Exploring the Factors shaping green purchasing decision-making: the role of Product Categories

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Abstract:

Promoting green consumerism encourages individuals to make environmentally responsible choices when purchasing, consuming, and disposing of products. This study explores the differences in green consumer behaviour across three important product categories that play significant roles in the lives of consumers and the global economy: food, textiles, and mobile phones. Additionally, this study explores the barriers to green consumption within the chosen product categories. Data were collected through a self-administrated online survey. The results indicate that consumers' environmentally responsible choices differ in purchasing, consuming, and disposing of goods across product categories. Furthermore, this study reveals a discrepancy between consumers' perception of environmentally responsible choices when purchasing, consuming, and disposing of goods and their actions. Finally, barriers to green consumption vary among product categories. Price appears to have a greater impact on food than the other two products, while habit plays a more significant role in the case of mobile phone consumption compared to the others. The results of this study are important for businesses and policymakers in addressing the global challenges related to sustainability.

Keywords: *Green consumption; green purchasing decision marketing; product categories; sustainability*

1. Introduction and objectives

Sustainable consumption is important for achieving Sustainable Development Goals (SDGs) set by the United Nations. Research has shown consumers become increasingly conscious of their choices when it comes to purchasing, consuming, and disposing of products that affect the environment [1]. More and more consumers are willing to or actively make environmentally responsible choices in their purchasing, consumer, and disposal of products to reduce consumption's environmental footprint[2]. Understanding consumers' environmentally responsible decision-making is thus crucial for achieving the UN SDGs related to sustainable consumption. It also helps businesses identify opportunities to reduce environmental impacts[2-5]. Previous research on green consumption has primarily focused on the purchase behavior of environmentally friendly products [3, 6]. Luthra and Deshwal claimed that the factors influencing the purchase of green product across product categories based on the findings in the literature review [7]. Geiger *et al.* proposed a comprehensive definition of green consumption, i.e., the four-dimensional cube model of sustainable consumption behavior – the SCB cube[8]. The four dimensions are 1) consumption stage (including acquisition, usage, and disposal of products), 2) consumption area (specifying the product category), 3) sustainability (which includes both the ecological impact and socio-economic impact), and 4) impact of choice behavior.

While extensive studies have investigated the factors that trigger sustainable purchase behavior in three product categories: food, textiles, and mobile phones, there is still a lack of comprehensive understanding of sustainable consumption within the chosen product categories. This study is among the first to apply the SCB cube model proposed by Geiger *et al.* [8]. Furthermore, extant research on factors influencing green consumption has mainly been measured at a general level, such as social norms and consumer efficiency. Little is known about the barriers to green food consumption, textiles, and mobile phones. Therefore, the results of this study are expected to fill the knowledge gap.

2. Research Questions

Against the background, we propose the following research questions:
- How do consumers perceive their green choices concerning purchasing, using, and disposing of food, clothes, and mobile phones?
- How do consumers make green choices about purchasing, using, and disposing of food, clothes, and mobile phones?
- What barriers are to green decisions for food, clothes, and mobile phones?

3. Literature Review

The definition of green consumption behavior has been traditionally focused on purchasing behavior, where consumers actively seek environmentally friendly products to minimize their impact on the environment [1-3, 5, 8]. This shift in consumer behavior is a response to growing concerns about climate change, pollution, and resource depletion. Many researchers have only focused on a single behavior, such as the purchase of environmentally friendly goods or recycled/refurbished goods [8], others found that green consumption behaviour is a multi-dimensional concept influenced by various factors. Environmental concern, environmental responsibility, subjective norms, and awareness contribute to green purchase behavior, and environmental attitudes can mediate green purchase behavior [9-11]. According to a survey conducted by Landbrug & Fødvarer, approximately one-third of Danish consumers are willing to engage in environmentally friendly practices in their daily lives[12]. Although many consumers are willing to support and embrace green consumption, the actual demand for green products remains surprisingly low [9].

To gain a comprehensive understanding of green consumption behavior, it is essential to consider the entire consumption cycle. As proposed by Geiger *et al.*, green consumption behaviour encompasses three primary phases: acquisition, use, and disposal [8]. In Geiger *et al.*'s model of SCB-cube, sustainable consumption has four dimensions: sustainability, the consumption cycle, areas of consumption, and the impact of chosen behavior [8]. Sustainability measures the socioeconomic and ecological impacts of consumption; the consumption cycle includes acquisition (e.g. buying, sharing, renting, swapping, etc.); using and disposing of the products/services (e.g. recycling, re-selling, removing, etc.); areas of consumption is interchangeable with consumption domains, consumption categories or consumption fields and refer to specific product or service categories; the impact of choice behavior reflects the impact of choice behavior on sustainability[8].

