

# Ecological Purchase Intentions

Do consumers actually care about the environment?

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Rajiv Hanoeman

Student number: 313087

Thesis supervisor: Drs. N. Hofstra

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## Abstract

Consumers of the world have been made more aware of environmental issues that have risen during this time. The shift towards environmental behaviour has been in part due to the popularity rise in ecological awareness. Studying environmental behaviour is a popular subject in the academic field. Many researchers investigated the motives what drives one to act this way. Although a great amount of studies have been done on behaviour, very little has been written primarily on ecological purchase intentions. This paper aims to contribute to that scarce research. A sample of 2668 respondents was utilized to determine whether consumers actually care about a sustainable environment and which factors influence their ecological purchase intentions. The factors environmental attitude, perceived responsibilities and age were applied to measure these intentions. Several variables were linked to these factors. The variables of environmental attitude and age had the largest impact on ecological purchase intentions, with the need to talk as the strongest predictor. The results reflected that according to the consumers themselves, they value a sustainable environment. However, the environmental concerns are not consistently translated to their actual intentions.

## Preface & acknowledgements

Fascinated and inspired by environmental documentaries of *Tegenlicht* (Dutch) and the non-profit organisation *the Story of Stuff*, my interests and willingness to act in the environmental field rapidly grew. Hence the decision to write about ecological purchase intentions was not a difficult choice to make. Despite several setbacks and challenging times I encountered during the thesis period, I am glad to eventually contribute to this field.

My thesis supervisor Nel Hofstra is also a big inspiration for environmental consciousness. I sincerely felt privileged to have her as my supervisor, I am grateful for the guidance that she provided during this period. My thanks also go to Luit Kloosterman for providing the dataset for this research.

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*“Be the change that you wish to see in the world.”*

*- Mahatma Gandhi -*

Rajiv D. Hanoeman  
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## Chapter 1 Introduction

Over the past few decades, consumers of the world have been made more aware of environmental issues that have risen during this time. They have been made aware of these issues in increasing levels in areas that are unavoidable to the up-to-date citizen. Areas such as the media (McIntosh, 1991), increased number of environmental groups (Tapon and Leighton, 1991), and stricter laws pertaining to the environment both nationally and internationally (Charter, 1992) can be considered. In one way or another all can be seen as significant.

This is important, because consumers themselves are heavily involved as factors in environmental pollution, as there are many consumption patterns that link back to ecological damage (Balderjahn, 1988). It has been found that specific demographics, personality, human values and attitude variables can be used for grouping ecologically-concerned consumers. Balderjahn's research on this focused on understanding what determined a consumer's ecological consciousness, using predictors based on the above-mentioned variables as well as theoretical frameworks based on prior research on ecological-concerned consumers.

The United Nations also determined that the biggest cause of deterioration of the global environment is the unsustainable pattern of consumption and production, mainly in industrialized countries (UNEP, 2001). The plan of action that the UN created and intended to use globally, called Agenda 21, contained the above statement. Despite the advancement in human development, with the increase of consumption it results in environmental degradation (Thompson et al., 2010). One of the solutions to this was stated in Agenda 21, called sustainable consumption, and is defined as the consumption of goods and services that satisfy the needs of the present generations without compromising the needs of the future ones (Heiskanen and Pantzar, 1997).

In the past few years, these areas added to the concerns of the public, the top issues being mainly about the quality of water, hazardous / toxic waste, pollution from public and private transportation, deforestation, and more, just to name a few (Ottman, 2011, The New Rules of Green Marketing).

## 1.1 Managerial relevance

Ottman (2011) continues into discussing various points where companies can make use of these turn of events for consumers wanting to go green, noting them as business opportunities. Due to the growing demand for green products and services by consumers, businesses themselves can promote themselves as green companies offering greener products and services than their competitors. This in turn enhances their sales, their image, and gives the employees and the company on a whole a boosted morale to uphold.

With the concept of a premium cost increase for a green good over a regular version of a good, consumers that are willing to green are prepared to pay extra. There are sceptics that require proof through research before making the extra investments for the extra costs of introducing new green products. For those willing to buy however, accept the premium price because expectations have grown over the years, and environmental friendliness can be seen as an additional measure of quality for products.

Along with this new measure of quality, green products also can offer consumer benefits which can also be marketed as additional advantages on top of being greener than the competition. Ottman (2011) listed benefits such as compact fluorescent light bulbs saving more money while used and last longer at the same time, hybrid cars running near silently and gives the driver a green image and organic produce being safer and having better taste.

Another benefit to striving to go green is that it is a new source of innovation according to Ottman. Going green and creating opportunities to go green is doing something new in itself, and in order to stand out from the competition, you will need to create green technologies, business models and designs. These will bring attention to your company through new customers as well as the public eye and create new competitive advantages that also show that your company is moving with the current times and trends, as well as staying ahead of the curve. Some examples given by Ottman include Toyota converting vehicle manufactories that were truck- and SUV-focused to manufacture hybrid-engine vehicles, and in-home energy meters that allow you to monitor your energy use within your home.

Ottman did however focus on the other side of greener products, which can in fact lead to increased costs for manufacturing. For example, greener packaging in a different size causing issues with shipping crate sizes, or even extra costly activities, such as transporting waste in

bulk to be recycled. This is the reason behind the use of the tool called life-cycle assessment (LCA), and it assesses all of the steps and issues involved with creating a greener product. The assessment focuses on four main topics: raw materials acquisition and processing, manufacturing and distribution, product use and packaging and after-use/disposal. With conducting an LCA, decisions have to be made in the process over things. For example, deciding whether to look at the product alone or include its packaging. Other issues to keep account for are those that the consumer has to add themselves to the product in order to function throughout its lifetime or the waste from the transportation of the product. This assessment is very crucial to keep in mind when making the decision to make greener products because realistically-speaking, it is not an easy or cheap conversion.

Chen and Chang (2012) also agree with the idea that companies should apply green marketing strategies to increase the value of their products to customers and environmental watchers, which in turn also increased their competitive advantage in this regard. They state that as green products are more popular in markets today, green marketing is more common and the companies going along with this are seen to be more in tune with current trends. These marketing activities include creation and promotion of products that meet customer's needs in terms of environmental care. Not only does a company stand out more on their own compared to other non-green companies when they use green marketing, but they can create new rules in their market through their green marketing. Peattie (1992) repeats that consumers are willing to buy greener products that have been proven through research to be safer for the environment, and therefore stated that companies should provide this reliable proof to reduce customer's perceived risk. Even though it can be hard to provide this information, it is a must to do so to win their trust.

Chen (2008) listed the five following reasons for companies to adopt green marketing:

- Utilizing green opportunities.
- Increasing corporate images.
- Raising product value.
- Enhancing competitive advantages.
- Complying with environmental trends.

It is also noted by Chen (2012) that executing green marketing can raise consumer purchase intentions. There are potential consumers that have a view about greener goods being of lower



quality or do not deliver on promises for the environmental safety. Also, consumers may not agree on attributes that depend on taste or opinion, such as value, quality, price and performance. The best way to get consumers to see those attributes as superior in the greener product is to compare them to non-green products, and to enhance consumer purchase intentions, greenness and high-quality attributes need to be combined. Reducing consumer perceived risk about how they feel negatively about greener products can ease their doubts and raise their trust.

Balderjahn (1988) determined that in order to develop ecologically appropriate market segmentation strategies, a proper identification and description of an ecologically-concerned consumer is needed for both private and public sectors. These segmentation strategies can help companies know how to better position their greener good in order to appeal more to consumers. Regardless, it is best for the manufacturers to clearly show that the product does not harm the environment and that purchase and usage of the product contributes to environmental damage reduction.

Finally, Grimmer and Bingham (2013) state that some consumers seek to buy goods based on a company's role in society and its level of environmental responsibility. Therefore it is a major point to go green for a company, and to make sure that it is known to the public and market. In 2008, green consumers had an annual buying power of \$500 billion worldwide (Ferraro, 2009). Even in the years of the financial crisis of 2008, spending for greener goods and services increased by 18% over the two years of the crisis (The Co-operative Bank, 2010). Focusing on the UK alone during the crisis showed that the green market grew from £36.5 billion in 2007 to £43.2 billion in 2009. These figures show that due to the growth in green expenditure reflect that consumers have a positive attitude towards greener products, and included greener options into their purchasing decisions according to Maignan and Ferrell (2004) and Vermillion and Peart (2010).

## 1.2 Relevant Research

Research has been conducted in the past about ecological behaviour, and one important piece of research was conducted by Fraj and Martinez (2007) where it focused on environmental attitudes as meaningful predictors of ecological behaviour. They found that consumers increasingly choose ecological products when they shop because of them being healthier

options and the help they give in sustaining the environment for the future. Consumers are prepared to abandon harmful goods and make the switch to greener goods, and companies are aware of how important it is to reflect that in the developing and marketing of their green goods. They developed a conceptual model and framework and found that environmental attitudes have a significant effect on ecological behaviour. Their research helped them to understand how consumers feel and how their attitudes best define their behaviour in relation to environmental problems.

Barr (2003) conducted research on whether environmental action is influenced by a number of factors, such as environmental values, situational characteristics and psychological variables. This research began because of the increase in interest in how people could be encouraged to be more ecological at home. The factors mentioned before were found to be crucial in promoting environmentally responsible behaviours like saving energy and waste recycling.

With the above-mentioned research papers, it shows the most similar research done to this paper, but more papers came across what is considered a consumer paradox when it comes to what they think about the environment, and what they actually do to help it.

Diekmann and Preisendörferer (1998) found that it was shown that there are considerable inconsistencies between society's environmental attitudes and their behaviour. They look at and dissect the concept of environmental behaviour from two separate views to get a better understanding of these inconsistencies. They found three strategies that these two views have in common, which were shifting attention, low-cost, and subjective-rationality. Even despite a high degree of consciousness for the environment, it was found that everyday experience pointed to obvious inconsistencies between verbal claims and actual behaviour, with behaviour following traditional lines of action.

Wong et al. (1996) and Aspinall (1993) found a paradox as well, that despite the increase in society's sympathy towards the environment, environmentally-friendly products had not achieved the expected level of market success. Kalafatis et al. (1999) noted that in many consumer product categories, environmentally-friendly producers had achieved disappointingly-low levels of market share.

This finding was supported by the findings of UK surveys that showed that although consumers had increasing concerns with the environment's state of being, even at a decreasing rate, their willingness to buy environmentally-friendly products had dropped.

Grimmer and Bingham (2013) also make note that despite increased interest, evidence for the impact of the environmental initiatives on consumer behaviour is both contradictory and equivocal. The actual size of the green market despite the growing talk of trends has been questioned as well (Papaoikonomou et al., 2011). Cowe and Williams (2000) refer to the 30:3 syndrome, which meant that while 30% of consumers may say that they are concerned about firms' social responsibility, green goods account for 3% of the market share at the most. Polonsky (2011) talked about how green marketing is not reaching its potential for influencing consumer behaviour as well as improving the environment. Carrington et al. (2010) notes that even though the number of consumers that proclaim to be motivated by social and environmental issues grow, there is evidence that shows that the translation to actual consumption is less obvious. Devinney et al. (2010) shortly puts it that the green consumer is mythical to them.

