications and limitations of the study and suggests some future research directions.

2. Theoretical Framework

Antecedents to green purchase intention have to date been addressed by several authors. Some of them address the issue in general relation to green products (e.g., [4,11]), or to products packed in environmentally friendly packaging [12]. Some authors develop the given issue in relation to specific products, usually foodstuffs. These studies are generally performed in relation to green food products [16–18] or a specific item of food, e.g., wine, chocolate or fruit, etc. [19–26]. Occasionally we can find papers dealing with these antecedents in relation to other products, e.g., green furniture [13] or in relation to cosmet-

ics [27]. Unfortunately, only one study has so far focused on purchase of environmentally friendly cleaning products [28]. This examines the influence of advertising on the preference for environmentally sustainable products. Therefore, when defining antecedents to green purchase intentions in relation to consumer chemicals, previous approaches must be carefully evaluated and antecedents which are likely in relation to consumer chemicals must be selected using previous research approaches.

De Marchi et al. [29] state that consumers interested in health and sustainability issues gravitate towards products with environmental protection and health attributes. Subsequent environmental knowledge induces willingness to buy green products, as Barber et al. ascertained [30] in the case of environmentally friendly wines. According to the literature [19,31], this concerns fears (arising from consumer interest in environmental issues) which form their purchase intentions. Moon et al. [32] cite environmental awareness, prosocial behaviour and openness to new experiences as influences aiding acceptance of a sustainable product; D'Amico et al. [24] add curiosity. Other sources also cite the importance of awareness for consumer purchase intentions in relation to green products [4,17,33]. Moon et al. [32] note that it is precisely environmental awareness which has the strongest association with acceptance of a sustainable product, and according to Garvey and Bolton [34], increasing consumer awareness about the environment leads consumers to engage in systematic environmental behaviour and to give preference to products which contribute towards environmental protection. This is why, also in compliance with the literature [4,11–13], we consider interest (raising awareness and often also evoking fears) to be a proven antecedent of consumer intent when purchasing green food products. Based on this conviction, the following Hypothesis H1 was formulated for research in the field of purchasing of green consumer chemicals.

Hypothesis H1. *Environmental concern affects green purchase intention positively.*

Rousseau and Vranken [23] revealed that education plays a role in purchasing of organic apples, as do a vegetarian lifestyle and the respondents' membership in one or more conservation-focused organisations. At the same time, Ghvanidze et al. [31] conclude that a healthy lifestyle influences food purchasing. Those consumers who espouse the given lifestyle assess the utility value of foods on the basis of nutritional information about the product. It can therefore be assumed that a lifestyle focused on reducing the impact of one's own life on the environment influences consumers to purchase environmentally friendly products. This is why the following Hypothesis H2 was formulated.

Hypothesis H2. *A green lifestyle affects green purchase intention positively.*

The authors Boztepe [35] and Thøgersen et al. [36] cite several key factors which influence choice of a green product, and these include consumer awareness relating to the specific product and the environmental properties of the given product. On the basis of the research in the field of purchase intentions associated with environmentally friendly wine, D'Amico et al. [24] summarise that willingness to pay occurs among consumers who are well informed about organic products and that consumer intention to purchase organic food depends on their knowledge of green products. This product knowledge is for example used and also established by means of eco-labels. This concerns a relatively important tool as in Germany, for example, a label symbolising sustainability is sufficient to target 85% of the population [37]. Bronnmann and Asche [19] also mention the importance of eco-labels. According to their research, consumers prefer wild seafood with an eco-label to seafood without a label. However, the consumers' willingness to pay for eco-labels depends on the objective information they are provided and the subjective perceptions they have of eco-labels [23]. If they have sufficient knowledge, they can base their purchase decision on the presence of an eco-label, a carbon footprint label and low-calorie content [29]. However, ecological certification alone need not be enough to assure the consumer of the quality of the given green product [24]. For example, Silva et al. [22] show via their

research that the vast majority of consumers ignore sustainability labelling relating to foodstuffs (chocolate). This is why they recommend the dissemination of information helping people to understand the importance of environmentally friendly and sustainable brands. Girgenti et al. [25] also agree with this opinion, assuming that improving consumer awareness of attributes such as “locally grown” and “local product” will help to encourage more environmentally friendly consumption of raspberries and blueberries. The conclusions of all these studies point to the fact that product knowledge is an antecedent of purchase intentions. This is why the following Hypothesis H3 was formulated.

