Purchasing of environmental friendly computers
How consumers value green characteristics based on a conjoint analysis

Bachelor Thesis within Business Administration
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Abstract

Problem: Environmental awareness was rated as the most current trend in 2006 by the readers of Swedish newspaper DN (Olausson, 2007), and in 2005 97 per cent of the Swedish population thought that environmental issues will have or already have had an influence on Sweden (Swedish Environmental Protection Agency, 2005). Higher awareness about environmental issues leads to more environmental friendly products and new processes by companies for lower consumption of energy and harmful materials. However, the importance of the contribution of households and electronics on the environment seems to be underestimated. Therefore, it is of importance to understand how consumers consider the environmental friendliness of electronic products, and computers in specific for this thesis.

Purpose: The purpose of this thesis is to examine how consumers value environmental friendliness when buying computers and how this influences their purchase decision.

Method: In order to achieve the purpose stated, a conjoint analysis was first made through an experiment in order to see how the consumer make trade-offs between certain attributes of computers. After the experiment, respondents were asked to answer a questionnaire which has been used to connect computer purchasing and environmental values to consumer behaviour theories.

Conclusions: The assumption on environmental friendliness being the least valued attribute by consumers has not been supported by the results of the conjoint analysis done; in fact it has instead portrayed environmental friendliness as the second most important, before price and performance, only after accessories. The results have also shown that environmental friendliness was appreciated in a computer, and that its existence in a computer affects the purchase decision positively. The results of the post-experiment questionnaire have illustrated that environmental friendliness of computers has a strong effect on the purchase decision when combined with other attributes, although it may not be regarded of high value by itself. While a computer by it self are likely to satisfy needs as low as social need, the environmental friendliness of computers appears to satisfy esteem needs. It has also been demonstrated that social factors could have strong effects on purchasing of green computers if more and better information were available. Further, moral obligations and attitude to behaviour factors concerning green computers seem to be strong, while perceived control and subjective norms appear to be low in today’s society.
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1 Introduction

In this section the background and problem are introduced, and the purpose of this thesis is presented.

1.1 Problem Background

During the 21st century, globalisation and internationalisation have been two very current issues. Although international trade has been present throughout much of history, there is a trend of increasing international trade around the globe, in terms of globalisation. Globalisation refers to a shift towards a more integrated and interdependent world economy, thus the globalisation of markets refers to the merging of historically distinct and separate national markets into one huge global market place. This has lead to dynamic business markets with constant and rapid changes. Strong development in technology concerning transports, communication and information processing has made international trade more efficient and profitable (Hill, 2007).

The effects of globalisation have proven advantageous for example by growth in income, especially for developing countries, hence decreased inequalities in global income and poverty. However, less positive consequences of globalisation have arisen as well. Social issues like exploitation of developing countries, and in its turn issues about labour rights and human rights have been issues in some parts of the world. Globalisation has also had a major effect on our environment. When writing about environment in this thesis we mean the earth’s natural environment. Expressed differently, all living and non-living things that occurs naturally on earth. Environmental issues such as global warming and climate change depends to a large extent on the increase in consumption made possible through international trade. Higher consumption leads to more transportation, higher environmental effects of production processes as well as more waste for us to handle. Thus, the stronger economy has lead to increased use of fuel and energy all around the world to the point where the environment can not cope with much more. Therefore, environmental issues are a current and very important issue to discuss.

As a result from this, the environment has developed from just a concern of specialists to the top of many nations’ agendas. Consumer awareness about environmental issues is increasing in almost the same pace. A study done by CNN in 2002, involving 25000 consumers in 175 countries, showed that 71 per cent of the respondents were dissatisfied with the state of the environment and 67 per cent said that it is getting worse (Amine, 2003). In Sweden, environmental awareness was pointed out as the most current trend in 2006, by the readers of the Swedish newspaper Dagens Nyheter (Olausson, 2007). Further, according to the Swedish Environmental Protection Agency (2005), 97 per cent of the Swedish population thought in 2005 that environmental issues will, or already have had an influence on Sweden.

Today, new and stronger environmental laws are introduced; companies work to develop more environmental friendly products and incorporate new processes which will lower consumption of energy and harmful materials. Here, we want to define the concept environmental friendly which will be used frequently throughout our thesis. For a product to
be considered to be environmental friendly it must only inflict minimal damage to the environment.

### 1.2 Problem Discussion

The area we have chosen to study closer is the consumer electronics business. The Swedish Energy Agency (2004), estimate that 17 per cent of energy consumptions within households can be accounted to computers, DVDs and TVs. Households are responsible for 40 per cent of the 400 billion kilowatt hours of energy consumed in Sweden each year (Haldorson, 2007). There is a clear connection between energy consumption and environmental issues. The use of energy is contributing to discharges, which on a local level influence our health and create acidification and over-fertilisation. In larger perspective energy consumption contribute to global changes of the climate (The Swedish Energy Agency, 2007).

Recent studies carried out by the Swedish Environmental Protection Agency (2005), shows that up to 80 per cent of the Swedish population is prepared to pay extra for green products. This is a very positive figure, but there seems to be a gap between being prepared to do something and actually doing it. Results of a study from Statistics Sweden (Statistiska Centrallybyrán) show that 55 per cent of all Swedish people prefer ecologic before conventional food. The same study reveals that only 2-3 per cent of all food consumption in Sweden is in fact ecologic. Of that 2-3 per cent, 70 per cent is consumed by a very small and environmental engaged population consisting of 2 per cent of Sweden’s total population (Olausson, 2007). The food industry has been successful when it comes to promoting green products, but still it seems hard to get people to buy them. Therefore we assume that the same phenomenon exists also in other fields.

We think that there are some important differences between the purchasing decisions of food and household electronics. First of all, the prices are on very different levels, food items are very cheap compared to electronics. To pay just a few more Swedish kronor (SEK) for an ecological food item might not be a hard decision, but in the case of electronics when the price difference between the cheapest one and more environmental friendly products could be hundreds or even thousands of Swedish kronor, the choice is more complicated. The second difference is the frequency of the purchase. Food is something that is bought often, sometimes many times a week, while electronics are bought with an interval of some years. The third difference is that while environmental friendly food, like ecological food, is often conceived as higher quality than ordinary food our guess is that electronics are sometimes conceived the other way around – that environmental friendly electronic products are of worse quality than ordinary products.

As within the food industry, there are a lot of contradictions regarding environmental consuming when looking at the consumer electronics market. Even though environmental awareness has been high, especially in the northern parts of Europe, green marketing strategies and eco-label schemes in the consumer electronics area has proved to fail. In one study only a minority of the consumers showed to be prepared to pay more for green electronics, but 25 per cent of consumers in Europe are said to be sensitive to specific green performance of electronics (Stevels, 2000). The Swedish market seems to give a more positive impression. According to the Swedish Environmental Protection Agency (2005), 75
per cent of the Swedish population is willing to buy energy efficient household electronics. However, if they really choose to buy those products when they are in the decision process is not a matter of course.

The specific area within consumer electronics of focus in this thesis is green consumption of computers. It involves many important aspects to discuss since this is a market where the choice of purchase can actually make a big difference. The difference in energy consumption from two new computers can be as big as 350 kilowatt hours per year and when purchasing a laptop computer instead of desktop you can reduce energy consumption with as much as 80 per cent (Energy-Star, 2007). To put this in some relation, for example 1 kilowatt hour is enough energy to use a 40 W light bulb for 25 hours or a microwave oven for 40 minutes (Swedish Energy Agency, 2006). But it is not only energy demand which is important when looking on the computer industry’s environmental impact, production processes and recycling are of significance as well.

When we write about environmental friendly computers, we mean computers that are better than the alternative computers, with regard to energy consumption or any other measurement for environmental friendliness. Unfortunately there are no computers, and will never be, that don’t affect the environment in a negative way, but there are computers that make a less negative impact and these will be called environmental friendly in this thesis.

From the information search we have done, and also from our personal experiences, we realise that even though environmental friendliness at the first glance seems like an attractive attribute in a computer it can not be seen as a fact. Even though buying a green computer can be said to contribute to a better environment, we are not sure that consumers think in this way when it comes to computers. Instead, we have got the impression that environmental friendliness in a computer is rather low valued compared to other attribute like price. The problem here is that despite the state of our environment and the potential positive influences from a green computer, at the first glance environmental friendliness seems to have a low importance when buying a computer. Hence, in this thesis we would like to find out if the impression we got is right and also to explore why environmental friendliness is valued the way it is.

1.3 Purpose

The purpose of this thesis is to examine how consumers value environmental friendliness when buying computers and how this influences their purchase decision.
2 Frame of Reference

In this section the relevant theories are described and discussed, which are used as a framework for this thesis. These theories are later used to analyse the empirical results. The last part of this section is a summary of the Frame of Reference, and the research questions are presented.

To help us understand what a consumer goes through and considers during the decision making process and how green characteristics influence the decision we have chosen to use, mostly, consumer behaviour theory. However, as a support to the purchasing behaviour theory, the first part is about green marketing. It concerns green marketing, as well as information about ethical consumers, green computers and eco-labels.

The main theories of interest are about consumer behaviour. One important part of consumer behaviour is the factors that influence the purchase decision in one way or another. Examples of such theories are provided under Consumer Behaviour, which is the second part, and include among other Maslow’s theory of motivation, levels and factors of decision making and theory of planned behaviour.

2.1 Green Marketing

For us to fully understand what consumers have in mind when they buy or decide not to buy green products we think it is important to include a section talking about green marketing and the effects that this concepts have had on consumers. Thus, in this section we present some of the history of green marketing and what effects it has lead to. Further, information about ethical consumers, green computers and eco-labels are included.

2.1.1 What is Green Marketing?

Flodhammar (1991) defines green marketing as follows: “Green marketing is a social process by which individuals and groups obtain what they need and want through exchanging products and value with others in an ethical way that minimises negative impact on the environment.” (Flodhammar, 1991, p 25). This definition is to a large extent something that most authors within this field agree with. Namely, green marketing is something more than just marketing. It is widely supposed that for companies to benefit from green marketing they must have a wide environmental commitment throughout the whole company, its culture and strategy. This implies that traditional marketing methods (for example the 4P’s) are not enough to convince a customer that a product or business is environmental oriented; instead the company must prove that all its operations are performed in a sustainable way (Tjärnemo, 2001).

However, green marketing was often used by companies and organisations in different ways. In the late 1980s and in the beginning of the 1990s green marketing experienced a boom. Between 1989 and 1990 introduction of new green products in the US doubled. Printed ads as well as TV ads including a green message increased close to 400 per cent in volume during the same period (Peattie & Crane, 2005). However, by the mid 1990s research show stagnation in the amount of green consumerism and a severe gap between concern for the environment and actual purchasing of green products (Peattie & Crane, 2005).
Peattie and Crane (2005) have developed five different approaches to green marketing that to a large extent was used by companies during the boom. They have named them: green spinning, green selling, green harvesting, enviropreneur marketing and compliance marketing. This is marketing strategies that, according to Peattie and Crane can not bee seen as real green marketing.

Many of the firms which most actively used green marketing were the ones that had been criticised for being dirty and to be harmful for the environment. As a reactive approach they have tried to convince customers of their environmental commitment through offensive PR efforts called green spinning. The problem being, that these companies had no aim to develop the product or the production nor had they any intentions to increase their customer focus.

Green selling occurred during the 1990s when consumer trends showed that green characteristics were important for customers when making a purchase decision. Companies tried to take advantage of this by promoting green qualities in already existing products without changing them at all. As a consequence, suspicion was created amongst customers. Still today customers are suspicious when it comes to green products. The mistrust has lead to that many companies have chosen not to make any environmental claims because of fear to loose customers (Peattie & Crane, 2005).

Green harvesting firms were often focused on short-term profitability and cost reductions. As a result they became interested in the environment when it was obvious that greening could allow them to cut costs through energy and material input efficiencies, packaging reductions and logistics rationalising. However, concurrent with the cost reductions, end customers experienced no price reduction, if anything quite the opposite. The firms served niche markets, with what they saw as a premium product, looking for big profits. The finance orientation of green harvesting has lead to the tendency of perceiving green products as expensive (Peattie & Crane, 2005).

Peattie and Crane (2005) explain that the enviropreneur marketing approach to green marketing is more of a genuine approach in the sense that companies has a real green commitment throughout the organisation. There are two types of enviropreneur marketing: Boutique enviropreneur marketing is the marketing of green products produced by companies only producing environmental product, for example the Body Shop. Corporate enviropreneur marketing is when companies promote green brands as well as non-green products. The problem with this type of green marketing has been the company’s belief that a product would sell just because it is green. Marketers forgot to find out what customers really wanted and green product were often perceived as over-priced, unattractive and simply inferior to conventional products.

Compliance marketing approach is taken by conservative firms which aim at going through as little change as possible. They simply comply with environmental laws and try to benefit from it by promoting it (Peattie & Crane, 2005).

Hence, these failed approaches lead to green products being perceived as being over-priced, unattractive and in many cases as having worse quality than conventional products. A suspicion against companies promoting green products was also developed. Some of these beliefs and attitudes may still be alive today, affecting consumers purchasing behaviour.
2.1.2 The ethical consumer

The ethical consumer is an extreme consumer, in the direct opposite of the consumer who does not care at all about ethical matters. Not many consumers are totally ethical, but it can be interesting to know more about this consumer, in order to understand more about why they behave like they do.

In the traditional buying decision the consumer would normally buy the product with the highest quality that they can afford. For an ethical consumer the decision is much more complicated. Price and quality is still important, no consumer would pay unlimited money for a product that is not worth it or buy something that taste bad. However, an ethical consumer also adds other criteria in the buying decision. For example the consumer could choose to buy a fair trade-labelled or eco-labelled product instead of other cheaper alternatives. To be an ethical consumer does not only mean to buy more ethical products, but also to avoid buying products that is bad for the environment or to boycott a company that are using child labour in their production. There are different types of ethical consumers, depending on their motives for being ethical. These motives could be political, religious, spiritual, environmental or socially driven (Harrison, Newholm & Shaw, 2005).

