

Reflection of our Concern for the Environment on our Purchases

A discrete choice analysis on the importance of various attributes, specifically
EU Ecolabel, for dishwashing detergents

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Management Summary

This research focuses on people's raising concern and awareness for the environmental issues and how this is reflected in their daily purchases. Although reports point out the increasing level of environmental awareness, there is reason to believe that consumers do not act in accordance to their concerns based on literature. This research aims to clarify to what extent consumers prefer to buy environmentally friendly non-durable products. Specifically, EU Ecolabel is used as a tool to point environmentally friendliness of a product and dishwashing detergents are taken as a representative category for non-durable products to figure out consumer preferences. Literature and preliminary analysis are used as sources to determine the attributes, which consumers consider when they are buying a dishwashing detergent, to use in further analysis. A choice-based conjoint survey, in combination with demographic and environmental perspective questions, is created to collect data from consumers in the Netherlands and in Turkey. Although Netherlands is the focus of this study, additional research in Turkey is conducted to validate the conjoint results. Conjoint analysis for both countries and latent class analysis for the consumers in the Netherlands are used to evaluate consumer preferences.

Results suggest that consumers place a certain level of importance to the presence of EU Ecolabel on a dishwashing detergent, although it turned out to be not the most important attribute in the Netherlands. In addition to that, consumers are willing to pay a premium to purchase a dishwashing detergent with EU Ecolabel. Moreover, it is found that segmenting consumers on their environmental preferences is in fact possible. This study recommends higher visibility to EU Ecolabel for successful implementation since it is clearly considered important among the consumers.

Preface

This thesis constitutes the final part of my Master of Science in Marketing Management at Tilburg University. It is the result of my one-year long intensive master studies, where I enjoyed growing academically and personally.

All through my studies, I met quite a few people that helped me through my journey and guided my way through a professional career. I would like to thank my teachers and my professors that I met starting from primary school up until the university, who helped me become the person I am today. Especially, I would like to thank Dr. Lale Güler, who was always there for me as an outstanding advisor and as a friend. I also would like to thank my supervisor MSc. Bart Schiffelers, who guided me to improve my thesis.

Moreover, I would like to thank all of my friends for patiently filling in my survey in order for me to complete my research. Most importantly, I would like to thank my family, who supported my every move and encouraged me to become better, and Utku Özgan for motivating me and always believing in me, even more than me.

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Chapter 1: Introduction

Chapter 1 of this paper will constitute a basis for the problem of choice, namely EU Ecolabel's impact on consumer purchase decision as an environmental label on a non-durable product category. To elaborate more on the problem indication; theoretical and practical research questions will be presented, a brief overview of the research method will be introduced, and theoretical and managerial/social relevance of the problem will be explained. Lastly, this chapter will be concluded with an outline for this paper.

1.1. Problem indication

Daily conversations as well as public opinion surveys show that consumers become more aware and concerned for the environment. One of such surveys is Sustainable Development Survey (2002), which is done across 15 European countries. It shows that 72.9% of the Europeans think that their quality of life is influenced by the state of the environment. Among these respondents, 32.5% even thinks that their quality of life is “very much” influenced by the environment (p. 4). Moreover, according to a study on “The Attitudes of European Citizens Towards the Environment”, “46% of European citizens believe that the most effective answer for solving environmental problems is ‘making national or European Union regulations stricter, with heavy fines to offenders’ ” (p. 13). A recent report by European Commission (2013), also reveals that “95% of the respondents agree that using environmentally products is the right thing to do”, whereas only 26% of them noted often buying such products and 54% of them classified themselves as occasional buyers (p.6). This survey is based on the answers of European citizens across 27 European Union states and in Croatia.

Considering the level of concern among European citizens, their perspective on a potential solution, and their buying habits concerning environmentally friendly products, European-wide executions of sustainable practices are subject to research. EU Ecolabel is an example of such implementations. As the web source of European Commission states, EU Ecolabel is a Europe-wide certification, which is launched in 1992, showing a product is environmentally friendly and good quality in a reliable and verifiable manner. This label is awarded after thorough consideration of end-to-end product life cycle including raw material collection, production, packaging, transportation, moment of usage and recycling, by diverse parties such as industry experts and consumer organisations. Moreover, it is present on more than 36,000 products, across various product categories such as beauty care, cleaning, clothing, electronic equipment

and furniture (European Commission, 2016). Hence, the presence of this label on various products aims to simplify the European consumer's consideration and purchasing process by assuring the product's sustainability, environmentally friendly impact, and good quality.

Although environmental awareness and concern are stated facts by the consumers in public opinion surveys; it is not definite whether the consumers think of it during a purchase, and to what extent this is reflected to consumer behaviour and purchase decision. Based on formerly found weak relationships on this topic, Bamberg (2003) suggests that expecting a general attitude, such as environmental concern, to influence specific behaviours, so to say environmentally friendly behaviours, results in disappointment. He argues that specific behaviours can be formed by 'situation-specific cognition' that is related to the framing of the individual. He empirically proves his hypothesis by analysing the returns of the students for a green electrical product to request information. This study shows that environmental concern does not have a direct impact on a product purchase, thereby suggesting a reason to believe that environmentally conscious or concerned consumers do not necessarily buy environmentally friendly products. Pirani and Secondi (2011) further specifies this issue among European Citizens and suggest that even though European citizens place importance on environmental issues, this is not apparent in their life-style. Based on these findings, one can wonder whether an ecolabel plays a role, compared to the other attributes such as price and quantity, on a consumer's purchase intention.

There is also research remarking that consumers doubt the effectiveness of the environmentally products. Lin and Chang (2012) argue that as consumers get more environmentally concerned, they tend to overuse these products to achieve the same level of effectiveness. This claim also holds for the non-durable products such as dishwashing detergent.

Furthermore, higher number of research regarding the ecolabel effect on durable product purchases, such as studies from Sammer and Wüstenhagen (2006), and Veisten (2007), compared to similar research concerning non-durables, such as the study of Teisl, Roe and Hicks (2002), points out a gap in literature to conduct more research.

This gap along with the inconsistency in the attitudes and behaviours of consumers create an invitation for research to analyse the importance and role of an ecolabel, EU Ecolabel in this case, while a consumer goes through a decision making process to buy a certain product, namely a dishwashing detergent. Thereby, the purpose of this study is to clarify the effect of environmental awareness and concern of consumers on the purchase decision of a non-durable (FMCG) product using the EU Ecolabel as a cue for a product's environmental impact and sustainability, and further to segment the consumers based on their preferences. This study will

focus on dishwashing detergent to illustrate consumer consideration of the environment when purchasing a non-durable.

1.2. Problem statement and research questions

This research focuses on the following problem statement: “What role does EU Ecolabel play relative to other attributes in a consumer’s buying decision for a non-durable product, and is it possible to segment consumers based on their preferences?”

In order to provide a valid explanation and determine the role of EU Ecolabel from different aspects, theoretical and practical research questions are distinguished.

1.2.1. Theoretical research questions

Theoretical research questions that will be answered in this paper are as follows:

- (1) What is sustainability?
- (2) What is an environmental label and what are the characteristics of it, specifically EU Ecolabel?
- (3) What is the role of environmental labels in durable and non-durable products?
- (4) What are the different stages of a consumer’s decision making process, in which an ecolabel can play a role?
- (5) What are the potential attributes, next to the ecolabel, that might play a role when buying a non-durable product, dishwashing detergent in particular?

1.2.2. Practical research questions

This paper aims to answer the following practical research questions:

- (1) To what extent does the presence of EU Ecolabel on a non-durable (FMCG product) such as dishwashing detergent, compared to other decisive attributes, influence the purchase decision?
- (2) Is it possible to segment consumers based on their environmental preferences?
- (3) How much more consumers are willing to pay for a product with the EU Ecolabel when purchasing a dishwashing detergent?
- (4) What advice can be given to the companies concerning their future actions on the topic of environmental consideration and ecolabels?

1.3. Demarcation

This paper aims to determine the role of EU Ecolabel when buying a non-durable product since previous research made use of several durable product categories such as Sammer and Wüstenhagen's (2006) study on washing machines and Veisten's (2007) study on wood furniture, whereas less attention is payed to non-durables, for instance by Teisl, Roe and Hicks (2002) on canned tuna. Moreover, considering that non-durables include a wide range of products, it is important to note that only one product category will be analysed in this paper. Due to the fact that cleaning products are occasionally questioned for their sustainability, environmental and health impact, as underlined in the Sustainable Cleaning Products Summit in Paris in 2015, it is reasonable to select one of the cleaning products as a representative product category. Moreover, it is justifiable to include the frequency of usage and product variety in the selection criteria. Bearing these criteria in mind, dishwashing detergent constitutes a good representative. According to a statistical portal, it is estimated that in 2015 "3,974 thousand people in the UK used dishwasher detergent once a day or more" (Statista, n.d.). Based on these results and the audience of the survey, which will be university students; it is reasonable to substitute dishwasher detergent with (hand) dishwashing detergent because university students are not usually in possession of a dishwasher in the Netherlands. In addition to that, the biggest supermarket chain in Netherlands, namely Albert Heijn, has over 30 different dishwashing detergents in its assortment¹. On the grounds that (hand) dishwashing detergent is frequently used and has many variety, it is selected as the product category to be focused.

Furthermore, as the previous arguments suggest, Netherlands will be the country of focus and respondents will be university students. They will constitute a good focus due to the following facts: since they are assumed to be mostly living in a shared apartment with limited budget, they are mostly not in possession of a dishwasher, therefore they buy a dishwashing detergent frequently to hand-wash their dishes and they are conscious buyers representing the community, because they form the most educated part of the society. Specifically, the respondents of this research will be composed of Tilburg University students, where there is a good mixture of Dutch and international students both from EU and non-EU countries. According to Tilburg University website; among 13,579 students in total, there are "1,209

¹ Retrieved on May 21, 2016, from Albert Heijn website: <http://www.ah.nl/zoeken?rq=afwasmiddel>

international students from 85 countries”². This mixture will ensure the presence of different environmental attitudes from different backgrounds and cultures, bringing more insight to the research. Thus, this research will be limited to the city of Tilburg in the Netherlands.

1.4. Research method

This research will start with a literature review to specify the attributes that can be used for non-durable cleaning products. Following this, the preliminary research will allow testing the predefined attributes and determining which attributes are actually considered among consumers when making a purchase decision for a dishwashing detergent. Afterwards, discrete choice analysis (choice-based conjoint) will be conducted on this product category with a survey specifically designed for this purpose. It will be distributed among university students in order to discover the relative importance of the attributes, which are selected after the literature review and preliminary research. In addition to the choice-based conjoint, respondents will be required to provide some demographic and behavioural data to further segment the respondents. Consequently, latent class analysis will be used to segment the market in different groups based on their preferences, demographics and behaviours.

1.5. Theoretical and managerial / social relevance

The reason of interest in the impact of EU Ecolabel relative to other attributes when buying a non-durable product, dishwashing detergent, is based on its both theoretical and managerial/social relevance. It is important to distinguish between these two titles because the first one specifies the gap in literature, whereas the latter sees the topic as a practical issue that needs to be clarified.

1.5.1. Theoretical relevance

Previous research focused on durable products to determine the importance of an ecolabel and the willingness to pay of consumers for an ecolabel. One such research is done by Sammer and Wüstenhagen (2006). They analyse the importance of EU energy label, along with other

² Retrieved on June 06, 2016, from Tilburg University Website
<https://www.tilburguniversity.edu/education/exchangeprograms/whytilburg/theuniversity/keyfigures/>

product attributes, and consumers' willingness to pay for this attribute while consumers make a purchasing decision for washing machines, using discrete choice analysis. In addition to this, Veisten (2007) uses two different methods, choice-based conjoint analysis as an indirect statement and open-ended contingent valuation as a direct statement, to determine the willingness to pay of consumers for eco-labelled wood furniture. As these examples, research pay attention to the durable products on the topic of ecolabels, possibly because environmental concern is mostly considered as a long-term issue. Realizing consumers' high awareness on the issue, it is reasonable to hypothesize that environmental impact is again in the consideration set of consumers when buying a non-durable product. From an academic perspective, figuring out the importance of environmental impact in the ever-changing consumer decision making process across different categories is vital to understand and analyse the contemporary consumers.

1.5.2. Managerial / social relevance

Based on the consumer perspective and broad range of EU Ecolabel, it is interesting to search the utility of this certification for the consumers. From a managerial perspective, it is valuable to know to what extent consumers care about this certification and how much more they are willing to pay for this attribute. This information will be particularly useful for the companies, essentially manufacturers of dishwashing detergents and similar products, and European Commission, which is the controlling entity for EU Ecolabel. The non-existence of prior research on the topic claims that this research will be of additional data to the company managers while deciding on whether to acquire such certification and determining what amount to invest. Moreover, it will provide insight on consumer preferences to suggest considerations or changes on EU Ecolabel for the European Commission.

1.6. Outline of the paper

After this chapter of introduction, the paper will continue with a theoretical framework chapter that will respond to the theoretical research questions. Next, the methodology part will focus on the specifics of the research method. Afterwards, the results of the research and findings will be analysed in detail. Then, the paper will be finalized with a conclusion part, where further discussion, recommendations, limitations and suggestions for future research will be explained.

Chapter 2: Theoretical Framework

Chapter 2 of this paper will answer the theoretical research questions that are raised in part 1.2.1, with the aim of clarifying the academic relevance and importance of the topic, as well as preparing a basis for the practical research that will follow.

2.1. Sustainability

Sustainability is a topic of recent interest both from a theoretical and a managerial perspective. It is relevant for this research in terms of its environmental aspect. This part of the paper will focus on the definition and importance of sustainability, and provide ways to achieve sustainability.

2.1.1 Definition of sustainability

Sustainability is a topic of long-term debate, on which involved parties have different approaches towards its definition. According to Hawkins (2006, p.1), the first definition of sustainable was “capable of being borne or endured”. However, now a different definition is observed in practice, which is “capable of being upheld or defended”, (Hawkins, 2006, p.1). Hawkins (2006) argues that environmentalists are supportive of the former perspective, whereas businesses support the latter and the governments go back and forth between the both. Environmental Science website illustrates Hawkins’ view by defining sustainability as “the study of how natural systems function, remain diverse and produce everything it needs for the ecology to remain in balance”, (Environmental Science, n.d.). Moreover, Carrillo-Hermosilla, P. del Río González, Könnölä, and Pablo del Río González (2009) claim that each of these different definitions are based on a mutual idea, which is the following:

However, most of said definitions are underpinned by a generally accepted idea: sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs. In short, it suggests a trade-off between present-day well-being and the future well-being of members of society. (p.1-2)

Combining these definitions into a more understandable and simpler phrase, sustainability can be explained as a collection of strategies and implementations with regard to the best interest of the environment to preserve it for the future.

2.1.2 Importance of sustainability

According to Aras and Crowther (2009), sustainability is one of the most important global issues nearly every entity, whether it is a corporation or a government, focus on. They claim that the current interest in sustainability is related to the various aspects such global warming, ecological footprint, resource depletion, competition and population increase. Firstly, Aras and Crowther (2009) take the stand that global warming is an accepted fact, which requires individual and corporate behavioural changes to decrease the adverse or future effects. They claim that one of the reasons for the concern of sustainability is raised by this perceived need for change. Although there are debates over its existence and effect, ecological foot print is related to the traces left after consumption demands of human population and the environment's ability to regenerate this consumption. This issue mostly comes up with CO₂ emissions and it again raises concerns for sustainability according to them. Next, resource depletion means the limited resources, mostly in terms of energy, on Earth and it is one of the main factors that created the sustainability concept in the first place. As there are only finite resources and each company is in need for them, this leads to competition. Finally, increasing population of the world, as it increases consumption demand, brings up the question of sustainability as well. Moreover, Aras and Crowther (2009) believe that sustainability is one of the components that gives a company competitive advantage and makes a corporation durable. They suggest that sustainability should be present in every part of a corporation's strategic plan.

In addition to this, Global Poverty Project (2012) argues that the most prominent issue is climate change caused by human development, mostly by the contribution of developed countries to the carbon emissions. In order to resist the adverse effects, such as decline in agricultural productivity, increased water stress, rising sea levels, risks to human health, and threats to ecosystems and biodiversity, global actions should be taken to achieve environmental sustainability, since sustainability is the key to a safe and healthy world.

Furthermore, according to Dangelico and Pujari (2010), many companies, including Ford, SC Johnson and Lipton Tea, own sustainable or environmentally friendly products and such product innovations are likely to further increase. They claim that companies introduce these green products to "attract, satisfy and retain customers" since the green market is increasing rapidly (Dangelico and Pujari, 2010, p.473).