Hypothesis H3. *Product knowledge affects green purchase intention positively.*

Bangsa and Schlegelmilch [14] recommend that marketing and social factors be ranked among the antecedents of green customer behaviour. This seems to be a justified recommendation, taking into account other papers by authors dealing with the issue. Maniatis [17], for example, cites environmental promotion as one of the key factors influencing choice of a green product on the part of the consumers. Bodur et al. [28] found that not only the form of advertising influences preference for environmentally sustainable products, but also that this preference is enhanced by advertising messages which highlight the individual behaviour of individuals while purchasing such products. Moreover, De Graaf et al. [38] assume that communication with customers can influence change in purchase intention (in the case of foodstuffs). They therefore recommend providing information focused on animal welfare, the absence of disease in the animals or exact specification of the products from these animals. It seems that even general CSR activities not directly relating to a specific product have a positive impact on the evaluation of the given company’s products [39]. Woo and Kim [16] also identified an existing relationship between marketing activity and purchase intention in the context of green foodstuffs. In their opinion, discounts, product availability and sales support, including various incentives, play an important role in purchase intent. Not only therefore on the basis of the recommendations provided by Bangsa and Schlegelmilch [14], but also on the basis of a study which was performed in the field of cleaning agents [28], we formulate the hypothesis H4.

Hypothesis H4. *Promotion affects green purchase intention positively.*

As far as the second recommended antecedent is concerned, i.e., the influence of community, it seems that this has already been proven in general terms. The authors Salazar et al. [40] confirmed their own hypothesis that social groups (such as colleagues, family and friends) have a positive influence on the likelihood of choosing socially and environmentally friendly products. The authors Rousseau and Vranken [23] reached similar conclusions in relation to food products. During their research, they identified the influence of respondents’ membership in one or more conservation organisations on willingness to pay for organic apples. It can therefore be assumed that community influence will also exist in the case of purchasing green consumer chemicals. The following hypothesis was formulated for research:

Hypothesis H5. *Community affects green purchase intention positively.*

The anticipated antecedents to consumer intention to purchase green consumer chemicals can be divided into internal antecedents associated with the personality of the given consumer (environmental concern, green lifestyle and product knowledge) and external antecedents associated with the influence of purchase incentives and the community in which the consumer lives (promotion, community).

A regression model can be identified on the basis of the hypotheses proposed above which illustrates the influence of environmental concern, green lifestyle, product knowledge, promotion and community on green purchase intention. A path diagram of the research model is provided in Figure 1.

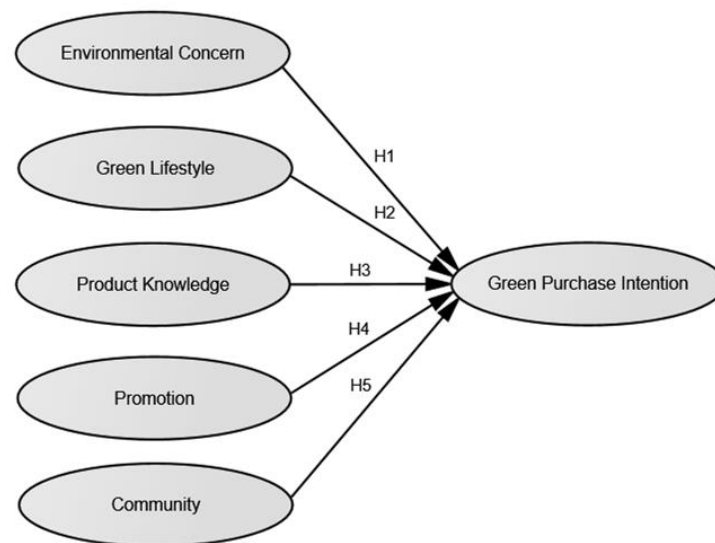


Figure 1. Research model.

In order to test the validity of the research hypotheses in the research model, research into the attitudes of Czech consumers towards purchasing green consumer chemicals was designed and implemented.

3. Materials and Methods

Research was organised as survey using an online questionnaire. The designed questionnaire was tested among 30 selected respondents of different gender, age and educational background to eliminate errors and any failings in formulation in the questionnaire before actual collection of data.

Data was collected in the period from June to September 2020 among Czech consumers aged 15 to 64. A quota sampling method was used when selecting respondents with balanced quotas for gender and age according to the information available on the structure of the economically active population of the Czech Republic [41]. A total of 250 valid questionnaires were returned and these subjected to statistical analysis. Demographic data about gender, age and level of education of the respondents is presented in Table 1.

Table 1. Characteristics of the respondents.

Variable	Value	Number	Percentage
Gender	Male	128	51.2
	Female	122	48.8
Age	15–24	35	14.0
	25–34	50	20.0
	35–44	62	24.8
	45–54	55	22.0
	55–64	48	19.2
Education	Primary level	5	2.0
	Secondary level	132	52.8
	Tertiary level	113	45.2
Total	-	250	100.0

The sample of respondents can be considered representative of the age and education of the population in the Czech Republic due to the chosen method of data collection, although the sample is slightly dominated by people with higher levels of education compared to the structure of the population in the Czech Republic. The reason for this

was low willingness on the part of people with no education or only primary education to participate in these types of surveys.