### 1.3 Research questions

The contradictions stated in the preceding paragraph might raise questions if consumers actually appreciate a sustainable environment. It has been shown above that although the consumers might say they care about the environment, the results of the previously mentioned studies show otherwise. The consumers' paradox will also be studied in this paper.

In the previous paragraph it is also stated that several studies have been conducted on environmental behaviour. This is a very broad topic, including recycling, waste management, consuming etc. The current paper therefore will only focus on purchase intentions instead of behaviour.

The goal of this paper is to examine how certain factors affect the ecological purchase intentions of consumers. Not many studies exist about ecological purchase intentions, despite being mentioned in numerous papers. In this way, the research will contribute to scarce research in a growing market.

Based on the initial findings, the actual value of a sustainable environment to consumers seems questionable. By measuring ecological purchase intentions, this can be tested. Therefore, the research question of this thesis will be:

**“Do consumers value a sustainable environment and which factors affect their ecological purchase intentions?”**

The following sub research questions will support to answer the main question:

- ❖ Does a positive environmental attitude affect ecological purchase intentions?
- ❖ Do perceived responsibilities affect ecological purchase intentions?
- ❖ Does age influences ecological purchase intentions?

## Chapter 2      Theoretical Background

### 2.1 Green versus Ecological

Nowadays the term green is often used to indicate environmental concerns. Green can be described as a descriptor, for a good or service for example, which inflicts reduced or minimum or no harm to the environment. It is used by companies in green marketing for their goods and services to emphasize that they have an environmentally-safer alternative to others in the market. The level of green can vary from a slight change compared to a regular good, to a completely environmentally-friendly process of creation until shipping that does no harm at all to the environment.

Looking at the definition of ecological and it is a deeper, more meaningful representation of what is needed for the environment. The Merriam-Webster dictionary<sup>1</sup> defines ecological as “the study of the relationship between organisms and their environment”, in this case, organisms pertain to humans specifically. Another description<sup>2</sup> states that it is “the branch of sociology that is concerned with studying the relationships between human groups and their physical and social environments”. A third description<sup>2</sup> states that it is “the study of the detrimental effects of modern civilization on the environment, with a view towards prevention or reversal through conservation”. This third description is the one that this research paper will side with, and is the reason why ecological is used in the research question instead of green. Since there is no vague measurement involved, the goal is clear to preserve or reverse the damage done to the environment.

### 2.2 Theory of planned behaviour

This paper uses the theory of planned behaviour based on the original thought process, the theory of reasoned action, or TRA, written by Fishbein & Ajzen (1975). The idea behind this theory is that consumer’s attitudes and subjective norm towards environmental issues can steer them towards greener purchases for the sake of the environment. The model for TRA is supported and has been cited by many research papers linked to consumer behaviour literature where the goal was to predict intentions. One paper that used TRA in such a manner was by Lee and Green (1991). TRA was also used to determine the behaviour of consumers in the

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<sup>1</sup> <http://www.merriam-webster.com/dictionary/ecology>

<sup>2</sup> <http://www.thefreedictionary.com/ecological>

research done by Mostafa (2007) and Mei et al. (2012). The main reasons TRA was acceptable to use in those papers was a combination of the following assumptions: that purchase intentions were based on the consumer's preference, that consumers are rational and use the information available to them as a basis for their choice, and that consumers consider the consequences of their choice of product purchased (Dodd, 2010; Fishbein and Ajzen, 1975).

With that brief insight into the predecessor of the theory of planned behaviour, Ajzen (1985) took TRA and expanded it past the limiting factor of looking at consumer preference (volitional control). This was done by including beliefs in relation to the possession of necessary resources and opportunities for performing a certain behaviour (Madden, 1992) and the thought that the more resources and opportunities a consumer thinks that they have, the greater the perceived behavioural control over their behaviour.

This perceived behaviour control is a variable that is added to the existing model of TRA which has a direct effect on behaviour and an indirect effect on behaviour via intentions. This indirect behaviour implies that when a consumer feels that they have little control over doing what they want to do because of a lack of resources, then they have low motivation to do the action even if they believe that doing the action is a good thing (Madden, 1992). Consumers' behaviour is strongly influenced by the confidence they have in their ability to perform the behaviour (Bandura et al., 1980). This, according to them, is why the indirect link from perceived behavioural control to intentions is a reflection of the motivational influence of control on behaviour via intentions. The other link to perceived behaviour control from behaviour is a direct link that reflects the actual control that a consumer has over their actions.

Ajzen and Madden (1986) completed their first test of this theory with students' class attendance, where the results showed that perceived behaviour control was a significant predictor of intentions after controlling for attitudes and subjective norms. But on the contrary, perceived behavioural control did not contribute to the prediction of target behaviour after controlling for intentions. This shows with the significant level of response that intentions are a far better connection for predictions than with predicting behaviour.

Oreg and Katz-Gerro (2006) built on Ajzen's theory by testing a model that predicted pro-environmental behaviour with the addition of Inglehart's and Schwartz's individual works on value dimensions. Inglehart's postmaterialistic values showed to be the more significant of the two,

affecting environmental concern, leading to environmental concern, perceived threat and perceived behavioural control affecting willingness to sacrifice, affecting a number of pro-environmental behaviours.

Kalafatis et al. (1999) also used Ajzen's theory as a conceptual framework for their paper on cross-market examination with green marketing. Their result showed that there was significant support for the robustness in explaining intention, while the theory varied in accordance to behaviour depending on how established and clearly-formatted the market was. This is yet more proof that intentions should be used in measurements over behaviour.

In short, the theory of planned behaviour would predict two possible effects of perceived behavioural control on behaviour, where perceived behavioural control firstly reflects motivational factors which have an indirect effect on behaviour through intentions, and secondly where it reflects actual control with a direct link to behaviour independent of intentions.

### 2.3 Environmental attitude

Eilam and Trop (2012) defined environmental attitude as a requirement for achieving environmental behaviour. An analysis was made between pro-environmental attitudes and behaviour, where intention to act was a determinant of pro-environmental behaviour. This intention to act was a factor made up of variables, including attitudes. A 1993 survey used by Eilam and Trop (2012) found high levels of environmental attitudes and low levels of environmental behaviour. This finding did not give the feeling of a positive conclusion as in the end, it is action that makes a difference. Kinnear et al. (1973) stated that a buyer's attitude has to express their concern for ecology. It was also written that attitudes have served as predictors of energy conservation behaviour, ecologically-conscious purchasing and product use and recycling.

Balderjahn (1988) stated that other researchers had found that specific factors, including attitudinal variables were useful for characterizing ecologically-concerned consumers. Dersken and Gartrell (1993) had concluded in their research that environmental attitudes affect recycling behaviour only where a structured recycling program existed. Guagnano et al. (1995) also looked into recycling behaviour, with attitude theories decreasing in predictive value as more external factors came into play.

The research conducted by Fraj and Martinez (2007) focused on environmental attitudes as meaningful predictors of ecological behaviour. They concluded that environmental attitudes have a significant effect on ecological behaviour, and learned more about what attitudes define their behaviour in relation to environmental problems.

These theory discussions from paragraph 2.2 and 2.3 lead into the first hypothesis for this paper to solve, which is:

*H1: A positive environmental attitude enhances ecological purchase intentions*

## 2.4 Perceived responsibility

The first trace of the concept of perceived responsibility comes from the paper of Kinnear et al. (1973) where perceived consumer effectiveness was identified and was created as a measure to see how far a person believes an individual consumer can be effective in pollution reduction. Henion and Wilson (1976) take this measure and expand it to determine that the ecologically-concerned consumer is an internally-controlled individual, and this concept is a strong predictor for their perception of economic problems.

Mei et al. (2012) discuss perceived responsibility by first looking at government initiative. It refers to the initiative taken by the national government or the support given by the national government (Diekmeyer, 2008). Diekmeyer stated that the role of the government in environmental protection is undeniable, and as the role model to its country, they should lead by example in organizing sustainability programs. By leading, the government should initiate and promote sustainable events to the community to bring about sustainability awareness to its society (Mei et al., 2012). Chen and Chai (2010) mentioned an example of a government leading by example with the Malaysian government publicizing various strategies to implement sustainable consumption and development. Haron et al. (2005) also used Malaysia as an example by using social advertisement to educate their people about environmental awareness and concern.

Mei et al. (2012) mentioned peer pressure in their paper, and this research uses their stand on it as an addition to perceived responsibility. Cohan's (2009) take on perceived responsibility referred to the psychological pressure that each person experienced when comparing their



actions with others, or in other words, peer pressure. He states that it was clear that supplying people with information was not enough to create a change in behaviour. Peer pressure by not following the same decision as others in their surrounding could cause a large behavioural shift, thus changing their surrounding could change that person's mindset (Daido, 2004). Social influence was also mentioned in regards to perceived responsibility as whether an action should or should not be performed by someone in another's point of view (Kalafatis et al., 1999). Social influence was found by Lee (2008) to be the top predictor of young consumer purchasing behaviour in Hong Kong. Also mentioned and argued was that social influence was the top factor in defining purchase intentions for environmental goods in the UK (Kalafatis et al., 1999).

Stern et al. (1995) stated the importance of looking into the social structure that individuals are situated in, based on their concept of social structures shaping the individuals that exist in them. The theory behind this is that these social structures shape individuals' experiences, leading to shaping their personal values, beliefs and behaviours. Oreg and Katz-Gerro (2006) determined that individuals' environmental attitudes and behaviour are not only determined by socioeconomic logic but also by the peer pressure of cultural values.

This research saw a correlation with perceived responsibility and social responsibility with the research conducted by Thompson et al. (2010) where it was found that social responsibility is the concept where businesses are obliged to handle society's welfare further than the requirements of society. These obligations include minimizing harmful impacts to the environment, and should ideally be managed as a whole, rather than as individual undertakings. A company cannot think about the creation of an ecological product without considering how every factor involved in creating the product impacts the environment, in other words, the entire product life cycle (Wasik, 1996).

Specifically, firms have been increasingly noticeable to the public in terms of environmental issues in part due to environmental disasters caused by industrial manufacturers around the world (Chen, 2011). This unwanted exposure to the public and mainstream reputation has resulted in more companies making themselves more ecological in terms of image and infrastructure, also due to the rising concerns of global warming (Molina-Azorí et al., 2009; Haden et al., 2009). This shows that firms should apply green marketing strategies to enhance the perceived value of their company and products in light of the rise in environmental awareness, and in turn, increase their competitive advantage with competitors (Chen and

Chang, 2012). To successfully sell their eco-friendly products to the public, companies should provide reliable information to customers willing to buy green products with trustworthy information that reduces their perceived risk (Peattie, 1992).