2.1.3 Achieving sustainability

To achieve sustainability, Environmental Science (n.d.) proposes three pillars, which are stated in the World Summit on Social Development in 2005. These pillars are economic development, social development and environmental protection. Economic development is related to serving the people without harmful effects. For this, “providing incentives for businesses and other organisations to adhere to sustainability guidelines beyond their normal legislative requirements” is proposed. (Environmental Science, n.d.). Social development pillar is based on many aspects including awareness and legislation to protect people, access to resources, sustainable housing education. Environmental protection covers the actions taken to ensure the future of the environment and humans. It is stated as the primary concern to have a future. For the purpose of environment protection, businesses are regulated to decrease pollution and carbon emission. In addition to this, individuals also take precautions by recycling, consuming less electricity, using public transport or sometimes even walking instead of using public transport (Environmental Science, n.d.).

Further, it is important to note the business approach for sustainability. For this purpose, worldwide examples of corporations that are making an effort to achieve sustainability will be illustrated. Most prominent one of such firms is BMW according to Forbes’ news on The World’s Most Sustainable Companies 2016. They explain the reason why BMW scores high on the list is due to both its environmental and economic efforts. BMW’s environmental efforts include “efficient use of water, energy, and lack of waste” (Dill, 2016). This list continues further with famous consumer brands from various product categories such as Reckitt Benckiser at number 9, Coca-Cola Enterprises at number 13, L’Oreal at number 14, H&M at number 20 and Philips at number 22.

Although not evident in these examples, holding an environmental label should be considered among the sustainability efforts of the companies since it combines the environmental efforts of a company in a presentable manner. Due to the fact that an environmental label is awarded individually to the products, having an environmental label may not be explicitly stated as a company’s environmental effort. However, holding an environmental label shows a company’s willingness and efforts to achieve sustainability. It constitutes as an important attribute and a cue for consumers to spot sustainable products and help preserve the environment. Therefore, it is only reasonable to address holding an environmental label as a way to achieve sustainability.

2.2. Environmental labels

Environmental labels are special logos that are placed on the products to give information about a product's sustainability efforts and environmental impact. This part will cover the different types of environmental labels and list the important characteristics of them.

2.2.1 Definitions and characteristics of environmental labels

According to United Nations Environment Programme (n.d.), ecolabelling or other environmental impact stating materials in general are defined as tools that help consumers make informed decisions on a product or a service based on environmental and social specifications. It is possible to divide these labels into several categories, where only one category is actually considered as an ecolabel. United Nations Environment Program (n.d.) acknowledge that ecolabels, also referred to as ISO Type I labels, “identify overall environmental preference of a product (i.e. good or service) within a product category based upon life cycle considerations” that are certified by an objective third-party rather than producers. Germany’s Blue Angel, European Union’s ecolabel EU Flower, India’s Ecomark and Scandinavian Countries’ Nordic Swan are all examples of this type of environmental labels. Next, there are the “certification schemes or sustainability labelling”, which are formally classified as ISO Type-I-like. Even though, they are very much alike to ecolabels defined above, they focus on a specific environmental impact, such as energy consumption or agricultural practice, and they are limited to a specific sector, such as energy required appliances or agricultural goods. Common examples for such labels are FSC, MSC, organic labels and Rainforest Alliance. In addition to this, there are environmental labels defining a single attribute, which are self-declared and generally named ISO Type-II labels. They are often company-based logos regarding the environmental impact. Lastly, there are quantitative tables on products that give detailed product information, formally called ISO Type-III. They are mostly matrices showing nutritional characteristics (United Nations Environment Programme, n.d.).

In more detail, UN’s document on A Guide To Environmental Labels (2009) states that “An ecolabel is a label which identifies overall environmental preference of a product or service based on life-cycle considerations”, referring only to the specific subgroup of the labelling scheme. In addition to this, they are voluntary and they have to be based on concrete scientific evidence (p.2).

2.2.2 European Union Ecolabel

European Union Ecolabel, or EU Flower as its symbol suggests, is one of the aforementioned ecolabels, visuals of this label can be found in Appendix I. It is a certification controlled, ruled and awarded by a decision making entity called EU Ecolabelling Board. This board is composed of representatives from Competent Bodies of European Union, Iceland, Liechtenstein and Norway, and representatives from other organizations of interest groups such as European Environmental Bureau (EEB) and Bureau Européen des Consommateurs (BEUC). Although it is a European-wide scheme, the application process and first point of contact are kept at the national level, where objective organisations, called Competent Bodies, ensure the process and the standards (European Commission, 2016).

Products included in EU Ecolabel's awarding scheme varies extensively; from major areas of production to accommodation, including more than 36,000 products. For each product category, a set of different stakeholders as well as industry experts analyse end-to-end product life cycle, starting from raw material collection until the moment of usage and recycling, to determine the environmental impact of the product or service. This makes sure that different products and services are evaluated differently and thoroughly according to necessary specifications. In order to follow the recent developments and trends along with ensuring highest performance and quality, EU Ecolabel is frequently reviewed and updated (European Commission, 2016). Further details on different criteria for different product categories can be found in European Commission's respective website.

To clearly explain what EU Ecolabel controls and maintains on products and how it protects the environment, the following general and specific examples are provided in EU Ecolabel's webpage. Light bulbs that hold this label use more than 80% recycled material in their packaging. If this label is awarded to a campsite or an accommodation, this ensures the restricted usage of pesticides and fertilisers. A hotel in Paris reported 16% less gas and 32% less water consumption only in one year, even though the guest number has increased (European Commission, 2016).

With its presence on a wide range of products and thorough controlling criteria EU Ecolabel ensures decreasing environmental impact of products and services. In addition to this, EU Ecolabel helps consumers to make informed decisions about their product choice, and select an environmental friendly and sustainable product.

2.3. The role of environmental labels in durable and non-durable products

It is important to separate the products into durable and non-durable for the purposes of this research, because consumers may have different approaches and evaluations for these two classes of products. As Solomon, Bamossy, Askegaard and Hogg (2006) illustrates consumers can go through a routine response behaviour, limited problem-solving or extensive problem-solving depending on the product's price, frequency of purchase, level of consumer involvement, product's class and brand, and availability of time, while they are making a purchase decision. Since durable and non-durable products significantly differ in lifetime-meaning the period of time the consumer uses the product-, they vary also in terms of price, frequency of purchase and consumer involvement. Thus, it is reasonable to think that consumer decision making process for durable and non-durable product categories are different. Therefore, it can be assumed that the role of environmental labels on these two categories should be analysed separately. Other research also focus on only durables or non-durables, thereby supporting this argument. Examples of such research will be illustrated and the gap in literature on the non-durable category will be clarified in this section.

2.3.1 Durable products

For durable products, as Sammer and Wüstenhagen (2006) denote in their research, The European Energy Label can be considered as the most well-known such label due to its compulsory presence on “all white goods, home appliances and light bulbs sold within the EU” with the aim of helping consumers determine the energy usage of appliances (p.186). This label is awarded within a scale from A to G, in which products are ranked according to their energy efficiency. In this scale, ‘A’ denotes the most efficient one, whereas ‘G’ denotes the least efficient. Using discrete choice analysis, Sammer and Wüstenhagen (2006) show that consumer preference varies when a washing machine is awarded the A ranking rather than B or C. Consumers are more in favour for A-rated washing machines than the other. In fact, their willingness to pay for such a machine increases significantly. Additionally, one can argue that this label is also about paying less for the energy costs. However, even if consumers prefer A-rated machines due to monetary reasons, this still helps the environment no matter the reason of purchase is financially driven or environmentally driven. Hence, this research illustrates that an environmental label plays an important role whilst consumers are considering different products and making a purchase decision.

Rather than a ranking environmental label on a specific attribute, companies can make use of an environmental label that awards a particular product category with its presence. One such research is done on wood furniture by Veisten (2007) using a fictitious environmental label. The research took place in two IKEA stores in England and Norway to increase the realism. An existing IKEA branded wood dining table is awarded with the fictitious label and the effect of the presence of this label on willingness to pay of consumers is both directly and indirectly analysed respectively with an open-ended contingent valuation and choice-based conjoint analysis. Although different studies in two locations result in varied levels of willingness to pay, consumers are in general favour of paying a price premium for environmentally labelled products.

Both of these studies on durable products illustrate the role of an environmental label in the consumer decision making process and consumer's willingness to pay for such an attribute.

2.3.2 Non-durable products

Environmental labels also affect consumer decisions for non-durable products as it is evident in the research of Teisl, Roe and Hicks (2002). They study the role of dolphin-safe environmental label on consumer decisions for buying canned tuna. When a certain method is used to capture yellowfin tuna in Eastern Tropical Pacific, dolphins are used and they may end up getting killed. Before the dolphin-safe label was introduced, dolphin population in the area had been in danger. In their study, Teisl et al (2002) make use of this controversial issue to determine whether consumers are influenced by the dolphin-safe labelling on tuna cans. Their analyses show that introducing this label increased market share of canned tuna on a continuous basis, thereby claiming that consumer behaviour is influenced by environmental labels.

Moreover, research on non-durable product categories show that if a product holds an environmental label, consumers tend to believe that they have a superior level of another attribute in some product categories and an inferior level on another attribute in some others. This is evident in both Sörqvist, Haga, Langebong, Holmgren, Wallinder, Nöstl, Seager and Marsh's (2015), and Lin and Chang's (2012) studies. The former researchers claim that consumers evaluate environmental labelled (organic) food better in taste and health aspects. Whereas the latter researchers illustrate the consumers' tendency of overusing due to its perceived inferior level of effectiveness for cleaning products, including dishwashing detergents.

Based on various studies, it is possible to conclude that durable and non-durables product categories holding environmental labels evoke different reactions from the consumers. Considering the details of research conducted in both areas, the lack of research on non-durable category is noticeable. One might argue that this is because environmental concern is considered as a long-term issue. However, high awareness and concern among consumers make it possible to assume that they would also consider environmental aspects while purchasing non-durables.

Furthermore, among the research done on non-durables, only Teisl et al (2002) focus on the environmental label effect on product purchases. Other research focus on the environmental label's effect on different product attributes, such as Lin and Chang's (2012) research on product quantity, and Sörqvist et al's (2015) research on sensory and nutrition judgements. Thus, less attention is given to the environmental label's role on purchase intentions. Therefore, more research is necessary to analyse the role of environmental labels, in comparison with the other attributes, in order to gain more insight on consumer preferences.

2.4. Consumer decision making process

As various marketing literature, according to Solomon, Bamossy, Askegaard and Hogg (2006), consumers go through a decision making process. This process consists of problem recognition, information search, evaluation of alternatives, product choice and outcomes. Consumers start this process by realizing their need or want for a product. Then, they collect information about their product options. Afterwards, they analyse the different alternatives they found in the information collection and select a product. Lastly, they evaluate their experience and satisfaction with the product.

For the category of dishwashing detergents as for many other non-durables, it is not likely to influence the problem recognition, since they are assumed to be not in the early stages of product life-cycle, it is not feasible to affect the primary demand for this product with external efforts from the marketers. EU Ecolabels is not likely to play a role in this stage. Next, dishwashing detergents is not a category with high perceived risk, consumers may not go to the information search stage extensively. Thus, the other stages of decision making process can be more effective in order to convince the consumers.

2.4.1 Evaluation of alternatives

As Solomon et al (2006) state, this is the stage, where much of the effort is spent by the consumer. For every product category, there are many choice alternatives and consumers need to pick the most suitable one in their evoked set. Since dishwashing detergents is a fast moving consumer good with a low consumer involvement, where consumers often follow a habitual decision rather than going through all alternatives, targeting the consumer in the retail environment can be a good way to place the intended product in the consumer's evoked set. This can be done by promotions at the point of purchase and placement of the product in the eye-level of the consumer in the shelf so that it will take more attention. Once the product is in the consumer's evoked set, consumer is triggered to analyse the benefits associated with the product.

Based on the fact that EU Ecolabel is a relatively new concept and a non-functional attribute, increasing the level of word of mouth can trigger the curiosity of the consumers and they might be willing to search and try a product with his label. According to a BazaarVoice report (2012), 49% of the millennials are likely to get influenced by friends and family and 51% of them are likely to consider recommendations from strangers through user-generated content. Since millennials population is over 1.5 billion around the world (BazaarVoice, 2012) and they are today's shoppers, it is important to focus on ways to influence them. Putting a certain attribute in their evoked set is likely to boost sales.

Moreover, it may be possible to persuade consumers that a specific brand is the best solution to their problem. EU Ecolabel can come into the picture in this stage by stating its benefits and convincing the consumers on buying a product with EU Ecolabel, or any environmental label, is good for reducing the damage to the environment.

2.4.2 Product choice

When the alternatives in the evoked set is analysed, it is time for selecting one of them. Even if the consumers have other alternatives in mind, they might go for the same brand every time due to inertia or loyalty. On contrary, if the consumer does not buy the same brand, he can pick a decision rule depending on the importance and complexity of the situation. Consumers sometimes pick the most important attribute of the product and judge the alternatives on that or they simply add the positive attributes and select the product with the most. In this case, holding the suitable level of the most important attribute or having more number of positive

attributes are important to convince the consumer towards a purchase. The first process is applied in the non-compensatory decision rules and the latter is applied to compensatory decision rules. (Solomon et al, 2006) Even for the most environmentally aware consumers, environmental labels may not be the most important attribute. Otherwise, they would choose the product with this label for every purchase. Since the first condition may not be satisfied; products with environmental labels, or particularly EU Ecolabel, can try to achieve a desired level on many attributes so that they may become more likely to be selected based on the compensatory decision rules. In order to achieve that, knowing which attributes play an important role for the consumers when they are buying a non-durable product, specifically dishwashing detergent, is useful. Thus, this research will serve to this purpose by determining the role of the attributes.

2.5. Potential attributes of dishwashing detergents

Desk research is conducted to determine the potential attributes of dishwashing detergents. The website of the biggest supermarket chain in the Netherlands, namely Albert Heijn, is used to gather the necessary information. Brand, price, size, perfume and price per litre information is listed at Albert Heijn's online catalogue when dishwashing detergents are analysed, examples can be found in Appendix II. For some products additional information on allergies, eco label, packaging can also be found. Moreover, it is also listed if this product is on sale at that week. Based on the information availability, these attributes can form the set of potential attributes in addition to the EU Ecolabel, which is the main purpose of this study. Moreover, along with these attributes, Lin and Chang (2012) suggest colour of the package is a cue for the greenness of the product. They also illustrate how green products can use environmentally friendly wording in their brand name to further hint this attribute to the consumers. Definition and importance of these attributes will be explained one by one in this section.

2.5.1 Brand

Brand is defined as “a distinguishing name and/or symbol (such as a logo, trademark, or package design) intended to identify the goods or services of either one seller or a group of sellers, and to differentiate those goods or services from those of competitors.” (Aaker, 1991, p.7) In terms of brand management, a brand is a cue to bring unique associations to the mind of the consumers about a specific product and makes the product uniquely labelled (Keller,

1993) A certain brand of dishwashing detergent can evoke favourable or unfavourable associations in the minds of consumers while they are evaluating the product.

Moreover, brand name can be used as an extrinsic cue to signal a product's quality (Zeithaml, 1988). Since consumers are not experts on the ingredients of a dishwashing detergents, they may rely on extrinsic cues to evaluate the quality of the product. This fact also appears in the report of Nielsen (2016) on homecare, where 37% respondents state that a trusted brand name is important for their cleaning product purchase.

Furthermore, as proposed by Lin and Chang (2012), brand names hinting environmental-friendliness of the products will also be used. In Albert Heijn's website there are washing detergents that contain 'eco' in their brand name, without holding the EU Ecolabel. This is an interesting aspect to search since it will determine the preference of consumers for eco name and ecolabel.

2.5.2 *Price*

Price is the monetary amount assigned to a product that refers to its value. According to Zeithaml (1988), consumers often use price as an extrinsic cue to evaluate the quality of a product. Since dishwashing detergent is a fast moving consumer good, consumers are less involved and they usually do not spend too much time on comparing the products and decide which product to buy in the point of purchase (Pelsmacker, Geuens & Bergh, 2013, p.159). Based on these, we assume that consumers are likely to use price as an inference for the product quality for dishwashing detergents to make a quick decision. However, they might only be willing to spend a small amount of money on a less involving product. This study will show based on which aspect consumers evaluate price and how much more or less they are willing to pay for an environmentally friendly product dishwashing detergent.

Price per litre is also listed in supermarkets to allow consumers to compare the prices of the products on an equal base. Due to the various sizes of packaging, it is not always easy for consumers to do the math and compare the prices objectively. Hence, supermarkets help consumers with combining the two attributes of price and size. In terms of research, when the attribute price is used, this supermarket created attribute is not appropriate due to its correlation with price. However, this attribute can be used without the presence of the attribute price and show two things at once. The decision on which of these are to be used will be based on the consumer responses in the preliminary analysis.

Furthermore, promotion is also related to the price of a product. As it is often obviously stated in the retail environment, this attribute can be a distinctive part of a consumer's decision. Thus, it is also important to note this attribute. Depending on the outcome of the preliminary research, sale information can be a separate attribute in the actual survey.