The survey ascertained 20 attitudes towards statements which indicated the individual constructs under investigation in the research model. The statements used were taken over from previous research [4,11–13,16,31,33,42], although they were modified slightly in certain cases. The reason for this modification was an effort to adapt the indicators to the specifics of the constructs under investigation and to eliminate any failings in formulation identified during testing of the questionnaire. All of the variables were measured on a five-point Likert scale (where 1 = “strongly disagree”, 2 = “disagree”, 3 = “neutral”, 4 = “agree” and 5 = “strongly agree”). Detailed information about the constructs and their indicators are presented in Table 2.

Table 2. Constructs and indicators.

Construct	Indicator
Environmental Concern	EC1: Human intervention in the environment often has disastrous consequences. EC2: The balance of nature is very delicate and can easily be disturbed by human activity. EC3: If we do not change our behaviour, it will lead to major environmental disasters. EC4: I am concerned about the deteriorating quality of the environment.
Green Lifestyle	GL1: I have a tendency to influence people in my environment to protect the environment. GL2: I do everything I can to contribute towards preserving an acceptable environment for future generations. GL3: I limit my consumption of resources (energy and water, etc.) because it contributes towards protection of the environment. GL4: I take pride in actively contributing towards protection of the environment.
Product Knowledge	PK1: I am able to judge whether the products I buy are environmentally friendly. PK2: I know more about green products than the average person. PK3: I understand the labels used on the packaging of green products.
Promotion	P1: I would buy a green product if it were on sale. P2: I would buy a green product if it were discounted in a sales promotion. P3: I would buy a green product if it were linked to a loyalty programme.
Community	C1: By buying a green product, I would make a good impression on the people around me. C2: The people around me would appreciate it if I bought green products. C3: Using green products would enable me to gain social acceptance from people around me.
Green Purchase Intention	GPI1: I am willing to change the brand of a product I buy in order to buy green products. GPI2: I tend to try new products which are environmentally friendly. GPI3: I am willing to change the product I currently buy for its more environmentally friendly version offered by the same brand.

Structural equation modelling [43] was used to verify the validity and reliability of measuring and to verify the validity of the research hypotheses using SPSS 22.0 and AMOS 23 software packages.

4. Data Analysis and Results

During the first step of data analysis, analysis was performed of the reliability and validity of measuring with the aid of confirmatory factor analysis. In the second step, regression weights in the research model were estimated and tested with the aid of path analysis. The statistical significance of the regression weights was first tested in the whole sample of respondents and subsequently in selected groups of respondents by gender (men, women), age (under the age of 34, 35 or older) and level of education (primary or secondary level, tertiary level).

4.1. Reliability and Validity Analysis

The reliability and validity of the constructs was verified using confirmatory factor analysis, the results of which, including selected measures of reliability (composite reliability, Cronbach's Alpha) and validity (average variance extracted), are contained in Table 3.

Table 3. Results of confirmatory factor analysis.

Construct	Indicator	Standard Loading ¹	Variances Error	Composite Reliability	Cronbach's Alpha	Average Variance Extracted
Environmental Concern	EC1	0.825	0.301	0.898	0.881	0.659
	EC2	0.787	0.276			
	EC3	0.854	0.205			
	EC4	0.780	0.411			
Green Lifestyle	LS1	0.829	0.360	0.850	0.813	0.533
	LS2	0.706	0.317			
	LS3	0.623	0.504			
	LS4	0.748	0.306			
Product Knowledge	PK1	0.842	0.314	0.828	0.824	0.620
	PK2	0.709	0.457			
	PK3	0.806	0.380			
Promotion	P1	0.915	0.166	0.902	0.900	0.772
	P2	0.976	0.051			
	P3	0.725	0.529			
Community	C1	0.872	0.188	0.864	0.816	0.611
	C2	0.775	0.255			
	C3	0.686	0.415			
Green Purchase Intention	GPI1	0.897	0.227	0.904	0.909	0.774
	GPI2	0.836	0.327			
	GPI3	0.905	0.189			

¹ Goodness of fit indices: $\chi^2 = 340.936$, $\chi^2/df = 2.2$, IFI = 0.942, TLI = 0.928, CFI = 0.942, RMSEA = 0.069.

The construct reliability can be quantified using measures of internal consistency in scale items, i.e., using composite reliability and Cronbach's Alpha [4,11–13,16,27,33]. The values of both variables should achieve values greater than 0.7 [43,44]. Table 3 shows that the values of the composite reliability are found within the range 0.828–0.904, and the values of Cronbach's Alpha are within the range 0.813 to 0.909. Therefore, the constructs are confirmed to be reliable.