In this thesis the focus has been on the environmental factors, and therefore our ethical consumer could also be called a green consumer, a consumer who is undertaking green consumption.

2.1.2.1 Information

It is a general view that the mass of information available in today’s society, mainly through media and the Internet, has increased the social and environmental awareness among consumers (Harrison et al., 2005). Even though awareness is very important it does not solve all problems. Harrison et al. (2005) clearly point out that a high awareness does not always lead to action. One of the reasons for this could be that the information necessary to make an ethical buying decision is lacking. There are different potential providers of information of this sort.

Harrison et al. (2005) write that the government can for example help the consumers choose ethical through product labelling initiatives. They can also publish information, for example over the Internet, or monitor the claims that company’s use for their products. Since there have been a lot of criticism that they are not always true, many consumers no longer believe in the ethical claims of products (Burns and Blowfield, 1999, cited in Harrison et al., 2005). The government can attempt to stop this development and make the claims more trustworthy.

Campaign groups can try to influence companies or the government’s legislation, or they can inform the consumers and thereby try to make them consume more ethical. Ways to inform consumers are for example through seminars, information stalls, media and education. Campaign groups can, like governments, introduce initiatives of product labelling schemes. NGOs can also help consumers by producing specialist ethical consumer publications, like shopping guides, magazines, websites or rate companies in order of their ethical performance (Harrison et al., 2005).

In the private sector niche ethical companies can enter the market and provide information about ethical issues, and offer their more ethical products or services to consumers. A suc-
cessful example of this, according to Harrison et al. (2005), is the Body Shop, which initially made the consumers more aware of animal testing. Mainstream companies can through their CSR reports give ethical information. Their advertising and information on their products can also be useful as a guide for the consumers, but since it has been misused by some companies claiming to be more ethical than they really are, it is not always a good method. Additionally, in some circumstances companies don’t write how environmental friendly their product really is, because they are afraid that information will not attract consumers, but rather make them think the product is of worse quality (Harrison et al., 2005).

2.1.3 Green Computers

In this section, areas where computers and production of computers can be made more environmental friendly are included. Due to lack of information this has been done through describing what computer producers are doing today. Fujitsu Siemens and Hewlett Packard are used as examples, but other companies are working with environmental issues as well. This section is divided in three parts: the production stage, the usage stage and the recycling stage.

Stevels (2000) explores the decision taken by Philips Consumer Electronics to split the green attributes into five focal areas as, energy consumption, material application, packaging and transport, chemical content/substances, durability/recyclability. Philips has also decided to make a positioning of green marketing in their product creation process after the consumer research done. This involves processes as: eco design, bringing benefit for consumers, firms, society and environment. Benefits should result from material (lower cost), immaterial (easy in use, more fun), and emotional (feel good, less fear, quality) factors (Stevels, 2000).

2.1.3.1 The Production Stage

The first, and maybe also the most important thing when it comes to environmental friendly production of computers is the energy usage. As in every other business there are a lot of measures to take to lower energy consumption. Fujitsu Siemens for example have, despite higher production, been able to cut their energy consumption in half since 1993. They have achieved this by making the most out their resources; they have incorporated an assembly line recycling system where energy and water is reused as much as possible. Further, they use technology like low energy lightings, motion detectors, concrete core cooling and well regulated air conditioning systems (Fujitsu-Siemens, 2007). Hewlett Packard is also active in searching new ways to lower their in-house energy use. They take help from their own technology using flat panel displays. They have calculated that this action alone could reduce the energy use by more than 4 million kilowatt hours per year. That equals approximately 2000 tonnes of carbon dioxide.

Looking at things affecting the environment besides energy usage in the computer industry we can see that much effort is put on hazardous substances and waste and employee travelling.

2.1.3.2 The Consumption Stage

During the consumption stage of a computer, energy consumption is definitely the most important, if not the only factor influencing the environment. It may feel like there is not
very much difference between different computers but that conception is wrong. Actually, the differences are big. Energy consumption of two new desktop computers can differ as much as 350 kilowatt hours per year. Choosing a laptop computer instead of a desktop can result in 80 per cent lower energy consumption (Energy-Star, 2007).

Also how you use the computer has an important effect on energy usage. Fujitsu-Siemens has for example introduced new power saving features such as switched monitor outlets which can lower power consumption by 50 per cent. They have also introduced new modes in their computers to make it easier for consumers to save energy (Fujitsu-Siemens, 2007).

2.1.3.3 The Recycling Stage

Most computer manufacturers work much with recycling products. For example both Hewlett Packard and Fujitsu-Siemens have a trade in program, where they offer cash in exchange for old computer hardware. Both companies also provide computers which are entirely recyclable. Fujitsu-Siemens aims to produce products that are easy to repair, upgrade, reuse and to recycle (Fujitsu-Siemens, 2007).

2.1.4 Eco-labels

The European Union eco-label called EU Flower presents itself as a guide to greener products and services, and as a voluntary scheme designed to encourage business to more environmental friendly products and services and help European consumers to easily identify them. The key aims of the label is stated as: to achieve significant environmental improvements by developing, publishing and promoting criteria that push the market forward, to ensure the credibility of the label, to encourage the manufacturers, service providers and retailers to apply for the label, to encourage purchasers to buy products and services with the label, and to improve consumer awareness and behaviour regarding the optimal use of environmental friendly products and services (EU Eco-label, 2007).

The official Nordic eco-label, The Swan (Svanen) is introduced by the Nordic Council of ministers and demonstrates that a product is a good environmental choice. The label concerns certain criteria using methods as samples from independent laboratories, certificates and control visits and it is given for 3 years' periods, in order to ensure that the products are being constantly developed (The Swan Eco-Label, 2007).

Blue Angel is an environmental label, which offers industry, trade, and craft companies the ability of documenting their environmental competence. The label is Germany based in its origin and has been used for 25 years. Today it has reached about 3600 products and services from approximately 580 label users in Germany and other countries (RAL, 2007).

The Energy Star is a global label for electronic equipment with low energy consumption in standby, created by the US Environment Protection Agency (EPA) in 1992 (Harrison et al., 2005). The European Union also use this labelling of energy efficient office equipment, the EU Energy Star. It is represented on its official page as a label which any environmental conscious manufacturer want to get and which lets the consumers pick the most energy efficient models (European Commission, 2007).
2.2 Consumer Behaviour

Before turning deeper into the subject of consumer behaviour it is valuable to know more about what is meant by the concept consumer and some short history of consumption, to get some background to where we are today. The definition of consumer behaviour is also mentioned below.

The “consumer” is a concept that has been developed in only a century. The priority for households is always to fulfil the basic needs. Only if there is money left after fulfilling these needs they can spend money on other goods, entirely free of choice. The money left for spending on other than basic needs is their “discretionary income” (Antonides & Raaij, 1998).

After the World Wars the majority of the developed countries returned to being wealthy. This meant, according to Antonides and Raaij (1998) that more people had a discretionary income. Paterson (2006), states that particularly young people have more money to spend than before. It also became a larger selection of goods to spend money on. As a result, interesting cultural changes could be seen in the society. The increased consumption created new ways of expressing status, identities, notion of belonging, and taste and style. In this new modern society, consumption is not an isolated decision on purchases, but it is a part of a larger cultural process, in which we communicate believes and taste to others in the society. Consumption has also turned into a more frequent activity (Paterson, 2006).

Antonides and Raaij (1998, p.1) explain that after the Second World War “consumer held more power because they were able to make choices about their purchases. This increased freedom of choice makes it important to gain insight into consumer behaviour to help explain preferences for products and brands”. Kotler, Wong, Saunders and Armstrong (2005) agree and state that Consumer Behaviour is important, since marketers need to understand how their customers are thinking. As Solomon (2004) point out: if firms don’t understand their consumers they have no chance of satisfying their needs, which is one of the basic marketing concepts.

Consumer Behaviour is defined as how “individuals or groups select, purchase, use, or dispose of products, services, ideas or experiences to satisfy needs and desires” by Spiegel (1996 cited in Solomon, 2004, p.7). Consumer Behaviour is going to be studied closer, as these theories could be useful to help us understand how buyers of computers make their purchasing decision and how environmental factors influence that decision.

2.2.1 The consumer decision making process

In the buying decision process the consumer passes through five stages: need recognition, information search, evaluation of alternatives, purchase decision and finally the post purchase behaviour (Kotler et al., 2005).

Solomon (2004) argues that individual decision making starts with problem recognition, and continues with information search, evaluation of alternatives, and end with product choice. Hence a learning process based on the how well the choice worked out, will surely take place after the decision is made, and this will influence the likelihood that the same choice will be made next time the need for a similar decision occurs.
Wells and Prensky (1996), has another description of the decision making process where the process is a four-step model that starts with need recognition. They first consider how consumers search for alternatives and organise the information after the need recognition. Then they examine the ways consumers evaluate alternatives and integrate the criteria into a rule which can be applied in product choosing.

These three descriptions of the consumer decision making process are not very different from each other, and their core is the same. The model by Kotler et al. (2005) is a bit more extensive though, and therefore we decided to use it in our thesis. The central topics of the consumer decision making process for our purpose are the evaluation of alternatives and purchase decision phases of the process, hence more attention is paid to these steps while other steps are included and described briefly in order to put these two stages in the right context. However, it should be stated that all stages are highly interrelated. This can easily be seen as the authors cited in this paragraph all name the steps differently although the process as a whole is to a great extent similar. Further, in reality consumers may not always follow the decision making process step by step. Instead, the consumers might go through the steps in a different manner or even skip steps.

![Figure 2.1 The consumer decision making process (Kotler et al., 2005)](image)

**2.2.1.1 Need recognition**

The buying decision process starts with the consumer recognising a need for a product (Kotler et al., 2005). Solomon (2004) states this step as; whenever the consumer sees a significant difference between his or her current state of affairs and some desired or ideal state, need recognition occurs since the consumer then perceives that there is a problem to be solved, small or large, simple or complex. According to him, this process is often stimulated by marketing efforts although need recognition can and does occur naturally.

**2.2.1.2 Information search**

Kotler et al. (2005), argue that after the need for a product is noticed, the consumer could immediately buy a suitable product if the need is strong. Otherwise the consumer might not take any action and only memorise the need. Most likely is the consumer to start the information search, in which their attention is heightened or an active information search process is started. Sources for information can be personal sources for instance family, friends or neighbours. Examples of commercial sources are advertising and sales persons. Public sources are for example mass media or consumer-rating organisations. Lastly, experiential sources are to handle or use the product (Kotler et al., 2005).

Consumers gather both general information about the product category and explicit information about actual alternatives in this step. This information is available from a number of sources; internal and external. Internal sources refer to consumer’s memories and accumulated knowledge gained from previous experiences. Internal sources are used when the
search activity is ongoing and where high involvement or accumulated knowledge exists. External sources are used when specific information is needed. This might be the case when the process involves high involvement, a new discovered need, little knowledge, marketing communications, or interpersonal communications (Wells & Prensky, 1996).

Consumers actively consider a set of alternatives called evoked or consideration set during the decision making process, which is constructed from internal memory and external sources. Of all alternatives some are excluded, the ones not considered to be bought are placed into the so called inept set, and alternatives consumers are indifferent towards are placed in the inert set (Wells & Prensky, 1996).

Molander (1998), argues that the consumer relies on the stored information in order to use in the decision making process, once the process starts. She also refers to studies done earlier which has shown that the consumer engages in relatively little external information search in a purchase decision making process, even in more complex problem solving processes. This is exemplified by a study which has shown results of 60 per cent of the purchases of new automobiles are made by one-store shoppers (Molander, 1998).

2.2.1.3 Evaluation of alternatives

Kotler et al. (2005) argue that the consumer is evaluating which product to buy in the evaluation of alternatives stage. When making this decision the consumer considers and grades the importance of many different attributes of the product. How the consumer evaluates the alternatives depends on the consumer’s personality and characteristics, but also the situation. Wells and Prensky (1996) mean that the evaluation in addition depends on the level of effort the consumer spends on the task. While buying food may be a very routine process where not much effort is spent, the process of buying for instance a car may result in a much higher level of effort spent. Further, sometimes consumers might buy a product on impulse and at other times they make their choice very carefully (Kotler et al., 2005).

Molander (1998) draws attention to the existence of evoked set in evaluation of alternatives. The evoked set consists of the products already in memory. Evaluation of products occurs interrelated to the knowledge the consumer already has about the product or the product group. The category in which the consumer places the product is determinant in its comparison with other products. Therefore the categorisation has a crucial effect on the evaluation process and the products in consumer’s evoked set are expected to share same characteristics.

The evaluation of the different alternatives occurs in two stages. First the consumer selects certain evaluative criteria and second he/she establishes a decision rule to integrate those criteria into a choice. Commonly decisions are divided as compensatory and non-compensatory rules. The choice of a compensatory versus a non-compensatory rule is among other things influenced by the consumer’s level of involvement and effort (Wells & Prensky, 1996).

Compensatory rules give a chance to the product although it does not meet certain criteria in all attributes, and require more mental effort from the consumer since it is more used in extended problem solving (Howard, 1989). When using compensatory decision rules, the consumers tend to be more involved in the purchase and thus are willing to exert more ef-
fort (Solomon, 2004). In the multi attribute compensatory rule, the consumers consider all attributes simultaneously to calculate an integrated rank ordering. The rank ordering is calculated based on all attributes weighted by their relative importance. This rule uses all of the criteria and takes their relative importance into account (Wells & Prensky, 1996).

A simple non-compensatory rule is used if the consumer has low involvement in the decision and desires to avoid applying effort in his or her choice (Wells & Prensky, 1996). When using non-compensatory rules the consumers consider each attribute by itself separately. Non-compensatory rules are made if the product knowledge or the product familiarity is low, according to Howard (1989).

However, sometimes neither compensatory nor non-compensatory rules are used; instead elimination rules help consumers to discard a number of alternatives quickly and easily. For instance consumers might choose McDonald's instead of an unfamiliar restaurant and thereby lowering the risk of non-satisfaction and the complexity of the process (Wells & Prensky, 1996).