Eilam and Trop (2012) looked at how the role of acquisition of environmental behaviour was explained by the assumption that changes on a personal level can lead to changes on a societal level for sustainability. In short, if everyone acts environmentally-minded, society will act environmentally safe. Fraj and Martinez (2007) briefly mention that people are aware that environmental protection is not only up to firms and institutions but also their own responsibility as consumers. Diekmann and Preisendörfer (1998) discussed the differences with aspirations and reality, where many conferences deal with environmental issues but fail to meet expectations. Next, it was discussed about national governments having restrictive funding for environmental agencies, and political parties using promises for environmental policies with no real effort to carry them out. Finally, at the individual citizen-level, they note that aspirations and reality do not appear to co-exist together.

Despite the research made in perceived responsibilities shown in this subchapter, consumer perceived responsibility has not been measured in most papers. This study can contribute a new factor to intentions by testing with the following hypotheses:

*H2a: Perceived social responsibility influences ecological purchase intentions*

*H2b: Perceived corporate responsibility influences ecological purchase intentions*

*H2c: Perceived governmental responsibility influences ecological purchase intentions*

## 2.5 Ecological consumer

Brooker (1976) discussed an early concept of the ecological consumer, the socially conscious consumer. The paper concluded that individuals who are higher in self-actualization are more likely to be ecological consumers over those with lower levels. This meant that as the person becomes psychologically healthier, the likelier this person will take action for the sake of society/the environment. The use of ecological products shows that there is concern for the preservation of a healthy environment, although the results aren't immediately seen. The ecological consumer must be one that is willing to bear the possible extra costs of these ecological products, and assume the value of the future benefits of the environment. This also

includes passing on alternative, cheaper goods that are more harmful to the environment. This target group of consumers is also perfect for other products to help other various types of social problems.

Thompson et al. (2010) continues with their interpretation using green consumerism, where if corporations are to continue using environmental marketing strategies, consumers must willing to buy the green goods they are marketing. Therefore, gaining an understanding of an ecological consumer is crucial. Kilbourne et al. (2002) state that there isn't a clear agreement of ecological consumers and what they want, will do or how to measure them. Peattie (2001) reached a universally-accepted explanation for ecological consumer behaviour - it will occur when concern for the environment translates into ecologically conscious consumer behaviour. Most of the ecological consumer behaviour researchers try to categorize ecological consumers by linking various variables with consumers that show ecologically-conscious consumer behaviour (Thompson et al., 2010).

Ecological consumers are pictured to make ecological purchasing decisions according to two purchase characteristics. These are the will to change to buy a green good, and the confidence in this green good (Peattie, 2001). In these goods, there is an imbalance of information between the consumer and the company making the good. According to Akerlof (1970), this often results in consumer confusion or ignorance in regards to the range of quality of goods in the market. One of the things that causes this is how green goods have qualities that cannot be evaluated or experienced before purchasing them (Karstens and Belz, 2006). An example of green usage that has wide appeal is the use of recycled, eco-friendly paper, because it does not differ much in price from other paper, and the confidence is high in this type of good.

Another definition of an ecological consumer is from the research by Renfro (2010), where it was defined as a consumer who supports businesses that are run in environmentally-friendly ways. The ecological consumer is also concerned about how green the purchased good is as well.

Mei et al. (2012) listed attributes that an ecological consumer could have:

- Most-likely well-educated young adult women with more money to spend
- They will expect green products to function as well as non-green products, and aren't willing to pay too much extra or give up too much quality

- Will not solely buy a green product just for the environmental benefits alone, must still meet their basic needs in a product
- Will be likelier to respond to product attributes that benefit them personally
- Are not willing to take one much extra inconvenience with using the green product, or make extra effort to purchase the product over a non-green product
- Are not expecting a perfectly-green product for the environment, but are looking for active movements in environmental benefits, backed by facts

Each of these attributes was listed with a possible implication for the green marketing that corresponded with each attribute, with a solution for each of them as well. Lu et al. (2010) talked about consumer trust positively affect consumer purchase intentions, and when focusing on ecological consumers, it would imply that ecological trust of goods would positively affect their ecological purchase intentions. Thompson et al. (2010) also showed a similar stance by saying that if a consumer does not have confidence in the green good having a meaningful influence, they are less likely to have a preference for green goods in general. This is once again crucial for marketers to make clear so that ecological consumers can have confidence in the benefits of the ecological good.

### 2.5.1 Demographic factor: Age

Thompson et al. (2010) talked about prior research, namely Straughan and Roberts (1999) and Rowlands et al. (2003) stating that demographic variables alone are not effective in marketing use to segment green consumers. These authors stated that a combination of psychographic and demographic variables is a better solution for the segmentation of green consumers. Balderjahn (1988) shared the same thought process when it was stated that the predictive power of demographic and socioeconomic variable is normally low.

Diekmann and Preisendörfer (1998) discussed the negative effect of age on environmental consciousness and how it was in line with earlier research such as VanLiere and Dunlap (1980) and Jones and Dunlap (1992). Diekmann and Preisendörfer (1998) stated that although younger people are much better informed about ecological problems and show higher levels of environmental consciousness, there is no significant effect with age on behaviour. This is in line with many other research papers which concluded that for the younger generation, what is being said and actual behaviour do not match often. Older people have shown to be less

environmentally concerned when it came to their shopping behaviour including recycling. On the other hand, their means of transportation involved less use of automobiles, meaning less pollution (Diekmann and Preisendörfer, 1998).

However, Gilg et al. (2004) found that age had a positive impact on green consumption, with older age groups more likely to save their money and consume less than the younger age groups. The more recent study of Gilg et al. (2004) might suggest that the significance of age has increased. With the statements above to justify, this paper decided to use the demographic factor age as a variable, and formed the third hypothesis:

*H3: Age influences ecological purchase intentions*

## 2.6 Hypotheses

To summarize, the following hypotheses have been formulated based on the discussed theory:

- H1: A positive environmental attitude enhances ecological purchase intentions
- H2a: Perceived social responsibility influences ecological purchase intentions
- H2b: Perceived corporate responsibility influences ecological purchase intentions
- H2c: Perceived governmental responsibility influences ecological purchase intentions
- H3: Age influences ecological purchase intentions

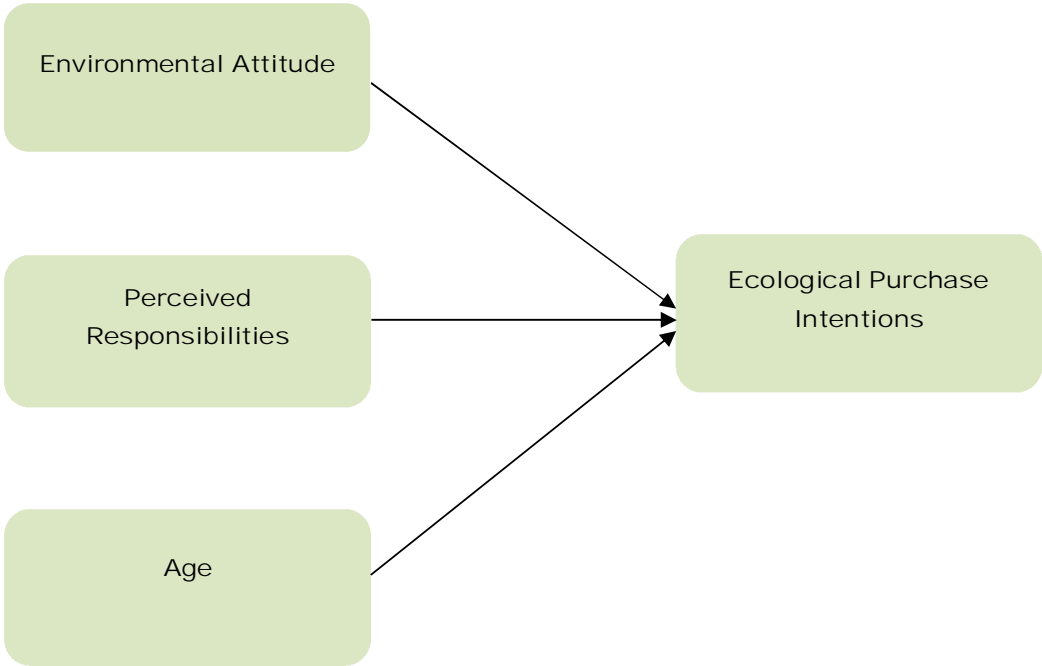
### Chapter 3 Methodology and Dataset

This chapter begins by introducing the conceptual framework. Subsequently, the questionnaire and its measures will be discussed, the hypotheses will be linked to the framework, a description of the data will be given and data analyses will be explained.

#### 3.1 Conceptual Framework

According to the theoretical background, there are several elements that could influence ecological purchase intentions. This research proposes a conceptual framework that suggests that ecological purchase intentions are directly influenced by three factors.

Figure 1 Conceptual Framework



The described literature has argued that environmental attitude can be an important factor to foresee ecological purchase intentions. Fraj and Martinez (2007) for example focused on environmental attitudes as meaningful predictors. Eilam and Trop (2012) defined environmental attitude as a requirement for achieving environmental behaviour.

Perceived responsibilities can be considered as the consumer's opinion on who is accountable for the production and usage of eco-friendly products. These responsibilities will be measured and tested for ecological purchase intentions. In this paper a distinction is made into corporate, governmental and social responsibilities. Even though the concept of consumer's perceived responsibility was established in 1973 (Kinnear et al.), very little has been written about this concept.

According to the literature, age is also a factor that can affect the ecological purchase intentions. Diekmann and Preisendörfer (1998) stated that age did not have a significant effect on ecological behaviour. Nevertheless, in a more recent study of Gilg et al. (2004), age did had a significant impact on behaviour. To validate if the age factor is significant, the influence of age will be tested on purchase intentions in this paper.

The goal of this thesis is to discover more about the three factors, and if they significantly affect ecological purchase intentions. The following subchapters will discuss how these factors will be tested.

### 3.2 Measures

A questionnaire<sup>3</sup> has been used to evaluate the consumer's view about certain environmental topics. The questionnaire is in English and it consists of 18 questions. However, 5 questions have been disregarded due to the lack of relevance for this study. The main goal of the questionnaire is to examine how the respondents consider the environment. This paper will test if the opinions of the respondents are congruent with their purchasing intentions.

The first section of the questionnaire emphasizes on the general concern about the environment. A distinction has been made between flora and fauna. Respondents are surveyed on how they feel about these two topics. Besides questions about flora and fauna, there is also a consumers' awareness question. This question discusses the significance and actuality of eco-friendly products.