Construct validity is the degree of the measurement scale that can be a real reflection of the constructs presented in the study. The average variance extracted is commonly used to evaluate this [4,11–13,16,27,33], the values of which should be greater than 0.5 for all constructs [43]. Table 3 shows that the value of the average variance extracted in the factor analysis model is found within the range 0.533–0.774, which indicates very good construct validity in this study.

4.2. Path Analysis

The path analysis of the research model made it possible to estimate the value of regression weights for each path in the regression model [43]. The confirmation of the research hypotheses is therefore supported by the statistical significance of these estimates at a level of 0.05. In addition to this, the size of the regression weights allows us to assess the strength of the relationship between the antecedent and purchase intention, with the strength of the positive effect of the antecedent on consumer intention to purchase green consumer chemicals increasing as the value of the weight increases.

Table 4 shows that environmental concern, green lifestyle, product knowledge and promotion have a significant influence on purchase intention throughout the whole of the

consumer population under investigation (regardless of gender, age and education). From among these four antecedents, environmental concern has the strongest influence (0.386). On the other contrary, the influence of community was not confirmed by the analysis.

Table 4. Results of path analysis in the whole of the sample of respondents.

Hypothesis	Regression Weight	S.E.	C.R.	<i>p</i>	Result
H1: Environmental concern affects green purchase intention positively.	0.386	0.060	6.457	<0.001	Supported
H2: Green lifestyle affects green purchase intention positively.	0.314	0.054	5.789	<0.001	Supported
H3: Product knowledge affects green purchase intention positively.	0.298	0.054	5.475	<0.001	Supported
H4: Promotion affects green purchase intention positively.	0.148	0.048	3.117	0.002	Supported
H5: Community affects green purchase intention positively.	0.077	0.056	1.368	0.171	Not supported

Differences in purchase behaviour depending on gender can be identified through comparison of the results of the analysis in the group of men (Table 5) and in the group of women (Table 6). Whereas environmental concern, green lifestyle, promotion and community rank among the major antecedents to purchase intention among men, the purchase intentions of women are significantly influenced by environmental concern, green lifestyle and product knowledge. Product knowledge, the influence of which is insignificant in the group of men, is on the contrary the strongest antecedent (0.462) in the group of women.

Table 5. Results of path analysis in the group of men.

Hypothesis	Regression Weight	S.E.	C.R.	<i>p</i>	Result
H1a: Environmental concern affects green purchase intention positively.	0.474	0.089	5.300	<0.001	Supported
H2a: Green lifestyle affects green purchase intention positively.	0.277	0.086	3.216	0.001	Supported
H3a: Product knowledge affects green purchase intention positively.	0.112	0.074	1.510	0.131	Not supported
H4a: Promotion affects green purchase intention positively.	0.149	0.065	2.314	0.021	Supported
H5a: Community affects green purchase intention positively.	0.191	0.082	2.324	0.020	Supported

Neither the analysis of the data in the group of consumers under the age of 34 (Table 7) nor in the group of consumers aged 35 or older (Table 8) showed any statistically significant influence of community on purchase intention. The purchase intentions of younger consumers are also not significantly influenced by promotion. The strongest influence on the purchase intentions of young consumers is exerted by environmental concern (0.551) and product knowledge (0.460). On the contrary, the most important antecedent to purchase intention among older consumers is green lifestyle (0.558).

Table 6. Results of path analysis in the group of women.

Hypothesis	Regression Weight	S.E.	C.R.	<i>p</i>	Result
H1b: Environmental concern affects green purchase intention positively.	0.316	0.080	3.923	<0.001	Supported
H2b: Green lifestyle affects green purchase intention positively.	0.362	0.090	4.037	<0.001	Supported
H3b: Product knowledge affects green purchase intention positively.	0.462	0.078	5.894	<0.001	Supported
H4b: Promotion affects green purchase intention positively.	0.098	0.074	1.318	0.188	Not supported
H5b: Community affects green purchase intention positively.	0.015	0.073	0.205	0.838	Not supported

Table 7. Results of path analysis in the group of consumers under the age of 34.

Hypothesis	Regression Weight	S.E.	C.R.	<i>p</i>	Result
H1c: Environmental concern affects green purchase intention positively.	0.551	0.122	4.532	<0.001	Supported
H2c: Green lifestyle affects green purchase intention positively.	0.165	0.075	2.198	0.028	Supported
H3c: Product knowledge affects green purchase intention positively.	0.460	0.106	4.357	<0.001	Supported
H4c: Promotion affects green purchase intention positively.	0.062	0.079	0.786	0.432	Not supported
H5c: Community affects green purchase intention positively.	0.139	0.093	1.496	0.135	Not supported

Table 8. Results of path analysis in the group of consumers aged 35 or older.