### 2.2.1.4 Purchase decision

The two stages evaluation of criteria and purchase decision are highly connected to each other, and the processes that are described in the evaluation of criteria are true in this stage too.

The final purchase decision is also influenced by other people’s attitudes, for instance what family and friends advise. When the consumer is about to buy a product the decision might be reconsidered, due to unexpected situational factors, which could be for example that another purchase has become more important. Therefore, the first intention of the consumer might not result in a purchase after all (Kotler et al., 2005).

### 2.2.1.5 Post purchase behaviour

This last step of the model refers to the purchase results in either a satisfied or dissatisfied consumer, and this is dependent on the consumer’s expectations and the actual performance of the product (Kotler et al., 2005). Consumer satisfaction or dissatisfaction is determined by the overall feelings, or attitude, a person has about a product after it has been purchased (Solomon, 2004).

### 2.2.2 Maslow’s hierarchy of needs

This theory tries to explain why people are driven by specific needs at different times. The needs are positioned in a hierarchy according to the importance. The most commonly discussed needs are: (with the most important need first) physiological needs, safety needs, social needs, esteem needs and self-actualisation needs. People are according to this theory trying to fulfil the most important need first and only when this need is satisfied they are going to move to the next need. That can sometimes explain why people buy a specific product and not another one (Kotler et al., 2005).
The model however is not universal for all cultures. The case in the Anglo-Saxon culture values might put individualisation and self-actualisation above all, but this can not be generalised for all the other cultures. People are mostly motivated by a need for order (aesthetic needs) and belonging (esteem needs) in Japan and German-speaking countries, meanwhile, need for security and belonging motivate the behaviours in Latin and Asian countries. A European person has most likely satisfied her physiological, safety, or social needs, and her purchasing decision of an electronic device is most probably not motivated by those needs but rather an aesthetic need, estees needs, or a need for self-actualisation or cognition (Kotler et al., 2005).

2.2.3 Factors of consumer behaviour

The behaviour of consumers is influenced by cultural, social, personal and psychological factors. These factors are going to be explained shortly below, based on the descriptions by Asch and Wolfe (2001):

- Cultural factors influence consumers to a large extent, since individuals are formed by the society they grow up and live in. The individual learn the values, perceptions and preferences from the society. Each culture also consists of smaller groups of subcultures, which also influence the consumers’ behaviour, like religious groups and social classes.

- The social factors are reference groups, family, social roles and status. A reference group is a group that influences the behaviour of the individual, most likely a group in which the person belongs and interacts.

- Personal factors also affects consumer’s buying decisions and they are age and life-cycle stage, occupation, economic circumstances, lifestyle and personality.

- The psychological factors, which are for example motivation, perception, learning, beliefs and attitudes, as well as the needs consumers have. Not only basic needs, as
hunger, but also needs for recognition, esteem and belonging. The different types of needs are positioned by Maslow in his theory of motivation in the previous section.

2.2.4 Levels of decision making

The level of effort allocated to making a product choice; the time and cognitive resources the consumer spend during the purchasing process; is a useful way in categorising consumer decision making. Searching for alternative products, organising the collected information, developing criteria in order to evaluate products, and choosing which product to buy is enabled by this effort. The level of effort can be seen as a continuum divided into three categories: extensive, limited, and routine (Wells & Prensky, 1996).

Extensive decision making entails major effort in identifying criteria and choosing how to apply them to the purchase process since there is high involvement from consumers at this level. Here consumers do not make frequently purchasing decisions, but rather need to identify new criteria and apply them to the decision, because they do not keep up with the attributes of such products (Wells & Prensky, 1996). The consumer’s effort to gather new information is low in the case of limited decision making, hence the consumer applies existing criteria to a habitual purchase decision. Routine decision making involves the direct replication of a previous decision making process to habitual purchase decisions, which involves very little effort and applies to frequently purchased packaged goods (Wells & Prensky, 1996).

The level of effort is significantly influenced by the level of involvement a consumer feels toward the need. The significant risk observed in choosing the wrong product will also affect the effort exerted. Thus previous experience on a product category also has an influence on the effort level (Wells & Prensky, 1996).

In the theory of the decision making process the process is often seen as an active and deliberate problem solving process (Molander, 1998). For example, both Solomon (2004) and Howard (1989), argues that a consumer purchase is a response to a problem. Since some purchase decisions are more important than others, the amount of effort we put into each decision differs. Consumer researchers have found it convenient to think in terms of continuum, which is fixed on one end by habitual decision making while on another end an extreme extended problem solving is needed. Nonetheless, it is also found that many decisions fall in somewhere between and are characterised by limited problem solving (Solomon, 2004). Howard (1989) discusses the same range of levels of decisions, although he limits himself to three types of decisions; extended problem solving, limited problem solving and habitual problem solving. Extended problem solving processes is often started by a motive central to the self concept and the result of the process is perceived as being quite risky. Limited problem solving is much more direct. The buyer does not have the motivation to engage in an extensive information search nor to carefully consider different alternatives. Alternatives in this type of decision making are often based on one or a few alternatives.

2.2.5 Theory of planned behaviour

The most frequently used model for understanding consumer attitudes, purchase intentions and behaviour is the theory of planned behaviour (McEachern, Schröder, Willock, White-
lock & Mason, 2007). The theory of planned behaviour was developed by Ajzen in 1991 and is a social psychological theory which allows the user to investigate the influence of attitudes, personal and cultural determinants and volitional control on consumer decision intentions (Kalafatis, Pollard, East & Tsogas, 1999).

![Diagram of the Theory of Planned Behaviour](image-url)

The model includes three factors based on beliefs; attitude to behaviour, subjective norms and perceived control. Intention is a direct function of these three factors, and further behaviour is a direct function of Intention.

Attitude to behaviour (AB) is determined by the sum of the expected outcomes (outcome beliefs) and is weighted by an evaluation of the desirability of the outcome. The outcomes are also evaluated on how likely they are to happen. Further, the outcomes that affect AB are only those that are easily brought to mind by the respondent (Kalafatis et al., 1999).

Subjective norm (SN), are in the same way as AB based on beliefs easily brought to mind by respondents. These beliefs are called referent beliefs and they reflect what the consumer think that others expect him/her to do. Subjective norms controls the behaviour motivated by the will to act as other people think the consumer should act. This is an internal process which generates feelings of self respect, success or failure. Those that might influence behaviour, called referents, could be family, friends, co-workers, companies, organisations etc (Kalafatis et al., 1999).

Also the third factor, perceived behaviour control (PC), is based on beliefs, in the case it is control beliefs. In contrast to AB and SN, PC has both direct effect on behaviour as well as effect through intentions. The effect on intentions is due to the motivational implications PC might have. Expressing it differently, if a person think that he/she do not possess the necessary resources or opportunities to do something, for example buying an environmental friendly computer, he or she is not likely to form intentions to do so. As said earlier, PC also has direct effect on behaviour. People’s behaviour has been proven to be strongly influenced by the confidence they have in the matter (Kalafatis et al., 1999). According to Flannery and May (2000), PC can be divided in two parts; internal and external behaviour control. The internal control exists of the amount of information a person has, along with the person’s skills, abilities, emotions and compulsions concerning the behaviour. External control factors are those factors that are issues outside the individual. These are often situational factors and may for instance be the lack of possibility to get somewhere.
The theory of planned behaviour has been criticised on some points. Doubts have been raised because the model does not take moral/ethical obligations into account. McEachern et al. (2007) suggest that there are increasing evidence that moral obligations influence consumer attitudes and consumer behaviour. Shaw and Shiu (2002) explain that the importance of moral obligations depend on the social context. If involved in an ethical or moral intensive buying process, the decision making may in fact be driven by the moral or ethical obligations.

We have taken this criticism into consideration and when using this theory for analysing our problem we have taken moral aspects into account. Questions about our respondents’ moral obligations have been included in our post-experiment questionnaire, and have been analysed together with aspects already covered by the theory of planned behaviour.

2.3 Summary and research questions

The Frame of References provided serves the aim of creating a basis of understanding of the subject, as well as generating guidelines for the analysis.

Theory about green marketing is the first major section of the Frame of Reference, and aims to provide an explanation of its possible effects on the consumer and consumer behaviour in the context of buying green products. The definition of green marketing by Flodhammar (1991) is: “Green marketing is a social process by which individuals and groups obtain what they need and want through exchanging products and value with others in an ethical way that minimises negative impact on the environment” is studied and its interrelation to previously failed approaches that created a suspicion on green products are discussed. The clarification of ethical consumer theory is further developed by the explanation of green computers theory in the stages of production, consumption, re-cycling, and eco-labels.

Consumer Behaviour theory prefaces the section through exploring the concept of consumer and the history of consumption, and also defining the term of consumer behaviour. Different approaches on the consumer decision making process by Solomon (2004) and Wells and Prensky (1996) are presented, yet it is Kotler et al. (2005)'s perspective being employed as the main reference, and the steps of this process are then further explored from his point of view; need recognition, information search, evaluation of alternatives, purchase decision, and post-purchase behaviour. Evaluation of alternatives and purchase decision has been emphasised because of their higher relevance to our purpose. In order to understand this process in depth some of the major influences on decision process are then studied: the theory of motivation by Maslow, factors of consumer behaviour, levels of decision making, and theory of planned behaviour.

To reach the purpose of our thesis we have formulated two research questions:

Research question 1: Is environmental friendliness valued by consumers when buying computers?

Further, this question can be divided. We have done that by stating two hypotheses in order to investigate if they can be supported by our empirical findings:
Hypothesis 1: Environmental friendliness is the least important attribute to the purchase decision of the attributes tested.

Hypothesis 2: High environmental friendliness will be preferred in front of lower environmental friendliness by our respondents.

Research question 2: How can the obtained values of environmental friendly computers be explained by consumer behaviour theory?
3 Method

In this section the research methods we have chosen are presented and discussed. First the research approach, research strategy, qualitative and quantitative methods are considered, before going through what a conjoint analysis is and explaining our research plan, in which we tell how we have designed our research and how the data are collected and interpreted. The last matter for discussion is the reliability, validity and generalisability of the research.

3.1 Research approach

There are two research approaches that can be used: deductive and inductive. In the deductive approach the process starts with stating a hypothesis from available theory, which is later tested with the collected data. The result of this approach is thus to test weather the hypothesis is applicable for the chosen case, and if it is necessary to change the theory. One characteristic of the deductive approach is that it aims at generalisation. Therefore, in order to be able to generalise about human behaviour the sample selection is important (Saunders, Lewis & Thornhill, 2003).

The other research approach is inductive. In this approach the researchers collect data and are then tries to make sense of the data through analysis. This data analysis leads to the development of theory. One possible objective of an inductive approach is to get a feeling of what is going on and to get a better understanding of a problem. In contrast to the deductive approach, the inductive approach is more flexible in the way that it is possible to suggest alternative explanations of what is going on (Saunders et al., 2003).

The approach used in this thesis was a deductive approach. We have stated two hypotheses, which we came up with from our theoretical framework. When the data was collected, we tested our hypotheses against the data and made a conclusion if the hypotheses were supported by the results or not. Further, we analysed the result with help from the theories in our theoretical framework. This approach resulted in a theoretical contribution.

3.2 Research strategy

We used a multi-method approach, in which we combined an experiment with expert interviews before the experiment and questionnaires afterwards. A multi-method approach is when more than one research method is used in a thesis, which is often beneficial. One reason is that different methods can help fulfil different parts of a thesis (Saunders et al., 2003). That is how we have used the different research strategies in this thesis. The expert interviews helped us to construct the experiment in an accurate way, the experiment was used to collect our main data, about how different product features of computers are ranked and how important environmental friendliness is, and the questionnaires gave us more information that helped us analyse our data from the experiment.

The main research strategy that was used in this thesis is an experiment. According to Saunders et al. (2003) this is a classical form of research which often involves a theoretical hypothesis, a sample from a known population, a change in one or more of the variables, measurement on few of the variables and control of the other variables. Bryman and Bell (2007) state that in a true experiment the independent variables are manipulated with the aim of deciding if and how this changes the dependent variable.
There are two different types of experiments: field experiments and laboratory experiments. Field experiments occur in real-life setting, while laboratory experiments take place in a laboratory or another controlled contrived and controlled setting (Bryman & Bell, 2007). In laboratory experiments the researcher has greater control over the experimental arrangements and the setting. Another advantage is that laboratory experiments are easier to repeat, since they don’t involve as many arrangements that are difficult to reproduce as field experiments. There is often a high experimental realism in laboratory experiments, which is emphasised by Aronson & Carlsmith (1968, cited in Bryman & Bell, 2007), and it means that the respondents of an experiment are involved and taking the experiment very seriously. However, there are also disadvantages of laboratory experiments. The setting of the laboratory might be unrelated to the context and experiments in the real world. Thus another matter is that it is difficult to know how applicable the results from the laboratory experiment are to the real world (Bryman & Bell, 2007). Some of these issues are discussed further under the validity and reliability heading in the end of this section.

3.3 Qualitative versus Quantitative

In quantitative research numerical data is collected, while qualitative research is dealing with non-numerical data (Saunders et al., 2003). Richards (2005) state that the data needed in qualitative research is often more complex, since it will only be understood in relation to the context. The purposes of a quantitative research are often generalisability, prediction or causal explanation, while the purposes of qualitative research often are contextualisation, interpretation or understanding the perspectives of the actors (Siegle, 2007).

Since the strategy of this thesis was to collect quantitative data through an experiment, analyse the data with conjoint analysis, which gave us statistical measurements, and that we tried to make theoretical generalisations, this is a quantitative study. Even though this is mainly a quantitative study some qualitative data was collected and analysed through expert interviews and a post-experiment questionnaire.

3.4 Conjoint Analysis

Malhotra and Birks (2000, p. 632) describe that conjoint analysis “is a technique that attempts to determine the relative importance consumers attach to salient attributes and the utilities they attach to the levels of attributes”.

According to Aaker, Kumar and Day (2003) conjoint analysis is a very functional tool. It is often used in marketing, where it can be appropriate for selection of features to offer in a new or modified product/service, setting price levels or trying out a new concept of product/service. Wittink and Cattin (cited in Malhotra & Birks, 2000) report that conjoint analysis has been used in areas of new product and concept identification, competitive analysis, pricing, market segmentation, advertising and distribution.