In the second section eco-friendly definitions and responsibilities are argued. Via multiple questions, the respondents are inquired about their opinion concerning the meaning of eco-

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<sup>3</sup> See appendix 1

friendly and who should be responsible for these types of solutions. The perceived roles of the corporate world, the government and the consumers are measured. Furthermore, respondents are inquired regarding the importance on how companies should act to fulfil the current trend of eco-friendly products and services.

The third and final section contains questions that address the respondent's environmental intentions. Striving to be more eco-friendly and the need to talk about environmental issues are measured. When compared with the questions of the first two sections, these questions give insight on the thoughts that consumers have will translate into their intentions. The impact of eco-friendly labels and age are also measured in the final section.

A five-point Likert scale has been used in the first two sections to measure the opinion based items. The scale ranges in order from one extreme to the other, namely strongly disagree to strongly agree. Options in the middle are disagree, neutral and agree. In the third section of the questionnaire, besides the five-point scale, a three-point scale for yes and no answers is used to test the environmental intentions. Lastly, age is categorized in 5 groups.

### 3.3 Sample and data description

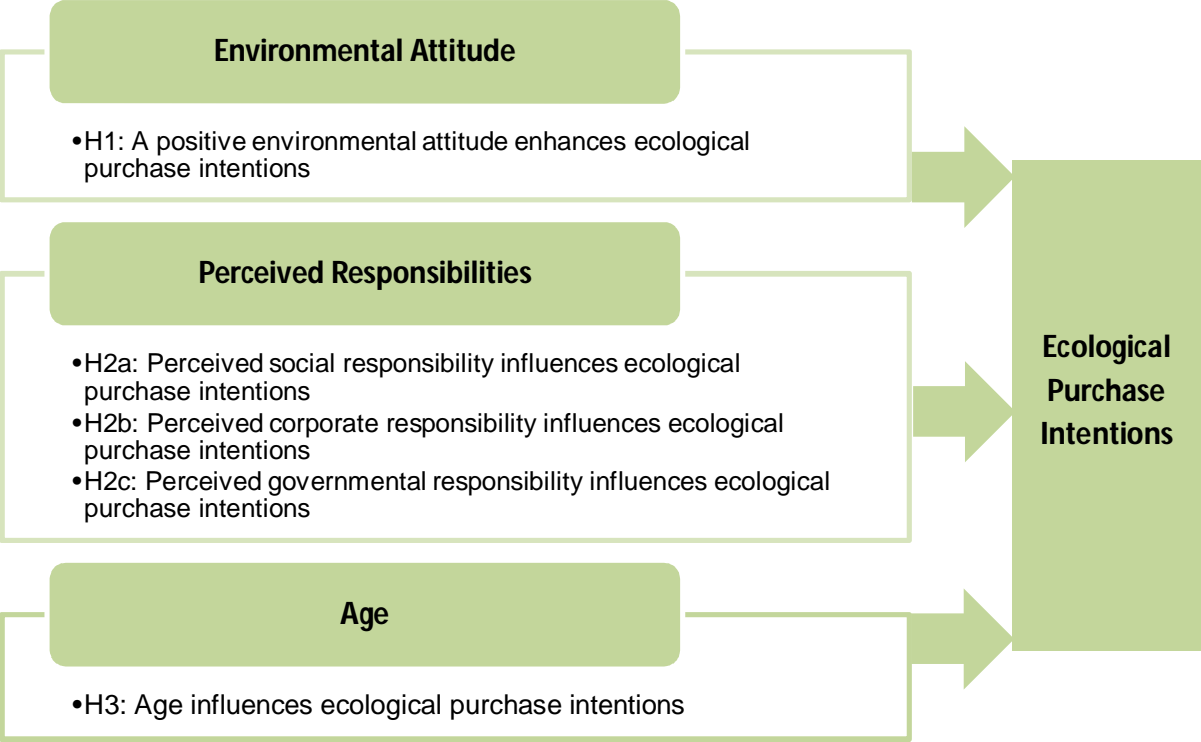
The data for this research was obtained via third-year students who participated in the Consumer Behavior course in 2011 & 2012 at the Erasmus University Rotterdam. The objective of their assignment was to measure differences on environmental topics between generations. The students were divided into pairs. Each team collected approximately 25 respondents. In total, 2668 valid results were collected. To enhance the validity of the samples the students took, this research combines all the results.

The students distributed the questionnaire via various channels. E-mail and online networks like Facebook were used. A face-to-face method was also applied by the students. For example, students who did not follow the course were inquired at the campus. Besides Dutch students, international students participated in the course as well. However, no nationalities and places of residency were noted, therefore it cannot be assumed that all the respondents have a Dutch nationality or live in Holland.



The questions that are important for this research are described with descriptive analyses. The statistical program IBM SPSS, version 19, will be used to examine the collected data. Graphic analyses of the results are made in bar charts, and are viewed in the next subchapters to assist each analysis. Each bar chart will display the proportion distribution to each response of the specific question. In the following figure, the relationship between the hypotheses and each factor that influences ecological purchase intentions are linked.

Figure 2 Conceptual Framework linked with hypotheses

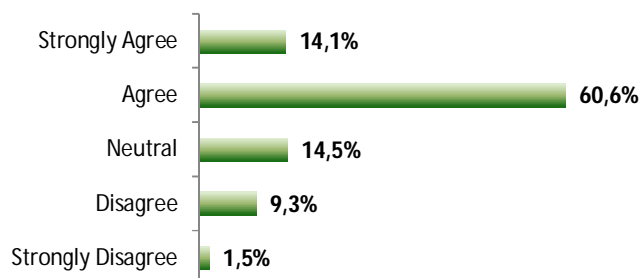


With the above figure giving a clear visualization of the established relationship between the hypotheses and factors, the corresponding variables will be discussed in the following paragraph.

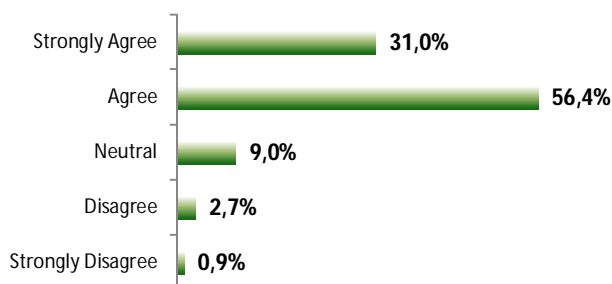
**3.3.1 Environmental attitude variables**

In total there are 4 variables regarding environmental attitude. The first question about environmental attitude states that an increasing amount of consumers recognizes the relevance of taking care about “mother earth” considering the design, production and disposing of the purchased products. 74.7% agrees with this statement, this is in line with the increased environmental awareness that has been discussed in the introduction.

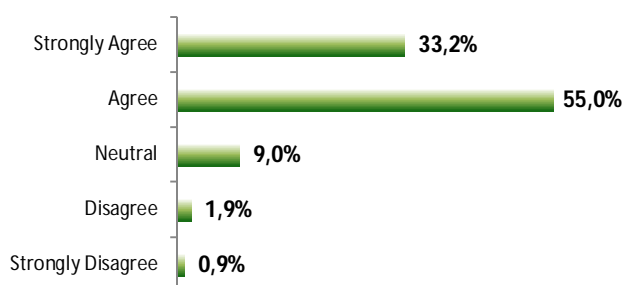
**Chart 1 Recognize the relevance**



**Chart 2 Caring about flora**

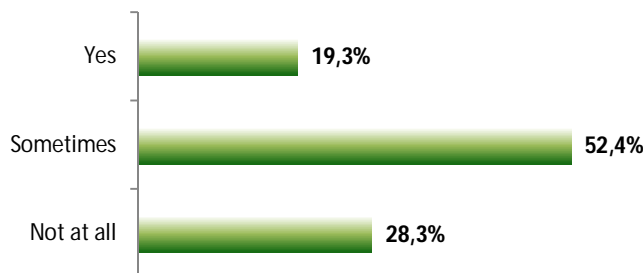


**Chart 3 Caring about fauna**



The following two questions ask if the respondents agree with statement “Caring about the flora (vegetation) and fauna (animals) is important”. For these questions a large number of at least 87% agrees that both topics are important. There is very little difference between these two results. It seems that the respondents value both flora and fauna almost equally important. Similar to the previous question this outcome can be seen as expected considering the rise in environmental consciousness.

**Chart 4 The need to talk**

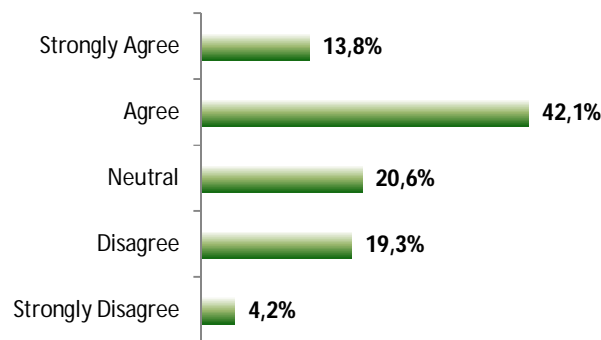


The final environmental attitude variable measured if the respondents felt the need to talk about environmental issues with their family and friends. 28.3% of the respondents did not felt the need at all. Nevertheless, the majority of the respondents did actually share their environmental concerns.

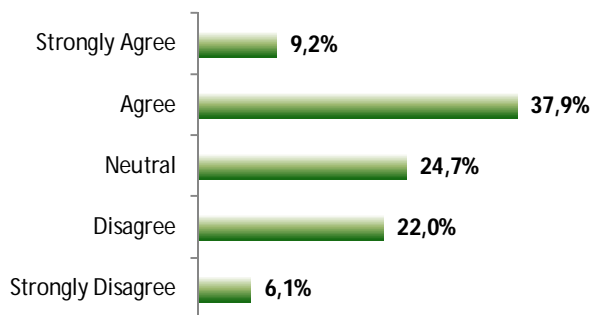
### 3.3.2 Perceived responsibility variables

To measure perceived responsibilities, 6 variables have been selected. The graphs on this page regard the section where the respondents were inquired about what they felt eco-friendliness should have a strong focus on. Technology based is a variable for perceived corporate responsibility.

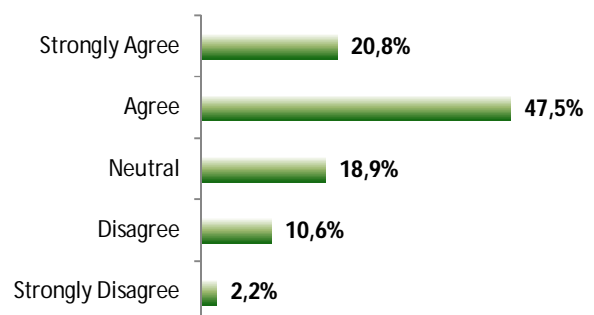
**Chart 5 Technology based solutions**



**Chart 6 Government based solutions**



**Chart 7 Social/cultural based solutions**



Striking is that more respondents feel that society is responsible for eco-friendly solutions instead of the technology bases and government based solutions. According to 68.3% of the respondents, society should focus on eco-friendly solutions, whereas 48.1% agrees with the government and 55.9% agrees that it should be technology based. The disagreement levels reflect the same distribution. Chart 6 is the only variable that is linked with perceived governmental responsibility.