Hypothesis	Regression Weight	S.E.	C.R.	<i>p</i>	Result
H1d: Environmental concern affects green purchase intention positively.	0.303	0.063	4.799	<0.001	Supported
H2d: Green lifestyle affects green purchase intention positively.	0.558	0.077	7.212	<0.001	Supported
H3d: Product knowledge affects green purchase intention positively.	0.155	0.059	2.638	0.008	Supported
H4d: Promotion affects green purchase intention positively.	0.175	0.055	3.162	0.002	Supported
H5d: Community affects green purchase intention positively.	0.006	0.065	0.094	0.925	Not supported

Table 9 shows that all of the antecedents under investigation influence the purchase intentions of consumers with a lower level of education. Dominant antecedents are environmental concern (0.376) and green lifestyle (0.374).

Table 9. Results of path analysis in the group of consumers with a primary or secondary level of education.

Hypothesis	Regression Weight	S.E.	C.R.	<i>p</i>	Result
H1e: Environmental concern affects green purchase intention positively.	0.376	0.070	5.382	<0.001	Supported
H2e: Green lifestyle affects green purchase intention positively.	0.374	0.076	4.896	<0.001	Supported
H3e: Product knowledge affects green purchase intention positively.	0.163	0.073	2.227	0.026	Supported
H4e: Promotion affects green purchase intention positively.	0.164	0.055	2.987	0.003	Supported
H5e: Community affects green purchase intention positively.	0.149	0.074	2.014	0.044	Supported

Table 10 shows that as consumers become more educated, the influence of promotion and community become less important. Environmental concern then becomes the strongest antecedent of purchase intention in the group of consumers with a tertiary level of education (0.464).

Table 10. Results of path analysis in the group of consumers with a tertiary level of education.

Hypothesis	Regression Weight	S.E.	C.R.	<i>p</i>	Result
H1f: Environmental concern affects green purchase intention positively.	0.464	0.105	4.408	<0.001	Supported
H2f: Green lifestyle affects green purchase intention positively.	0.199	0.073	2.718	0.007	Supported
H3f: Product knowledge affects green purchase intention positively.	0.362	0.076	4.742	<0.001	Supported
H4f: Promotion affects green purchase intention positively.	0.144	0.080	1.794	0.073	Not supported
H5f: Community affects green purchase intention positively.	0.066	0.083	0.799	0.425	Not supported

The level of education has the least influence on consumer purchasing behaviour. In the two groups classified by education that were investigated, purchase intentions are most influenced by environmental concern, as is the case in the population as a whole.

5. Discussion

Primary research confirmed the conclusions of the latest studies [4,11–13], this being that one of the strongest antecedents of green purchase intention is environmental concern. Environmental concern has already been confirmed as a strong antecedent when purchasing specific environmentally friendly products (e.g., wine [30]). Our research extends the portfolio of these products to include consumer chemicals. This is the strongest antecedent in all of the consumer segments investigated, with the exception of women and consumers aged 35 or over. In the segment of women, the strongest antecedent is product knowledge. In the segment of consumers aged 35 or older, the strongest antecedent is green lifestyle. However, even in these segments, environmental concern is a strong antecedent. It can therefore be concluded that green consumer chemicals are purchased by people who are interested in the environment, aware of the need to protect it and are concerned about its development.

The research showed that, apart from environmental concern, other very strong antecedents to green purchase intention exist in relation to consumer chemicals, these being green lifestyle and product knowledge. The opinion of the authors [23,31] can therefore be extended in the sense that lifestyle influences purchase intention not only in

the case of environmentally friendly foods but also in the case of green consumer chemicals. A green lifestyle is one of the strongest antecedents in almost all of the consumer segments, in the segment of consumers with a primary or secondary level of education and, in the segment of consumers aged 35 or more, it is in fact the strongest antecedent.

Product knowledge plays an important role not only when purchasing green food products, as, for example, stated by D'Amico et al. [24], but also when purchasing green consumer chemicals. This antecedent is insignificant only in the segment of men. In the case of women and young consumers, it is on the contrary the strongest antecedent. Women, who are also influenced when making purchases by environmental concern and green lifestyles, place the greatest emphasis on obtaining information about green products and then formulate their purchase intention on the basis of this information. Young people under the age of 34 are comparatively strongly influenced both by product knowledge and by environmental concern—this probably concerns the simultaneous acquisition of information about green products and environmental protection, which this group of consumers then relies on when making purchases.

On the basis of the recommendation by the authors Bangsa and Schlegelmilch [14], we included marketing and social factors in our research. The research which was conducted was able to confirm that their recommendation was justified. Promotion influences the purchase intentions of consumers in the case of green foods, as stated by Woo and Kim [16], but also in the case of green consumer chemicals. However, the opinion held by Maniatis [17] that this is one of the key factors cannot be confirmed. It asserts itself weakly as an antecedent and is not the strongest antecedent in any of the consumer segments. The significance of this purchase intention was not confirmed in three consumer segments, namely women, young people under the age of 34 and respondents with a tertiary level of education. The strongest antecedent in the case of women and young people under the age of 34 is product knowledge (jointly with environmental concern in the case of young people). It can therefore be assumed that these two segments rely more on their own knowledge rather than succumbing to current marketing influences. In the case of consumers with a tertiary level of education, purchase intentions are in particular influenced by environmental concern, but also by green lifestyle and product knowledge. This segment of consumers is more or less immune to promotion.