2.5.3 Size

Size of the product defines how many litres of dishwashing detergent is present in a certain package. Although sometimes more can be economically better, it is controversial when it comes to environmental products. According to Lin and Chang (2012)'s, consumers tend to perceive environmentally friendly products less effective due to its superiority in environmental friendliness, thereby using more in quantity to achieve the same result. Furthermore, it is interesting that consumers, who are regarded more environmentally friendly, overuse these products, whereas the opposite applies for the non-environmentally friendly consumers. It is controversial in the sense that the ones, who want to protect the environment, use this product, however with their over usage pattern they are still harming the environment. As a result, this study leads to the idea that bigger packages will be preferred by consumers when they buy an environmentally friendly product.

The focus of the current study is dishwashing detergent, which is an example of such a product. Therefore, the role of the attribute size will be investigated in combination with the attribute environmental label, addressing this issue.

2.5.4 Perfume

Perfume is another attribute listed when dishwashing detergents are concerned. It is related to the certain scent that the detergent has and it may affect people's preference. As Bone and Jantrania (1992) explains, the role of smell on a product purchase has been investigated starting from 1930's. Many suggest that a good smell is enough to influence a purchase. Consumers may learn about this attribute through advertisement or past experience. For some categories, the scent can be considered as an important product expectation, thereby changing a consumer's evaluation for a product. When it comes to dishwashing detergents, some might have an affection for the classical lemon scent or some might prefer the unusual exotic scents brands started to offer such as Ajax's passion fruit. Since it is uncertain to what extent

consumers value the smell of the dishwashing detergent and find this attribute integral, it is a striking attribute to search on.

2.5.5 Colour

Lin and Chang (2012) claim that most of the environmentally friendly products make use of certain colours in their packaging. They specify that green, pink or colourless packages is commonly used as a cue for sustainability. Based on their argument, these colours can be used as the levels of the packaging colour attribute. In the case of dishwashing detergents, based on the desk research, it can be concluded that most of the packages are colourless. However, depending on the ingredient of the product, the product colour changes and this makes the appearance of the dishwashing detergent colourful. The information found in desk research shows that the ingredient, which designates the product colour, can be the perfume, products with the lemon scent are yellow, or the extra hygiene characteristic, the products with this property are blue. Since the colour of the dishwashing detergent can be related to its perfume in some cases, it may be correlated with the attribute perfume. Whether consumers pay attention to the colour and judge the product by its colour will be determined by the preliminary analysis.

All of these listed attributes are potential attributes that may or may not be presented to the respondents in the survey. Which attribute to use in the survey will be determined by the preliminary research and they will be listed along with their respective levels in chapter 3.

Chapter 3: Methodology

As briefly mentioned in chapter 1, discrete choice analysis (choice-based conjoint) will be used as the research method to analyse the role of EU Ecolabel compared to other attributes while a consumer is buying a dishwashing detergent. This chapter will focus on the specifics of the method to be used.

3.1. Conjoint Analysis

Conjoint analysis is a market research method to analyse the consumer preferences on specific attributes and attribute levels for a product category. In order to do that, various combinations of attributes are presented to the respondents and depending on the type of conjoint analysis the respondent needs to rank the products, rate the products or choose one product from the given set. Afterwards, from the preference for the complete profile of a product, part-worths of attributes are calculated (Huber, 2007).

This technique will be used in this study to find the role of each attribute, especially EU Ecolabel, in the context of dishwashing detergents. This method is chosen because it is highly suitable to analyse the role of different attributes in a purchase situation, where the overall product is being evaluated. With conjoint analysis, it is possible to provide respondents with a number of attributes of dishwashing detergents at the same time in order for respondents to express the relevance of each attribute for their purchase decision.

First step of this research is to determine the right type of analysis, ranking, rating or choosing to collect the data. This study will make use of a special type of conjoint analysis called choice-based conjoint, where choice sets including two or three products will be presented to the consumers to figure out their preference. Choice-based conjoint is selected for this study because of its following advantages. First, it is a more realistic approach in terms of research due to the fact that people come across with choices daily: choosing a suitable good or service, choosing the best political party to vote, choosing a route to go. Using this familiar environment to determine consumers' revealed preference is a realistic approach that market researchers use (Raghavarao, 2011). Next, it reflects the real demand better due to the choosing task (Huber, Wittink, Johnson, Miller and 1992). Moreover, a no-choice option is possible in choice-based conjoint, allowing respondents to select that option in case there is no suitable product in the choice set (Johnson, 1994). However, this method also has disadvantages compared to ranking and rating. Firstly, due to presenting all attribute information at once, respondents may be

overwhelmed with information just for a single answer (Johnson, 1994). Limiting the number of attributes to at most six as Green and Srinivasan (2006) suggest is a way to overcome this disadvantage. Next, with choice-based conjoint only aggregate results can be obtained, meaning that utilities for a single respondent are not estimated (Huber et al, 1992). Since this study aims to find out the society's preference in general towards environmentally labelled dishwashing detergents, reporting the results in the aggregate level is not expected to affect the analysis negatively.

For the purpose of the current study, aggregate results are appropriate and sufficient since general market response to EU Ecolabel, along with other dishwashing detergent attributes, will be analysed. Moreover, realism benefit of choice-based conjoint will help participants to imagine themselves in a purchase situation. This is highly important for the product category in question since most of the purchase decision is made in store (Pelsmacker et al, 2013), without rating or ranking attributes explicitly. Based on these reasons, choice-based conjoint is selected to reveal the relative importance of various attributes when buying a dishwashing detergent.

As directed by Green and Srinivasan (1990), to obtain better results from the choice-based conjoint it is important not to exceed six attributes. To determine which relevant potential attributes and levels will be selected, preliminary analysis will be conducted.

3.2. Preliminary Analysis

Based on the attributes of dishwashing detergents found by desk research, presented in chapter 2.5, a number of potential attributes have been identified. A preliminary analysis before the actual choice-based conjoint survey will be implemented in order to select the attributes that will be used in the survey.

3.2.1. Goal

Conducting a preliminary research to select attributes has three reasons. First, if the respondents mention the attributes listed in chapter 2.5, it will signal verification for these attributes. Second, the respondents may add more attributes while they are telling about their shopping experience for the dishwashing detergents. This will allow the identification of new attributes. Lastly, by asking detailed questions about consumer preferences, insights for potential attribute levels will be obtained. Hence, the preliminary research will provide

verification for previously found attributes, identification of new attributes and insights for potential levels of the attributes.

3.2.2. *Structure*

Semi-structured face-to-face interviews, the combination of standardized and conversational interviews as Japec (2005) suggests, will be done for achieving the goals stated in the previous part. The interviews will involve a number of predefined questions to learn about consumer preferences. In addition to this, as Japec (2005) suggests, face-to-face interviews will allow the interviewer to have some freedom to ask detailed questions to deepen respondent's answers just like a conversation.

The predefined interview questions will be composed of two types of questions on attributes: unaided and aided. First, respondents will be asked to directly state the attributes that come to their mind without any clue. This part will form the unaided questions. Detailed questions will follow in order to understand the importance of the attributes and find preferred levels. Later, in the aided part, the interviewer will state other attributes and ask respondents to talk about their preferences. At the end, a rating part will take place, where respondents will be required to distribute 100 points among the attributes that they stated, in case there is a new one, in addition to the ones the interviewer provides. Total points will not only consist of the ratings that the respondent gives, but also additional points will be added to each attribute based on their order of retrieval by the respondent in the unaided part. In more detail, the attribute that comes into mind first will receive 10 more points, the second will receive 9 and so on. Questions of the semi-structured interview can be found in Appendix III.

3.2.3. *Results*

Ten semi-structured face-to-face interviews were conducted for the preliminary analysis. Applying the 'stopping criterion' depicted by Francis, Johnston, Robertson, Glidewell, Entwistle, Eccles and Grimshaw (2010), ten interviews are found to be satisfying since the respondents started to reply roughly the same and it is assumed that no additional information can be extracted from more number of respondents. Hence, ten interviews constitute a saturation point.

To be in line with the planned sample of the choice-based conjoint, respondents consisting of Tilburg University students, from different nationalities (Dutch, Greek, Italian and Turkish)

with the same number of female and male respondents are selected to conduct the interviews. In terms of nationality, 50% of the respondents are chosen to be Dutch since the study is conducted in the Netherlands.

During the interviews, almost all of the respondents (90%) mentioned price as an attribute they consider, 80% of them even stated this attribute first. Brand with 50% and perfume with 40% unaided retrieval follow the attribute price. Interestingly, two out of ten respondents stated environmentally friendliness of the dishwashing detergents and one of them further defines quality based on the environmental impact of the product. Moreover, none of the respondents stated any preference for promotion in the unaided part.

Some of the respondents introduced additional attributes such as quality, effectiveness, package and lotion. However, they evaluate quality and effectiveness based on the brand or the environmental impact, thus they are not new attributes. Furthermore, a respondent mentioned the package of the product, meaning whether it is appealing or not and another mentioned the lotion as another attribute. Since only one out of ten respondents stated their preference towards package and lotion, this does not provide enough reason to use these attributes.

When respondents are asked about their price preferences, 20% of the respondents believe above €3 would be an expensive price, another 20% believes above €2 would be an expensive price, 10% says more than €2.5 for a bottle of 500 ml would be too high and another 10% claims €1.10 as the maximum willingness to pay. The remaining 40% could not retrieve the price information for a dishwashing detergent. 60% of the respondents stated that they did not check the price per litre information on the price tag.

Only 20% of the respondents confidently stated that quality of a dishwashing detergent is related to its price. Others were either not sure or did not agree.

When asked, all of the respondents said they would pay attention to the brand on sale but their purchase decision would depend on the brand or the cheapest price.

40% of the respondents claimed Dreft as their preferred brand and only one respondent out of ten says AH Basic is his favourite. The remaining 50% of the respondents stated no preference for a specific brand. Further, 40% of the respondents agree that they would consider private label dishwashing detergent from Albert Heijn.

Almost all of the respondents wanted perfume in the dishwashing detergent that they buy and 40% specifically stated lemon as their preferred scent.

Based on their answer for the frequency of purchase, the replies from all respondents are appropriate for this research since they all buy dishwashing detergent at least more than once a year.

In the ranking part, all of the respondents gave at least 20 points to the price, the maximum being 65 points. Overall, price received a total of 395 points from ten respondents. Although only one respondent mentioned size in the unaided part, when asked the attribute size is the second important attribute based on the rankings with a total score of 145. Furthermore, attributes brand, promotion, perfume, colour, package and lotion received totally 130, 115, 115, 80, 20 and 10 points respectively.

The combination of points from the unaided part and the aided rankings shows the following order of relevance among the attributes: price, brand, size, perfume, promotion, colour, package and lotion. Detailed answers and rankings can be found in Appendix IV.

3.3. Choice of attributes and levels

Conjoint analysis is a highly practical method of research, involving realistic product attributes and levels. In order to implement a well-designed conjoint study, selection of attributes and levels is highly important. As Hair, Black, Babin and Anderson (2010) explain, attributes and levels of each attribute should be communicable and actionable. Communicable property is related to a clear and realistic definition, and actionable refers to the distinctiveness and the ability to implement the attributes and levels. In addition, number of levels should be balanced in order not for consumers to focus more on one attribute, as directed by Hair et al (2010). These criteria are taken into account when specifying the attributes and levels.

As defined earlier, in order to select appropriate attributes and levels a combination of desk research, literature review and preliminary analysis is used. Since the aim of this research is to determine the EU Ecolabel's role in purchase intentions, it is not tested in the preliminary analysis. Moreover, brand names including the word 'eco' are also related to the environmentally friendliness of the product, this attribute is also not tested in order not to provide a clue for the respondents about the actual survey. In addition to these two attributes, based on the results of the preliminary analysis price (per bottle), brand, size and perfume are selected as other attributes, which will be included in the survey. Table 1 shows the overview of the attributes and corresponding levels.

Price Based on the expensive and cheap price perceptions of the respondents in the preliminary analysis and real product prices listed in Albert Heijn's website, realistic price levels are determined. To have equal steps between levels real prices are adjusted to a certain extent.

Brand Brand names ‘Dreft’ and ‘AH’ are selected based on their frequency of appearance in the preliminary analysis. Furthermore, since Klok is the only brand that holds EU Ecolabel in Albert Heijn’s website, it is selected to bring more realism to the study. Hence, the study consists of a known brand, a private label and an eco-brand.

Attribute	Level 1	Level 2	Level 3
Price	€0.95 (2)	€1.42 (1)	€1.89 (0)
Brand	Dreft (2)	AH (1)	Klok (0)
Eco supplement	Yes (1)	No (0)	
EU Ecolabel	Yes (1)	No (0)	
Perfume	Lemon (1)	No (0)	
Size	400 ml (-1)	500 ml (0)	

Table 1: Attributes, levels and assumed betas for the levels, specified in parenthesis with Italics, of the choice-based conjoint analysis

‘Eco’ supplement In the desk research, it is found that some of the brands have both a basic and a ‘eco’ product. Moreover, as Lin and Chang (2012) propose ‘eco’ brand names are also a cue to address the environmental friendliness of the product. Thus, a supplement of the word ‘eco’ will be used as another attribute to uncover consumer preferences.

EU Ecolabel The purpose of this study is to determine the role of EU Ecolabel, in comparison to other attributes, while consumers purchase a dishwashing detergent. Therefore, the presence of this environmental label on the package is one of the attributes.

Perfume Preliminary analysis showed that consumers care about the smell of the dishwashing detergent they purchase and most of them prefer the lemon scent. Hence, lemon will be used as the level corresponding to the presence of perfume in this study. To prevent respondents from focusing on this attribute, only two levels (one being the preferred smell ‘lemon’) will be presented.

Size In terms of realism, 400 ml and 500 ml bottles are selected as the levels, since they are the most common sizes in Albert Heijn’s website. There is only one brand, AH Basic, with

1000 ml bottle. Therefore, introducing such a bottle size would compromise the realism of this study.

3.4. Design

To implement an orthogonal and balanced design, where the levels occur independently from each other with equal frequency, as directed by Hair et al (2010), the software SAS is used. The codes for this software can be found in Appendix V.

After entering the number of attributes and levels, SAS output suggested a full factorial of 144 stimuli and saturated number of stimuli is 9. Since full factorial corresponds to a large number, where the respondents would not be able to complete, and saturated gives the minimum amount of stimuli needed; another number of stimuli needs to be chosen, which is called fractional factorial. To decide on the suitable number of stimuli, first the stimuli number without violations is considered. As shown in figure 6 in Appendix VI, only 36 and 72 stimuli are with no violations. Considering the directions of Hair et al (2010) on the number of evaluations, a researcher should present as few stimuli as possible to ensure the reliability and representativeness of the respondents. Even though, there is not a strict limitation on the number of stimuli, up to 20 tasks are enough for respondents. Since this study will combine the stimuli in choice sets of two, in addition to a none-option, up to 40 stimuli can be selected in order not to exceed 20 tasks. Therefore, 36 is chosen as the number of stimuli to present the respondents. This design yields 100% D-efficiency, see figure 7 in Appendix VI.

Before combining the stimuli in the choice sets, the following restrictions are applied to preserve the realism of the study:

- (1) The brand ‘Dreft’ cannot have the lowest price, since €0.95 is unrealistically low for this brand and consumers may be pushed to this brand at this low price level.
- (2) The brand ‘Dreft’ is only sold in 400 ml bottles. Since offering this brand with a bigger size will affect the price implications, the real scenario will be used.

After applying these restrictions, D-efficiency decreased to 94.6%, shown in figure 8 Appendix VI. This percentage is still acceptable since it is normal to have a lower efficiency with a design including restrictions.

Previous to running SAS command to form the choice sets, assumed betas are specified, which can be seen in Table 1 in section 3.3. For the attribute price, lower price levels are set as superior alternatives. Next, for the attribute brand, Dreft is set to be the best alternative and AH as the following, since none of the participants mentioned the brand name Klok in the

preliminary analysis. The ‘eco’ supplement for brand name is assumed to be seen superior compared to a brand without an ‘eco’ name. The presence of the EU Ecolabel is also considered as a superior level. The lemon scented dishwashing detergents are also specified to be better based on the answers in the preliminary analysis. Lastly, 500 ml sized bottle is assumed to be a better option compared to 400 ml bottle.

Combining all these specifications, SAS provided the survey design in figures 10 and 11 in Appendix VI.

3.5. Survey

The software SAS provided the basic survey design for the conjoint analysis. Afterwards, Qualtrics software is used to present the survey to the respondents. In addition to the design from SAS, filter question will be used in the beginning to eliminate respondents, who are not the target of this study, and segmentation questions will be asked at the end of the survey to learn more about the respondents.

Segmentation questions will be composed of demographics and environmental perspectives. Demographic information will include gender, age, study level (bachelor or master), nationality, time spent living in the Netherlands, living situation (shared apartment with students, family house or studio). These questions aim to uncover the basic information of the respondents and their living habits.