**Chart 8 Business\_legal\_requirements**

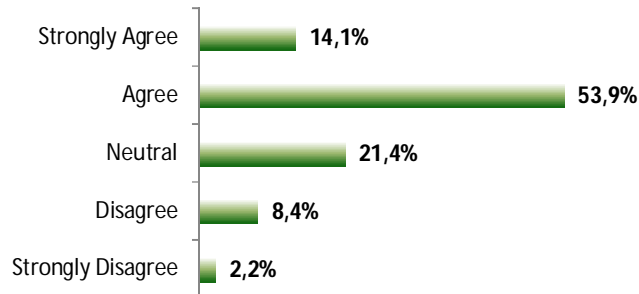


Chart 8 corresponds with the statement that the business needs to pay attention to the environmental impact in order to meet legal requirements without disturbing their potential of expanding market segment. 68% of the respondents agree with this statement.

**Chart 9 Business\_production\_methods**

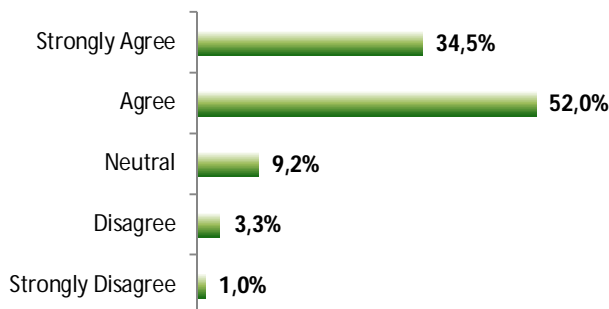
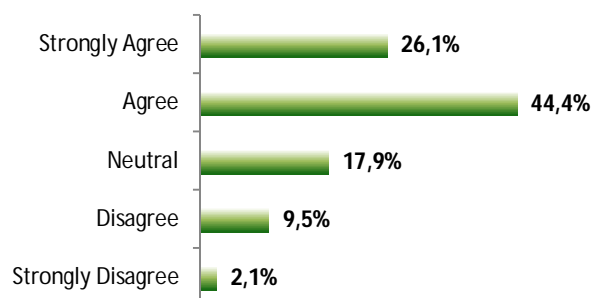


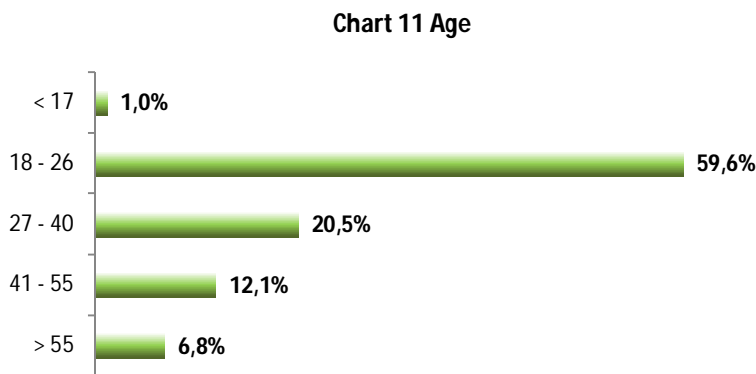
Chart 9 corresponds with the statement that the business needs to pay attention to current production methods and consuming behaviour of the consumers in order to minimize the use of energy, pollution and waste. An astonishing number of 86.5% agrees with this statement.

Chart 10 corresponds with the statement that consumers are responsible to make a change in purchasing eco-friendly products. 70.5% of the respondents agree that they are responsible.

**Chart 10 Consumers are responsible**

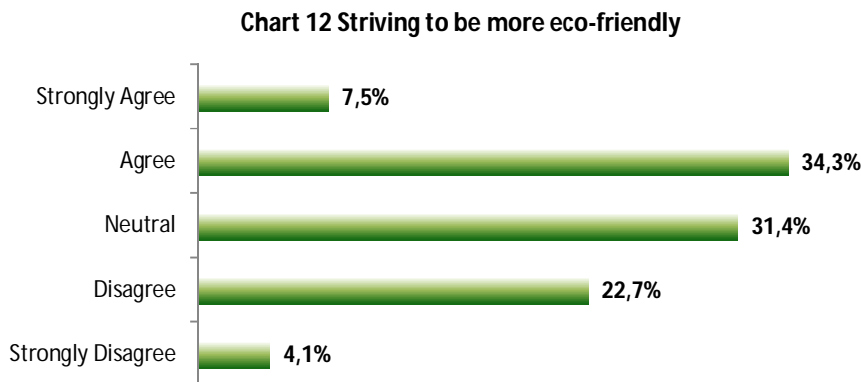


### 3.3.3 Age variable



A large majority of the respondents are between 18 and 26 years old. Explanation for this could be that several teams surveyed their friends and other students at the campus. Only 1% of this sample is younger than 18. Diekmann and Preisendörfer (1998) and Gilg et al. (2004) stated that older age groups are less likely to consume eco-friendly.

### 3.3.4 Dependent variable



The variable that is linked to ecological purchase intentions is based on the question if the respondent considers itself as a person who is striving to be a more eco-friendly consumer. Almost 42% agrees with this statement and 27% disagrees. Although the percentage agree is higher than disagree, it appears that in this study there is also a case of the consumer paradox. In chart 10 70.5% agreed that the consumers are responsible to purchase eco-friendly. However, compared with this chart 28.5% seem to have changed their mind/intention.

### 3.4 Data analyses

In this subchapter, statistical subjects will be discussed. The statistical program IBM SPSS, version 19, has been used to examine the collected data. Firstly, the preliminary work that is necessary to correctly assess the data will be mentioned. From then on, various statistical tests which have been applied will be discussed.

#### 3.4.1 Data preparation

The adopted data was entered in excel. For this study the data has been inserted and modified in SPSS. For the majority of the questions, a five-point Likert scale had been used in the survey. These questions are coded as ordinal variables in SPSS. 1 for strongly disagree, 2 for disagree – 5 for strongly agree. The remaining questions are coded as nominal variables: no as 1, do not know/sometimes as 2 and yes as 3. Finally, age is dissected in 5 categories. To examine the significance and influence of each age category, dummy variables (recoded into 0 and 1) have been constructed. There were no missing values in the dataset.

#### 3.4.2 Normal distribution

To determine which statistical tests can be used to analyse the data, the normality of the collected data has to be assessed first. Furthermore, normal distributions are good descriptions for random sampling and to estimate several types of chance outcomes, such as tossing a coin many times (Moore, 2003).

*“The normal distribution in statistics, also known as the Gaussian distribution, is defined by the two parameters mean and standard deviation. It can be considered as a theoretical frequency distribution for a set of variable data, usually represented by a bell-shaped curve symmetrical about the mean”<sup>4</sup>.* Normally distributed data implies that the majority of the observations in a sample are near the mean, whereas relatively few observations deviate to the left or right border. The difference among these observations is measured by the standard deviation.

There are several options in SPSS to test if the data is normally distributed. In this paper a normal probability plot will be constructed and histograms will be plotted. The normal probability plot is a graphical method that reflects the values of the dependent variable against the standardized values of the independent variables. If the values follow a straight linear line, it can

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<sup>4</sup> <http://easycalculation.com/statistics/learn-normal-distribution.php>

be assumed that the data is normally distributed. The histograms reflect each of the variables in graphs with a bell-shaped curve, the data can be considered normal if the curve is symmetrical.

Besides these tests, there is also a test on skewness and kurtosis. These tests are necessary because the earlier discussed graphical method can be interpreted in different ways. With a perfect normal distribution both skewness and kurtosis present a value of 0. However, values between -1 and +1 are commonly accepted (Field, 2005). Skewness shows the asymmetry and deviation in a normal distribution. A positive skewness value, thus larger than 0, indicates that the majority of the sample can be found on the left side of the mean, whereas a negative value smaller than 0 indicates that the majority of the sample is on the right side of the mean. Kurtosis is a measurement to identify a flattened or a peaked distribution. A value larger than 0 indicates a higher peak than the normal distribution, this means that the majority of the sample can be found near the mean due to the low variation in the observations. A value of kurtosis smaller than 0 results in a flattened peak compared to the normal distribution, this indicates that the observations in the sample are widely spread around the mean. To simplify, skewness indicates if the bell-shape is curved to the left or right, kurtosis indicates if the bell-shape is flattened or peaked. The means and values of these tests can be found in table 1.

<b>Variables</b>	<b>Mean</b>	<b>Std. deviation</b>	<b>Skewness</b>	<b>Kurtosis</b>
Recognize the relevance	3.76	0.86	-0.98	0.97
Caring about flora	4.14	0.75	-1.10	2.39
Caring about fauna	4.18	0.74	-1.11	2.57
Technology based solutions	3.42	1.08	-0.43	-0.65
Government based solutions	3.22	1.08	-0.30	-0.75
Social/cultural based solutions	3.74	0.98	-0.72	0.09
Business legal requirements	3.69	0.89	-0.81	0.66
Business production methods	4.16	0.80	-1.16	2.11
Consumers are responsible	3.83	0.99	-0.76	0.11
<b>Striving to be more eco-friendly</b>	<b>3.18</b>	<b>1.00</b>	<b>-0.17</b>	<b>-0.65</b>
The need to talk	1.91	0.68	0.12	-0.87
Younger than 17	0.01	0.10	9.99	97.81
18 - 26	0.60	0.49	-0.39	-1.85
27 - 40	0.20	0.40	1.46	0.15
41 - 55	0.12	0.33	2.32	3.41
Older than 55	0.07	0.25	3.43	9.75

According to the normality tests, 8 out of the 16 of the variables are not normal distributed. However, the dependent variable is normally distributed. The normal probability plot and the corresponding histogram also confirm the normality of the dependent variable related with the independent variables. This is one of the key assumptions for using multiple regression analysis, the corresponding graphs can be found in appendix 3.

### 3.4.3 Correlation analysis

A correlation test measures to what extent linear relationships exists amongst the variables (Field, 2005). The correlation describes the strength, also known as effect size, and direction of the linear relationship. Using this analysis can determine which variables are valuable to further examine. In this paper it will be measured to what extent the independent variables (X) associate with the dependent variable (Y).

The correlation analysis results into a coefficient that can be positive as well as negative. The value lies between -1 and 1. A coefficient of 0 indicates that there is no relationship at all between the variables, and a value of 1 or -1 means there is a perfect positive or negative relationship. For example, if the correlation coefficient between caring about fauna and caring about flora is 1, it means that caring about fauna implies that the respondent also cares about the flora.