As far as the community antecedent is concerned, the conclusion is somewhat ambiguous. This is to say that this antecedent only influences purchase intentions in the segment of men and in the segment of consumers with a primary or secondary level of education. For these consumers, the importance of the social environment in which they live and the feeling of acceptance by the community when they purchase green consumer chemicals was confirmed.

On the basis of the results of the research, it is therefore possible to summarise that all internal antecedents do act as antecedents to purchasing green consumer chemicals (environmental concern, green lifestyle and product knowledge) as well as promotion from the external antecedents. The external antecedent of community has no significant impact on the purchase intentions of all consumers only in the segment of men and consumers with a primary or secondary level of education.

6. Conclusions

6.1. Theoretical Implications

The article contributes towards development of knowledge in the field of environmentally friendly consumer purchasing behaviour, which has been intensively addressed by only a few authors to date. On the basis of primary research, it has been confirmed that it is not possible to satisfactorily explain green consumer purchasing behaviour using individual-centric behavioural models alone. In order to ensure comprehensive rendering of the customer's decision-making process, it is necessary to add further variables to the standard linear modelling approach. Research into purchase intentions showed that a role is played both by internal antecedents (environmental concern, green lifestyle and

product knowledge) and by external antecedents (promotion). The influence of the external antecedent community was not however sufficiently proven. At the same time, the research expanded the theoretical understanding of antecedents of the consumer chemical purchase intention. Not only were the main antecedents of purchase intentions identified for all consumers, but also in individual segments according to the consumers' gender, age and level of education.

6.2. Managerial Implications

The results of the research also provide some important conclusions, in particular for marketing managers. This is to say that they show that it is necessary to differentiate the impact on different consumer segments depending on which antecedents of purchase intention are at work and which of them are the strongest. For women and young consumers, it is crucial to increase their knowledge of green consumer chemicals. On the contrary, in the cases of men, older consumers and consumers with a lower level of education, it is advantageous to promote green consumer chemicals using discounts or loyalty programmes. In general, it would be advisable to provide all consumers with information which increases their interest in and awareness of the environment and also their concern about the future development of the environment if consumption patterns do not change.

6.3. Limitations and Future Research

The main limitation of the study which was performed is the difficulty of generalising the results to other consumer regions. It can be assumed that similar conclusions could be drawn from research carried out in countries with similar political and economic situations (e.g., other Visegrad Group countries). Differences could then be identified in countries with highly developed political, economic and social systems or, on the contrary, in developing countries. We consider it appropriate to confirm or refute these assumptions and it would therefore be desirable to conduct similar research in other countries and to compare the findings with ours. We also believe that future research should focus on the antecedent green lifestyle. This is a very important antecedent for the purchasing of green consumer chemicals (and probably other green products) despite the fact that its importance is not emphasised in the professional literature.

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References

1. Lai, C.K.; Cheng, E.W. Green purchase behavior of undergraduate students in Hong Kong. *Soc. Sci. J.* **2016**, *53*, 67–76. [[CrossRef](#)]
2. Dabija, D.C.; Postelnicu, C.; Dinu, V. Cross-Generational Analysis of Ethics and Sustainability. Insights from Romanian Retailing. In *Current Issues in Corporate Social Responsibility*; Idowu, S.O., Sitnikov, C., Simion, D., Bocean, C., Eds.; Springer International Publishing: Berlin, Germany, 2018; Volume 10, pp. 141–163.
3. Dabija, D.-C.; Bejan, B.; Grant, D.B. The Impact of Consumer Green Behaviour on Green Loyalty among Retail Formats: A Romanian Case Study. *Morav. Geogr. Rep.* **2018**, *26*, 173–185. [[CrossRef](#)]
4. Panda, T.K.; Kumar, A.; Jakhar, S.; Luthra, S.; Garza-Reyes, J.A.; Kazancoglu, I.; Nayak, S.S. Social and environmental sustainability model on consumers' altruism, green purchase intention, green brand loyalty and evangelism. *J. Clean. Prod.* **2020**, *243*, 118575. [[CrossRef](#)]