This study purposes to reveal the relation between the environmental concern and buying behaviour of people. Therefore, the questions on environmental perspectives constitute an important part of this survey. To examine the environmental perspectives of the respondents, questions on their environmental consciousness, recycling and other environmentally-friendly behaviours, and environmental buying habits will be asked. The question on environmental consciousness is inspired from the research done by Alsmadi (2007). In this research, ten statements are used to measure environment consciousness of the participants. Variations of three statements in this study, which are believed to address the levels of environmental consciousness due to the scores assigned by the participants, will be used in the survey in order to measure environmental consciousness. To be precise, selecting “I appreciate living in a healthy and clean environment” is assumed to be associated with a low level of environmental consciousness. Next, selecting “I make an effort to maintain and preserve the environment” is assumed to show moderate level of environmental consciousness. Finally, selecting “In addition to my efforts, I always advise others to keep the environment clean” is assumed to

refer to the high level of environmental consciousness. The question on the recycling behaviour is formed by observing the target sample's behaviours and attitudes towards recycling. Other environmental behaviours that might hint care for the environment is motivated from the list Krause (1993) made on the lifestyle adjustments that environmentally conscious people are doing or willing to do. The question on environmentally-friendly buying behaviour is structured based on the assumption that not paying attention, considering and buying are appropriate levels that may show the extent of people's buying behaviour.

The information from both demographics and environmental perspectives will allow forming profiles and segmenting the market by latent class analysis. Example questions from the survey can be found in Appendix VII.

Moreover, the aim of this study is to explore the preferences of consumers towards environmental labels when they are purchasing non-durable products and dishwashing detergents are only used as a tool for testing. Therefore, the frequency of purchase of respondents for this category is not the concern of this study. Hence, the survey does not include such a question.

3.6. Sampling and procedure

As outlined in the Demarcation part, 1.3, the survey will be distributed among the students of Tilburg University due to their representativeness of a larger community based on their international composition and conscious purchase behaviours. An online survey is prepared to reach the target group easily considering their limited time and online involvement. Providing this survey online will allow respondents to fill in the survey in their own convenience, thereby ensuring higher participation. In order to reach this group, social media groups, such as Facebook groups, involving both international and Dutch students, and direct contact information available to the researcher will be used.

The sufficient number of respondents to reach can be determined by the directions found in literature. Combining the findings of Aldrich and Nelson (1984), and Hosmer and Lemeshow (1989), a minimum of 10 observations is needed to estimate each parameter. The survey design suggests 9 parameters to estimate, as shown in the saturated value depicted in SAS output in Appendix VI, figure 6. Thus, a minimum of 90 observations is necessary to obtain significant and reliable results. Moreover, Orme (1998) suggests observations between 150-1200 in practice.

3.7. Further validation of the research

One can reasonable think that consumers from the European Union countries are somewhat used to the practice of environmental labels. Bearing this in mind, it is hard to rule out or control for extraneous effects. Thus, it is interesting to compare the results from the Netherlands to another country, where the practice of environmental labels is not widespread and EU Ecolabel is not present. Considering the facts that Turkey is a candidate state to enter EU and in case of its entry, EU Ecolabel may be implemented soon in the country; Turkey constitutes as an ideal country to check the validity and reliability of the study. Moreover, conducting this research in Turkey may also provide insights for future expectations of this practice.

For this purpose, a partner university of Tilburg University³, namely Koç University, is selected to investigate, since it is assumed that both universities share similar values and a similar student profile based on their partnership. Moreover, the sample is enlarged to also recent graduates of Koç University, since Turkey is assumed to hold a different lifestyle. Students in Turkey may most of the time live with their families and they may not be shopping for a dishwashing detergent occasionally. To apply the same survey to a similar sample, both Koç University students and recent graduates are targeted with the survey designed for Turkey.

In order not to change the study, only the prices and the brand names are adjusted to Turkish Lira and brands sold in Turkey to make the survey more realistic. The same considerations and assumptions are applied when selecting the prices and brand names. For example, the attribute price has the same steps between its levels and the brand names are composed of a known brand, a private label and an ecological brand in Turkey.

Some of the wordings in the survey have also been changed to ask whether the participants are from Koç University and whether they have been living in Turkey for a while.

Other than the above, there are no further changes; all the assumptions and restrictions are kept the same since they also apply to Turkey. Another survey with the mentioned adjustments will be distributed among Koç University students and recent graduates in the same way as explained and the same number of participants will be targeted. Example questions from the survey designed for Turkey can be found in Appendix VII.

³ Retrieved on July 24, 2016 from Tilburg University website:
<https://www.tilburguniversity.edu/about/schools/economics-and-management/education/partner-universities/>

Chapter 4: Analysis and Results

This chapter will analyse the data gathered from the surveys. It will start with data preparation, continue with the results of the conjoint analysis and further illustrate the segmentation done with latent class analysis.

4.1. Data preparation

146 respondents attempted to complete the survey designed for the Netherlands. Among them, only 126 completed the survey, however 30 of them were filtered since they were either not a student from Tilburg University or they have not been living in the Netherlands for more than six months. This leaves 96 successful and complete responses to analyse with conjoint and latent class analysis. The amount of responses gathered are certainly enough to perform conjoint analysis, considering the fact that even 1 response is enough to calculate part-worths. This amount also allows for latent class analysis in case of small number of segments. This will be further discussed in the relevant part, when the number of segments will be selected. The number of responses was rather lower for the survey designed for Turkey. Overall 89 people started to survey, where only 57 of them completed until the end. Among these, 15 of them were filtered by the first questions. Hence, only 42 responses are eligible for the analysis. In light of the previous reasoning, 42 allows to perform conjoint analysis. However, due to small amount of responses latent class analysis for this survey will not make much sense, since the same number of parameters will be estimated with small number of observations, and it will not represent the different segments in the society. Therefore, only conjoint analysis will be performed for this data.

Some of the questions on demographics and environmental perspectives needed to be organized for the analysis. This was required because some of the answers consisted of text, which would not be meaningful in the analysis, this was the case for nationality, and some of the answers such as age and the time period spent living in the Netherlands (or in Turkey) were continuous and different for nearly all the respondents.

For the nationality variable, three classes have been created to differentiate respondents as European Union citizen, Non-European Union citizen and citizen of a European Union candidate state. The categorization is based on the information presented in the official website

of European Union⁴. This classification is motivated with EU Ecolabel's presence in the member states and its assumed less acknowledgement in other states. Since the survey conducted in Turkey only had Turkish respondents, this variable is not distinguishing. Thus, this variable is eliminated when analysing the data for Turkey.

For the continuous variable 'age', data revealed that there are limited number of respondents, who are below the age of 20 and who are 30 or higher. Most of the respondents are accumulated between the ages of 20-29. These factors are taken into account while separating the age groups and the following groups are formed based on the ages of the respondents: below 20, 20-24, 25-29, and 30 or older. Although, there is no respondent, who is 30 or older, in the survey conducted in Turkey, the other three age groups are adapted the same for this survey.

For the continuous variable 'the time period spent living in the Netherlands', groups are formed based on the following assumptions. First, it is assumed that living in the Netherlands up to 1 year is a common situation for international students. Next, living in the Netherlands up to 5 years can mean a transition period and above five years would demonstrate an accustomed life in the Netherlands. This classification only holds for the survey of Netherlands, since nearly all of the respondents of the survey in Turkey lived in there for their whole life and only one respondent lived in Turkey for six years, which is still in the same category and too little to show significant difference.

4.2. Sample characteristics

Prior to the analysis, it is important to note the sample characteristics of both surveys. This will allow better understanding of the results. 67% of the respondents of the Netherlands survey comes from EU countries, whereas 11% comes from non-EU countries and 22% comes from a candidate country, which is Turkey in this case. 75% of the sample is female and 87% of all the respondents are between the ages 20-29. 52% of them lives in the Netherlands for a year, 14% for 2-5 years and 34% for more than 5 years. Only 5% of the respondents lives with their family, the rest is either living in a shared apartment (68%) or alone (27%). This information increases the likelihood that the respondents do their own shopping. Moreover, 63% of the respondents seem to have the lowest level of environmental consciousness, while 28% has a moderate level and 9% has a high level. Only 11% of the sample does not recycle, most of

⁴ Retrieved on July 26, 2016 from European Union website: http://europa.eu/about-eu/countries/index_en.htm

them, 51%, recycle on a moderate level. In addition to recycling, 81% of the respondents show between 1-3 other environmentally friendly behaviours. Finally, 71% of the sample seems to consider environmentally friendly options during their purchases, although they do not always buy that option.

When it comes to the survey conducted in Turkey, all the respondents are Turkish and nearly all of them, except 1, spent all their live living in Turkey. The gender distribution is somewhat even in this sample with 52% female and 48% male respondents. 64% of the respondents are between the ages 20-24 and 24% are between 25-29, the rest is below 20. 60% of the respondents live with their families, which might be a limitation of the study since they may not be doing their own shopping. In addition to these, 43% of the sample shows low level of environmental consciousness, whereas 33% shows moderate and 24% shows high level. 81% of the sample seems to adapt either higher or moderate level of recycling. Moreover, 81% of them practice up to 4 other environmentally friendly behaviours. Lastly, 71% of the respondents states considering environmentally friendly options during their purchase.

Considering the achieved variety, the sample is assumed to be representative for both universities. A summary table of both surveys can be found in Appendix VIII.

4.3. Conjoint analysis

All the attributes are specified as nominal for the analysis. Only the attribute ‘price’ offers the possibility to specify it as numeric. However, one can argue that if a respondent cares about another attribute more than price, linearity may not be the case for that respondent. Moreover, applying this would result in decreasing the number of parameters with only one. Since this study is not focused on this aspect, it also would not make so much difference in terms of results and complexity.

The initial data is analysed by Latent Gold with only one class, meaning that the data is not separated into latent classing, thereby all the respondents are in one class. The surveys conducted in two separate countries, Netherlands and Turkey, are analysed separately. Associated outputs of the analysis can be found in the Appendix IX.

When the data is considered as one class and subsequent model is analysed for the survey conducted in the Netherlands, the model returns a hit rate of 68%, which means 68% of the time the estimated responses are equal to the observed ones. Moreover, the Wald test for attributes shows significance for all attributes, except for ‘brand’, with a p-value below 0.05. This means that the attribute ‘brand’ does not matter for the population. The attribute ‘price’

appears to be the most important attribute based on its relative importance of 30%. The attribute ‘EU Ecolabel’ follows price with a relative importance value of 9%. The importance order of the other attributes are as follows: perfume, size, Eco name supplement and brand. Moreover, ‘no-choice’ is also defined as an attribute in the design and it seems to have the highest relative importance value of 44%. Looking at the parameters, it is obvious that respondents mostly decided to avoid no choice, based on the positive 1.3 value of the level 0 of no-choice. This means respondents preferred choosing a product rather than none. Since no-choice option is presented in every question and respondents preferred not to choose it, this makes no-choice an important attribute.

The conjoint analysis of the survey conducted in Turkey shows a hit rate of 63%. According to the Wald test, all attributes are significant with a p-value below 0.05. Responses suggests that the attribute ‘EU Ecolabel’ is the most important attribute based on its relative importance of 17%, the attribute ‘brand’ is slightly less important than EU Ecolabel with a relative importance of 16%. Respondents seems to care about ‘price’ again with a similar relative importance, valued at 13%. Following these, the attributes perfume, size and eco name supplement come respectively. The relative importance of ‘no-choice’ as an attribute again implies that respondents were inclined to select a product rather than none with a value of 33%. Comparing the results of both surveys, it is interesting to find that samples have such different preferences. Respondents from the Netherlands seems to be more price sensitive, whereas Turkish consumers care more about the presence of the ecolabel. Next, Netherlands’ sample does not pay attention to the brand, however brand is the second most important attribute for the other sample. Moreover, Turkish consumers only care about the price after ecolabel and brand. Comparison of the two countries is summarized in table 14, Appendix IX.

4.4. Latent class analysis

With latent class analysis, the respondents are segmented into different classes according to their choices. The purpose of this analysis is to see how many different preference groups are present in the society and what are the properties of these groups. Latent class analysis will only be explained for the survey of Netherlands, since the small number of respondents in the other survey does not allow this analysis.

Selecting a suitable model involves considering the trade-off between the fit and complexity. Due to the relatively low number of respondents, Consistent Akeike Information Criterion (CAIC) can be used to determine the model. Moreover, Bayes Information Criterion (BIC) is

also a widely used criterion to balance these two factors. To determine the model, the combination of these information criteria will be used. The smallest value for CAIC suggests the usage of 2-class model with a value of 2253.1656 and the CAIC value of the 3-class model is also close to this value, 2257.0779. The smallest BIC value, 2182.0779, offers the usage of 3-class model. Hit rates of these models are noted as 76% for the 2-class model and 79% for the 3-class model. Comparing all these criteria, 3-class model is selected to be more suitable for the data. Comparison table can be found in Appendix X.

Wald test of the initial 3-class model shows significance for every attribute except for ‘brand’, with a p-value above 0.05. This means that ‘brand’ is not important for the population in general. Thus, brand is removed from the attributes and the second model is formed. After the removal of the attribute ‘brand’, the hit rate of the model improves to 80% and all attributes have significant p-values for the Wald test. When Wald(=) test is checked for significance, the attribute ‘eco name supplement’ has a p-value above 0.05 and this shows that ‘eco name supplement’ is class independent, meaning that preferences for this attribute do not significantly differ across segments. This finding requires another modification to the model, which is labelling ‘eco name supplement’ as class independent. The third model shows a hit rate of 80% and significant attributes in both Wald and Wald(=) tests. Z-values of this model demonstrate that ‘price’ has no effect for class 2, ‘ecolabel’ has no effect for class 3, ‘perfume’ has no effect on class 2 and size has no effect on both class 2 and 3, with z-values between -1.96 and 1.96. Since these attributes do not matter in the specified classes, labelling them with ‘no effect’ in the model will reduce the complexity of the model even further. Thus, this modification is also applied and the 4th model is created. This new model has a hit rate of 80%. Wald and Wald(=) tests show significance for every attribute and z-values are also significant for each attribute across each class, except for the attribute price for class 3. This requires a final modification to the model, where price is set to have no effect for class 3.

After all the steps of modifications, a final model is reached with a hit rate of 79%, which means the predictions match with the observed values 79% of the time, and significant attributes from all the tests; Wald, Wald(=) and z-value. Thus, all the attributes in the final model matter for the sample, they significantly differ across classes and only the attributes that have an effect for a class is included in the calculations for that class. Parameters for the intermediate models and the final model can be found in Appendix X. Results of the final model shows that all attributes in the model matter for class 1, however price is the most important attribute with a relative importance of 43%. Class 2 seems to care about only environmental attributes, which are eco name supplement and EU Ecolabel. The most

important attribute for them is EU Ecolabel with a relative importance of 33%. Class 3 cares the most about the perfume with a relative importance value of 30%. All these segments have a high relative importance for no-choice with values of 39%, 58% and 67% respectively. Checking also the parameters, they have more inclination to choose an option rather than the no-choice, which means they preferred a product in most of the choice sets. Relative importance for each attribute across classes can be found in Appendix X.

4.5. Description of segments

The final model with 3-classes reveal such different preferences in terms of purchase behaviour, as the name of the segments imply. Only the preference for the attribute ‘eco name’ is identical in each segment, since it is found to be class independent. Moreover, based on the Wald tests, the covariates are found to be not significant, possibly due to lower number of observations. Therefore, one should evaluate the results with caution, see table 28 in Appendix X. More information on each segment can be found in Appendix X.

4.5.1. *Class 1 – Economizers*

Economizers is the biggest class in this analysis with a size of 53%. Based on the profile, 72% of this class is composed of students between 20-24 of age, among whom 59% is from EU, 21% is from a candidate country. 72% lives in a shared apartment and 23% lives alone. 70% of this group shows the lowest level of environmental consciousness and only 4% shows the highest level. 96% of them are involved moderately or highly in recycling and 63% considers buying environmentally friendly products.

As mentioned before, Economizers are highly price sensitive with a relative importance of 43%. 92% of this class prefers to buy a dishwashing detergent for €0.95, which is the cheapest price. It is no surprise that the second most important attribute for this class is size; 65% of them would like to purchase a bigger size. When it comes to the other attributes, it seems like Economizers would like to have other attributes as long as it is cheap or big; 64% would like to have EU Ecolabel and 60% would like to have perfume.

In line with the profile in this segment, based on the ProbMeans, there is a 76% chance of being in this segment if one selects a dishwashing detergent with the lowest price. In addition to this, there is a 60% chance that a person selecting 500 ml bottle will be in this segment. For the other attributes, the chance of belonging to this segment is around 50% for each level, meaning

that they have no strong preference for a specific level. This also makes sense since Economizers is the most crowded segment.