Pearson's correlation coefficient will be used to measure the relationships, also known as Pearson's  $r$ . The coefficient is useful because it provides an unbiased measure of the importance of an effect (Field, 2005). In his book Field also states commonly accepted numbers for effect size:

- Small effect  $r \approx 0.10$
- Medium effect  $r \approx 0.30$
- Large effect  $r \approx 0.50$

In SPSS the significance and effect size ( $r$ ) of correlations can be calculated. A relationship between variables exists if the correlation coefficients are significant.

Person's formula can be found on the next page, where  $\mu_x$  refers to the means of the independent variables whereas  $\mu_y$  reflects the mean of the dependent variable.  $\sigma_x$  and  $\sigma_y$  reflect the standard deviation.



(3.1) *Pearson's correlation coefficient formula*

$$r = \frac{COVxy}{\sigma_x\sigma_y} = \frac{\sum(Xi - \mu_x)(Yi - \mu_y)}{(N - 1)\sigma_x\sigma_y}$$

### 3.4.4 Multiple regression analysis

While correlation measures the effect size of a linear relationship among two variables, regression goes a step further. It is believed that regression analysis is probably the most widely applied statistical method for forecasting and financial analysis. With regression analysis it is possible to predict one variable from another. A correlation coefficient reflects how strong a relationship between two variables is, regression analysis constructs a predictive model based on the data. Through this model values of the dependent variable can be predicted from the independent variables (Field, 2005).

In this paper it will be examined which variables can indicate/predict ecological purchase intentions. As mentioned earlier, this study has 16 variables including the dependent variable. Hence the predictive power of 15 variables will be tested. To determine if these variables influence effect on ecological purchase intentions, a significance level, also known as p-value, of 5% will be applied. This level suggests that only if it is certain by 95% that the result is genuine, it can be accepted as significant (Field, 2005).

In SPSS Linear Regression will be selected to construct the regression model.

To clarify how multiple regression analyses work, the formula can be found below. In this research the dependent variable is ordinal, so it is not possible to reproduce the same formula for the data. However, the results can predict the influence on ecological purchase intentions

(3.2) *Multiple regression formula*

$$Y = \beta_0 + \beta_1X_1 + \beta_2X_2 + \dots + \beta_nX_n + \varepsilon$$

Where:

Y = Dependent variable

Xn = Independent variables

$\beta_0$  = Intercept/starting point of the model

$\beta_n$  = Coefficients/estimates belonging to each variable x for the individual i

$\varepsilon$  = error or residue of the model

To use regression analysis, several assumptions have to be met/true:

- Normal distribution
  - This assumption has already been tested and fulfilled by the normal probability plot, histogram, skewness and kurtosis. Nevertheless, from a statistical view it is recommended that all variables used in the model are normally distributed.
- Lack of multicollinearity
  - A risk in many datasets is multicollinearity, this stands for a high correlation between independent variables. In the previous subchapter it was mentioned that a high correlation is favourable, however this only applies to the correlation between a dependent and independent variable. A strong correlation between independent variables can result into an arbitrary regression model. In this the case both variables practically explain the same variance in the dependent variable due to the high standard error and low coefficient. Consequently, the importance of the variables in the model cannot be determined. Multicollinearity can be measured in SPSS with the option collinearity diagnostics. This option produces a variance inflation factor (VIF). According to several researchers that Field (2005) states in his book, VIF values above 10 and below 0.2 are worthy of concern. In this study the values are between 1 and 2, the numbers can be found in appendix 5.
- Linear relationships among dependent and independent variables
  - This assumption has already been tested and fulfilled by the normal probability plot and correlation analysis.
- Independent errors
  - For any succeeding observations in regression analysis, the residuals should be uncorrelated (Field, 2005). This problem is also known as autocorrelation and it often occurs with time series in regression models. It can wrongly enlarge regression estimates and increase p values. For this assumption Durbin-Watson is the test to use in SPSS. The number of this test varies between 0 and 4. A number near 2 is commonly accepted, and implies that there is very little correlation between residuals. In this study the Durbin-Watson number is 1.7, hence this assumption has been met.

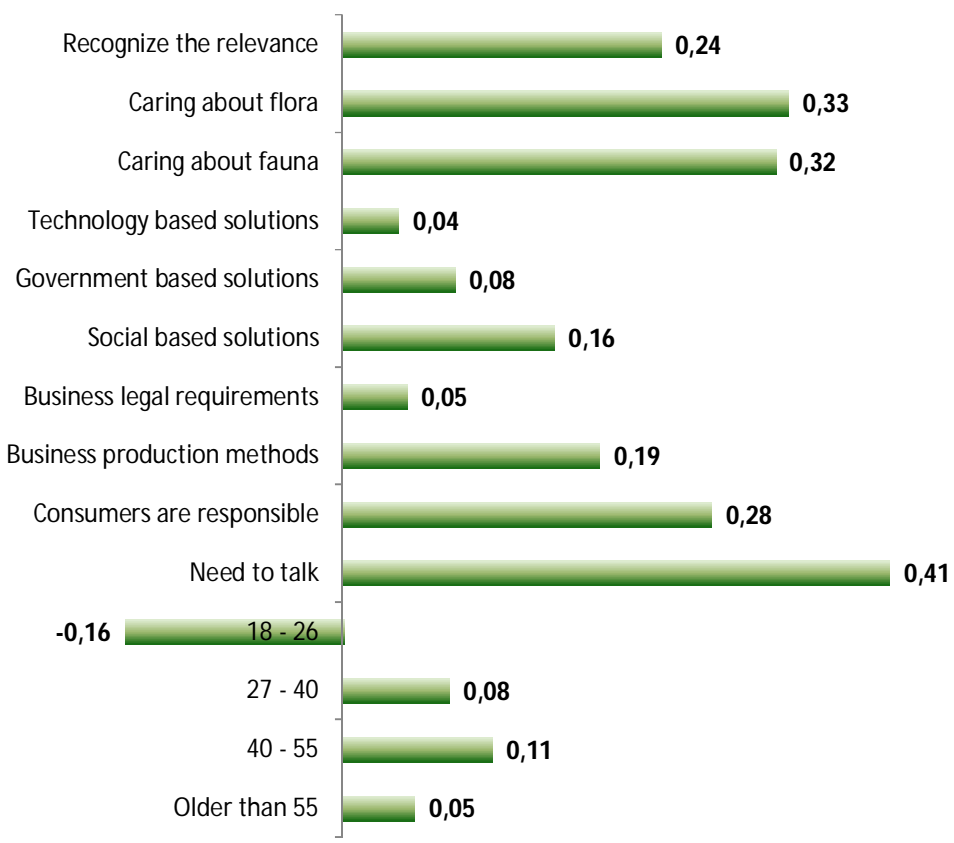
## Chapter 4 Results

In this chapter the statistical results and importance of the correlation analysis and regression analysis will be discussed. Subsequently, at the end of this chapter the hypotheses will be tested by means of these results.

### 4.1 Correlation results

The chart underneath shows the correlations coefficients of the independent variables associated with the dependent variable. This analysis can help us understand which individual independent variable is important to the variable of ecological purchase intention. Every displayed variable in the chart is significant, so those variables are related to the intentions to be a more eco-friendly consumer. Of all the variables selected for this study, the only exception is the age category younger than 17. This variable has no significant relationship with the dependent variable.

Chart 13 Correlations with the strive to be an eco-friendly consumer



The other age category of 18 – 26 appears to be the only variable that has a negative relationship with the dependent variable. This implies that an increase in that age category results into a decrease in the strive to be an eco-friendly consumers. However, with a coefficient of  $-0.16$  the effect size is relatively small as discovered from the previous chapter. The small effect size also implies for the other age categories, where respondents between 40 – 55 years old appear to have the strongest association versus the respondents of 55 years and older with the lowest association of the age categories.

Most variables regarding the perceived responsibilities similarly show small effect sizes related to ecological purchase intentions. The statement that eco-friendly means a strong focus on technology based solutions has the lowest effect of all variables on ecological purchase intentions. The only variable directly linked to governmental responsibility also has a low association with ecological purchase intentions. On the other hand, the statement that consumers are responsible to make a change in purchasing eco-friendly products has a medium effect size with a coefficient of  $0.28$ . This is the strongest association within perceived responsibilities, and certainly worth examining.

From all the selected ones in this model, the variables linked to environmental attitude appear to have the largest effect size on ecological purchase intentions. The statement that an increasing amount of consumers recognizes the relevance of taking care about “mother earth” considering the design, production and disposing of purchased products has the lowest association within this set. Feeling the need to talk about environmental issues with family/friends has the highest association with ecological purchase intentions of all variables in this paper. With a coefficient of  $0.41$  the effect size is exactly between medium and large, respectively  $0.3$  and  $0.5$ . This implies that the need to talk is an important variable regarding ecological purchase intentions.

The correlation amongst all the variables can be found in appendix 4. As expected the correlation between caring about flora and fauna is the highest of all, nonetheless the VIF is acceptable for using both variables in the regression analysis.

## 4.2 Multiple regression results

Although correlation analysis is useful to study the different variables, the analysis cannot determine in which direction the dependent variable will follow when all variables are tested together. In this subchapter we will discuss the predictive power of the significant variables.

After fulfilling the required assumptions, a regression model with all selected variables is constructed. The significant variables with their corresponding coefficients can be found in table 2.

<b>Table 2 Significant regression results</b>	
<b>Variables</b>	<b><math>\beta</math></b>
Recognize the relevance	0.09
Caring about flora	0.14
Caring about fauna	0.15
Business legal requirements	-0.05
Business production methods	0.06
Consumers are responsible	0.13
Need to talk	0.43
27 - 40	0.15
40 - 55	0.20

Every variable concerning the environmental attitude in this model has a significant effect on ecological purchase intentions. These variables positively influence the strive to be a more eco-friendly consumer. The predictive power of the  $\beta$ 's, or coefficients, do vary a lot. The statement that consumers recognize the relevance has the lowest coefficient within this set, this suggests that the variable has the least influence on ecological purchase intentions within environmental attitude. Caring about flora and fauna appear to have a positive effect that is almost similar, this not surprising after studying the results of the questionnaire. The need to talk about environmental issues proves yet again to be a very important variable for this study. With a coefficient of 0.43 it has the highest influence on ecological purchase intentions within this model.

To measure the influence of perceived responsibilities, 6 variables have been used in this study, 3 of those appear to have a significant effect in this model. The only variable for measuring perceived governmental responsibility is not significant. For perceived corporate responsibility 2 out of 3 variables are significant. The variable that does not have an influence in this model is the statement that eco-friendly means a strong focus on technology based solutions. Striking is the negative influence of the statement that the business needs to pay attention to the environmental impact in order to meet legal requirements. This means that agreeing with statement results into a decrease in ecological purchase intention. Although the coefficient, and

therefore the predictive power, is relatively low, this variable has a significant value. Perceived social responsibility has 1 significant variable out of 2. The insignificant variable is the statement that eco-friendly means a strong focus on social/cultural based solutions. However, the other statement that consumers are responsible to make a change in purchasing eco-friendly products, is significant and has a predictive power of 0.13 which can be considered as influential.