The conjoint analysis starts with the attributes being divided into a number of levels. These levels of each attribute are then combined into profiles. This is the profiles the respondents should evaluate in terms of desirability. Conjoint analysis is therefore dependent on the respondents’ subjective opinions (Malhotra & Birks, 2000). The steps in which attributes and levels are chosen will be explained more extensively below, when we write about the different stages of the research plan.
Instead of interviewing consumers of what features they consider important in a product, a conjoint analysis makes the researcher able to see how the consumer make trade-offs between certain attributes. The problem when asking the consumers of which attributes they think is important is that they tend to answer that all the attributes are important. Conjoint analysis force the consumer to think about if one attribute is so desirable that it is reason enough to sacrifice another, and if they had to sacrifice an attribute, which one would it be? In this way the researchers can get more sensitive and useful information than would be obtained by just asking the consumers (Aaker et al., 2003). This also gives a more realistic situation, since the consumer in reality might not find a computer with all the important attributes with a suitable price, but rather need to choose the best alternative.

Limitations of conjoint analysis are that it assumes that it is possible to identify the important attributes and that consumers make evaluations with these attributes in mind and in that way make trade-offs between different alternatives. What it does not consider is that there are situations where image and brand name is thought of as more important by the consumer than the attributes of the alternatives. It is also a risk that the trade-off model not represents the choice process the consumer goes through, even if the consumer actually considers product attributes (Malhotra & Birks, 2000).

Another limitation is according to Aaker et al. (2003) that the full-profile approach, which is the one used in this thesis, can be a highly demanding task for the respondents. Therefore the number of attributes that can be used is limited. Gustafsson, Hermann and Huber (2001) mean that the limit is four attributes with three levels, since more attributes and levels would make the rating of the profiles very complex for the respondents, and they might also not be able to rank the profiles in the same way if they were asked to do it again.

3.5 The research plan

Gustafsson et al. (2001) points out the importance of determining a research plan of the process before carrying out a practical conjoint analysis. They also underline the significance of not carrying out each step after each other and making decisions independently, although each step by itself can be suitable for revealing findings. Gustafsson et al. (2001) build their flow diagram of conjoint analysis on seven steps: selection of the preference function, selection of data collection method, selection of data collection design, selection of the way the stimuli are presented, selection of data collection procedure, selection of the method for evaluation the stimuli and estimation of benefit values.

Malhotra and Birks (2000) list the steps in conjoint analysis as formulate the problem, construct the stimuli, decide the form of input data, select a conjoint analysis procedure, interpret the results, and assess the reliability and validity. In this process identifying the significant attributes and attribute levels is involved at the first step, and these are used to construct the stimuli to be used in a conjoint evaluation task. The data obtained after the respondents rate or rank the stimuli using a suitable scale is then analysed. At last the reliability and the validity of the interpreted results are assessed.

The most appropriate model for explaining our process is presented by Korpe et al. (2002). This one is more suitable for us, since the flow diagram by Gustafsson et al. (2001) starts earlier in the research process, with selecting data collection method for example, which we already done; instead we wanted a model only for the conjoint analysis process. The model
by Malhotra and Birks (2000) also start earlier, with the formulation of the problem, and their model don’t seem to go through the selection of the conjoint analysis design in as much detail as the model by Korpe et al. (2002), for example they don’t include the “selection of attributes” stage.

The structure Korpe et al. (2002) use in conducting conjoint analysis is based on a five-step process. In order to create an analysis that reflects the reality well, one must carefully consider each step and combine attributes and attribute levels that will give the respondents a chance of perceiving an alternative as the most beneficial. In figure 3.1, the structure implied for performing the conjoint analysis of this paper can be seen.

![Figure 3-1 The research plan of conjoint analysis (Korpe et al. 2002)](image)

Gustafsson et al. (2001) further argue that a good conjoint analysis occurs if the process is hypothesis driven. Each stage shall be used in order to approve or reject potential solutions and people who will make the decisions as a result of the research shall be fully involved with the project at all times. In order to perform this analysis some key assumptions are to be integrated according to Korpe et al. (2002), as every product alternative is a roll of different attributes and levels, and attributes can vary as psychological or physical, there are differences in consumer preferences for attribute bundles. As a result a ranking of consumers’ perceptions on utility values of each attribute level was used in this thesis. This allowed us to see which attributes that are perceived with highest values in comparison to others.

### 3.5.1 Stage 1: Selection of attributes

In order to structure the different profiles within conjoint analysis process, the attributes and attribute levels are selected. Expert interviews were held in the selection of attributes stage. Expert interviews are interviews that are made with individuals who are considered to be influential, famous and/or well-informed in the particular area studied. Hence, they are interviewed because of their expertise about a specific matter. In that way valuable information can be reached (Marshall and Rossman, 1999).

In our case we choose to interview sales personnel within the computers sections of Sweden’s major electronic device retailers. We consider the sales personnel to have a valuable knowledge about what kind of attributes the consumers are asking for when purchasing a computer, since they have close contact with the consumers by informing and helping them in their purchasing decision process. We used a semi-structured qualitative interview.
method when we made our expert interviews, and had pre-determined questions prepared (see appendix A). One of the questions we asked was about which the in general most important characteristics are that the consumers demand when buying a computer. In total eleven salesmen where asked about their opinion. Since we after eight interviews realised that we were getting answers similar to the information from previous interviews and after three more we still did not get any new information, we considered this number of interviews to be sufficient. The interviews took place in an informal manner, in the sense that we simply approached the personnel in the store and asked them if they could spare some time to answer our questions.

By this method, we obtained three important attributes: Price, Performance and Accessories. In addition, in essence with our purpose, environmental friendliness has been added as the fourth attribute.

3.5.2 Stage 2: Choosing stimulus representation

After the selection of the most relevant attributes based on the results of the expert interviews, the results of the expert interviews was once again considered in the division of these attributes into different levels in order to create trade-offs between different profiles. The alternatives provided by the interviews were first discussed in comparison and in relation to results of further online research for the most relevant attributes and their possible levels. By using brainstorming as an internal search, the outcome of the discussion about the comparison of alternative levels on each attribute selected provided the most relevant attribute levels for this paper.

A combination of three levels on each of four attributes was acquired. The result of $3^4$ combination of conjoint analysis plan, meaning four chosen attributes and three different levels for each attribute. The dependent variable is the purchasing decision of consumers on computers, while independent variables are presented below.

**Price**: The importance of price in purchase decisions is well known and there was no need to exaggerate price levels in our experiment since it is environmental friendliness that is to be examined and not only its relation to price. Therefore, we have decided not to put the price levels very high. On the other hand, too low prices and price differences could result in price not being considered at all. We have examined price levels in some computer stores and decided that price levels between 6000 and 8000 SEK are applicable for our study. Hence, the levels were decided to be 6500 SEK, 7000 SEK and 7500 SEK.

**Performance**: As a result of the expert interviews we found that processor, memory and hard drive were characteristics valued most by consumers when it comes to performance. By doing some brainstorming as well as looking at existent computers for sale we decided that our levels would be: Dual Core Processor, 2 GB Memory and 220 GB Hard Drive. These levels are in line with what is currently seen as a high performance on a laptop computer today. Since they all represent the best alternative possible none can be seen as better rather respondents have to make tradeoffs based on their own preferences.

**Accessories**: Wireless LAN, DVD writer and Windows Vista Home Edition was decided to be the levels for accessories. This was based on the answers we got from experts, who commonly said these are important traits. In similarity to the performance levels, we can
not say that one of these levels is better than the other. Thus, the respondents will face a trade off situation.

**Environmental Friendliness:** In a decision process of choosing between different computer profiles, especially in its relation to the purpose of the paper, environmental friendliness was a given choice as an attribute. However, in similarity to price attribute, it is likely to have different levels of environmental friendliness rather than trade-off alternatives as it was in Performance and Accessories. Thereby, environmental friendliness of the computer was presented in levels as 1, 3, and 5 on a scale reaching from 1 to 5; where 1 being the least environmental friendly and 5 being the most environmental friendly. The final levels of attributes are presented in table 3.1 and the profile cards are presented in appendix C.

One can see a difference between how we chose to divide the levels of each attributes. Price and environmental friendliness has been divided in three different levels while performance and accessories are structured more like trade off. The reason for this is our belief that if having levels at performance and accessories these attributes would be too heavily correlated with price. Instead we chose these types of levels where respondents have to choose one accessory or performance level over the others. This type of research design is rather unorthodox when looking on previous conjoint analysis. However, it has been done before. Wittink, Krishnamurthi and Nutter (1982), uses attributes like job location and functional activity with levels Chicago, Dallas, New York and San Francisco and auditing, consulting, investment, banking and marketing research when researching what influences a students when making the decision what summer job to take. Korpe et al. (2002), also uses attribute levels similar to ours when they include levels MP-3 Player, Colour-Display + Digital Camera and 3G in the attribute features when testing what influences a purchase decision of mobile phones. Further, textbook authors Malhotra and Birks (2000) and Aaker et al. (2003) give examples of conjoint analysis using similar attribute levels to ours.

<table>
<thead>
<tr>
<th>Price</th>
<th>Performance</th>
<th>Accessories</th>
<th>Env. Friendliness</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 500 kr</td>
<td>Dual Core Processor</td>
<td>Wireless LAN</td>
<td>Env. Friend. 1</td>
</tr>
<tr>
<td>7 000 kr</td>
<td>2 GB Memory</td>
<td>DVD writer</td>
<td>Env. Friend. 3</td>
</tr>
<tr>
<td>7 500 kr</td>
<td>220 GB Hard Drive</td>
<td>Windows Vista Home</td>
<td>Env. Friend. 5</td>
</tr>
</tbody>
</table>

Table 3-1 Attributes and levels of attributes for the conjoint analysis

Table 3-1 represents the $3^4$ combination results in a possibility of 81 computer profiles that the respondents can choose among. However, it would have been impossible for the respondents to make a relevant choice among so many alternatives, as well as it would have been unfeasible for us to draw conclusions of the choices made. In order to solve the difficulty mentioned, it was necessary to apply a system design which could make complex design more feasible and compact. For this intention, an orthogonal design was done by using Statistical Package for the Social Sciences (SPSS) which neither causes side effects nor make attributes dependant on each other. Thereby it reduces testing and development time (SPSS Inc. 2007). By using this method, a combination of 9 profiles instead of the original 81 was gained (see Appendix B), and those 9 profiles will explain the same results as it would be in the case of 81 profiles mentioned. The accurateness and strictness of the experiment will remain strong although the number of profiles will decrease radically.
Moore and Holbrook (1990) argues that orthogonal designs in conjoint analysis can produce some unrealistic attribute combinations, for instance low-prices luxury cars; very powerful, low wattage air-conditioners. Hence this might be the case in this experiment as well, for instance a computer profile of 6500 SEK and the best level of environmental friendliness could be perceived as unrealistic. There have been arguments for avoiding this kind of non-representative stimuli. However, Moore and Holbrook (1990) mean that empirical evidence has shown that problems arising due to environmental correlated attributes are less serious in practice than they have been argued to be in theory. Therefore, the authors state that using an orthogonal design will have none or a minimal impact on the reliability and validity of the experiment results.

3.5.2.1 Saturated design

In a traditional conjoint analysis a researcher includes at least the amount of profiles ranked by the respondents should be 1.5 to 3 times more than the parameters to be estimated. In our experiment we have used a saturated design. Rechtschaffner (1967), states that a saturated design is frequently used when researchers wants to test a set of independent variables on a dependent variable with the fewest test possible. Further, Fang, Lin, Winker and Zhang (2000) writes that a saturated design is when the number of experiments (profiles) equals or is less than the number of parameters to be estimated. In our experiment, this allows us to test all our parameters with the use of nine profiles. This will ease the strain on our respondents since they will have to rank fewer profiles. The positive effect of lower strain levels of our respondents are more discussed in section 3.6. The drawback in this kind of design is that the researcher will not be able to provide an estimate of the experimental error. Lin (1995), states that non-orthogonality would decrease the efficiency of a saturated design experiment. Therefore, one should try to use designs that are as “near orthogonal” design as possible. We have assured that this is the case in our experiment through using SPSS to generate an orthogonal design for us.

3.5.3 Stage 3: Choosing Response Type

There are different types of responses the researcher can ask the respondents for. They could be asked to rank or rate the alternatives. In the rating method respondents grade the perceived value on a numbered scale. When using this method many alternatives can get the same rating, and then they are all of the same preference level. In the ranking method the respondents instead rank the different computers in the order they prefer them, i.e. which one they are most likely to buy until the one they are least likely to buy (Gustafsson et al., 2001).

There is also a method called choice method, in which the respondent is asked to choose the one alternative they prefer the most in different choice sets (Haaijer & Wedel cited in Gustafsson et al., 2001).

We have chosen to use the ranking method, in which we get information about which computer respondents would rank as their number 1 to 9. This will give us a full preference structure for all the nine computers. When choosing what kind of response type we should use we knew that we wanted to create an experiment as close to reality as possible. Those in favour of ranking mean that this method accurately reflects the consumers’ behaviour in real situations (Malhotra & Birks, 2000). In real buying situations the consumers can only buy one computer and they have to make a choice. Hence, the consumer has to do a trade-
off between the different computers, which could be really difficult. This made us consider the choice-based conjoint analysis, but then we would only get information about their first choice. Since we thought it would be valuable for us to know the rank of all the nine computers, we have instead chosen the ranking method. This is still quite realistic, since the one they rank as number one is the one they will choose in a choice method. The only difference is that now we get additional information about the following choices the respondents make.

3.5.4 Stage 4: Collecting Data

3.5.4.1 Sample selection

The aim of a quantitative study is to make generalisations about a population; however it is most often impossible to study the whole population. Therefore, in every research process, it is an important step to decide which sample to study (Marshall, 1996).