Geiger *et al.*'s model of SCB-cube provides a comprehensive overview of sustainable consumption and can assist businesses and policymakers in identifying areas for improvement in sustainable development. Put differently, businesses and policymakers can steer the consumption cycle toward a more sustainable direction by offering tailored products/services that align with consumer preference for sustainability.

4. Method

The data used in this paper were obtained as part of a large survey of sustainable consumption. The respondents are undergraduate students' on social networks. The data were collected by self-administered questionnaires via a link on students' social media.

The questionnaire consists of four parts. Part One contains questions concerning respondents' sociodemographic background. Part Two includes questions related to consumer attitudes towards sustainability. Part Three contains questions related to motivations for sustainable purchasing. Items for measuring sustainable attitudes and motivations were taken from extant literature [13]. Part Four consists of questions concerning respondents' perceptions of environmentally responsible choices regarding the purchase, use, and disposal of food, clothes, and mobile phones, as well as their actual behavior. Perceived barriers to environmentally responsible choices. Items for measuring perceived barriers are based on literature [3, 4] and a summary of class brainstorming. Part Five comprises multiple items for measuring sustainable lifestyles based on [14, 15] a summary from class brainstorming. The time for answering the questionnaire is about 18 - 20 minutes. Notably, this study does not include Part Two, Three, and Five of the questionnaires.

After closing the questionnaire, 537 usable questionnaires were received and used for the analysis. Table 1 in the Appendix displays the socio-economic profile of the respondents. Most respondents are female, have higher education, and currently live in Southern Denmark.

5. Findings

Table 2 in the Appendix displays mean scores for the consumers' perceived importance of taking environmental concerns when purchasing, using, and disposing of food, clothes, and mobile phones, as well as the extent to which they consider environmentally friendliness when buying, using, and disposing of food, clothes, and mobile phones. Although the two scales for importance and individual considerations are not directly comparable, it is interesting to note that mean scores for the importance of all consumers acting sustainably are generally higher than mean scores for the respondents' own considerations. This pattern may partly be explained by the fact that, to some extent, consumers who prioritize green consumption are hindered by barriers when trying to put it into practice. To detect the differences across product categories, we conducted a series of paired t-tests comparing mean scores for different product categories. It can be noted that mean scores for mobile phones are significantly lower than mean scores for

food and clothes regarding purchase and usage, but not for disposal. The differences in product categories can underline that there could be some barriers to green consumption behavior, which will be discussed further below.

Table 3 in the Appendix presents mean scores and standard deviations for consumers' perceived barriers for purchasing food, clothes, and mobile phones. The first eight barriers are common for all product categories, followed by two related to food, three common to clothing and mobile phones, and two unique to clothing and mobile phones, respectively. We conducted a series of paired t-tests to identify differences, comparing mean score pairs for different product categories. Table 3 shows various barriers and how they vary across the three product categories. There are several differences in the results among the three product categories. For example, respondents perceive sustainable options in food to be relatively more expensive than for clothing and mobile phones. Furthermore, respondents believe that sustainable options in food and mobile phones have a shorter lifespan. The results indicate that consumers encounter several barriers to purchasing sustainable mobile phones. These can roughly be divided into two categories. First, consumers find it challenging to locate a sustainable mobile phone (statement 'e', MEAN 3.11 compared to 2.87 and 1.65 for food and clothes, respectively) and challenging to find information to assess which mobile phones are sustainable (statement 'b', MEAN 3.76 compared to 3.22 and 3.38 for food and clothes, respectively). It is also evident that they believe that the range of sustainable options is limited (statement 'b', MEAN 3.76 compared to 3.22 and 3.38 for food and clothes, respectively). These barriers all pertain to the market offerings and indicate that consumers believe the market does not currently offer them sufficient sustainable options or trustworthy information on making sustainable purchase. Second, the results show that consumers' habits act as a barrier to purchasing sustainable mobile phones (statement 'g', MEAN 3.57 compared to 2.63 and 2.88 for food and clothes, respectively). The data reveals that consumers prefer to buy what they are accustomed to, especially in the case of mobile phones (statement 'f', MEAN 3.75 compared to 2.79 and 3.16 for food and clothes, respectively). Compared to food and clothing, this preference makes sense, as the time required to learn how to operate a different operating system is greater than learning how to use a different brand of t-shirts.

Table 4 in the Appendix displays mean scores and consumers' perceived barriers to disposing of food, clothes, and mobile phones, as well as the first four barriers being common to all three product categories, followed by two specific to closing and two specific to mobile phones. We conducted a series of paired t-tests to identify significant differences, comparing mean score pairs of product categories. The results indicate that the barriers to disposal vary across the three product categories. For example, respondents believe it is more difficult to dispose of food in a sustainable manner (statement 'a', MEAN 2.49 compared to 1,88 and 1.85 for food and clothes, respectively). Overall, respondents indicate lower barriers to disposing than purchasing in a sustainable way. Two points worth noting are that 1) food is perceived as the most challenging of the three categories to dispose in a sustainable manner and 2) the most significant barriers for hindering sustainable dispose of mobile phones are keeping it as a reserve or privacy concerns.