4.5.2. *Class 2- Green Consumers*

38% of the sample is segmented as Green Consumers. Based on the profile, 81% of them are between the ages of 20-29 and they are either from an EU-country, 75%, or a candidate country, 25%. 62% lives in a shared house, whereas 30% lives alone. Among this class, every level of environmental consciousness is observed and it is the group with the most people that has high level of environmental consciousness, with 19%. 86% of this group pays attention to recycling and 14% doesn't recycle at all. 3% among Green Consumers always buys the environmentally friendly option and 84% considers to buy.

As overviewed in the previous part, Green Consumers care for the EU Ecolabel the most, with a relative importance of 33%. Among them 72% prefers to purchase a dishwashing detergent with EU Ecolabel. As it is the case in the other classes, since this attribute is class independent, 57% would also like to have an ‘Eco name’ on the product. Green Consumers are indifferent about other attributes, which is like a proof of their environmental friendliness.

Although, this segment is highly environmentally friendly, based on the ProbMeans there is only 41% chance that someone who prefers to have a dishwashing detergent with EU Ecolabel would be one of the Green Consumers. This can be attributed to the size of the segments and the fact that much of the respondents are classified as Economizers. Furthermore, if someone is paying €1.42 or €1.89 for a dishwashing detergent, it is most probably a Green Consumers by chances of 66% and 79% respectively. In addition to this, if a consumer shows the highest level of environmental consciousness, he/she can be a Green Consumer by a chance of 78%.

4.5.3. *Class 3 – Hedonists*

Hedonists have a class size of 9%. Based on the profile, they are only composed of students from the age groups 20-24 and 25-29 and there is an even distribution between these two groups. 75% of this segment comes from EU countries. There is no student living with his/her family in this group and the majority (63%) lives in a shared apartment. They show low, by 62%, or moderate, by 38%, level of environmental consciousness and half of this class does not recycle. Compared to the other classes, the number of other environmentally friendly behaviours are also lower, i.e. no one practices more than 2 of them. Moreover, 38% of this

class does not even pay attention to buying environmentally friendly products, whereas the rest considers these products.

Putting the attribute ‘eco name’ aside, Hedonists are indifferent for all the attributes except for perfume. It is already stated that the most important attribute for them is perfume with a relative importance of 30%. Furthermore, 97% of them would like their dishwashing detergent to have a lemon perfume. This also explains where the name of the segment comes from.

Looking at the ProbMeans, it is not easy to estimate someone’s belonging to this segment since it is the smallest segment by size. Therefore, there is not a good chance of being a Hedonist given that someone prefers a specific level of any attribute. This even holds for the attribute ‘perfume’.

4.6. Willingness to pay

Willingness to pay for EU Ecolabel can be evaluated for both surveys separately. It can be calculated by finding the monetary value of one unit of utility and using this amount to value the presence of EU Ecolabel. In order to do so, first step is to take the maximum importance level of price, which is the difference between part-worth of the best level of this attribute and the part-worth of the worst level. Next, the difference between the best and worst level of price in monetary value is taken and by combining these two, worth of one unit of utility in monetary value is calculated. Afterwards, the change in utility, when EU Ecolabel is present, is found by looking at the maximum importance value. Finally, the previously found worth of one unit of utility in monetary value is multiplied with this number to find out the willingness to pay for EU Ecolabel.

When these calculations are made for the consumers in the Netherlands, it turns out that they are willing to pay approximately €0.28 more to have a dishwashing detergent with EU Ecolabel. If the same calculations are done for the survey conducted in Turkey, it demonstrates that consumers in Turkey are willing to pay ₺1.27 more to have a dishwashing detergent with EU Ecolabel. This analysis shows that in each case consumers are willing to pay a premium for a non-durable product with EU Ecolabel. Moreover, it is possible to calculate willingness to pay for different segments among the consumers in the Netherlands. Since only Economizers (Class 1) place importance to price, this calculation can only be done for them. Results show that Economizers are willing to pay €0.12 more for the presence of EU Ecolabel. Detailed calculations and summary table can be found in Appendix XI.

Chapter 5: Conclusion, Discussion, Recommendations and Limitations

In the final part of this paper, answers to the problem statement and practical research questions will be presented. Next, discussion of the findings will be revealed and recommendations to European Environmental Commission, companies and academics will be provided. Finally, limitations of this research will be noted.

5.1. Conclusion

In order to answer the following problem statement “What role does EU Ecolabel play relative to other attributes in a consumer’s buying decision for a non-durable product, and is it possible to segment consumers based on their preferences?” and practical research questions demonstrated in part 1.2.2, possible attributes for a dish washing detergent are first identified by literature review and desk research. Then, with preliminary analysis, suitable attributes are selected and tested through conjoint analysis and latent class analysis.

1-class results reveal that all attributes matter for the consumers in the Netherlands, except for the attribute brand. Consumers in Turkey seem to care about all attributes. Moreover, consumers are in fact influenced by EU Ecolabel when they are making a purchase decision for a non-durable. Based on the conjoint analysis results, EU Ecolabel occurs to be the second most important attribute for the consumers in the Netherlands and the most important attribute for the consumers in Turkey.

In addition to these, it is possible to form three distinct segments among the consumers in the Netherlands according to their preferences. One of these segments includes the consumers with highly environmentally friendly preferences. As explained in part 4.5.2, this segment constitutes 33% of the sample. Member of this segment, Green Consumers, have a clear preference for the presence of the EU Ecolabel and their behavioural data also suggests the practice of environmentally friendly behaviour. Other segments specified by the latent class analysis demonstrate preference for price and perfume.

Further analysis on willingness to pay shows that consumers in both the Netherlands and Turkey are willing to pay a premium to have EU Ecolabel on a dishwashing detergent. This amounts to approximately €0.28 for the Netherlands and ₺1.27 for Turkey. Segmented willingness to pay can only be calculated for Economizers in the Netherlands and it shows €0.12 of willingness to pay.

5.2. Discussion

Existing literature and reports suggests that there is an inconsistency between consumer beliefs and purchase behaviours. This research aimed to clarify whether such an inconsistency exists and what are the consumer preferences on EU Ecolabel for a selected non-durable product category of dishwashing detergents.

Results on the consumers in the Netherlands show that a non-negligible group of people, named as Green Consumers, shows consistency between their environmental perspectives and purchase behaviours. Moreover, although 73% of the sample stated at least considering environmentally friendly options, they value price more than EU Ecolabel. It is interesting in the sense that if one checks the actual price of the environmentally friendly option in Albert Heijn, it is among one of the cheapest. This suggests a controversy that people didn't reveal in the research. As Lin & Chang (2012) offers, this may base on the believed inferior quality of environmentally friendly products or as Pelsmacker et al (2013) states, habitual buying of experienced brands and not going through an intensive decision making process can be the reason of this controversy.

Furthermore, brand seems to have 'no effect' for the consumers in the Netherlands. It is surprising due to the fact that the results of the preliminary analysis showed higher stated importance for this attribute. Some respondents even associated brand with effectiveness and quality. Considering these, the fact that brand does not actually play a role in the purchase decision, is an unforeseen result. This may be based on the logical decision making of the respondents, which reveals that instead of selecting a product that they 'like', they would rather select the logical option in terms of price or ecolabel. Moreover, higher price might also hint higher quality, thereby allowing consumers to judge the quality of the product based on its price and not on the brand. Furthermore, one may suggest that this finding is the consequence of selective sampling of this research. A wider sample, where a bigger portion of the society is included, may not show the same preference.

The results of the survey in Turkey suggests a different view since the most important attribute for this group of consumers is found to be EU Ecolabel. However, this label is not in practice in Turkey. The reason why Turkish consumers are attracted to this attribute may be due to the novelty of this label and superior belief on European Union practices. Additionally, due to low number of respondents, one can assume that most of the respondents personally know the researcher. This may have created a bias towards the EU Ecolabel. On the contrary, although the stated preference shows high importance for EU Ecolabel, the second most important

attribute, only with a slight 1% difference, suggests the preference of the famous, widespread brand. This is an interesting finding because there is an environmentally friendly brand, which originates from an environmental organization called Turmepa, as one of the levels and the sample revealed the least preference for that brand. Low brand awareness of this organization may take the blame as the cause.

5.3. Recommendations

In a choice environment, where all the attributes are clearly explained and visible, consumers decided to pay attention to EU Ecolabel. This shows that consumers are in the right mental state to place an ecolabel in their evaluation set for a non-durable product category. This is a highly useful information since the authorities, such as the European Environmental Commission, can make use of this fact to further promote EU Ecolabel. Considering the fact that the consumers place high importance to price and products holding this label are not necessarily expensive, as in the example of dishwashing detergents, one would expect high preference for this product in case of a certain level of awareness. The recommendation therefore for the European Commission is to increase awareness of EU Ecolabel and inform the society on its benefits to avoid counterarguments on inferior product quality and to increase the positive associations with the products holding this label.

In line with this logic, companies that have EU Ecolabel on their products can also emphasize this aspect in order to boost both EU Ecolabel's awareness and their environmentally friendly image. The companies that do not have EU Ecolabel yet, may consider acquiring this certification based on the fact that consumers clearly care about this label. Information on willingness to pay of consumers for this label can be of additional value since this may help estimate the pay-off from such an investment.

One can argue that research on EU Ecolabel, and other labels, might also increase awareness and influence the purchase of such products. Academics should increase their focus on environmentally friendly products, mostly on the non-durable product category, in order to transform the society into a more environmentally conscious and friendly community. Specifically, the inconsistency between the stated and the revealed preference of the consumers, when it comes to environmental products, can be further investigated. On one hand, it is found that consumers prefer cheaper products. On the other hand, whereas the products with EU Ecolabel are actually not expensive, they still do not prefer them. Then, maybe low prices imply low quality and prevent consumers from buying. Moreover, the fact that the

consumers in the Netherlands found not to place importance on brand is interesting enough to explore the reasoning behind. Further research is necessary to clarify the underlying reasons of such issues and determine how to overcome them.

5.4. Limitations

First of all, this research is done in a university setting as a master thesis. Hence, less number of respondents was an expected limitation due to low involvement of other students in such studies. Moreover, the time period that the study was conducted is summer, thereby suggesting an even lower return. This selective sampling also suggests similar preference, which can also constitute a limitation for this research.

Second, the method of analysis also involved certain limitations. Conjoint analysis is a realistic tool that mimics the purchase environment, but it also creates an environment with more decisive criteria. Many of the unofficial comments from the respondents include the fact that ‘they were not paying that much attention to a dishwashing detergent’. Since conjoint analysis aims to maximize trade-offs with high level of information, this was an expected drawback. Respondents pay more attention than they normally do and this influences the research to have somewhat ‘exaggerated’ results on their preferences.

Third, the survey design included choice sets with somewhat more appealing choices. With increasing the number of iterations and multiple runs of the design codes, this issue was addressed, but the selected model is found to be the best one. In order not to give up on realism, removing the restrictions for a better design was not preferred. Further research addressing these facts can be useful to enlighten more in the area of ecolabels and non-durable products.

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Appendix I: European Union Ecolabel



Figure 1: Logo of European Union Ecolabel, or EU Flower, taken from European Commission's website: <http://ec.europa.eu/environment/ecolabel/eu-ecolabel-for-consumers.html>



Figure 2: EU Ecolabel's representation on a product, taken from Albert Heijn's website: <http://www.ah.nl/producten/product/wi154339/klok-eco-afwasmiddel>

Appendix II: Desk Research from Albert Heijn's Website

The screenshot shows a product page for Dreft Afwasmiddel original citroen. At the top, there is a navigation bar with links for Producten, Bonus, Allerhande box, Recepten, Winkels, Acties, and Meer... Below the navigation bar, there is a search bar and a product image of a yellow Dreft dishwashing detergent bottle. To the right of the image, the product name "Dreft Afwasmiddel original citroen" is displayed, along with the price "Prijs per LT € 3,55". Below the product name, it says "400 ml" and "1.42". A detailed description follows: "Dreft verwijderd zeer doeltreffend en snel alle vetten en etensresten" and a bulleted list: "• Dankzij de krachtige formule volstaat een kleine hoeveelheid afwasmiddel", "• Voor een schone & glanzende vaat", and "• Het afwasmiddel dat tot 75% langer meegaat". A section titled "Productinformatie" is present, stating "Er is op dit moment tijdelijk geen productinformatie beschikbaar."

Figure 3: Product information on Dreft dishwashing detergent:
<http://www.ah.nl/producten/product/wi220243/dreft-afwasmiddel-original-citroen>

The screenshot shows a product page for Klok Eco afwasmiddel. At the top, there is a navigation bar with links for Producten, Bonus, Allerhande box, Recepten, Winkels, Acties, and Meer... Below the navigation bar, there is a search bar and a product image of a blue Klok dishwashing detergent bottle. To the right of the image, the product name "Klok Eco afwasmiddel" is displayed, along with the price "Prijs per LT € 1,90". Below the product name, it says "500 ml" and "0.95". A detailed description follows: "Klok afwasmiddel zonder parfum en kleurstoffen heeft een krachtige vet oplossende werking en maakt uw vaat glanzend schoon." and a bulleted list: "• Zonder parfum en kleurstoffen, beperkt de kans op huidproblemen.", "• De speciale formule zorgt ervoor dat het milieu optimaal wordt gerespecteerd.", and "• Sinds 2001 bekroond met het Europees Ecolabel.". A note states: "Wanneer u het doseringsadvies van de verpakking opvolgt, kunt u met één flacon Klok Afwasmiddel tot 100 keer afwassen!" A section titled "Productinformatie" is present, stating "Er is op dit moment tijdelijk geen productinformatie beschikbaar."

Figure 4: Product information on Klok dishwashing detergent:
<http://www.ah.nl/producten/product/wi154339/klok-eco-afwasmiddel>

Appendix III: Semi-Structured Interview on Dishwashing Detergents

Introduction

I am writing my master thesis about consumer preferences on dishwashing detergents. My purpose is to analyse the role of different attributes of dishwashing detergents that might influence the purchase decision. For this, I will ask you some questions regarding your shopping experience for this product. This interview will take about twenty minutes of your time. Thank you in advance for helping me!

Interview

I would like you to imagine yourself in need for a dishwashing detergent to hand-wash your dishes. You go to Albert Heijn XL in Tilburg to buy one and you slowly move to the aisle, where the dishwashing detergents are located. You should answer the following questions as if you are there.

1. You see that the assortment of dishwashing detergents is pretty wide, so you have to make a choice. When you are selecting a suitable dishwashing detergent, to which features/product specifications do you pay attention?
2. Why are these features important to you?
3. You said price is one of the features you consider, how do you compare the prices of different products?
4. Do you pay attention to the price per litre listed in the label on the shelf?
5. Above which price would you never pay to a dishwashing detergent? In other words, what is an expensive price for you for a dishwashing detergent?
6. What is a cheap or a reasonable price for you to pay for a dishwashing detergent?
7. Do you think its price is related to the quality of a dishwashing detergent?
8. Do you consider buying the brand on sale?
9. How often do you buy the brand on sale? (Depending on the respondent's answer to question 8)
10. Do you have a favourite dishwashing detergent brand that you usually buy?
11. What other brands of dishwashing detergent do you consider? (Depending on the respondent's answer to question 10)
12. Which perfume/scent do you prefer in the dishwashing detergent you buy?
13. How often do you purchase a dishwashing detergent?

14. Now I will give you a list of features of dishwashing detergents. You have 100 points to distribute among these attributes based on their relevance to you.

- a. Brand
- b. Price
- c. Promotion
- d. Size
- e. Perfume/scent
- f. Colour of the product/package
- g. Additional attributes based on respondent's answer in question 1

Ending

Thank you for your participation.