There are two sampling procedures available, probability and non-probability sampling. In probability sampling all population members has a known equal probability to be included in the sample. To be able to determine this probability a sampling frame is needed as well as information on the sampling units (Aaker et al., 2003).

In non-probability samples the respondents are chosen from the population because they have special traits or qualities that are interesting for the researchers. Further, non-probability sampling methods allow a sample to be selected even though no complete sampling frame is available (Hague, 2006). Aaker et al. (2003), states that in this way, non-probability sampling eliminates the costs and trouble involved with developing a sampling frame.

In this thesis we have chosen to use non-probability sampling. The main reasons for this are our time and resource constraints. We have no access to any sampling frame and developing one would be too costly especially in the terms of time.

Hague (2006) argues that when non-probability sampling is used the researchers should identify groups from the population and after that take the samples from those groups.

In our thesis the group drawn from the Swedish population will consist of persons between 20 and 30 years old. Individuals between these ages have grown up with computers and therefore many of them have a lot of knowledge about computers. We also assume this part of the population to be more knowledgeable about environmental issues, since they have been educated about these issues in school. Because of the characteristics mentioned, we think this sample group could have some knowledge and interest in green computers.

When selecting the sample a number of different techniques can be used. Hague (2006) as well as Aaker et al. (2003) distinguish between four types of non-probability sampling procedures: judgemental, snowball, convenience, and quota sampling. We will make use of primarily a mixture between judgemental and convenience sampling.

In judgemental sampling the researchers use their own judgement on which persons they will choose for the sample (Hague, 2006). Aaker et al. (2003) means that judgmental sampling is often associated with some sort of bias, however in some situations the technique is useful or even advisable. One situation where it is useful is where researchers want a
sample that is deliberately biased. This is where we will make use of the judgmental sampling technique. We want our sample to consist of people that are planning to buy computers within the near future and people that have just bought a computer. This may cause a bias in the sense that these people are more likely to be informed about computer traits as well as having a stronger interest in being a part of our experiment than people not planning to buy a computer. We think that this bias is useful since people actually buying a computer are biased in the same way.

A convenience sample is a quick and inexpensive type of sampling. The procedure is basically that the researchers contact sampling units that are easily available (Aaker et al., 2003). In our case this means that we will contact friends, family, colleagues etc. that we know have bought or are about to buy a computer. The convenience sample technique will also allow us to approach random people to see if they fit into our sample and asking them if they would like to be a part of our research.

Shepard and Zacharakis (1997, cited in Chabo & Saouma, 2005) state that a sample of 50 respondents is sufficient number when making a conjoint analysis. Our sample will consist of approximately 40 to 50 respondents. That should be enough in order to make theoretical generalisations based on our results.

### 3.5.4.2 Experiment procedure

When discussing the setting of experiments there are often two main categories of experiments mentioned. Field experiments takes place in a natural setting and would imply that we took our respondents to a real store selling computers to conduct our experiments (Aaker et al., 2003). Laboratory experiments on the other hand take place in an artificial setting where the researcher constructs the desired conditions (Malhotra & Birks, 2000). Experiments in artificial settings tend to be less expensive than field studies but on the other hand respondents are more likely to be subject to demand artefacts. When choosing or experiment setting we have looked upon these issues together with the issue of internal versus external validity, which will be discussed more in depth in section 3.6. We have made the decision that laboratory experiments will suit us the best, much because of the costs and difficulties associated with bringing our sample units to a computer store.

The respondents were shown profile cards with a picture of the computer and a list of the computers characteristics. Showing pictures is, according to Green and Srinivasan (1978), a good way for researchers to make the experiment task more interesting and the stimuli more realistic. However, they also say that pictures may result in that the consumers make judgments based on characteristics that where not intended to be included in the experiment. Therefore, we have all our computers have the same design as well as no brand. We then asked the respondents to rank the computers (see appendix C).

### 3.5.4.3 Post-experiment questionnaire

After the respondents ranked the computers, they were also asked to fill in a short questionnaire. The reason was that we wanted to get some additional information, which gave us a greater opportunity to make a valuable analysis.

A questionnaire is most often used in a survey strategy, but they can also be useful in experiments and case study strategies. It can be used as the only data collection method, but it
is usually more valuable in combination with other methods, in a multi-method approach (Saunders et al., 2003). This is how a questionnaire was used in this thesis.

A questionnaire is a good and efficient method when the researcher wants to collect data from a large sample since each respondent is asked to respond to the same questions; it’s not specialised to fit any person better than another. Using questionnaires is yet more difficult than it can seem. One of the reasons for this is that it is important to construct the questionnaire with caution, in order to ensure a high response rate, validity and reliability. Another important factor to think about is that the questionnaire should be good enough to collect the data that are needed to answer the research questions and fulfil the purpose of the thesis (Saunders et al., 2003). Ways to maximise the response rate, validity and reliability is according to Saunders et al. (2003) to carefully design each question, make a clear layout of the questionnaire, to write an adequate explanation of the questionnaire’s purpose, make a pilot test before the real data collection starts and to administrate the questionnaire in a careful manner.

How the questionnaire should be designed depends on how they are administered. The one used in our research is a self-administrated questionnaire – one which is completed by the respondents themselves (Saunders et al., 2003).

The questionnaire was built of three types of questions. The first two questions are basic questions about the respondent, which are very easy and quick for them to fill in. The first one about the age of the respondents is a quantity question. The second one is a categorical question where the respondent selects the gender.

The rest of the questions are likert-style rating questions, which are commonly used to collect data on the respondents’ opinions. This type of question is a statement and the respondent should answer if they agree or disagree with the statement. The most common scales are four-, five-, six- or seven-pointed scales (Saunders et al., 2003). We have chosen to use a five-point scale, in which we also get answers about how strongly the respondents agree or disagree (see the questionnaire in appendix D). The five answer alternatives were do not agree at all, agree a little, agree partly, agree much and agree completely. The reason for having five answer alternatives was that it gives the respondents the opportunity to answer agrees partly, which is an “in-between” alternative, when they can not answer either if they agree a little or much. With more than five alternatives it might be harder for the respondents to choose one answer and also more difficult to analyse, since the answers could be more widely spread.

In order to avoid confusing the respondents we used the same response scale for all the statements (Dillman 2000, cited in Saunders et al., 2003). We also included one negative statement in the questionnaire, since including both positive and negative statements according to Saunders et al. (2003) make the respondents more careful reading the questions and answering them.

The reason why we didn’t choose interviews afterwards the experiments, instead of questionnaires, is that interviews would have been more time-consuming and the respondents of our experiments could thus have been unwilling to be interviewed.
3.5.5 Stage 5: Interpreting Output

The results obtained from respondents taking part in our experiment has been analysed in SPSS. With the help from the computer program, a multiple regression analysis has been done to obtain the utility levels for each attribute and level. Regression analysis is used by most researchers and provides a simple yet exact way of measuring the collected data (Aaker et al., 2003).

According to Pallant (2001) a multiple regression model is typically used to address a certain kind of research questions. One of them is when to decide which variable in a set of variables is the best predictor of an outcome. Hence, a multiple regression model suits the purpose of our report in a good way.

There are several types of multiple regression analyses available. The main types are standard, hierarchical and stepwise. We use standard multiple regression which means that the independent variables are entered into the equation simultaneously (Pallant, 2001).

There are some assumptions of multiple regression analysis. One of them is that of multicollinearity. Multicollinearity exists when the independent variables are highly correlated. We have tested the existence of multicollinearity by looking at tolerance values calculated by the multiple regression programs. If this value is low then it indicates that the multiple correlations with other variables are high, thereby suggesting multicollinearity (Pallant, 2001).

The second step of interpreting the outcome of our regression has been to evaluate the model by looking at the statistical term R Square. R Square measures the proportion of the variation in the dependent variable that is explained by the combination of the independent variables in the multiple regression models. Thus, it measures how well the regression model fits the data (Aczel & Sounderpandian, 2002).

The third step of analysing our results has been to evaluate each of the independent variables and to see which of the attributes and levels in the model contributed the most to the purchase decision of a computer. To do this we look at the values under Standardised Coefficients from the SPSS table. “Standardised” means that the values for each of the levels has been converted to the same scale, making it possible to compare them to each other (Pallant, 2001).

When doing the regression analysis, we used dummy variables to assign the levels of each computer (see appendix E). Therefore, the output from SPSS has been recalculated to obtain the final utility values.

Also, to make our results easier to understand, the utility values for each level of each attribute has been recalculated to fit on a scale reaching from 0 to 1. Thus, it is important to understand that here the utility value 0 does not imply that respondents were indifferent to this level. Rather, it is the level least valued by consumers. It also implies that a utility value of 0.5 in this case is half of the highest utility value.

When analysing our post-experiment questionnaire the answer alternatives from our questionnaire have been given numbers from 1-5, for each question, where 1 is don’t agree at all, 2 is agree a little, 3 is agree partly, 4 is agree much and 5 is agree completely. These numbers has then been written into SPSS for each question. In that way we could make de-
scriptive statistics (frequency tables) and charts showing our results. Especially the bar charts make it easy to get a good overview of the results of the questions.

3.6 Validity, Reliability and Generalisation

Green and Srinivasan (1990) as well as Aaker et al. (2003) reports that conjoint analysis provides a substantial level of validity. However, the validity of a conjoint analysis depends to a great extent if concepts in the experiment are clear and properly operated. Variables not included in the experiment will not be available for analyse and this might mean a risk for the researcher. Statistically the validity of the conjoint analysis will increase with the number of attributes, and thereby the number cases each participant completes. However, more attributes and hence more cases might cause too much strain at the respondent and lead to information overload. This would also reduce the validity of the experiment. Therefore the number of cases evaluated by the respondents must be reasonable (Bruns, 2004).

To make sure that the most important attributes will be included in our conjoint measurement we have conducted expert interviews where salesmen at electronic device retailers has been asked to list the most important variables influencing peoples buying decision of computers. Together with using our own knowledge about computers and this paper in specific, through brainstorming, and an online research, we are confident that the attributes and levels used in our experiment will assure a good validity. It can also be mentioned, since we are more interested in learning about the relation environmental friendliness has to the dependant variable and to the other independent variables, rather than looking on how well the dependent variable are explained by all independent variables, it may not be that devastating for our purpose if we missed an important attribute. Further, as mentioned it is important to expose the respondents to a reasonable number of cases. Bruns (2004) argues that empirical evidence suggest that 30 cases per respondent is a reasonable amount. Using an orthogonal design we have managed to decrease our experiment to 9 profiles while keeping the accuracy of the experiment (Gustafsson et al., 2001).

Another important issue when discussing validity is that of external versus internal validity. In our case this question is highly related to the setting we choose to conduct our experiment in. Conducting the experiment in an actual electronic device retail store could result in a higher external validity. If an experiment has high external validity it means that the results of the experiment would hold also outside the experiment setting. On the other hand, if holding the experiment in an electronic device retail store it would decrease the internal validity of our research in the sense that respondents are exposed to influences that might have an effect on their responses, not manageable for the researchers. Therefore it is always a trade off decision between making field studies or laboratory experiments. We have chosen to sacrifice some of the external validity when making laboratory experiments mainly because we in this case value internal validity higher and the cost associated with field studies are too big (Aaker et al., 2003). However, there are ways to increase the external validity in a laboratory experiment. Malhotra and Birks (2000) argue that the lack or realism in a laboratory setting does not need to lead to lower external validity. Further they state that one must be aware of the aspects different from the real situation. External validity will be decreased only if these aspects interface with the independent variables. In our case one of the independent variables are likely to be different from an actual purchase, the environmental friendliness. This is because real computer stores are not likely to have any information of how environmental friendly a computer is. On the other hand we can in-
crease external validity by making the experiment situation more realistic. One example would be to use real computers for the respondents to choose from. In our case we have used pictures, which will not influence validity as much as real computers would do but still it adds some realism to the experiment. The reason for not using computers is that it is very hard to get access to nine new computers with a similar design. We have used the same computer on all pictures changing only the colour of the screen. We have been aware of the fact that in a conjoint analysis one should keep all the conditions the same except the attributes which are to be tested. However, we feel that this violation will have no influence on the results since it is of a very minor importance to the consumer what colour the screen saver has when buying a computer.

In relation to the issues discussed, Green and Srinivasan (1990) reports that to achieve as high validity as possible the experiment should take place as close to an actual purchase decision as possible. This indicates that the greatest validity is achieved through field studies in computer stores and not doing so would make this risk for errors higher. To minimise this risk, and to get as close to the actual purchase as possible, although making laboratory experiments, we have decided to only include persons who will buy computers in the near future and people who have just bought a computer in our sample.

According to Malhotra and Birks (2000), demand artefacts may be another problem related to doing laboratory experiments. This is a phenomenon where respondents guess the purpose of the experiment and tries to answer accordingly. We feel that this might be a problem for us since we include the attribute environmental friendliness in our computer profiles. Environmental friendliness is not likely to be coupled with computers by our respondents and therefore the purpose of our study might be rather easy to guess. To minimise this risk we have chosen to mention all attributes to the respondent before the experiment, not putting any emphasis on any of them. Further, one can reason that this might not be a problem because of the fact that if environmental friendliness would be mentioned by retailers it would probably be done in a similar way as our experiment.

Our experiments and questionnaires were all undertaken in Swedish, our native language. The reason for this is because our sample group consisted of Swedish speakers only and to avoid misunderstandings and misinterpreted questions this was the best way to do it. After the experiment, the experiment form and the questionnaire have been translated to English. We have done this very carefully in order not to change the meaning of any of the questions asked and in that way misinterpret the results. There was no need to translate the answers from our respondents since their responses were numerical.

When looking at the reliability of our research, much of it can be explained by how well the respondents understood the experiment and if the task was taken seriously. If respondents have difficulties in understanding the task they are assigned or are not at all willing to do it seriously, this will undermine the reliability of our results (Bruns, 2004).

We avoided situations where respondents do not understand what to do by giving them a thorough explanation of their task as well as assisting them if they have any question. Further, we have decided to let the respondents rank the alternative computers instead of putting a rating on them. According to Green and Srinivasan (1978) this approach is likely to be more reliable since it is easier for respondents to say which computer they prefer instead of rating their preference. Further, we have decided to only use persons who are about to
buy a computer or persons who have just bought a computer in our sample. This action is increasing the reliability of our results in the way that respondents are more motivated in taking part of the experiment.