5. Baktash, L.; Talib, M.A. Green marketing strategies: Exploring intrinsic and extrinsic factors towards green customers' loyalty. *Qual. Access Success* **2019**, *20*, 127–134.
6. Paço, A.M.F.; Raposo, M. Green Segmentation: An Application to the Portuguese Consumer Market. *Mark. Intell. Plan.* **2009**, *27*, 364–379. [[CrossRef](#)]
7. Dabija, D.C.; Bejan, B.M. Behavioral Antecedents for Enhancing Green Customer Loyalty in Retail. In *New Trends in Sustainable Business and Consumption, Proceedings of the BASIQ International Conference, Graz, Austria, 31 May–3 June 2017*; Pamfilie, R., Ed.; Editura ASE: Bucharest, Romania, 2017.
8. Asgharian, R.; Salehi, M.; Saleki, Z.S.; Hojabri, R.; Nikkheslat, M. Green product quality, green customer satisfaction, and green customer loyalty. *Int. J. Res. Manag. Technol.* **2012**, *2*, 499–503.
9. Ajzen, I. The theory of planned behavior. *Organ. Behav. Hum. Decis. Process.* **1991**, *50*, 179–211. [[CrossRef](#)]
10. Joshi, Y.; Rahman, Z. Factors Affecting Green Purchase Behaviour and Future Research Directions. *Int. Strat. Manag. Rev.* **2015**, *3*, 128–143. [[CrossRef](#)]
11. Jaiswal, D.; Kant, R. Green purchasing behaviour: A conceptual framework and empirical investigation of Indian consumers. *J. Retail. Consum. Serv.* **2018**, *41*, 60–69. [[CrossRef](#)]
12. Prakash, G.; Choudhary, S.; Kumar, A.; Garza-Reyes, J.A.; Khan, S.A.R.; Panda, T.K. Do Altruistic and Egoistic Values Influence Consumers' Attitudes and Purchase Intentions towards Eco-friendly Packaged Products? An Empirical Investigation. *J. Retail. Consum. Serv.* **2019**, *50*, 163–169. [[CrossRef](#)]
13. Xu, X.; Wang, S.; Yu, Y. Consumer's Intention to Purchase Green Furniture: Do Health Consciousness and Environmental Awareness Matter? *Sci. Total Environ.* **2020**, *704*, 135275. [[CrossRef](#)]
14. Bangsa, A.B.; Schlegelmilch, B.B. Linking Sustainable Product Attributes and Consumer Decision-making: Insights from a Systematic Review. *J. Clean. Prod.* **2020**, *245*, 118902. [[CrossRef](#)]
15. Rahman, I. The Interplay of Product Involvement and Sustainable Consumption: An Empirical Analysis of Behavioral Intentions Related to Green Hotels, Organic Wines and Green Cars. *Sustain. Dev.* **2018**, *26*, 399–414. [[CrossRef](#)]
16. Woo, E.; Kim, Y.G. Consumer Attitudes and Buying Behavior for Green Food Products. *Br. Food J.* **2019**, *121*, 320–332. [[CrossRef](#)]
17. Maniatis, P. Investigating factors influencing consumer decision-making while choosing green products. *J. Clean. Prod.* **2016**, *132*, 215–228. [[CrossRef](#)]
18. Wee, C.S.; Ariiff, M.S.B.M.; Zakuan, N.; Tajudin, M.N.M.; Ismail, K.; Ishak, N. Consumers Perception, Purchase Intention and Actual Purchase Behavior of Organic Food Products. *Rev. Integr. Bus. Econ. Res.* **2014**, *3*, 378–397.
19. Bronnmann, J.; Asche, F. Sustainable seafood from aquaculture and wild fisheries: Insights from a discrete choice experiment in Germany. *Ecol. Econ.* **2017**, *142*, 113–119. [[CrossRef](#)]
20. Cavallo, C.; Piqueras-Fiszman, B. Visual elements of packaging shaping healthiness evaluations of consumers: The case of olive oil. *J. Sens. Stud.* **2017**, *32*, e12246. [[CrossRef](#)]
21. Rokka, J.; Uusitalo, L. Preference for green packaging in consumer product choices—Do consumers care? *Int. J. Consum. Stud.* **2008**, *32*, 516–525. [[CrossRef](#)]
22. Silva, A.R.D.A.; Bioto, A.S.; Efraim, P.; Queiroz, G.D.C. Impact of sustainability labeling in the perception of sensory quality and purchase intention of chocolate consumers. *J. Clean. Prod.* **2017**, *141*, 11–21. [[CrossRef](#)]
23. Rousseau, S.; Vranken, L. Green market expansion by reducing information asymmetries: Evidence for labeled organic food products. *Food Policy* **2013**, *40*, 31–43. [[CrossRef](#)]
24. D'Amico, M.; Di Vita, G.; Monaco, L. Exploring environmental consciousness and consumer preferences for organic wines without sulfites. *J. Clean. Prod.* **2016**, *120*, 64–71. [[CrossRef](#)]
25. Girgenti, V.; Massaglia, S.; Mosso, A.; Peano, C.; Brun, F. Exploring Perceptions of Raspberries and Blueberries by Italian Consumers. *Sustainability* **2016**, *8*, 1027. [[CrossRef](#)]
26. Maehle, N.; Iversen, N.; Hem, L.; Otnes, C. Exploring consumer preferences for hedonic and utilitarian food attributes. *Br. Food J.* **2015**, *117*, 3039–3063. [[CrossRef](#)]
27. Choi, E.; Lee, K.C. Effect of Trust in Domain-Specific Information of Safety, Brand Loyalty, and Perceived Value for Cosmetics on Purchase Intentions in Mobile E-Commerce Context. *Sustainability* **2019**, *11*, 6257. [[CrossRef](#)]
28. Bodur, H.O.; Duval, K.M.; Grohmann, B. Will you purchase environmentally friendly products? Using prediction requests to increase choice of sustainable products. *J. Bus. Ethics* **2015**, *129*, 59–75. [[CrossRef](#)]
29. De Marchi, E.; Caputo, V.; Nayga, R.M.; Banterle, A. Time preferences and food choices: Evidence from a choice experiment. *Food Policy* **2016**, *62*, 99–109. [[CrossRef](#)]
30. Barber, N.; Taylor, C.; Strick, S. Wine consumers' environmental knowledge and attitudes: Influence on willingness to purchase. *Int. J. Wine Res.* **2009**, *1*, 59. [[CrossRef](#)]
31. Ghvanidze, S.; Velikova, N.; Dodd, T.; Oldewage-Theron, W. A discrete choice experiment of the impact of consumers' environmental values, ethical concerns, and health consciousness on food choices: A cross-cultural analysis. *Br. Food J.* **2017**, *119*, 863–881. [[CrossRef](#)]
32. Moon, S.; Bergey, P.K.; Bove, L.L.; Robinson, S. Message framing and individual traits in adopting innovative, sustainable products (ISPs): Evidence from biofuel adoption. *J. Bus. Res.* **2016**, *69*, 3553–3560. [[CrossRef](#)]
33. Chen, C.-C.; Chen, C.-W.; Tung, Y.-C. Exploring the Consumer Behavior of Intention to Purchase Green Products in Belt and Road Countries: An Empirical Analysis. *Sustainability* **2018**, *10*, 854. [[CrossRef](#)]