Appendix IV: Results of the Preliminary Analysis

Participant	Gender	Age	Nationality	Q1 & Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12	Q13
1	F	25	Italian	Price --> Wants to buy cheaper Ecoproduct--> Cares about the environment and her health Quality--> No harmful ingredients, no parabens Famous Brand--> Higher quality materials	Based on experience in her own country, ecolabel good quality no parabens etc	No	If 500 ml bottle is more than €2.5	€1	Not always	Yes	It depends on the good ingredients, not always. Ecolabel products are almost always not on sale.	No	N/A	No perfume or lemon	Once in 2 months
2	M	23	Dutch	Price --> He is a student and he can't afford to pay much, it can clean regardless of the price Brand --> What does the brand stand for, cleaning or refreshing product, quality of the brand Quality --> Feeling of the product you have, tells by brand Smell --> Wants a nice smell on the dishes	Checks all the detergents, selects the one with lowest price or lowest price/quality	No	Above €2 small ones	€1-1.5	Yes, a lower price usually leads to less quality, lower quality ingredients, although for this category it is not that related	Yes	Checks the bonus flyer of AH, if favourite brand is on sale, he buys. If it is not on sale, he buys the cheapest	Dreft	Destil, Mr.Proper, AH Basic	Citrus	Once in 2-4 weeks
3	M	22	Dutch	Price --> As a student, it is good to check, it also shouldn't be too cheap Package --> If it looks good, it tells about the quality	Check the price/volume	Yes	Above €3 small ones	Below €2	Yes, probably because of the good marketing	Yes	Nearly everytime	Dreft	AH private brands	No	Couple of times a year
4	M	23	Dutch	Price --> He wants the cheapest	Size of the bottle and its price	Yes	€2	€0.50	Little bit	Yes	Everytime if it is the cheapest	No	N/A	Prefers to have a perfume regardless of the smell	Once-twice a year
5	F	23	Dutch	Price --> She doesn't like to pay too much, it is not a car, it is not that important Colour of the package --> She likes to take the one that looks nice Size --> If it is a really small bottle, it should be a reasonable size. Also, related to the price	Price and compare on the size	No	N/A	N/A	A bit, not too much in this category	Yes	Everytime if it is the cheapest	No	N/A	Prefers to have a perfume regardless of the smell	Once in 2 months
6	M	23	Italian	Smell --> Best smell	According to the size	No	More than €3	€1.5	Yes, price and brand together	Yes	Good one on sale	Dreft	AH private brands	Lemon	When it is over
7	F	25	Turkish	Smell --> Makes the process fun Colour --> Looks nice on the counter Price --> Keeping up with the budget Lotion --> To soften the hands	If one's smell is nice but a little more expensive, then I would buy that one.	Yes, sometimes	€1.10	€0.80	No	Yes	If a certain brand is on sale	No	AH Eco, Clean Ultra	Lemon	Once in a month
8	F	26	Greek	Price --> She is a student, she wants a cheap one Size --> She wants more Environmental Friendly --> Because of her values Effectiveness --> More value for money, understands it based on ads and experience, so it is brand	If the size is the same, effectiveness is the same, then she looks at the price	No	N/A	N/A	Usually yes	Yes	Sometimes, if it is a smart choice	No	N/A	Lemon	When it is over
9	F	25	Turkish	Price --> Since she doesn't know the quality, she tells it based on price Brand --> A brand that I know before and trust Smell --> It symbolizes cleanliness to me	Looks at other products and stores	No	N/A	N/A	Yes, sometimes	Yes	Yes, if it is her favourite brand	Dreft	N/A	Eucalyptus	Once a month
10	M	24	Turkish	Price --> For saving reasons Brand --> Prefers to buy a brand he knows Colour --> Appealing colour	Checks different products	Yes	N/A	N/A	Yes	Yes	Yes, if it is a brand he knows	AH Basic	N/A	Lavender	When it is over

Table 2: Detailed answers of the participants for questions 1-13

Participant	Brand	Price	Promotion	Size	Perfume	Colour	Package	Lotion
1	5	50	5	30	10			
2	20	40	20	5	10	5		
3	10	40		30			20	
4		50	10	20	20			
5		65	10	15	5	5		
6	20	20	30	15	20	5		
7		40		5	20	25		10
8	30	30	15	15	5	5		
9	25	30	15		15	15		
10	20	30	10	10	10	20		
Total	130	395	115	145	115	80	20	10

Table 3: Results of question 14, aided ranking

Participant	Brand	Price	Promotion	Size	Perfume	Colour	Package	Lotion
1	8	10						
2	9	10			8			
3		10					9	
4		10						
5		10		8		9		
6					10			
7		8			10	9		7
8	7	10		9				
9	9	10			8			
10	9	10				8		
Total	42	88	0	17	36	26	9	7

Table 4: Additional points assigned to each attributed based on unaided retrieval

Participant	Brand	Price	Promotion	Size	Perfume	Colour	Package	Lotion
1	13	60	5	30	10	0	0	0
2	29	50	20	5	18	5	0	0
3	10	50	0	30	0	0	29	0
4	0	60	10	20	20	0	0	0
5	0	75	10	23	5	14	0	0
6	20	20	30	15	30	5	0	0
7	0	48	0	5	30	34	0	17
8	37	40	15	24	5	5	0	0
9	34	40	15	0	23	15	0	0
10	29	40	10	10	10	28	0	0
Total	172	483	115	162	151	106	29	17

Table 5: Sum of points received from both parts

Appendix V: SAS Codes

```
%mktruns( 3 3 2 2 2 2 )
%mktex( 3 3 2 2 2 2 , n = 36, seed = 35 ) /* create a linear design */
%mktlab(data=design, int=f1-f2)
%choiceff(data=final,           /* candidate set of alternatives */
          model=class(x1-x6),    /* model with 5 attributes */
          nsets=18,              /* number of choice sets */
          flags=f1-f2,            /* 2 alternatives */
          beta= 2 1 2 1 1 1 -1,   /* assumed beta vector */
          seed=35,                /* random number seed */
          maxiter=30)             /* maximum number of iterations */

proc print;
  id set;
  by set;
  run;

%macro restrict;
bad = (x1 = 1 & x2 = 1)+ (x2 = 1 & x6 = 2);
%mend;
%mktex( 3 3 2 2 2 2 , n = 36, seed = 35, restrictions = restrict );
proc print data=design ; run;

%macro restrict;
bad = (x1 = 1 & x2 = 1)+ (x2 = 1 & x6 = 2);
%mend;
%mktex( 3 3 2 2 2 2 , n = 36, seed = 35, restrictions = restrict ) /* create a linear design */
%mktlab(data=design, int=f1-f2)
%choiceff(data=final,           /* candidate set of alternatives */
          model=class(x1-x6),    /* model with 5 attributes */
          nsets=18,              /* number of choice sets */
          flags=f1-f2,            /* 2 alternatives */
          beta= 2 1 2 1 1 1 -1,   /* assumed beta vector */
          seed=35,                /* random number seed */
          maxiter=30)             /* maximum number of iterations */

proc print;
  id set;
  by set;
  run;
```

Figure 5: SAS codes for the choice-based conjoint design

Appendix VI: SAS Outputs for Survey Design

The SAS System

Design Summary

Number of Levels	Frequency
2	4
3	2

The SAS System

Saturated = 9
Full Factorial = 144

Some Reasonable Design Sizes	Violations	Cannot Be Divided By
36 *	0	
72 *	0	
12	1	9
24	1	9
48	1	9
60	1	9
18	6	4
54	6	4
30	7	4 9
42	7	4 9
9 S	18	2 4 6

* - 100% Efficient design can be made with the MktEx macro.
S - Saturated Design - The smallest design that can be made.
Note that the saturated design is not one of the recommended designs for this problem. It is shown to provide some context for the recommended sizes.

Figure 6: Output for selecting the number of stimuli

The SAS System					
Algorithm Search History					
Design	Row,Col	Current D-Efficiency	Best D-Efficiency	Notes	
1	Start	100.0000	100.0000	Tab	
1	End	100.0000			

The SAS System					
The OPTEX Procedure					
Class Level Information					
Class Levels Values					
x1	3	1	2	3	
x2	3	1	2	3	
x3	2	1	2		
x4	2	1	2		
x5	2	1	2		
x6	2	1	2		

The SAS System					
Design Number	D-Efficiency	A-Efficiency	G-Efficiency	Average Prediction Standard Error	
1	100.0000	100.0000	100.0000	0.5000	

Figure 7: SAS output for efficiency

The SAS System					
The OPTEX Procedure					
Class Level Information					
Class Levels Values					
x1	3	1	2	3	
x2	3	1	2	3	
x3	2	1	2		
x4	2	1	2		
x5	2	1	2		
x6	2	1	2		

The SAS System					
Design Number	D-Efficiency	A-Efficiency	G-Efficiency	Average Prediction Standard Error	
1	94.6411	87.1827	98.3973	0.5000	

Figure 8: SAS output for efficiency after restrictions

The SAS System									
Final Results									
Design		28							
Choice Sets		18							
Alternatives		2							
Parameters		8							
Maximum Parameters		18							
D-Efficiency		2.0687							
D-Error		0.4834							

The SAS System									
n	Variable Name	Label	Variance	Assumed Beta	DF	Standard Error	Wald	Prob > Squared Wald	
1	x11	x1 1	2.23527		2	1	1.49508	1.33772	0.1810
2	x12	x1 2	0.81050		1	1	0.90028	1.11077	0.2667
3	x21	x2 1	3.05622		2	1	1.74820	1.14403	0.2526
4	x22	x2 2	0.84093		1	1	0.91702	1.09048	0.2755
5	x31	x3 1	0.70196		1	1	0.83783	1.19356	0.2327
6	x41	x4 1	0.80117		1	1	0.89508	1.11721	0.2639
7	x51	x5 1	0.74778		1	1	0.86474	1.15641	0.2475
8	x61	x6 1	0.88377		-1	1	0.94009	-1.06373	0.2875
					8				

Figure 9: SAS output for final survey design summary

The SAS System														
Set	Design	Efficiency	Index	Prob	n	f1	f2	x1	x2	x3	x4	x5	x6	
1	28	2.06875	31	050000	973	1	1	3	2	1	2	1	1	
	28	2.06875	22	050000	974	1	1	2	3	2	1	2	2	
2	28	2.06875	23	050000	975	1	1	2	3	2	2	1	2	
	28	2.06875	29	050000	976	1	1	3	2	1	1	2	1	
3	28	2.06875	34	0.73106	977	1	1	3	3	2	1	1	2	
	28	2.06875	21	0.26894	978	1	1	2	3	1	2	2	1	
4	28	2.06875	18	050000	979	1	1	2	2	2	1	2	2	
	28	2.06875	8	050000	980	1	1	1	3	1	2	1	1	
5	28	2.06875	17	050000	981	1	1	2	2	2	1	1	1	
	28	2.06875	9	050000	982	1	1	1	3	1	2	2	2	
6	28	2.06875	20	050000	983	1	1	2	3	1	1	1	1	
	28	2.06875	5	050000	984	1	1	1	2	2	2	2	2	
7	28	2.06875	16	0.73106	985	1	1	2	2	1	2	1	2	
	28	2.06875	10	0.26894	986	1	1	1	3	2	1	1	1	
8	28	2.06875	12	050000	987	1	1	2	1	1	1	2	1	
	28	2.06875	4	050000	988	1	1	1	2	2	2	1	2	
9	28	2.06875	26	050000	989	1	1	3	1	2	1	1	1	
	28	2.06875	6	050000	990	1	1	1	3	1	1	2	1	

Figure 10: SAS output for choice set designs (1-9)

Set	Design	Efficiency	Index	Prob	n	f1	f2	x1	x2	x3	x4	x5	x6
10	28	2.06875	3	0.73106	991	1	1	1	2	2	1	2	1
	28	2.06875	33	0.26894	992	1	1	3	3	1	2	1	2
11	28	2.06875	20	0.88080	993	1	1	2	3	1	1	1	1
	28	2.06875	27	0.11920	994	1	1	3	1	2	2	2	1
12	28	2.06875	18	0.26894	995	1	1	2	2	2	1	2	2
	28	2.06875	25	0.73106	996	1	1	3	1	1	1	1	1
13	28	2.06875	19	0.26894	997	1	1	2	2	2	2	1	1
	28	2.06875	9	0.73106	998	1	1	1	3	1	2	2	2
14	28	2.06875	34	0.50000	999	1	1	3	3	2	1	1	2
	28	2.06875	14	0.50000	1000	1	1	2	1	2	2	2	1
15	28	2.06875	30	0.50000	1001	1	1	3	2	1	1	2	2
	28	2.06875	10	0.50000	1002	1	1	1	3	2	1	1	1
16	28	2.06875	3	0.73106	1003	1	1	1	2	2	1	2	1
	28	2.06875	33	0.26894	1004	1	1	3	3	1	2	1	2
17	28	2.06875	26	0.26894	1005	1	1	3	1	2	1	1	1
	28	2.06875	16	0.73106	1006	1	1	2	2	1	2	1	2
18	28	2.06875	30	0.26894	1007	1	1	3	2	1	1	2	2
	28	2.06875	13	0.73106	1008	1	1	2	1	1	2	1	1

Figure 11: SAS output for choice set designs (10-18)

Appendix VII: Survey



Hello,

You are invited to participate in the survey for my master thesis. In this survey, you will be asked about your dishwashing detergent preferences. It will take approximately 10 minutes to complete the questionnaire.

Your survey responses will be strictly confidential and data from this research will be reported only in the aggregate. Your information will be coded and will remain confidential.

Thank you very much for your time and support.

İdil Özsarı
MSc Marketing Management Student at Tilburg University
i.ozsari@tilburguniversity.edu

>>

Figure 12: Survey introduction page



Are you a student at Tilburg University?

- Yes
- No

>>

Figure 13: Filter question 1



Have you been living in the Netherlands for more than six months?

- Yes
- No

>>

Figure 14: Filter question 2



This survey targets Tilburg University students, who have been living in the Netherlands for more than six months. Thank you for your interest!

>>

Figure 15: Response viewed when one of the filter questions are not satisfied

This survey is designed to understand your preferences while you are buying a dishwashing detergent to hand-wash your dishes. Below, you can find the list of attributes of a dishwashing detergent. These attributes are explained one by one in order to allow you to fully understand the feature and its levels.

Price: This feature represents the price for a bottle of the dishwashing detergent in question in Euros.

Brand: It designates the manufacturer or the seller of the dishwashing detergent.

Name Supplement: This feature will demonstrate if there is a supplement in the brand name, such as an "eco" addition after the brand name as in AH Eco.

Ecolabel: This feature shows if a particular product has an ecolabel or not. In this context, the presence of an ecolabel shows that this product is approved by a higher entity, European Union Environmental Commission, on its environmentally friendliness and sustainability with the EU Ecolabel.

Perfume: It stands for the smell of the dishwashing detergent. Dishwashing detergents in this study will have either lemon smell or no perfume.

Size: It indicates the size of a bottle of the dishwashing detergent in ml.

Figure 16: Information on conjoint survey part 1

Next questions will compose of two dishwashing detergent options with various levels of the above features and a "none" option. You should select the option that meets your preferences and you should only select the "none" option if you prefer not to buy any dishwashing detergent if these two are your options, that means none of these dishwashing detergents meets your preferences. There are no right or wrong answers, you should pick the choice based on your preferences.

Below you can find an example question:

If you were to buy a dishwashing detergent, which one would you pick from the below options?

Attribute	Choice 1	Choice 2	None
Price	€0.95	€1.42	
Brand	Dreft	AH	
Name Supplement	Eco	-	
Ecolabel	EU Ecolabel	-	
Perfume	Lemon	-	
Size	400 ml	500 ml	None of the options meets my preferences

>>

Figure 17: Information on conjoint survey part 2

If you were to buy a dishwashing detergent, which one would you pick from the below options?

Attribute	Choice 1	Choice 2	None
Price	€1.89	€1.42	
Brand	AH	Klok	
Name Supplement	Eco	-	
Ecolabel	-	EU Ecolabel	
Perfume	Lemon	-	
Size	400 ml	500 ml	

Choice 1

Choice 2

None

>>

Figure 18: Example conjoint choice set from the survey

If you were to buy a dishwashing detergent, which one would you pick from the below options?

Attribute	Choice 1	Choice 2	None
Price	€1.42	€0.95	
Brand	AH	Klok	
Name Supplement	-	Eco	
Ecolabel	EU Ecolabel	-	
Perfume	-	Lemon	
Size	500 ml	400 ml	None of the options meets my preferences

Choice 1

Choice 2

None

>>

Figure 19: Example conjoint choice set from the survey

What is your gender?

- Male
 - Female
-

What is your age?

What is your level of study?

- Bachelor
 - Master
-

What is your nationality?

For how many years have you been living in the Netherlands?

Please select the living situation that describes you the best.

- I live in a shared apartment with other student(s)
- I live with my family
- I live on my own

Figure 20: Demographic questions

Which of the following statements describes you the best regarding your environmental consciousness?

- I appreciate living in a healthy and clean environment
 - I make the effort to maintain and preserve the environment
 - In addition to my efforts, I always advise others to keep the environment clean
-

Do you pay attention to recycling?

- Yes, I always separate recyclables and throw them separately
 - Yes, I guess I can say that
 - Does taking back deposit from beer bottles count as recycling?
 - No, I think not
-

Other than recycling, which of the following do you pay attention to in order to preserve the environment? (You can choose more than one answer)

- Use nontoxic products
 - Practice water conservation
 - Turn down heat in winter
 - Do not use products tested on animals
 - Buy environmentally friendly products
 - None of the above
-

Which of the following statements explains your buying behaviour the best?

- I always buy the environmentally-friendly alternative, if available
- I consider environmentally-friendliness of the product and make a choice in combination with the other attributes
- I do not pay attention to the environmentally-friendliness of a product

Figure 21: Questions on environmental perspectives



Are you a student or a graduate of Koç University?

- Yes
- No

>>

Figure 22: Survey for Turkey: Filter question 1



Have you been living in the Turkey for more than six months?

- Yes
- No

>>

Figure 23: Survey for Turkey: Filter question 2



This survey targets Koç University students and graduates, who have been living in Turkey for more than six months. Thank you for your interest!