Generalisability is to which extent one can generalise from the results of the experiment. Malhotra and Birks (2000) states that results gained from non-probability samples are not statistically projectable to the whole population. However, the purpose of our thesis is not make statistical generalisations to the whole population but rather to test the relationship between environmental friendliness and our dependent variable. Therefore, supported by Courtright (1996), the makeup of the sample becomes a secondary issue for us. Further one can claim that we are aiming towards doing some theoretical generalisations. Smaling (2003) means that theoretical generalisation is when you can generalise from one case to another case that belong to the same scope of theory. In other words, even though we can not generalise our results to the whole population one will be able to use our results as kind of a theory when analysing other consumers’ behaviour.
4 Results and Analysis

In this section the results from our conjoint analysis and questionnaire are presented and analysed. The structure follows the research questions and the theories in the Frame of Reference. Each question and theory are analysed separately.

4.1 Statistics from experiment

The sample group of a conjoint analysis experiment requires an amount of respondents equal to 10 times the amount of attributes, and since our experiment involves 4 attributes the aim was to have a sample group consisting of 40 to 50 respondents. Some of the people who were contacted did not want to or did not have time to participate in the experiment, while 2 of the respondents had a misunderstanding in filling in the experiment so their answers were excluded from the data presentation and analysis. This resulted in a sample group of 41 participants for both the experiment and the questionnaire, consisting of 22 female and 19 male respondents. The sample group was chosen between respondents of people between 20 and 30 years old, as mentioned earlier, and the mean value of age distribution of the sample group is 24,31. More detailed information about the age and the gender distribution of the sample group can be found in Appendix F.

The first thing we have done when analysing the output we got from our regression model in SPSS is to check for multicollinearity.

\[
\begin{array}{|c|c|c|c|c|c|}
\hline
\text{Model} & \text{Unstandardized Coefficients} & \text{Standardized Coefficients} & \text{Collinearity Statistics} \\
\hline
1 & \text{(Constant)} & 4.366 & .000 & .112 & .750 & 1.333 \\
& prix7000 & -1.71 & .000 & .367 & .750 & 1.333 \\
& prix7500 & -5.61 & .000 & .391 & .750 & 1.333 \\
& Port220GB & 203 & .000 & .414 & .750 & 1.333 \\
& PerDKP & 634 & .000 & .717 & .750 & 1.333 \\
& AssDVD & -1.098 & .000 & .813 & .750 & 1.333 \\
& AssVis1 & -1.244 & .000 & .207 & .750 & 1.333 \\
& Env3 & .317 & .000 & .478 & .750 & 1.333 \\
& Env5 & .732 & .000 & & & \\
\hline
\end{array}
\]

Table 4-1 Coefficients output from SPSS

According to Pallant (2001) the possibility for multicollinearity is high when the tolerance level is close to zero. The output in table 4-1 tells us that the tolerance value for each of our levels are .75, thus we do not appear to have violated this assumption.

The second step we took was to evaluate our model by looking at the value R Square, which can be seen in table 4-2 below.
The value obtained for R Square is 1.0 indicating that the variance in preference is totally explained by the model.

Third, we have evaluated the independent variables. Since we used dummy variables to enter our data the utility values in table 4-1 (Standardised Coefficients Beta) had to be recalculated. This was because only two of the three levels in each attribute have been entered in the regression model, the third level (in this case level 1) has the utility value of 0 before being recalculated. The sum of utility values for all three levels in an attribute should together equal zero. Thus we can formulate these equations, which is true for all attributes:

\[
\text{Level3-Level1} = \text{Standardised Coefficients Beta for level 3}
\]

\[
\text{Level2-Level1} = \text{Standardised Coefficients Beta for level 2}
\]

\[
\text{Level1} + \text{Level2} + \text{Level3} = 0
\]

When solving these equations for each attribute we ended up with the utility values seen in table 4-3.

<table>
<thead>
<tr>
<th>Attributes</th>
<th>Utility Level 1</th>
<th>Utility Level 2</th>
<th>Utility Level 3</th>
<th>Total Utility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Price</td>
<td>0.16</td>
<td>0.048</td>
<td>-0.207</td>
<td>0.415</td>
</tr>
<tr>
<td>Performance</td>
<td>-0.202</td>
<td>-0.011</td>
<td>0.212</td>
<td>0.425</td>
</tr>
<tr>
<td>Accessories</td>
<td>0.51</td>
<td>-0.207</td>
<td>-0.303</td>
<td>1.02</td>
</tr>
<tr>
<td>Env. Friendliness</td>
<td>-0.228</td>
<td>-0.021</td>
<td>0.25</td>
<td>0.499</td>
</tr>
</tbody>
</table>

Table 4-3 Utility values

### 4.2 How is environmental friendliness valued by consumers

Analysing the rankings received from our respondents with a conjoint analysis has given us the opportunity to see how the respondents in our experiment value environmental friendliness. One can determine this by looking at the sum of utility values for each attribute in the figure below (figure 4-1).
When looking at these data (figure 4-1) we can easily state that the attribute accessories was clearly the most important attribute for consumers when deciding upon which computer in the experiment to choose, having a much higher utility value than the other attributes. The three other attributes however, have been valued rather equal to each other. Among them, environmental friendliness is placed second with a total utility of 0.499 (see appendix E). Looking at the statistics only, price and performance is slightly less important than environmental friendliness.

**Hypothesis 1**: Environmental friendliness is the least important attribute to the purchase decision of the attributes tested.

This means that according to our results, our first hypothesis can not be supported by the results. Price and performance is in fact less correlated to our dependant variable, purchase intention. This is a rather unexpected result, as we thought especially price would score the highest correlation to the dependent variable. We think the reasons for these results are the effect of rather small differences in price and performance in our computer designs. These results also gives us an interesting insight, that while price differences are not too big, in our case 500 to 1000 SEK, environmental friendliness is valued higher by the respondents in our experiment. We think this is interesting since it shows that the respondents in our experiment are prepared, to some extent, to pay extra for environmental friendliness. Our assumption is, however, that if price differences would be higher the utility of price would be higher as well, and would pass environmental friendliness and eventually even the other attributes.

Compared to accessories, the environmental friendliness was not seen as very important by the respondents. This tells us that accessories are probably considered, by the average respondent, before the greenness of the computer. This is most probably true outside of our research setting as well. In our experiment though, the accessory attribute have relatively large differences between its levels. In reality, probably all of the levels included in our design would be included in a computer offer, while in our experiment the computer only in-
cluded one of the three. This implies that if the differences between the levels were smaller, the attribute environmental friendliness would most likely have a relatively higher importance.

Our second hypothesis was based on the assumption that higher environmental friendliness would result in higher utility values. In other words the ranking environmental friendliness 5 would be more liked than environmental friendliness 3 and so on. This may sound self explanatory but the fact is, as explained in section 2.2.1, that green products are sometimes perceived as unattractive, pricy and as having low quality.

_Hypothesis 2:_ High environmental friendliness will be preferred in front of lower environmental friendliness by our respondents.

In this case the results retrieved from SPSS allow us to accept this assumption. “Environmental friendliness 5” is in fact more valued than the other levels (figure 4-2). From our results we can note that if we would draw a line between the utility values it would result in a concave line, indicating that the differences in the respondents’ preference might be bigger at higher levels of environmental friendliness. In other words, one can suspect that, if included in the test, the difference in utility value between “environmental friendliness 1” and 2 would in fact be smaller than the difference between the rank 4 and 5.

When comparing the spread of utility values of environmental friendliness with the other attributes, we can see that the attribute again is, trailing to accessories and slightly ahead of price and performance (see appendix E). Dividing the spread for each attribute with the total spread of all attributes combined gives us an importance value. This value tells us that in our experiment approximately 23 per cent of the decision to buy a specific computer can be accounted to the level of environmental friendliness. Again, what these figures tells us is that respondents give greater value to the difference between environmental friendliness levels 1 and 3 than the difference in price between level 1 and 3. In other words, the impor-
tance of the difference between environmental friendliness 1 and 5 is bigger than the difference between the price levels 6500 SEK and 7500 SEK. Hence, this implies that our average respondent would be willing to pay at least 1000 SEK more for a computer with environmental friendliness 5 instead of 1.

4.3 How can these values be explained by consumer behaviour theory?

Our second research question has been analysed with the results from the conjoint analysis and in addition to that the results from the post-experiment questionnaire.

A summary of the results from the questionnaire can be seen in table 4-4. The results for each question are also repeated more than once throughout the analysis, as the data are analysed with help from consumer behaviour theories.

4.3.1 Evaluation of alternatives

<table>
<thead>
<tr>
<th>Question</th>
<th>Do not agree</th>
<th>Agree a little</th>
<th>Agree partly</th>
<th>Agree much</th>
<th>Agree completely</th>
</tr>
</thead>
<tbody>
<tr>
<td>Question 1</td>
<td>9,8%</td>
<td>9,8%</td>
<td>8,8%</td>
<td>41,5%</td>
<td>29,3%</td>
</tr>
<tr>
<td>Question 2</td>
<td>46,3%</td>
<td>19,5%</td>
<td>29,3%</td>
<td>2,4%</td>
<td>2,4%</td>
</tr>
<tr>
<td>Question 3</td>
<td>2,4%</td>
<td>19,5%</td>
<td>31,7%</td>
<td>22,0%</td>
<td>24,4%</td>
</tr>
<tr>
<td>Question 4</td>
<td>25,3%</td>
<td>34,1%</td>
<td>29,3%</td>
<td>7,3%</td>
<td>2,4%</td>
</tr>
<tr>
<td>Question 5</td>
<td>43,3%</td>
<td>14,4%</td>
<td>21,0%</td>
<td>7,3%</td>
<td>7,4%</td>
</tr>
<tr>
<td>Question 6</td>
<td>12,2%</td>
<td>24,4%</td>
<td>29,3%</td>
<td>22,0%</td>
<td>12,2%</td>
</tr>
<tr>
<td>Question 7</td>
<td>0,0%</td>
<td>14,6%</td>
<td>34,1%</td>
<td>17,1%</td>
<td>34,3%</td>
</tr>
</tbody>
</table>

Table 4-4 Responses to post-experiment questionnaire

It is argued in the theory of the evaluation of alternatives the consumer considers and grades the importance of many different attributes of the product throughout the decision. The consumer’s personality and characteristics as well as the situation are highly involved in the definite decision. The results provided from the experiment strengthen this theory. We can observe an alternative being ranked as the first choice by some people as well as last choice for others.

The theory also argues that the level of effort consumers spend signifies different ways of evaluation processes. This occurs in two stages, selection of certain evaluative criteria and establishment of a decision rule to integrate those criteria into a choice.

The respondents has to choose from the available criterions and make decisions about which ones are most important to them and how they will be weighted against the others. Environmental friendliness is the second most important attribute, together with performance, with the importance value of circa 23 per cent (see appendix E).

Analysing which type of decision rule that is used by consumers, can be a relatively hard task since all consumers are likely to have different methods of determining which computer to buy. However, theory tells us that consumer tend to use compensatory decision rules when putting a lot of effort in a decision. Our research results shows that most respondents, roughly 80 per cent (figure 4-3 and table 4-4), agrees partly, much or completely with the statement that they spend much time buying a computer.
Thus, we argue that when buying computers our respondents are most likely to use a compensatory decision rule. This implies that when choosing among the computers offered in the experiment, respondents have in one way or another ranked the attributes’ individual importance and from that made their decisions. The attributes’ individual importance ranked by the average respondent is likely to be coherent with the importance values presented in appendix E.

On the other hand, one might argue that despite our efforts to get the respondents highly involved they are not likely to be as highly involved as they would in reality. Therefore some respondents are likely to have used a non-compensatory decision rule while choosing a computer. This can also be expected to be true in a real purchase situation.

### 4.3.2 Maslow’s hierarchy of needs

In this section we will connect our empirical findings to the Maslow’s hierarchy of needs model. As Kotler et al. (2005) has argued, it can be assumed that the most Europeans have already satisfied their physiological, safety, and social needs, thus is more likely to buy a product to satisfy a higher need. Since our experiment took place in Sweden, this argument should apply on our respondents. However, we do believe that buying computers or environmental friendly products may also be the result of a need to strengthen more basic needs. Where a computer purchasing need fits in the pyramid of needs will most definitely vary depending on the individual reasons of purchase, still, in this section we will try to generalise where environmental friendliness will fit in the pyramid.

First, we believe that buying a computer today can be accounted to a level as low as a social need. In our society, and especially among young people, a lot or maybe even most socialising is made over internet and a prerequisite for doing this is to own a computer. On the other hand one can argue that if someone already owns a computer, buying a new one might not explain by the same level in the hierarchy. Our results on question 2 (figure 4-4), tells that esteem needs does not seem to be important.
Instead, we believe the needs triggering a purchase of a new computer are explained by self-actualisation. In other words, besides social needs a computer purchase might also be explained by the need of having a possibility to development and to be creative. The fact that a purchase of a computer can be explained by these two levels is interesting to us when put in relation to where the attribute environmental friendliness might be placed in the hierarchy of needs.

Today, there is definitely no physiological or safety needs involved with the purchase of a green computer. Apart from social needs already mentioned to be a part of the purchase of a “regular” computer, there are no needs in that level unique for a green computer. On beforehand one might think that there are esteem needs associated with the purchase decision of a green computer. It seems likely that the feeling of achievement and the respect from others, gained from buying an environmental friendly computer could be motivation enough. However, results from our questionnaire points in another direction. Question 2 (figure 4-4), tells us that respondents do not really care what others think of the computer they buy. Thus, it is not very reasonable to say that a green computer is bought with the intention to gain respect from others. In figure 4-5, the result from question 5 is presented.
These results, clearly tells us that respondents do not feel any expectations on them to buy an environmental friendly computer. This finding underlines the analysis of question 2. If the respondents do not feel any expectation to act in a certain way, then it is not likely they think they would gain respect from others by doing so. On the other hand, some of our results can be analysed to show that our respondents experience a sense of achievement by taking the decision to consume environmental friendly. Question 4 (figure 4-6) shows that respondents do believe that if they buy an environmental friendly computer, they would influence the environment in a positive way.
When respondents do something that is believed to be positive, it is reasonable to believe that they will feel a sense of achievement afterwards.