6. Discussion

The results showed that consumers do care about sustainability in all three product categories. The results showed a discrepancy between how important it is for consumers in general to choose the most sustainable product and how much the individual consumer considers sustainability when purchasing and using products from all three product categories. The discrepancy was

especially clear for mobile phones, which is also the category where sustainability is considered least when purchasing and using products. As hinted in the results section we argue that this is rooted in the barriers that was later presented. The results also shows that consumers are considering the environment more in the disposing phase of their consumption than the purchasing and usage phase. There might be many causing factors for this, in a Danish context, it might be explained by a series of public campaigns for disposing of especially clothes and mobile phones. This might explain why environmental consideration for disposal is considerably higher across all product categories than environmental consideration when purchasing and usage. This might change, as there are currently some public campaigns to shift electricity consumption towards times where there are a surplus and thus also more green electricity available. Campaigns like *washing in the evening* might make consumers more knowledgeable about how specific usage of products can make them more or less green.

When looking at both the data from Table 2 and Table 3, it appears that consumer would like to act sustainable but are not given the option or the information that makes it possible for them to make sustainability a salient part of their purchase decision, especially not when shopping for mobile phones. But the results also showed that consumers are habitual in their consumption of mobile phones and do not like shifting from what they have previously used. Comparing these results to the oligopoly structure of the smartphone market [16, 17], limits the consumers' choices, and if sustainability is not part of the dominant producers' products, consumers have little to no choice – if they want a new and sustainable smartphone. This has given rise to a large market for used mobile phones, but that is outside the scope of this paper.

7. Conclusion

The results indicate that consumers' environmentally responsible choices differ when it comes to purchasing, consuming, and disposing of goods, and these differences vary across product categories. Furthermore, this study reveals a discrepancy between consumers' perception of environmentally responsible choices during the purchasing, consuming, and disposing of goods and their actual actions. Finally, barriers to green consumption differ among product categories. Price seems to have a greater impact on food choice than on the other two products, while habit plays a more significant role in mobile phones consumption than in others.

8. Limitations

One of the major limitations for this study is the generalization of the research results due to the non-representative nature of the sample. The convenience sampling method and the distribution of the questionnaire have resulted in skewness in terms of gender, education level, regions of residence. Nevertheless, we believe that the current study can still provide significance and relevance in the context of sustainable consumption.

9. Future research

Future research could investigate how changes in perceived barriers can lead to changes in green consumption of food, textiles, and mobiles phones. This would be of interest to both academia and practitioners as it might highlight the tipping point for green consumption within specific product categories.

Another direction could involve extending this study into other product categories. By doing so, it would help develop a more holistic understanding of green consumption and how consumers can be supported in their sustainable decision making.

Finally, a comparative study is highly recommended across different research contexts (cultures). This could provide a nuanced understanding of the differences between various countries (cultures), eventually providing context-related advice to policymakers on the most effective approaches to succeed.

10. Managerial Implications

The managerial implications should focus on understanding the barriers and behaviors specific to different product categories, and then tailor strategies to address these challenges. For example, policymakers can design clear standards for assessing the environmental impact of certain products and provide better information and guidance for consumers when they want to dispose of the products in a sustainable manner. There should be more public campaigns to promote green consumption. Furthermore, incentives should also be offered for the sustainable disposal of products. This approach can promote sustainability practices, foster consumer engagement, and, ultimately, loyalty.

11. Appendix: List of Tables

Table 1. Profile of the respondents (N = 537)

	n	%
Gender		
Female	342	63.7
Male	195	36.3
Age		
15-19	5	.9
20-29	304	55.6
30-49	97	18.1
50-59	83	15.5
60+	48	8.9
Education		
Upper secondary/high school	134	25.0
Short or The first cycle of higher education (Academy Profession or bachelor's degree.)	285	52.7
The second cycle of higher education (Master's or Ph.D.)	113	21.0
Don't want to tell	7	1.3
Annual household income before tax and deductions (in DKK)		
Less than 100.000 DKK	119	22.1
100.000 – 299.999 DKK	129	24.1
300.000 – 499.999 DKK	77	14.4
500.000 – 999.999 DKK	105	21.4
1.000.000 DKK or more	55	10.2
Don't know or would not answer	42	7.8

Table 2.   Environmental concern and considerations when purchasing, using, and disposing food, clothes, and mobile phones