>>

Figure 24: Survey for Turkey: Response viewed when one of the filter questions are not satisfied

This survey is designed to understand your preferences while you are buying a dishwashing detergent to hand-wash your dishes. Below, you can find the list of attributes of a dishwashing detergent. These attributes are explained one by one in order to allow you to fully understand the feature and its levels.

Price: This feature represents the price for a bottle of the dishwashing detergent in question in Turkish Lira.

Brand: It designates the manufacturer or the seller of the dishwashing detergent.

Name Supplement: This feature will demonstrate if there is a supplement in the brand name, such as an "eco" addition after the brand name as in Pril Eco.

Ecolabel: This feature shows if a particular product has an ecolabel or not. In this context, the presence of an ecolabel shows that this product is approved by a higher entity, European Union Environmental Commission, on its environmentally friendliness and sustainability with the EU Ecolabel.

Perfume: It stands for the smell of the dishwashing detergent. Dishwashing detergents in this study will have either lemon smell or no perfume.

Size: It indicates the size of a bottle of the dishwashing detergent in ml.

Figure 25: Survey for Turkey: Information on conjoint survey part 1

Next questions will compose of two dishwashing detergent options with various levels of the above features and a "none" option. You should select the option that meets your preferences and you should only select the "none" option if you prefer not to buy any dishwashing detergent if these two are your options, that means none of these dishwashing detergents meets your preferences. There are no right or wrong answers, you should pick the choice based on your preferences.

Below you can find an example question:

If you were to buy a dishwashing detergent, which one would you pick from the below options?

Attribute	Choice 1	Choice 2	None
Price	2.00₺	2.47₺	
Brand	Pril	Migros	
Name Supplement	Eco	-	
Ecolabel	EU Ecolabel	-	
Perfume	Lemon	-	
Size	400 ml	500 ml	None of the options meets my preferences

>>

Figure 26: Survey for Turkey: Information on conjoint survey part 2

If you were to buy a dishwashing detergent, which one would you pick from the below options?

Attribute	Choice 1	Choice 2	None
Price	2.94₺	2.47₺	
Brand	Migros	Turmepa	
Name Supplement	Eco	-	
Ecolabel	-	EU Ecolabel	
Perfume	Lemon	-	
Size	400 ml	500 ml	

Choice 1

Choice 2

None

>>

Figure 27: Survey for Turkey: Example conjoint choice set from the survey

If you were to buy a dishwashing detergent, which one would you pick from the below options?

Attribute	Choice 1	Choice 2	None
Price	2.47₺	2.00₺	
Brand	Migros	Turmepa	
Name Supplement	-	Eco	
Ecolabel	EU Ecolabel	-	
Perfume	-	Lemon	
Size	500 ml	400 ml	None of the options meets my preferences

Choice 1

Choice 2

None

>>

Figure 28: Survey for Turkey: Information on conjoint survey part 1

What is your gender?

- Male
 - Female
-

What is your age?

What is your level of study?

- Bachelor
 - Master or higher
-

What is your nationality?

For how many years have you been living in the Turkey?

Please select the living situation that describes you the best.

- I live in a shared apartment with other student(s)
- I live with my family
- I live on my own

Figure 29: Survey for Turkey: Demographic questions

Which of the following statements describes you the best regarding your environmental consciousness?

- I appreciate living in a healthy and clean environment
 - I make the effort to maintain and preserve the environment
 - In addition to my efforts, I always advise others to keep the environment clean
-

Do you pay attention to recycling?

- Yes, I always separate recyclables and throw them separately
 - Yes, I guess I can say that
 - Does taking back deposit from beer bottles count as recycling?
 - No, I think not
-

Other than recycling, which of the following do you pay attention to in order to preserve the environment? (You can choose more than one answer)

- Use nontoxic products
 - Practice water conservation
 - Turn down heat in winter
 - Do not use products tested on animals
 - Buy environmentally friendly products
 - None of the above
-

Which of the following statements explains your buying behaviour the best?

- I always buy the environmentally-friendly alternative, if available
- I consider environmentally-friendliness of the product and make a choice in combination with the other attributes
- I do not pay attention to the environmentally-friendliness of a product

Figure 30: Survey for Turkey: Questions on environmental perspectives

Appendix VIII: Sample Characteristics

Variable	Variable Level	Count	Percentage
Gender	(1) Male	24	25%
	(2) Female	72	75%
Age	(1) Below 20	5	5%
	(2) 20-24	59	62%
	(3) 25-29	24	25%
	(4) 30 or older	8	8%
Study Level	(1) Bachelor	22	23%
	(2) Master	74	77%
European Union	(1) EU	64	67%
	(2) Non-EU	11	11%
	(3) Candidate	21	22%
Time period spent living in the Netherlands	(1) 1 year	50	52%
	(2) 2-5 years	13	14%
	(3) More than 5 years	33	34%
Living situation	(1) Shared apartment	65	68%
	(2) With family	5	5%
	(3) Alone	26	27%
Environmental Consciousness	(1) Appreciates	60	63%
	(2) Makes effort	27	28%
	(3) Advises others	9	9%
Recycling	(1) High	34	35%
	(2) Moderate	49	51%
	(3) Low	2	2%
	(4) Not at all	11	11%
Environmentally friendly behaviours other than recycling	(1)	26	27%
	(2)	32	33%
	(3)	20	21%
	(4)	5	5%
	(5)	2	2%
	(0)	11	11%
Environmentally friendly buying	(1) Always buys	2	2%
	(2) Considers	68	71%
	(3) Does not pay attention	26	27%

Table 6: Netherlands survey summary for demographic and environmental perspectives

Variable	Variable Level	Count	Percentage
Gender	(1) Male	20	48%
	(2) Female	22	52%
Age	(1) Below 20	5	12%
	(2) 20-24	27	64%
	(3) 25-29	10	24%
Study Level	(1) Bachelor	32	76%
	(2) Master	10	24%
Living situation	(1) Shared apartment	11	26%
	(2) With family	25	60%
	(3) Alone	6	14%
Environmental Consciousness	(1) Appreciates	18	43%
	(2) Makes effort	14	33%
	(3) Advises others	10	24%
Recycling	(1) High	12	29%
	(2) Moderate	22	52%
	(3) Low	3	7%
	(4) Not at all	5	12%
Environmentally friendly behaviours other than recycling	(1) 1	9	21%
	(2) 2	11	26%
	(3) 3	7	17%
	(4) 4	7	17%
	(5) 5	3	7%
	(0) 0	5	12%
Environmentally friendly buying	(1) Always buys	3	7%
	(2) Considers	30	71%
	(3) Does not pay attention	9	21%

Table 7: Turkey survey summary for demographic and environmental perspectives

Appendix IX: Results of Conjoint Analysis

Prediction Table		Estimated				
Observed		1	2	3	Total	
1		453.0	291.0	0.0	744.0	
2		194.0	729.0	0.0	923.0	
3		25.0	36.0	0.0	61.0	
Total		672.0	1056.0	0.0	1728.0	

Table 8: Predictions table – Netherlands

Attributes	Class1	Wald	p-value
Att1_Price			
0	0.9214	147.4078	9.8e-33
1	-0.0542		
2	-0.8672		
Att2_Brand			
0	0.0886	2.8226	0.24
1	-0.0786		
2	-0.0100		
Att3_EcoName			
0	0.1014	6.0344	0.014
1	-0.1014		
Att4_EUEcolabel			
0	0.2703	36.6811	1.4e-9
1	-0.2703		
Att5_Perfume			
0	0.1843	19.6298	9.4e-6
1	-0.1843		
Att6_Size			
0	-0.1419	9.1128	0.0025
1	0.1419		
Att7_NoChoice			
0	1.3007	379.1553	1.9e-84
1	-1.3007		

Table 9: Parameters – Netherlands

Importance	
	Class1
Maximum	
Att1_Price	1.7887
Att2_Brand	0.1672
Att3_EcoName	0.2028
Att4_EUEcolabel	0.5406
Att5_Perfume	0.3685
Att6_Size	0.2838
Att7_NoChoice	2.6013
Relative	
Att1_Price	0.3005
Att2_Brand	0.0281
Att3_EcoName	0.0341
Att4_EUEcolabel	0.0908
Att5_Perfume	0.0619
Att6_Size	0.0477
Att7_NoChoice	0.4370

Table 10: Importance table – Netherlands

Prediction Table		Estimated				
Observed		1	2	3	Total	
1		301.0	101.0	0.0	402.0	
2		134.0	174.0	0.0	308.0	
3		27.0	19.0	0.0	46.0	
Total		462.0	294.0	0.0	756.0	

Table 11: Predictions table – Turkey

Attributes	Class1	Wald	p-value
Att1_Price			
0	0.4085	15.5703	0.00042
1	-0.0010		
2	-0.4076		
Att2_Brand			
0	0.6285	20.9521	2.8e-5
1	-0.2090		
2	-0.4195		
Att3_EcoName			
0	0.1684	8.1276	0.0044
1	-0.1684		
Att4_EUEcolabel			
0	0.5518	69.0360	9.7e-17
1	-0.5518		
Att5_Perfume			
0	0.3038	22.8182	1.8e-6
1	-0.3038		
Att6_Size			
0	-0.2076	8.5163	0.0035
1	0.2076		
Att7_NoChoice			
0	1.0562	175.3311	5.1e-40
1	-1.0562		

Table 12: Parameters table – Turkey

Importance	
	Class1
Maximum	
Att1_Price	0.8161
Att2_Brand	1.0480
Att3_EcoName	0.3368
Att4_EUEcolabel	1.1036
Att5_Perfume	0.6077
Att6_Size	0.4153
Att7_NoChoice	2.1123
Relative	
Att1_Price	0.1267
Att2_Brand	0.1627
Att3_EcoName	0.0523
Att4_EUEcolabel	0.1714
Att5_Perfume	0.0944
Att6_Size	0.0645
Att7_NoChoice	0.3280

Table 13: Importance table – Turkey

Attribute	Consumers in Netherlands	Consumers in Turkey
Price	30%	13%
Brand	3%	16%
Eco Name Supplement	3%	5%
EU Ecolabel	9%	17%
Perfume	6%	9%
Size	5%	6%
No-Choice	44%	33%

Table 14: Comparison of relative importance of each attribute for consumers in different countries

Appendix X: Results of Latent Class Analysis

		LL	BIC(LL)	CAIC(LL)	Npar	L ²	df	p-value	Class.Err.	R ²⁽⁰⁾	R ²
Model1	1-Class Choice	-1233.1913	2507.4618	2516.4618	9	2458.0649	87	3.9e-455	0.0000	0.3460	0.1744
Model2	2-Class Choice	-1009.7315	2211.1656	2253.1656	42	2011.1452	54	5.7e-386	0.0066	0.5110	0.3826
Model3	3-Class Choice	-919.8759	2182.0779	2257.0779	75	1831.4340	21	2.5e-376	0.0050	0.5523	0.4348
Model4	4-Class Choice	-853.5584	2200.0665	2308.0665	108	1698.7991	-12	.	0.0030	0.5837	0.4744

Table 15: Information criteria table

Prediction Table		Estimated				
Observed		1	2	3	Total	
1		543.0	201.0	0.0	744.0	
2		157.0	766.0	0.0	923.0	
3		36.0	25.0	0.0	61.0	
Total		736.0	992.0	0.0	1728.0	

Table 16: Prediction table for the 2-class model

Prediction Table		Estimated				
Observed		1	2	3	Total	
1		572.0	172.0	0.0	744.0	
2		132.0	791.0	0.0	923.0	
3		41.0	20.0	0.0	61.0	
Total		745.0	983.0	0.0	1728.0	

Table 17: Prediction table for the 3-class model

Model	CAIC	BIC	Hit Rate
2-class	2253.1656	2211.1656	76%
3-class	2257.0779	2182.0779	79%

Table 18: Comparison of the information criteria used

Attributes	Class1	z-value	Class2	z-value	Class3	z-value	Wald	p-value	Wald(=)	p-value
Att1_Price										
0	2.5131	10.7285	0.4674	3.5626	-0.1141	-0.3699	135.0491	1.1e-26	74.4421	2.6e-15
1	-0.2281	-2.4950	-0.1123	-1.5296	0.2685	1.6535				
2	-2.2850	-10.7610	-0.3551	-2.8316	-0.1545	-0.6055				
Att2_Brand										
0	0.0189	0.0925	0.1329	0.8378	0.2327	0.6167	11.9861	0.062	11.2698	0.024
1	0.0886	0.7680	-0.2096	-2.4604	0.1915	1.1942				
2	-0.1075	-0.5479	0.0767	0.5699	-0.4242	-1.4293				
Att3_EcoName										
0	0.0848	0.7827	0.1510	2.1589	0.3840	2.3878	11.1690	0.011	2.4474	0.29
1	-0.0848	-0.7827	-0.1510	-2.1589	-0.3840	-2.3878				
Att4_EUEcolabel										
0	0.2912	2.4649	0.5201	6.8224	0.6761	3.2837	62.9568	1.4e-13	3.7522	0.15
1	-0.2912	-2.4649	-0.5201	-6.8224	-0.6761	-3.2837				
Att5_Perfume										
0	0.2400	2.7190	-0.0425	-0.5934	1.1846	6.1731	45.7798	6.3e-10	37.2272	8.2e-9
1	-0.2400	-2.7190	0.0425	0.5934	-1.1846	-6.1731				
Att6_Size										
0	-0.2934	-2.9545	-0.0849	-1.0369	-0.0215	-0.1129	9.8245	0.020	3.1680	0.21
1	0.2934	2.9545	0.0849	1.0369	0.0215	0.1129				
Att7_NoChoice										
0	3.0950	5.9344	0.6992	9.4045	4.4459	0.9522	126.2694	3.4e-27	21.2216	2.5e-5
1	-3.0950	-5.9344	-0.6992	-9.4045	-4.4459	-0.9522				

Table 19: Parameters table for the 1st 3-class model

Prediction Table		Estimated					
Observed		1	2	3	Total		
1		576.0	168.0	0.0	744.0		
2		119.0	804.0	0.0	923.0		
3		39.0	22.0	0.0	61.0		
Total		734.0	994.0	0.0	1728.0		

Table 20: Prediction table for the 2nd 3-class model

Attributes	Class1	z-value	Class2	z-value	Class3	z-value	Wald	p-value	Wald(=)	p-value
Att1_Price										
0	2.3681	15.6136	0.1841	1.9689	0.0453	0.1968	265.1399	2.4e-54	179.5230	9.4e-38
1	-0.1929	-2.2618	-0.0289	-0.4056	0.0257	0.1418				
2	-2.1751	-15.4275	-0.1551	-1.7402	-0.0710	-0.2877				
Att3_EcoName										
0	0.0638	0.8569	0.1771	3.2442	0.5371	2.6733	18.5600	0.00034	5.2544	0.072
1	-0.0638	-0.8569	-0.1771	-3.2442	-0.5371	-2.6733				
Att4_EUEcolabel										
0	0.2450	3.0780	0.5283	8.4640	0.7956	2.5805	88.9923	3.6e-19	9.1265	0.010
1	-0.2450	-3.0780	-0.5283	-8.4640	-0.7956	-2.5805				
Att5_Perfume										
0	0.1935	3.0084	0.0119	0.2150	1.6094	5.6542	41.0854	6.3e-9	32.4219	9.1e-8
1	-0.1935	-3.0084	-0.0119	-0.2150	-1.6094	-5.6542				
Att6_Size										
0	-0.2905	-4.6110	0.0136	0.2551	-0.1746	-1.0604	22.4436	5.3e-5	13.6461	0.0011
1	0.2905	4.6110	-0.0136	-0.2551	0.1746	1.0604				
Att7_NoChoice										
0	1.7710	12.6293	0.8733	10.7238	1.1894	4.5526	299.6726	1.2e-64	30.3283	2.6e-7
1	-1.7710	-12.6293	-0.8733	-10.7238	-1.1894	-4.5526				

Table 21: Parameters table for the 2nd 3-class model

Prediction Table		Estimated					
Observed		1	2	3	Total		
1		584.0	160.0	0.0	744.0		
2		133.0	790.0	0.0	923.0		
3		32.0	29.0	0.0	61.0		
Total		749.0	979.0	0.0	1728.0		