Of the 5 age categories, 3 groups appear to be insignificant in this model. The groups of 27 - 40 and 40 – 55 have a significant influence on ecological purchase intentions with respectively coefficients of 0.15 and 0.20. This implies that the category of 40 – 55 has a stronger intention than the younger group. In fact, the specific category is the second most powerful predictor in the regression model. The other variables and a total overview of the regression model can be found in appendix 5.

### 4.3 Overview of results

In this subchapter the hypotheses and independent variables are linked in order to indicate the consequences of the previous discussed results.

#### H1: A positive environmental attitude enhances ecological purchase intentions

- Recognize the relevance is significant with a  $\beta$  of 0.09
- Caring about flora is significant with a  $\beta$  of 0.14
- Caring about fauna is significant  $\beta$  of 0.15
- Need to talk is significant with a  $\beta$  of 0.43

This hypothesis is supported, all variables are significant.

#### H2a: Perceived social responsibility influences ecological purchase intentions

- Social/cultural based solutions is not significant
- Consumers are responsible is significant with a  $\beta$  of 0.13

This hypothesis is supported. Despite the insignificance of one variable, the correlation and  $\beta$  of the other variable appear to be significant enough to affect ecological purchase intentions.

Recommended is to further investigate this topic, and if possible add more variables to determine the importance of this topic.

### H2b: Perceived corporate responsibility influences ecological purchase intentions

- Technology based solutions is not significant
- Business legal requirements is significant with a  $\beta$  of -0.05
- Business production methods is significant with a  $\beta$  of 0.06

This hypothesis is supported because 2 out of 3 variables are significant in the regression model. Nevertheless, the overall effect of corporate responsibility appears to be small. Recommended is to further investigate this topic, and if possible add more variables to determine the importance of this topic.

### H2c: Perceived governmental responsibility influences ecological purchase intentions

- Government based solutions is not significant

This hypothesis is rejected. However, further investigation and additional measurement variables are recommended. In the literature the role of the government seemed influential to support environmentally friendliness.

### H3: Age influences ecological purchase intentions

- Younger than 17 is not significant
- 18 – 26 is not significant
- 27 – 40 is significant with a  $\beta$  of 0.15
- 40 – 55 is significant with a  $\beta$  of 0.20
- Older than 55 is not significant

This hypothesis is supported. Even though the majority of the age categories are insignificant, two age categories do positively influence ecological purchase intentions. The outcome is sufficient to accept the hypothesis.

## Chapter 5 Conclusion

The following research question was formulated at the beginning of this paper:

**“Do consumers value a sustainable environment and which factors affect their ecological purchase intentions?”**

To measure if consumers value a sustainable environment, the answers of both questions caring about the flora and fauna will be studied. These questions have been discussed in chapter 3.3.1, to recall 87% of the respondents agreed that both topics are important, while 70.5% agrees that consumers themselves are responsible for purchasing eco-friendly products. Based on these percentages it can be assumed that they do value a sustainable environment. Nevertheless, compared with the level of agreement with the dependent variable, only 42% strives to eco-friendly consumption. This is in line with the consumer paradox theories of Diekmann and Preisendörferer (1998), Carrington et al. (2010), and Grimmer and Bingham (2013). They all found inconsistencies between society's environmental attitudes and their behaviour. To conclude, consumers say that they value a sustainable environment, however only half of them behave this way.

To answer the second part of the main question, the sub research questions will be discussed assisted by the literature and results.

### *Does a positive environmental attitude affect ecological purchase intentions?*

A positive environmental attitude proves to be an influential indicator for ecological purchase intentions in this research. Fraj and Martinez (2007), and Eliam Trop (2012) had similar findings regarding the predictive power of environmental attitudes. In the study of Kinnear et al. (1973) attitudes also served as indicators for ecologically-conscious purchasing.

Within this study all the selected variables for environmental attitudes have a significant effect on ecological purchase intentions. Feeling the need to talk about environmental issues with family and friends appears to be a powerful predictor for ecological purchase intentions, this variable has the highest coefficient of the regression model.



### *Do perceived responsibilities affect ecological purchase intentions?*

Chen and Chai (2010), and Mei et al. (2012) mention that the government should initiate and promote sustainability for their society. The respondents of this study disagree, perceived governmental responsibility does not affect ecological purchase intentions. Only one variable is used in this study, it is desirable if more are added.

The results show a partial effect on perceived social responsibilities. At the same time, this effect is the strongest of all entities with perceived responsibilities. The variable consumers are responsible is significant and the correlation coefficient is relatively high, hence perceived social responsibility affects ecological purchase intentions.

The same applies for perceived corporate responsibilities, 2 out of 3 variables are significant. Nevertheless, the predictive power of this factor is questionable due to the negative and positive coefficients with almost the same value.

### *Does age influences ecological purchase intentions?*

Diekmann and Preisendörfer (1998) did not find a significant effect with age on environmental behaviour. They also stated that older people have shown to be less environmentally concerned when it came to their shopping behaviour. However, Gilg et al. (2004) found that age had a positive impact on green consumption. In this research the younger age groups also consumed more eco-friendly products.

Similar to Gilg et al. (2004), in this study a positive influence of age on ecological purchase intentions is established. The respondents between 27 – 40 and 40 – 55 showed a significant effect. In this study the influence of the older group is larger.

## **5.1 Limitations**

A major limitation is that this research design was largely adapted onto the available questionnaire and available dataset. A crucial shortcoming is that some themes have been left untouched in this questionnaire. For instance, there are very little psychographics and no demographics of the respondents besides age. These data can help gaining a better understanding of the ecological consumer. Even though the statements of Balderjahn (1998) and Thompson et al. (2010) state that the predictive power of demographics is low, more recent studies of Mei et al. (2012) and Ottmann (2011) segment the ecological consumers based on demographic and psychographic variables. Both studies seem to agree that females are more likely to consume eco-friendly products.

Another limitation might be that some student teams used the face-to-face method for the survey. A major disadvantage of this method is that the presence of the interviewers might encourage social desirable answers rather than a respondent's truthful answers (Duffy et al. 2005). With this study on ecological intentions the answers the respondents gave, might be biased towards environmental conscious. The number of respondents that were surveyed by the face-to-face method is not known, thus it cannot be determined how many of them might not answered truthfully so they do not seem oblivious to the environment.

Finally, multiple regression analysis is used while not all variables are normally distributed. Although the results of the normal probability plot and histogram justified the applied method, in the statistical field is preferred that all the variables for regression are normally distributed. The largest distortions occurred in the age categories. To prevent this in the future it is wise to approach and record an equal amount of these groups.

## 5.2 Recommendations for further research

A recommendation is to expand research on the need to talk about environmental issues. This has proven to be a strong predictor in this model. If this variable appears to be significant in other studies, it might be a useful variable to utilize in the academic and managerial field. In addition, demographics and psychographics should be added in the research model to gain a better understanding of the consumer.

Perceived responsibilities might provide new insights in this field. In this study a few variables that are linked to these responsibilities have significant outcomes. Nevertheless, the predictive powers of these variables appear to be low. To determine if perceived responsibilities can contribute to this field, it is advisable to conduct a study with more variables per entity and determine if the influence is similarly significant.

Eco-friendly labels might also be predictors for ecological purchase intentions. In the survey there was a question about these labels. Respondents were asked if, according to them, eco-friendly labels on shopping goods will improve the environment. The majority responded positively, and this resulted into a significant variable. In appendix 5 an additional regression model with the eco-friendly label variable is constructed. Due to the magnitude of this subject, this variable has not been discussed in this paper.

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## Appendix

### Appendix 1: Questionnaire

Q1:

An increasing amount of consumers recognizes the relevance of taking care about "mother earth" considering the design, production and disposing of the purchased products.

Do you agree or disagree?

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q2:

What is your opinion about the statement?  
"Caring about the **flora** (vegetation) is important"

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Why or why not? Please mention three points

Point 1: .....

Point 2: .....

Point 3: .....

Q3:

What is your opinion about the statement?  
"Caring about the **fauna** (animals) is important"

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Why or why not? Please mention three points

Point 1: .....

Point 2: .....

Point 3: .....

Q4: Have you heard about any problems caused by human consumption that affect the environment?

Please mention three problems.

Problem 1: .....

Problem 2: .....

Problem 3: .....

Q5:

The driving forces to sustainable marketing has led to eco-innovations in the field of products and services. More and more consumers want to know what "eco-friendly" really means, Consider the next three statements.

Q5A:

"Eco-friendly" means a strong focus on **technology** based solutions.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q5B:

"Eco-friendly" means a strong focus on **government** based solutions.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q5C:

"Eco-friendly" means a strong focus on **social/cultural** based solutions.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q6:

The trend on the demand side of the food industry and food chains(shops) shows that consumers are more and more concerned with 'eco-friendly' food products. Consequently the industry and the shop chains have to change their methods of production and selling of the products. Where do you think the business should start to make the change? Consider the next three statements:

Q6A:

The business needs to pay attention to the environmental impact in order to meet legal requirements without disturbing their potential of expanding market segment.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q6B:

The business needs to current business production methods and consuming behaviour of the consumers in order to minimize the use of energy, pollution and waste.

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q6C:

Consumers are responsible to make a change in purchasing 'eco-friendly' products..

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q7:

One of the ideas for creating a better environment is to change the behaviour of consumers towards more 'eco-friendliness' or sustainable purchasing.

Q7A:

Do you consider yourself as a person who is striving to be a more 'eco-friendly' consumer?

Strongly disagree	Disagree	Neutral	Agree	Strongly agree
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q7B:

Do you feel the need to talk about environmental issues with your family/friends?

Not at all	Sometimes	Yes
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q7C:

Do you think 'eco-friendly' labels on shopping goods will improve the environment?

No	Don't know	Yes
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Q8:

Do you prefer organic wine/beer above a fair trade wine/beer?

No	Don't know	Yes
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>



Q9:  
 What does it mean to say that something is 'natural'?  
 .....

Q10:  
 What should people do to live in harmony with nature?  
 .....

Q11:  
 Suppose you are the minister of environmental affairs, what would be your main policy goals?  
 .....

Q12:  
 What is the age of the respondent?