	Food		Clothes		Mobile	
Purchase	Mean	SD	Mean	SD	Mean	SD
a. How important do you think it is for the environment that consumers choose the most environmentally friendly alternative when purchasing …? [1]	3.41^a	.90	3.42^a	.99	3.00^b	1.15
b. To what extent do you consider choosing the most environmentally friendly alternative when purchasing …. [2]	2.92^a	1.02	2.41^b	1.13	1.55^c	.91
Usage						
c. How important do you think it is for the environment that consumers take sustainable considerations into account when preparing/using… [1]	3.23^b	.93	3.37^a	.91	2.86^b	.99
d. To what extent do you consider sustainability when you consume/use…. [2]	2.66^a	1.05	2.74^a	1.01	2.02^b	.98
Disposal						
e. How important do you think it is for the environment that consumers dispose of their in a sustainable way? [1]	3.35^b	.98	3.64^a	.95	3.62^a	.99
f. To what extent do you dispose of your .... in a sustainable way? [2]	3.48^b	1.21	3.80^a	1.09	3.45^b	1.24

[1] Measured on a 5-point scale ranged from 1 = "no importance at all" to 5 = " extremely important"

[2] Measured on a 5-point scale ranged from 1 = "not at all" to 5 = "to a very high extent".

 Means with different superscripts are significant from one another (p<.05).

Table 3.   Perceived barriers for purchasing food, clothes, and mobile phones[1]

	Food		Clothes		Mobile	
	Mean	SD	Mean	SD	Mean	SD
a. It is too expensive to choose sustainable over non-sustainable …[2]	3.40^a	1.07	2.81^b	1.19	2.41^c	1.10
b. It is too difficult to assess which … are the most sustainable	3.22^c	1.04	3.38^b	1.08	3.76^a	1.19
c. The quality of sustainable … is too poor	2.09^b	.95	1.95^c	.92	2.43^a	1.08
d. Sustainable … often has a shorter lifespan	2.66^a	1.07	1.82^b	.91	2.55^a	1.13
e. The range of sustainable … too limited	2.65^c	1.01	2.87^b	1.13	3.11^a	1.23
f. Prefer to buy what I usually do, even if it's less sustainable	2.79^c	1.11	3.16^b	1.20	3.75^a	1.29
g. Hard to change my … habits	2.63^c	1.10	2.88^b	1.27	3.57^a	1.34
h. Doubt whether the product is as sustainable as it is claimed	2.82^b	1.08	2.80^b	1.16	2.93^a	1.17
i. Have built up preferences for some non-organic …	2.21	1.16				
j. Thinking that sustainability claims are just a marketing trick to sell the product	2.42	1.11				
k. It gives a better feeling to get something completely new			3.00^a	1.35	3.08^a	1.38
l. Because second-hand/refurbished … do not give the same status as new … in my social circle			1.64^a	.99	1.62^a	.98
m. Because second-hand …. and/or …made of recycled material do not have the same quality as new …			2.33^b	1.13	2.96^a	1.26
n. Because second-hand clothes are not as modern as new clothes			2.38^b	1.26		
o. Second-hand/refurbished mobile phones do not have the same features as newly produced mobile phones					2.97^a	1.31

[1] For each statement, consumers are asked to indicate to what extent they perceived it as a barrier for acting green when purchasing food, clothes, and mobile phones.
[2] Each statement are asked three times where … is replaced with food, clothes, and mobile phones, respectively Measured on a 5-point scale ranged from 1 = "not at all" to 5 = "to a very high extent".
Means with different superscripts are significant from one another (p<.05).

Table 4.   Perceived barriers for disposing food, clothes, and mobile phones

	Food		Clothes		Mobile	
	Mean	SD	Mean	SD	Mean	SD
a. It is too difficult	2.49[a]	1.30	1.88	1.13	1.85	1.13
b. I don't know how to do it	1.86[a]	1.06	1.53[b]	.90	1.84[a]	1.16
c. We don't have waste sorting scheme at my residence place, all wastes end into one garbage bin.	1.95[a]	1.42	1.73[b]	1.22	1.78[b]	1.06
d. Because I does not understand, why I shall do that	1.68[a]	1.01	1.37[b]	.785	1.48[b]	.84
e. There is no incentive for me to do it			1.73	1.07		
f. It is not possible for me to donate to a place that is close to where I live			1.47	.87		
g. I keep the used mobile phones as reserve					2.67	1.34
h. I am afraid the security of data saved in my used mobile phone					2.41	1.41

[1] For each statement, consumers are asked to indicate to what extent they perceived it as a barrier for acting green when disposing of food, clothes, and mobile phones.

Measured on a 5-point scale ranged from 1 = not at all to 5 = to a very high extent. Means with different superscripts are significant from one another (p<.05).

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