34. Garvey, A.M.; Bolton, L.E. Eco-product choice cuts both ways: How pro-environmental licensing versus reinforcement is contingent on environmental consciousness. *J. Public Policy Mark.* **2017**, *36*, 284–298. [[CrossRef](#)]
35. Boztepe, A. Green marketing and its impact on consumer buying behavior. *Eur. J. Econ. Political Stud.* **2012**, *5*, 5–21.
36. Thøgersen, J.; Jørgensen, A.-K.; Sandager, S. Consumer decision-making regarding a “green” everyday product. *Psychol. Mark.* **2012**, *29*, 187–197. [[CrossRef](#)]
37. Janssen, D.; Langen, N. The bunch of sustainability labels—Do consumers differentiate? *J. Clean. Prod.* **2017**, *143*, 1233–1245. [[CrossRef](#)]
38. De Graaf, S.; Vanhonacker, F.; Van Loo, E.J.; Bijttebier, J.; Lauwers, L.; Tuytens, F.A.M.; Verbeke, W. Market opportunities for animal-friendly milk in different consumer segments. *Sustainability* **2016**, *8*, 1302. [[CrossRef](#)]
39. Hasford, J.; Farmer, A. Responsible you, despicable me: Contrasting competitor inferences from socially responsible behavior. *J. Bus. Res.* **2016**, *69*, 1234–1241. [[CrossRef](#)]
40. Salazar, H.A.; Oerlemans, L.; van Stroe-Biezen, S. Social influence on sustainable consumption: Evidence from a behavioural experiment. *Int. J. Consum. Stud.* **2013**, *37*, 172–180. [[CrossRef](#)]
41. Population Composition by Sex and Age Units as of 31.12. Available online: https://vdb.czso.cz/vdbvo2/faces/cs/index.jsf?_afPfm=VystupObjektParametry&pvo=DEMD001&sp=A&pvokc=&katalog=30845&z=T (accessed on 10 May 2020).
42. Kang, J.; Liu, C.; Kim, S.H. Environmentally sustainable textile and apparel consumption: The role of consumer knowledge, perceived consumer effectiveness and perceived personal relevance. *Int. J. Consum. Stud.* **2013**, *37*, 442–452. [[CrossRef](#)]
43. Byrne, B.M. *Structural Equation Modelling with Amos*, 3rd ed.; Routledge: New York, NY, USA, 2016; 437p.
44. Cortina, J.M. What Is Coefficient Alpha? An Examination of Theory and Applications. *J. Appl. Psychol.* **1993**, *78*, 98–104. [[CrossRef](#)]