- 8 - 17                      18 - 26                      27 - 40                      41 - 55                      Older than 55
- 

## Appendix 2: Frequency tables SPSS output

**Consumers recognize the relevance of taking care of "mother earth"**

		Frequency	Percent
Valid	Strongly Disagree	40	1.5
	Disagree	248	9.3
	Neutral	387	14.5
	Agree	1617	60.6
	Strongly Agree	376	14.1
	Total	2668	100.0

**Caring about the flora (vegetation) is important**

		Frequency	Percent
Valid	Strongly Disagree	23	.9
	Disagree	73	2.7
	Neutral	240	9.0
	Agree	1505	56.4
	Strongly Agree	827	31.0
	Total	2668	100.0

**Caring about the fauna is important**

		Frequency	Percent
Valid	Strongly Disagree	24	.9
	Disagree	52	1.9
	Neutral	239	9.0
	Agree	1467	55.0
	Strongly Agree	886	33.2
	Total	2668	100.0

**Eco-friendly means a strong focus on technology based solutions**

		Frequency	Percent
Valid	Strongly Disagree	112	4.2
	Disagree	514	19.3
	Neutral	550	20.6
	Agree	1124	42.1
	Strongly Agree	368	13.8
	Total	2668	100.0

**Eco-friendly means a strong focus on government based solutions**

		Frequency	Percent
Valid	Strongly Disagree	164	6.1
	Disagree	587	22.0
	Neutral	660	24.7
	Agree	1011	37.9
	Strongly Agree	246	9.2
	Total	2668	100.0

**Eco-friendly means a strong focus on social/cultural based solutions**

		Frequency	Percent
Valid	Strongly Disagree	58	2.2
	Disagree	283	10.6
	Neutral	505	18.9
	Agree	1267	47.5
	Strongly Agree	555	20.8
	Total	2668	100.0

**Business legal requirements**

		Frequency	Percent
Valid	Strongly Disagree	58	2.2
	Disagree	225	8.4
	Neutral	571	21.4
	Agree	1438	53.9
	Strongly Agree	376	14.1
	Total	2668	100.0

**Business production methods**

		Frequency	Percent
Valid	Strongly Disagree	27	1.0
	Disagree	88	3.3
	Neutral	245	9.2
	Agree	1387	52.0
	Strongly Agree	921	34.5
	Total	2668	100.0

**Consumers are responsible to make a change in purchasing eco-friendly products**

		Frequency	Percent
Valid	Strongly Disagree	56	2.1
	Disagree	253	9.5
	Neutral	478	17.9
	Agree	1184	44.4
	Strongly Agree	697	26.1
	Total	2668	100.0

**Do you consider yourself as a person who is striving to be a more 'eco-friendly' consumer?**

		Frequency	Percent
Valid	Strongly Disagree	110	4.1
	Disagree	605	22.7
	Neutral	837	31.4
	Agree	915	34.3
	Strongly Agree	201	7.5
	Total	2668	100.0

**Do you feel the need to talk about environmental issues with your family/friends?**

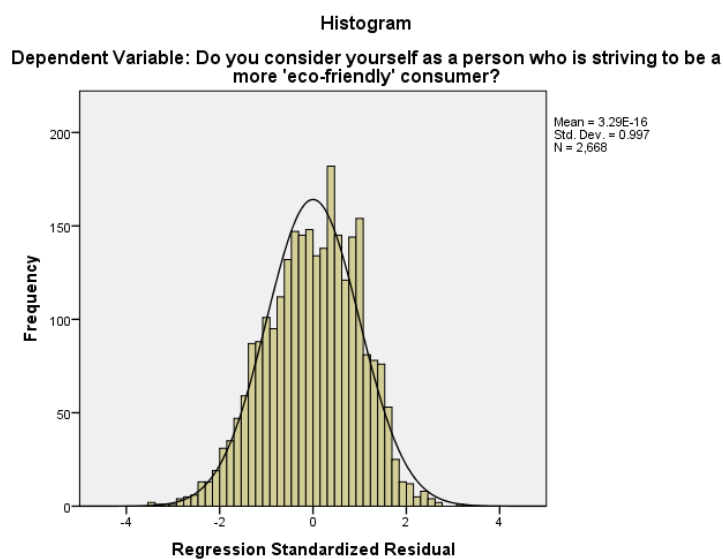
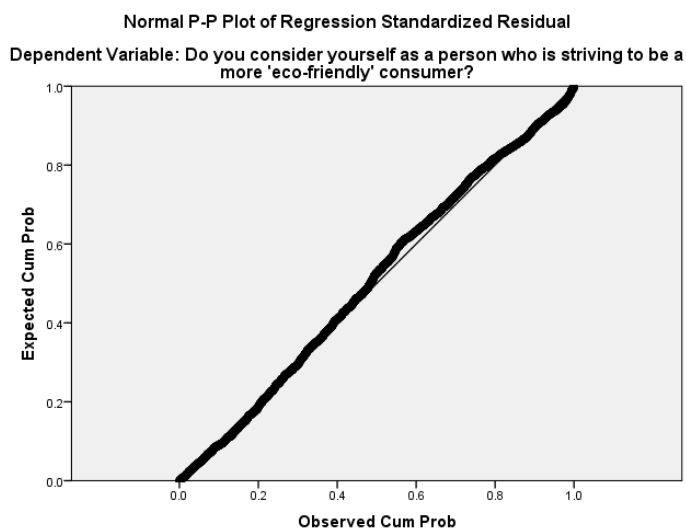
		Frequency	Percent
Valid	Not at all	755	28.3
	Sometimes	1399	52.4
	Yes	514	19.3
	Total	2668	100.0

**Do you think 'eco-friendly' labels on shopping goods will improve the environment?**

		Frequency	Percent
Valid	No	518	19.4
	Do not know	827	31.0
	Yes	1323	49.6
	Total	2668	100.0

### Appendix 3: Normal distribution plots & table

#### Normal Probability Plot



## Descriptive Statistics

	N	Mean	Skewness	Kurtosis
	Statistic	Statistic	Statistic	Statistic
Consumers recognize the relevance of taking care of "mother earth"	2668	3,76	-,979	,971
Caring about the flora (vegetation) is important	2668	4,14	-1,104	2,386
Caring about the fauna is important	2668	4,18	-1,112	2,566
Eco-friendly means a strong focus on technology based solutions	2668	3,42	-,432	-,654
Eco-friendly means a strong focus on government based solutions	2668	3,22	-,299	-,754
Eco-friendly means a strong focus on social/cultural based solutions	2668	3,74	-,715	,085
Business_legal_requirements	2668	3,69	-,813	,657
Business_production_methods	2668	4,16	-1,160	2,105
Consumers are responsible to make a change in purchasing eco-friendly products	2668	3,83	-,761	,112
Do you consider yourself as a person who is striving to be a more 'eco-friendly' consumer?	2668	3,18	-,171	-,653
Do you feel the need to talk about environmental issues with your family/friends?	2668	1,91	,116	-,867
Younger than 17	2668	,0097	9,987	97,811
18 - 26	2668	,5963	-,393	-1,847
27 - 40	2668	,2046	1,465	,146
41 - 55	2668	,1211	2,325	3,406
Older than 55	2668	,0682	3,427	9,753
Valid N (listwise)	2668			

## Appendix 4: Correlation table

	Recognize the relevance	Caring about flora	Caring about fauna	Technology based solutions	Government based solutions	Social based solutions	Business legal requirements	Business production methods	Consumers are responsible	Striving to 'eco-friendly'	Need to talk
Caring about flora	.361**										
Caring about fauna	.342**	.650**									
Technology based solutions	.080**	.078**	.086**								
Government based solutions	.038*	.100**	.120**	.348**							
Social based solutions	.140**	.196**	.204**	.068**	.233**						
Business legal requirements	.114**	.149**	.129**	.148**	.145**	.051**					
Business production methods	.195**	.277**	.294**	.104**	.077**	.181**	.145**				
Consumers are responsible	.167**	.236**	.242**	.056**	.053**	.188**	.112**	.198**			
<b>Striving to 'eco-friendly'</b>	<b>.238**</b>	<b>.334**</b>	<b>.324**</b>	<b>.041*</b>	<b>.083**</b>	<b>.158**</b>	<b>.047*</b>	<b>.192**</b>	<b>.276**</b>		
Need to talk	.177**	.278**	.235**	.026	.051**	.158**	.084**	.147**	.218**	.410**	
Age	.093**	.100**	.103**	.021	.092**	.027	.031	.042*	.101**	.153**	.163**

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

## Appendix 5: Regression tables

**Coefficients<sup>a</sup>** *The insignificant variables are marked*

Model	Unstandardized Coefficients		t	Sig.	Collinearity Statistics
	B	Std. Error			VIF
1 (Constant)	,076	,142	,535	,592	
Consumers recognize the relevance of taking care of "mother earth"	,089	,021	4,184	,000	1,205
Caring about the flora (vegetation) is important	,136	,030	4,491	,000	1,884
Caring about the fauna is important	,146	,030	4,789	,000	1,844
Eco-friendly means a strong focus on technology based solutions	-,009	,017	-,537	,591	1,167
Eco-friendly means a strong focus on government based solutions	,030	,017	1,743	,082	1,224
Eco-friendly means a strong focus on social/cultural based solutions	,018	,018	,997	,319	1,149
Business_legal_requirements	-,049	,019	-2,529	,011	1,072
Business_production_methods	,060	,022	2,671	,008	1,166
Consumers are responsible to make a change in purchasing eco-friendly products	,134	,018	7,502	,000	1,141
Do you feel the need to talk about environmental issues with your family/friends?	,431	,026	16,502	,000	1,154
Younger than 17	,138	,171	,809	,419	1,019
27 - 40	,154	,043	3,583	,000	1,088
41 - 55	,203	,053	3,816	,000	1,090
Older than 55	,088	,068	1,297	,195	1,060

a. Dependent Variable: Do you consider yourself as a person who is striving to be a more 'eco-friendly' consumer?

**Model Summary<sup>b</sup>**

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,520 <sup>a</sup>	,270	,266	,858	1,700

Below the regression results with the eco-friendly labels variable included.

**Coefficients<sup>a</sup>**

Model		Unstandardized Coefficients		t	Sig.
		B	Std. Error		
1	(Constant)	-.008	.142	-.054	.957
	Consumers recognize the relevance of taking care of "mother earth"	.082	.021	3.872	.000
	Caring about the flora (vegetation) is important	.131	.030	4.357	.000
	Caring about the fauna is important	.140	.030	4.607	.000
	Eco-friendly means a strong focus on technology based solutions	-.014	.017	-.851	.395
	Eco-friendly means a strong focus on government based solutions	.030	.017	1.756	.079
	Eco-friendly means a strong focus on social/cultural based solutions	.016	.018	.882	.378
	Business_legal_requirements	-.051	.019	-2.643	.008
	Business_production_methods	.060	.022	2.697	.007
	Consumers are responsible to make a change in purchasing eco-friendly products	.121	.018	6.684	.000
	Do you feel the need to talk about environmental issues with your family/friends?	.419	.026	16.086	.000
	Do you think 'eco-friendly' labels on shopping goods will improve the environment?	.113	.022	5.057	.000
	Younger than 17	.157	.170	.925	.355
	27 - 40	.158	.043	3.703	.000
	41 - 55	.186	.053	3.511	.000
	Older than 55	.082	.068	1.215	.225

a. Dependent Variable: Do you consider yourself as a person who is striving to be a more 'eco-friendly' consumer?