So when buying a new computer, we think that the main needs consumers experience are placed in the social, the esteem and the self-actualisation level of Maslow’s hierarchy of needs. The needs associated with environmental friendliness would be placed in the level of esteem needs. However, we do believe these esteem needs are rather small though. If a consumer wants to get the feeling of achievement there are probably more rational ways to achieve that through acting in a green way when it comes to for example recycling and fuel consumption.

This implies that, according to our analysis the most basic need associated with buying a computer, is the social need. This is supported by the results from our conjoint analysis, where utility for wireless internet access proved to the highest. This accessory is likely to fulfil the social need of buying a computer. Thus, this is most probably the need that consumers try to satisfy first when buying a computer. The esteem needs associated with environmental friendliness would come second, however as argued we believe this is not a very strong need and moreover a need that more easily could be satisfied with other actions or behaviours. Third, is the self-actualisation need that would be associated with the opportunity to use the computer as a tool to increase personal development and creativity.

Taking our analysis to the extreme however, one could suggest that the greenness in a computer could be associated with the most basic needs of all. Given all worrying reports concerning the state of our environment, it is not unreasonable to think that this issue can be a threat to our safety needs and also physiological needs such as food and water needs. The results from question four where most respondents (90%, see table 4-4) at least partly think they can influence the environment positively buy buying an environmental friendly computer, shows that if these threats where more real and more associated with computers respondents might buy environmental friendly computers to avoid these threats. Though, if this was the case today we would expect the utility values for environmental friendliness from our experiment to be much higher and the highest of all levels. Thus, as stated earlier, we do not believe environmental friendliness can be associated with the most basic needs today.

Comparing environmental friendly computers with other environmental friendly products may also reveal some aspects on how the greenness in computers is valued. We think that this issue can be discussed together with Maslow’s hierarchy of needs. From question six and seven (figures 4-7 and 4.8) we can read that generally respondents think it is more morally important to buy other environmental friendly products compared to computers.

When interpreting this with the hierarchy of needs as a base we think that other green products often is associated with a more direct threat to the consumers. Ecological food for example might be connected to safety needs since it is something the consumers are supposed to eat and if it is better for the environment it is logical to think that consumers also see them as healthier also for themselves. One can make valid connections between fuel consumption leading to pollutions and breathing, a physiological need. Hence, we think that many other products that are often connected to environmental friendliness have connections to lower levels of the hierarchy developed by Maslow than environmental computers are and therefore also are perceived as more important.
4.3.3 Factors of consumer behaviour

The factors of consumer behaviour (cultural, social, personal and psychological) are used to analyse the answers from the questionnaire.

The cultural factors are similar for the respondents throughout the sample, since they all live in the same society. Religion and social class are assumed not to influence the ranking.
of the computers a lot, and not the view on environmental friendliness and its importance either.

Social factors are on the other hand varying to a large extent amongst the consumers in the sample. Here the different groups, the consumers belong to and interact with is important. The consumer is affected by friends and family, and the social role and status the consumers currently have and want to have. The questions from our questionnaire that are relevant for social factors are number 1 and 2 (figures 4-9 and 4-4).

![Figure 4-9 Results of Question 1 in post-experiment questionnaire](image)

In question one the consumers are asked to answer on a statement “My choice of computer is influenced by recommendations, advices, opinions etc. from persons close to me”. A great majority, well more than half (70,8%, see table 4-4) of the respondents agreed much or completely with the statement that they are influenced by people around them. Therefore it can be said that how environmental friendly the computer people buy is, depends a lot of what their friends, family and other people they spend time with think about those matters. If the reference groups are very concerned with the environment the consumer is more likely to buy an environmental friendly computer. Since the result from our conjoint analysis showed that environmental friendliness of the computer is not the major concern when buying a computer, the people in our consumers’ surrounding are probably not very concerned of environmental friendliness of computers.

The statement in the second question is “It is important to me to buy a computer that persons in my social network would also like to have”, hence it aims to see if status is important when it comes to computer purchases. In this question almost half of the respondents (46,3%) answered that they did not agree at all, and the other half (48,8%) answered that they agree a little or partly. Only two respondents said that they agreed a lot or completely. Therefore the result from this question is quite straightforward, it’s not at all or only to a small extent important for the respondents that their friends and family would want to have the computer they are buying. This could be interpreted like respondents listen to a great extent what people in their surroundings are advising and recommending, but in the
final purchasing decision what they think is not the most important factor in the decision. Therefore the respondent would buy an environmental friendly computer although she/he considers the social contacts not likely to buy one.

Question number five in our questionnaire is also of some interest when analysing social factors. Respondents were asked here to answer on the statement “I feel an expectation to buy an environmental friendly computer”. The result (figure 4-5) has shown that most respondents did not agree at all, and almost 90 per cent (see table 4-4) answered that either they did not agree at all, or just agreed a little or partly. This result is interrelated with question one and two. It could be interpreted that there is not a high awareness of environmental friendliness of computers in the society today, and therefore many customers are not even aware that some computers are more environmental friendly than others. Since respondents’ social contacts are not very aware of environmental friendliness of computers, they can not advise the respondent about buying such a computer. Further, question two has shown that respondents do not necessarily buy an environmental friendly computer even though their contacts would do it.

As cultural factors, personal factors are not assumed to vary very much in our sample, since respondents are at almost the same age, many of them are students and hence share the same occupation and economic circumstances. Personal factors are further not easy to investigate, since analysing each respondent individually would be very demanding. Therefore they would not be discussed and analysed in this thesis.

Psychological factors are represented by our fourth question, which asks how much the consumers agree with the statement “I do not think I would influence the environment positively by buying an environmental friendly computer”. The response to this question (figure 4-6) was that (60,9%, see table 4-4) of the respondents did not at all agree with this statement or only agreed a little. Also quite a large number of respondents answered that they partly agreed (29,3%). The result is thus that most respondents think they will influence the environment positively by buying an environmental friendly computer, but also many are not completely convinced that they would. The reason for this might be that they are uncertain about to how large extent they would help the environment by doing so. In comparison to other environmental questions, this might seem to be of less importance, and the consumers are probably not certain about how large difference it is between an environmental friendly computer and one that is not. Since a majority thought they would affect the environment positively according to the result, the respondents are likely to buy an environmental friendly computer, if not another characteristic of the computer is seen as more important. This also requires that the consumer actually is striving to make a positive influence of the environment, which might not always be the case.

4.3.4 Levels of decision making

In question three (figure 4-3), the respondents were asked to respond to the statement “I spend much time on my choice of computer”. About one third of the respondents answered that they agreed partly. Almost half (46,4%, see table 4-4) of the respondents said that they agreed much or completely. The result has shown that respondents spend much time when buying computer. This question can however be interpreted differently, what is a lot of time for someone might not be for another person. What can be concluded is that
when consumers say they spend much time on buying a computer, they mean in comparison of buying other products.

The purchase decision of a computer involves extensive decision making, or according to Howard (1989) an extended problem solving, for the majority of our respondents. Buying a computer is thus a high involvement purchase in which much effort is used to find the most suitable computer. One reason why this is a high involvement purchase might be because of computers’ price levels a computer is quite expensive, in comparison to more frequent and cheaper purchases. There are also a lot of different models and features designed to fit different purposes, so it’s relatively important to find the one which will fulfil the respondent’s demands. Purchase of computers being a high involvement purchase seems to be accurate, since most people don’t buy a computer very often, and when they do they need to search quite a lot of information about the different features and models of computers.

The argument above is also related to question one where the respondents were asked if they are influenced by advices and opinions by their social contacts, in which the answer was that most of them are. The reason for this is probably that the consumers need all the help they could get finding information about computers and the different features. Family and friends are often seen as a more reliable source of information than for example sellers, since their major concern is selling a computer, while friends and family are more honestly trying to help the consumer to get satisfied with the purchase. If a friend of the consumer has high knowledge of computers and the consumer don’t, it’s naturally that the consumer would listen carefully to the recommendations and opinions of this friend before making the purchasing decision. However a consumer who consider herself as having enough knowledge, is not in a need of her social contacts’ advices, hence this might be the case for some of our respondents.

### 4.3.5 Theory of planned behaviour

The theory of planned behaviour is a popular theory for understanding consumer behaviour. This theory argues that intention and later behaviour are functions of three factors: Attitude to behaviour, subjective norms and perceived control.

The first factor, attitude to behaviour has been tested by letting our respondents react to the statement:” I do not think I would influence the environment positively by buying an environmental friendly computer”. The answers retrieved (figure 4-6) from this question can be quite easily interpreted. 60,9 per cent (see table 4-4) of the respondents answered that they did not agree at all or agreed a little with this statement. Further, only one respondent agreed completely. Attitude to behaviour is determined by the sum of outcome beliefs and is weighted by an evaluation of the desirability of the outcome. Moreover the outcomes are evaluated on how likely they are to happen and how easily brought to mind by the respondents they are. When looking on our question to respondents it can be said that the average respondent has a good outcome belief when it comes to buying environmental computers in the sense that they do believe that such behaviour would be good for the environment. Further, the desirability of the outcome is likely to be very high following the numerous discussions regarding environmental problems today.

The second factor of this theory is subjective norms, which are based on referent beliefs. This fact is associated with the will to act in a way other people think you should act. This
factor can also be analysed by looking at the responses we gained from our post-experiment questionnaires. The first question asked in the questionnaire gave us the rather expected answer that computer choice is influenced by referents to the buyer (figure 4-9). Further, on question 5, more than 68 per cent (see table 4-4) of the respondents did not agree at all or agreed a little with the statement “I feel an expectation to buy an environmental friendly computer” (figure 4-5). It seems like even though referents has an influence on computer choice, the average respondent do not feel any pressure on them to buy a green one. This is probably explained by a poor knowledge regarding green computers, and we think that if referents where more knowledgeable on environmental computers and their effect, the factor subjective norms would be stronger. One can draw a parallel to the environmental friendly cars where there might be a higher awareness thus also a higher pressure from referents on the buyer.

Perceived control is the third and final factor introduced by the original theory of planned behaviour. When relating this to our purpose one can say that a lack of information and knowledge about environmental friendly computers would make it unlikely for a consumer to create intentions to buy one. This is rather straightforward in the sense that a customer can not possibly feel a need for something he or she does not know exists.

Criticism has been raised on the original theory of planned behaviour due to the fact that it does not take moral obligations into account. This seems to be a very important issue when it comes to buying environmental friendly products and therefore we have included it in our questionnaire. The result shows that moral obligations to buying a green computer differ a lot from respondent to respondent. Most respondents (29.3%, see table 4-4) answered that they partly agree with the statement: “I think it is morally important to buy an environmental friendly computer” (figure 4-7). Of the other respondents, 46.4 percent answered that they either agreed a little or that they agreed a lot. Therefore it is hard to generalise a conclusion from this question. However, we can with confidence say that the respondents feel at least some moral obligations.

When analysing the theory of planned behaviour we think that the attitude to behaviour as well as, at least in some ways, moral obligations can be seen as influencing the intentions to buy an environmental friendly computer in a positive way while the other factors do not. Both the perceived control factor and subjective norms are weak, in our opinion, due to low knowledge regarding environmental friendly computers. We think, in agreement with this theory, this will weaken the intentions to buy a green computer. One could argue that the information and knowledge missing in order to support the behaviour could in reality be replaced by information from salesmen.
5 Conclusion

The aim of this section is to conclude the most important findings from the results and analysis.

To conclude our conjoint analysis and to answer the first part of our purpose, how consumers value environmental friendliness when buying computers, we have used the answers gained by analysing our first research question.

The results of the conjoint analysis did not support our first hypothesis that environmental friendliness is the attribute least valued by consumers. In our experiment, environmental friendliness is ranked second, before price and performance, only after accessories.

Analysing hypothesis two, concerning the spread of the environmental friendliness’ utility values has showed us that environmental friendliness is seen as something positive in a computer. The first and also lowest level of environmental friendliness also scores the lowest utility level and the third level has the highest utility. Thus, it can be said that environmental friendliness in a computer influences the purchase decision in a positive way. In relation, this also means that our fear of environmental friendly computers being perceived as lower quality products is not an issue in our experiment.

Further, analysing the spread of utility values for the environmental friendliness attribute has lead us to the conclusion that the respondents were willing to pay for environmental friendliness. Looking at the spread we can see that there is a higher difference between the lowest and the highest utility level for environmental friendliness than the same difference for price. This indicates that the respondents value the difference between the two extreme levels of in environmental friendliness higher than the difference between the highest and the lowest price (1000SEK).

The second part of our purpose and our second research question has been analysed by looking at the results from our post-experiment questionnaire. The findings has been analysed in relation to theories and will be concluded in the same way.

Of the respondents in our experiment a large part claims that they spend a lot of time to decide which computer to buy. This implies, according to theory, that they are most likely to use a compensatory decision rule when making a computer purchasing decision. Conclusions to be drawn from this is that environmental friendliness may not be valued that much by itself, but promoted together with other attributes it may have a strong influence on purchase decisions.

When analysing Maslow’s theory of motivation we can say that the needs connected to buying a computer appears to mainly be the social, the esteem and the self-actualisation needs. The environmental friendliness appears to be placed in the esteem need level of the pyramid. Hence, it is a bit higher than the social needs and should be looked on only after the social needs of buying a computer is satisfied. This conclusion is also supported by the results from our conjoint analysis, where utility for wireless internet access proved to the highest. This accessory is likely to fulfil the social need of buying a computer.