Table 22: Prediction table for the 3rd 3-class model

Attributes	Class1	z-value	Class2	z-value	Class3	z-value	Wald	p-value	Wald(=)	p-value
Att1_Price										
0	2.4090	15.3090	0.0295	0.2770	0.5848	3.2629	261.2564	1.6e-53	198.8275	6.7e-42
1	-0.1847	-2.1657	0.0013	0.0176	-0.2463	-1.7327				
2	-2.2244	-14.9938	-0.0308	-0.3296	-0.3385	-2.0443				
Att3_EcoName										
0	0.1536	3.7234	0.1536	3.7234	0.1536	3.7234	13.8634	0.00020	0.0000	.
1	-0.1536	-3.7234	-0.1536	-3.7234	-0.1536	-3.7234				
Att4_EUEcolabel										
0	0.3084	3.9112	0.5566	8.9420	0.0742	0.6282	93.3127	4.3e-20	15.8799	0.00036
1	-0.3084	-3.9112	-0.5566	-8.9420	-0.0742	-0.6282				
Att5_Perfume										
0	0.2046	3.1978	0.0061	0.1068	1.0624	8.0274	74.2768	5.2e-16	54.6644	1.3e-12
1	-0.2046	-3.1978	-0.0061	-0.1068	-1.0624	-8.0274				
Att6_Size										
0	-0.3066	-4.9350	0.0439	0.7917	-0.0562	-0.5055	25.4583	1.2e-5	18.4544	9.8e-5
1	0.3066	4.9350	-0.0439	-0.7917	0.0562	0.5055				
Att7_NoChoice										
0	2.0530	9.9709	1.2679	10.2941	0.3322	3.2460	247.8088	1.9e-53	75.9997	3.1e-17
1	-2.0530	-9.9709	-1.2679	-10.2941	-0.3322	-3.2460				

Table 23: Parameters table for the 3rd 3-class model

Prediction Table		Estimated					
Observed		1	2	3	Total		
1		584.0	160.0	0.0	744.0		
2		133.0	790.0	0.0	923.0		
3		32.0	29.0	0.0	61.0		
Total		749.0	979.0	0.0	1728.0		

Table 24: Prediction table for the 4th 3-class model

Attributes	Class1	z-value	Class2	z-value	Class3	z-value	Wald	p-value	Wald(=)	p-value
Att1_Price										
0	2.3980	15.1039	0.0000	.	0.5679	3.2022	251.4668	3.1e-53	242.3766	2.3e-53
1	-0.1851	-2.1887	0.0000	.	-0.2604	-1.8447				
2	-2.2129	-14.8347	-0.0000	.	-0.3075	-1.9378				
Att3_EcoName										
0	0.1483	3.7280	0.1483	3.7280	0.1483	3.7280	13.8982	0.00019	0.0000	.
1	-0.1483	-3.7280	-0.1483	-3.7280	-0.1483	-3.7280				
Att4_EUEcolabel										
0	0.3061	3.9220	0.5627	9.2727	0.0000	.	100.6794	1.4e-22	100.6794	1.4e-22
1	-0.3061	-3.9220	-0.5627	-9.2727	-0.0000	.				
Att5_Perfume										
0	0.2023	3.1828	0.0000	.	1.0410	8.0170	74.0818	8.2e-17	10.1301	0.0015
1	-0.2023	-3.1828	-0.0000	.	-1.0410	-8.0170				
Att6_Size										
0	-0.3021	-4.8769	0.0000	.	0.0000	.	23.7838	1.1e-6	23.7838	1.1e-6
1	0.3021	4.8769	-0.0000	.	-0.0000	.				
Att7_NoChoice										
0	2.0410	10.5209	1.2731	10.3615	0.3354	3.2525	252.8908	1.5e-54	77.3389	1.6e-17
1	-2.0410	-10.5209	-1.2731	-10.3615	-0.3354	-3.2525				

Table 25: Parameters table for the 4th 3-class model

Prediction Table		Estimated					
Observed		1	2	3	Total		
1		588.0	156.0	0.0	744.0		
2		146.0	777.0	0.0	923.0		
3		41.0	20.0	0.0	61.0		
Total		775.0	953.0	0.0	1728.0		

Table 26: Prediction table for the final 3-class model

Attributes	Class1	z-value	Class2	z-value	Class3	z-value	Wald	p-value	Wald(=)	p-value
Att1_Price										
0	2.3959	15.3937	0.0000	.	0.0000	.	252.0141	1.9e-55	252.0141	1.9e-55
1	-0.1846	-2.1639	0.0000	.	0.0000	.				
2	-2.2113	-15.0589	-0.0000	.	-0.0000	.				
Att3_EcoName										
0	0.1330	3.3370	0.1330	3.3370	0.1330	3.3370	11.1353	0.00085	0.0000	.
1	-0.1330	-3.3370	-0.1330	-3.3370	-0.1330	-3.3370				
Att4_EUEcolabel										
0	0.2928	3.7480	0.4666	8.7425	0.0000	.	88.9754	4.8e-20	88.9754	4.8e-20
1	-0.2928	-3.7480	-0.4666	-8.7425	-0.0000	.				
Att5_Perfume										
0	0.2036	3.1624	0.0000	.	1.7143	6.8520	56.8754	4.5e-13	10.0006	0.0016
1	-0.2036	-3.1624	-0.0000	.	-1.7143	-6.8520				
Att6_Size										
0	-0.3024	-4.8527	0.0000	.	0.0000	.	23.5486	1.2e-6	23.5486	1.2e-6
1	0.3024	4.8527	-0.0000	.	-0.0000	.				
Att7_NoChoice										
0	2.0746	8.5103	0.8153	10.9315	3.8221	0.8185	221.2085	1.1e-47	23.0876	9.7e-6
1	-2.0746	-8.5103	-0.8153	-10.9315	-3.8221	-0.8185				

Table 27: Parameters table for the final 3-class model

Covariates	Class1	z-value	Class2	z-value	Class3	z-value	Wald	p-value
Gender								
1	1.0776	1.3475	0.3306	0.4370	-1.4082	-0.9568	2.8534	0.24
2	-1.0776	-1.3475	-0.3306	-0.4370	1.4082	0.9568		
AgeGroup								
1	-0.1171	-0.0396	-0.5507	-0.1898	0.6678	0.1181	12.1086	0.060
2	2.1947	1.4794	0.4046	0.2771	-2.5994	-0.9106		
3	-2.6467	-1.9142	-1.3578	-1.0136	4.0044	1.5724		
4	0.5690	0.2621	1.5038	0.6993	-2.0729	-0.4944		
Study								
1	-0.2992	-0.4564	-0.4824	-0.7738	0.7816	0.6788	0.5997	0.74
2	0.2992	0.4564	0.4824	0.7738	-0.7816	-0.6788		
EU								
1	-2.4437	-2.3057	1.2381	0.8890	1.2057	0.7411	7.4629	0.11
2	3.3849	1.8087	-1.4585	-0.5482	-1.9264	-0.6417		
3	-0.9411	-0.7904	0.2204	0.1417	0.7207	0.3443		
LivingNL								
1	-2.6900	-1.5990	-2.3762	-1.3962	5.0662	1.5231	4.3644	0.36
2	1.8562	1.2088	2.4862	1.6298	-4.3425	-1.4667		
3	0.8338	1.0977	-0.1100	-0.1486	-0.7237	-0.5444		
LivingSituation								
1	1.7835	1.0295	0.4734	0.2732	-2.2570	-0.6665	4.1951	0.38
2	-1.5685	-0.6377	0.0866	0.0360	1.4820	0.3144		
3	-0.2150	-0.1827	-0.5600	-0.4849	0.7750	0.3509		
EnvCons								
1	2.0352	1.0083	1.2824	0.6349	-3.3177	-0.8308	5.7090	0.22
2	-0.2089	-0.1106	-0.7101	-0.3779	0.9190	0.2478		
3	-1.8263	-0.4912	-0.5723	-0.1538	2.3986	0.3250		
Recycling								
1	4.8387	1.6911	3.4501	1.4807	-8.2888	-1.9623	7.4298	0.28
2	0.7505	0.3145	0.2974	0.1746	-1.0479	-0.3746		
3	-4.2273	-0.6110	-2.9163	-0.6099	7.1436	0.9210		
4	-1.3619	-0.5328	-0.8312	-0.4237	2.1931	0.6676		
EcoBehs								
0	-0.5459	-0.1685	0.0445	0.0148	0.5014	0.0859	11.7372	0.30
1	-1.5442	-0.5609	-2.9396	-1.1806	4.4838	0.9353		
2	-0.1090	-0.0420	-2.1919	-0.9477	2.3008	0.5162		
3	4.1024	1.3643	0.8454	0.3087	-4.9479	-0.9296		
4	3.1433	0.6293	2.9748	0.6191	-6.1181	-0.6453		
5	-5.0466	-0.5711	1.2667	0.1889	3.7800	0.3112		
EcoBuying								
1	-1.7298	-0.2841	0.7151	0.1065	1.0147	0.1435	3.0675	0.55
2	0.8286	0.2621	0.4832	0.1421	-1.3118	-0.3459		
3	0.9013	0.2850	-1.1984	-0.3397	0.2971	0.0745		

Table 28: Parameters of covariates for the final 3-class model

Importance

	Class1	Class2	Class3
Maximum			
Att1_Price	4.6073	0.0000	0.0000
Att3_EcoName	0.2661	0.2661	0.2661
Att4_EUEcolabel	0.5855	0.9332	0.0000
Att5_Perfume	0.4071	0.0000	3.4287
Att6_Size	0.6047	0.0000	0.0000
Att7_NoChoice	4.1491	1.6306	7.6442
Relative			
Att1_Price	0.4338	0.0000	0.0000
Att3_EcoName	0.0251	0.0940	0.0235
Att4_EUEcolabel	0.0551	0.3298	0.0000
Att5_Perfume	0.0383	0.0000	0.3024
Att6_Size	0.0569	0.0000	0.0000
Att7_NoChoice	0.3907	0.5762	0.6742

Table 29: Importance table for the final 3-class model

Attributes/Class (Size)		Class 1 (53%)	Class 2 (38%)	Class 3 (9%)
Price	(0) €0.95	0.9211	0.3333	0.3333
	(1) €1.42	0.0698	0.3333	0.3333
	(2) €1.89	0.0092	0.3333	0.3333
Eco Name Supplement	(0) Present	0.5661	0.5661	0.5661
	(1) Not Present	0.4339	0.4339	0.4339
EU Ecolabel	(0) Present	0.6423	0.7177	0.5000
	(1) Not Present	0.3577	0.2823	0.5000
Perfume	(0) Lemon	0.6004	0.5000	0.9686
	(1) No Perfume	0.3996	0.5000	0.0314
Size	(0) 400 mL	0.3533	0.5000	0.5000
	(1) 500 mL	0.6467	0.5000	0.5000
No Choice	(0) No-No Choice	0.9845	0.8363	0.9995
	(1) No Choice	0.0155	0.1637	0.0005

Table 30: Profiles of choices for the final model

Covariates/Class (Size)		Class 1 (53%)	Class 2 (38%)	Class 3 (9%)
Gender	(1) Male	0.2727	0.2181	0.2500
	(2) Female	0.7273	0.7819	0.7500
Age	(1) Below 20	0.0583	0.0547	0.0000
	(2) 20-24	0.7206	0.4905	0.4999
	(3) 25-29	0.1627	0.3183	0.5001
	(4) 30 or older	0.0585	0.1366	0.0000
Study Level	(1) Bachelor	0.2398	0.2370	0.1250
	(2) Master	0.7602	0.7630	0.8750
European Union	(1) EU	0.5929	0.7523	0.7501
	(2) Non-EU	0.1943	0.0000	0.1250
	(3) Candidate	0.2128	0.2477	0.1249
Time period spent living in the Netherlands	(1) 1 year	0.5101	0.5132	0.6249
	(2) 2-5 years	0.0977	0.1909	0.1250
	(3) More than 5 years	0.3923	0.2959	0.2500
Living situation	(1) Shared apartment	0.7244	0.6218	0.6251
	(2) With family	0.0412	0.0788	0.0000
	(3) Alone	0.2344	0.2993	0.3749
Environmental Consciousness	(1) Appreciates	0.7019	0.5168	0.6249
	(2) Makes effort	0.2604	0.2901	0.3751
	(3) Advises others	0.0377	0.1931	0.0000
Recycling	(1) High	0.3965	0.3720	0.0000
	(2) Moderate	0.5638	0.4649	0.3751
	(3) Low	0.0000	0.0274	0.1250
	(4) Not at all	0.0397	0.1357	0.4999
Environmentally friendly behaviours other than recycling	(1) 1	0.0995	0.1609	0.0000
	(2) 2	0.2916	0.1641	0.6251
	(3) 3	0.3500	0.3008	0.3749
	(4) 4	0.2391	0.2107	0.0000
	(5) 5	0.0199	0.1088	0.0000
	(0) 0	0.0000	0.0547	0.0000
Environmentally friendly buying	(1) Always buys	0.0194	0.0274	0.0000
	(2) Considers	0.6277	0.8401	0.6249
	(3) Does not pay attention	0.3529	0.1325	0.3751

Table 31: Profiles of covariates for the final model

Attributes/Class (Size)		Class 1 (53%)	Class 2 (38%)	Class 3 (9%)
Price	(0) €0.95	0.7599	0.1959	0.0442
	(1) €1.42	0.1933	0.6580	0.1486
	(2) €1.89	0.0306	0.7908	0.1786
Eco Name Supplement	(0) Present	0.5339	0.3802	0.0859
	(1) Not Present	0.5339	0.3802	0.0859
EU Ecolabel	(0) Present	0.5206	0.4143	0.0652
	(1) Not Present	0.5596	0.3146	0.1258
Perfume	(0) Lemon	0.5398	0.3202	0.1401
	(1) No Perfume	0.5253	0.4681	0.0066
Size	(0) 400 mL	0.4473	0.4509	0.1018
	(1) 500 mL	0.5970	0.3287	0.0742
No Choice	(0) No-No Choice	0.5655	0.3421	0.0924
	(1) No Choice	0.1175	0.8819	0.0006

Table 32: ProbMeans of choices for the final model

Covariates/Class (Size)		Class 1 (53%)	Class 2 (38%)	Class 3 (9%)
Gender	(1) Male	0.5824	0.3317	0.0859
	(2) Female	0.5177	0.3964	0.0859
Age	(1) Below 20	0.5993	0.4007	0.0000
	(2) 20-24	0.6264	0.3037	0.0699
	(3) 25-29	0.3463	0.4825	0.1712
	(4) 30 or older	0.3755	0.6245	0.0000
Study Level	(1) Bachelor	0.5594	0.3937	0.0469
	(2) Master	0.5263	0.3763	0.0974
European Union	(1) EU	0.4746	0.4289	0.0966
	(2) Non-EU	0.9062	0.0000	0.0938
	(3) Candidate	0.5199	0.4310	0.0491
Time period spent living in the Netherlands	(1) 1 year	0.5225	0.3745	0.1030
	(2) 2-5 years	0.3849	0.5358	0.0793
	(3) More than 5 years	0.6098	0.3276	0.0625
Living situation	(1) Shared apartment	0.5714	0.3493	0.0793
	(2) With family	0.4231	0.5769	0.0000
	(3) Alone	0.4615	0.4197	0.1187
Environmental Consciousness	(1) Appreciates	0.5997	0.3144	0.0859
	(2) Makes effort	0.4938	0.3918	0.1144
	(3) Advises others	0.2153	0.7847	0.0000
Recycling	(1) High	0.5994	0.4006	0.0000
	(2) Moderate	0.5902	0.3466	0.0632
	(3) Low	0.0000	0.4922	0.5078
	(4) Not at all	0.1830	0.4460	0.3710
Environmentally friendly behaviours other than recycling	(1) 1	0.4646	0.5354	0.0000
	(2) 2	0.5728	0.2296	0.1975
	(3) 3	0.5604	0.3430	0.0966
	(4) 4	0.6144	0.3856	0.0000
	(5) 5	0.2045	0.7955	0.0000
	(0) 0	0.0000	1.0000	0.0000
Environmentally friendly buying	(1) Always buys	0.4993	0.5007	0.0000
	(2) Considers	0.4732	0.4511	0.0758
	(3) Does not pay attention	0.6952	0.1859	0.1189

Table 33: ProbMeans of covariates for the final model

Appendix XI: Willingness to Pay Calculations

Willingness to pay of consumers in the Netherlands:

For all consumers in the Netherlands

Price Change: €1.89 – €0.95 = €0.94

Chance in Utility: 1.7887

Implied monetary value per utility: €0.94 / 1.7887 = €0.5255

Utility gain from EU Ecolabel: 0.5406

Willingness to pay for EU Ecolabel: 0.5406 X €0.5255 = €0.2841

For Economizers (Class 1) in the Netherlands

Price Change: €1.89 – €0.95 = €0.94

Chance in Utility: 4.6073

Implied monetary value per utility: €0.94 / 4.6073 = €0.2040

Utility gain from EU Ecolabel: 0.5855

Willingness to pay for EU Ecolabel: 0.5855 X €0.2040 = €0.1195

Note that willingness to pay for other segments cannot be calculated; since price is not important for Green Consumers (Class 2) and Hedonists (Class 3), part-worths for price are not available in the final model for these groups.

Willingness to pay of consumers in Turkey:

Price Change: ₺2.94 – ₺2.00 = ₺0.94

Chance in Utility: 0.8161

Implied monetary value per utility: €0.94 / 0.8161 = ₺1.1518

Utility gain from EU Ecolabel: 1.1036

Willingness to pay for EU Ecolabel: 1.1036 X ₺1.1518 = ₺1.2711

Figure 31: Willingness to pay calculations for the consumers in the Netherlands