The theory factors of decision making provided us with a few answers mainly considering social and psychological factors. Social factors can be concluded to be important as a large majority of the respondents’ answered that they are influenced by social contacts when
making their decision. On the other hand, respondents do not feel any expectation on them to buy an environmental friendly computer. Thus, we think that today social factors do not influence a consumer to buy an environmental friendly computer very much. However, it looks like the social factors have a potential to influence towards a greener purchasing of computers. The thing lacking today, appears to be the knowledge and amount of information reaching consumers and their social contacts. Further, the psychological factor of buying a green computer can be seen as the beliefs that this action would actually bring something positive. Our respondents, in general do think that buying an environmental friendly computer would be a positive influence on the environment, however they do not seem completely convinced about it.

Theory of planned behaviour introduced us to four factors that influence the intentions of a consumer and thereby also the behaviour. We can conclude that two of the factors, attitude to behaviour and moral obligations are very likely to add to the intentions to buy a green computer. On the other hand, the other two factors perceived control and subjective norms can not be seen as strong today.

To sum things up, concluding all theories and the results from the conjoint analysis together there are some important points to state. First, environmental friendliness is and should be valued rather high by our respondents. All theories give us reasons to believe that environmental friendliness is actually something that are valued by consumers when informed about it. However, it seems like the relative importance of environmental friendliness is highly dependent on the differences in other attribute levels. In our experiment accessories ranked much higher and we believe this is thanks to the big differences in this attribute. We also believe that if performance and price attributes where designed in different ways they would also have had higher utility values than environmental friendliness.

However, we can also see the possibility of making environmental friendliness more independent from other attributes. This is something that can be analysed from most of the Consumer Behaviour theories used in this thesis. We think that today, the aspect making environmental friendliness dependent upon the other attributes is the lack of information. In Maslow’s hierarchy of needs environmental friendliness could be placed in the most important levels if the effect of environmental friendly computers where more spoken about. The influence of social contacts towards buying green computer would be stronger if the contacts were better informed and looking at the theory of planned behaviour factors subjective norms and perceived control factors would contribute more to the behaviour if there were more information about green computers.
6 Discussion

This section includes the authors speculative thoughts and ideas of the subject in the discussion of results, a discussion of this thesis' contribution and limitations, and finally some suggestions for further research.

6.1 Discussion of the findings

The purpose of this thesis was not to find out why or why not consumers buy environmentally friendly computers or how they could be influenced to do so. However, along the way of writing this thesis we have gained more knowledge about the subject and this has made us speculate a bit about these issues. Therefore we would like to further discuss some of our findings and share some of our thoughts in the area.

As the results and analysis has shown, environmental friendliness of the computers was the second most important attribute in our experiment. Our assumption has been that many consumers are not even aware that some computers are more environmental friendly than others. From our results we can interpret that the differences in environmental friendliness is highly valued compared to other attributes with rather small differences in their attribute levels and vice versa. We think that this is something that would also be reflected in reality. When buying a computer a consumer is very likely to face a decision involving many computers with small and hard to comprehend differences in many attributes. Thus, in such a situation we think that a computer which differs from others by being more environmental friendly would be highly valued by consumers.

However, in reality there is no information, or very little information, about which computer is most and least environmental friendly. If it would be, the situation in the real world would probably be more similar to our experiment. Our speculation is therefore that the problem with environmental friendly computers today, is to a large extent the lack of information about these computers.

This is supported by the findings that the respondent are prepared to pay at least some extra money for an environmental friendly computer, and an even more positive result is that it seems like these computers are not seen as of worse quality by the respondents. Hence, the respondents should buy an environmental friendly computer in situations when there is more than one suitable computer with information about environmental friendliness and the price difference is not too large. This could presume that there are too large differences between the price levels or other attributes of environmental friendly computers and “ordinary” computers today, and that make the consumers unwilling to buy them.

The respondents feel some moral obligation to buy environmental friendly computer, but they feel more moral obligations to buy environmental friendly products in general. In the analysis we suggested that one reason is that environmental friendly products are connected with lower needs in Maslow’s hierarchy of needs, thereby more important. Further, the average respondent doesn’t feel expectation to buy an environmental friendly computer, but think that he or she would influence the environment in a good way by buying an environmental friendly computer. Our speculation about this is that because of the lack of information about environmental friendly computers the consumers are not sure of how much difference it would make for the environment to buy an environmental friendly computer. Therefore the expectations on them and the moral obligations are not high. If
they would get information about that it actually make a really big difference, expectations and their moral obligations would be higher.

Marketing is one way to inform and influence consumers. However, green marketing should be done with care, since the wrong actions of companies have made the consumers a bit sceptical about claims of environmental friendliness in advertising. It would probably be better if the information could come from another direction, a source that the consumers would see as more reliable. This could be the government or non-governmental organisations, for example campaign groups. The government’s information could be in form of labelling initiatives. There already are some labels used for electronics, but the use of them for computers is not very wide-spread. Also here, the information is not very good. It’s not easy for the consumers to recognise the labels and to know what they stand for.

6.2 Contribution and limitations

A strong point of the paper is that we have used a multi-method approach; as expert interviews, an experiment, and a post-experiment questionnaire, making the paper more trustworthy and it makes it possible for us to make an analysis of broader perspective and understanding. We feel that we to some extent made some contributions to the way one can mix several research methods and in a way combine the results of them.

Further, the thesis has contributed with more knowledge about consumers’ view of environmental friendly computers. This is an area where, up until not little research has been done. Hence, this knowledge could be of interest for computer companies, as well as other organisations concerned with environmental matters.

As mentioned earlier about the choice of attributes and attribute levels of the experiment, the design of our conjoint analysis might be argued as a limitation due to have influenced the results from our experiment. However, the results received from the post-experiment questionnaire supported the results of the experiment providing correlated results for valuable analysis; hence the experiment still provides some interesting results despite of this possible limitation.

We have not been able to calculate any significance values from our experiment, and hence we can not tell how significant our result from the experiment is. This means that we can not statistically prove that we did not get our results by chance, which of course is a limitation.

Time can be concerned as a limitation the work we have done. Without the time issue we could have done so much more with the data collected from our experiment. It could have been to include control variables in our analysis and for example find out if environmental values differ between gender and age groups. Further, very interesting information could be found if making an analysis of both the conjoint analysis and the questionnaire together. It would have been possible to find out how a person who answered in a certain way on one question in the questionnaire valued environmental friendliness according to the conjoint analysis.
6.3 Suggestions for further research

One of the restrictions of this thesis was the perspective, as the focus of this thesis has been almost entirely on a consumer perspective. It could thus be very interesting to instead investigate the company perspective in this subject and then answer questions like for example: Are the companies trying to influence the consumers to buy more environmental friendly computers at all? How are they marketing these computers? What are their strategies for the future?

Further it could be interesting to find out more about what the government and non-government organisations think about the subject. Following questions are examples of what to could be interesting research subjects: Do they consider environmental friendly computers as an important question? How are they informing consumers right now? Are they planning to try to influence consumers to buy more environmental friendly computers?

It could also be valuable to make research about environmental friendliness in other electronic groups and perhaps make comparison between different product groups.

At last, there is also much space for more research concerning the consumer perspective of this topic. As mentioned in the time limitations made us to drop several interesting research questions which could be explored in our research. Gender and age issues are examples of what could be interesting to explore. Research about companies and organisations as consumers of computers would be another interesting subject to cover. If private computing can be said to have an environmental impact it seems reasonable to think that computers used at offices, schools and other organisations around the world make an even bigger difference.
References


Appendix A

Questions – Expert Interviews

Are there big differences in what different consumers demand when they buy computers?

Which are in general the most important characteristics?
## Appendix B

Orthogonal design generated by SPSS

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Appendix C

Computer profile cards

A
7500kr
220GB HÄRDDISK
WINDOWS VISTA HOME PREMIUM
MILJÖVÄNLIGHET 1

B
7500kr
DUBBELKÄRNIG PROCESSOR
TRÅDLÖST NÄTVERKSKORT
MILJÖVÄNLIGHET 3

C
7000kr
2GB RAM MINNE
WINDOWS VISTA HOME PREMIUM
MILJÖVÄNLIGHET 3

D
7000kr
DUBBELKÄRNIG PROCESSOR
DVD-BRÄNNARE
MILJÖVÄNLIGHET 4

E
7000kr
220GB HÄRDDISK
TRÅDLÖST NÄTVERKSKORT
MILJÖVÄNLIGHET 5

F
6500kr
DUBBELKÄRNIG PROCESSOR
WINDOWS VISTA HOME PREMIUM
MILJÖVÄNLIGHET 5

G
6500kr
2GB RAM MINNE
TRÅDLÖST NÄTVERKSKORT
MILJÖVÄNLIGHET 1

H
7500kr
2GB RAM MINNE
DVD-BRÄNNARE
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I
6500kr
220GB HÄRDDISK
DVD-BRÄNNARE
MILJÖVÄNLIGHET 3
Appendix D

Experiment and Questionnaire

Dear respondent,

We are three students at Jönköping International Business School, who now writes our bachelor thesis about consumer behaviour when buying computers and are therefore in need of your help. Your participation consists of two short sections, first an experiment and then a simple questionnaire. It is completely anonymous and therefore we ask you to put the questionnaire in the supplied envelope.

We are very thankful for your participation!
Frida Dahl, Ümit Dilek and Stefan Persson

Experiment

In the experiment you face a purchase decision, where you have nine computers to choose from. We want you to rank these computers (1-9) based on which one you would most likely to buy (rank 1) and then which you are second most likely to buy (rank 2) and so on. It is important to us that you consider your decisions carefully and make the ranking as realistic as possible.

Each computer profile consists of a combination of 4 attributes: price, performance, accessories and environmental friendliness (scaled on a scale 1-5, where 5 is the most environmental friendly).

Please fill in your ranking of the computer, where 1 is the computer you are most likely to buy and 2 the one you are second most likely to buy and so on.

<table>
<thead>
<tr>
<th>Computer</th>
<th>Ranking</th>
<th>Computer</th>
<th>Ranking</th>
<th>Computer</th>
<th>Ranking</th>
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</thead>
<tbody>
<tr>
<td>A</td>
<td>D</td>
<td>G</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B</td>
<td>E</td>
<td>H</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>F</td>
<td>I</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Questionnaire computer purchase

Age: .......... Female □ Male □

1. My choice of computer is influenced by recommendations, advices, opinions etc. from persons close to me.
   □ Agree completely
   □ Agree much
   □ Agree partly
   □ Agree a little
   □ Do not agree at all

2. It is important to me to buy a computer that persons in my social network would also like to have.
   □ Agree completely
   □ Agree much
   □ Agree partly
   □ Agree a little
   □ Do not agree at all

3. I spend much time on my choice of computer.
   □ Agree completely
   □ Agree much
   □ Agree partly
   □ Agree a little
   □ Do not agree at all

4. I do not think I would influence the environment positively by buying an environmental friendly computer.
   □ Agree completely
   □ Agree much
   □ Agree partly
   □ Agree a little
   □ Do not agree at all

5. I feel an expectation to buy an environmental friendly computer.
   □ Agree completely
   □ Agree much
   □ Agree partly
   □ Agree a little
   □ Do not agree at all

6. I think it is morally important to buy an environmental friendly computer.
   □ Agree completely
   □ Agree much
   □ Agree partly
   □ Agree a little
   □ Do not agree at all

7. I think it is morally important to buy environmental friendly products in general.
   □ Agree completely
   □ Agree much
   □ Agree partly
   □ Agree a little
   □ Do not agree at all

Tack så mycket!
Appendix E

Dummy Variables for input in SPSS

<table>
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<th>Levels</th>
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<th>Performance</th>
<th>Accessories</th>
<th>Env.Friend.</th>
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<td>3</td>
<td></td>
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<tr>
<td>Comp. C</td>
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<td>1</td>
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<tr>
<td>Comp. F</td>
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<td>1</td>
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<tr>
<td>Comp. G</td>
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<td>1</td>
</tr>
<tr>
<td>Comp. H</td>
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<td>0</td>
</tr>
<tr>
<td>Comp. I</td>
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Results from experiment

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<th>Utility Level 3</th>
<th>Total Utility</th>
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</tbody>
</table>

<table>
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<tr>
<td>Env. Friendliness</td>
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<td>0,347</td>
<td>0,68</td>
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</table>

\[ \text{Total Spread} = 2,548 \]

Tables above: First utility values calculated from SPSS output. Second recalculated utility values (0-1) and spread of utility values.

Importance Values

Importance Values = Spread (Attribute)/Total Spread

Price: 18%
Performance: 20%
Accessories: 39%
Env. Friendliness: 23%
Appendix F

Output from Questionnaire – Frequency tables

### Age of the respondent

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<td>17,1</td>
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<tr>
<td></td>
<td>24 years</td>
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<td></td>
<td>25 years</td>
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<td>4,9</td>
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<td>29 years</td>
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### Gender of the respondent

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### Question 1: My choice of computer is influenced by recommendations, advices, opinions etc. from persons close to me

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<th>Cumulative Percent</th>
</tr>
</thead>
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<td>9,8</td>
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<tr>
<td></td>
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<td>9,8</td>
</tr>
<tr>
<td></td>
<td>Agree much</td>
<td>17</td>
<td>41,5</td>
<td>41,5</td>
</tr>
<tr>
<td></td>
<td>Agree completely</td>
<td>12</td>
<td>29,3</td>
<td>29,3</td>
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<td></td>
<td>Total</td>
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</table>
**Question 2:** It is important to me to buy a computer that persons in my social network would also like to have

<table>
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<th>Percent</th>
<th>Valid Percent</th>
<th>Cumulative Percent</th>
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**Question 3:** I spend much time on my choice of computer

<table>
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<th>Frequency</th>
<th>Percent</th>
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<th>Cumulative Percent</th>
</tr>
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<tr>
<td>Total</td>
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**Question 4:** I do not think I would influence the environment positively by buying an environmental friendly computer

<table>
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<th>Percent</th>
<th>Valid Percent</th>
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**Question 5:** I feel an expectation to buy an environmental friendly computer

<table>
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<th>Cumulative Percent</th>
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**Question 6: I think it is morally important to buy an environmental friendly computer**

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<th>Cumulative Percent</th>
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**Question 7: I think it is morally important to buy environmental friendly products in general**

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<td>14.6</td>
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