PLANNED OBsolescence
THE PROPENSITY TO REPLACE A CELL PHONE DUE TO PHYSICAL VERSUS TECHNOLOGICAL OBsolescence AND THE ROLE OF ATTITUDE FUNCTIONS

Authors: Katarina Lyberg
          Anthony Bomboma

Supervisor: Johan Jansson

Student
Umeå School of Business
Spring Semester 2010
Bachelor Thesis, 15hp
Abstract

The cellular phone is very common to own in today’s modern society and sales are steadily increasing. There has been criticism towards the technical manufacturing of these products and the sustainability issue that comes along. We were interested in why the replacement purchases were so rapid and wanted to make a study on what ways this product becomes obsolete to its user and if attitudes towards the product value had an impact on replacement decisions.

A quantitative approach was used in the form of a questionnaire comprising 110 respondents of which all were students at Umeå University. We have found evidence that physical obsolescence affects student’s replacement decisions. We can also state that when replacement decisions are based on physical obsolescence, the reason for replacement is less done due to technological obsolescence. Furthermore we found that replacement decisions are mainly influenced by the utilitarian function of attitudes. When replacement decisions are based on physical obsolescence it is not likely that that the value-expressive and social-adjustive attitudes are being held. We also saw that when replacement decisions area based on technological obsolescence the student’s attitudes when deciding on replacement are more social-adjustive and value-expressive. The social-adjustive and the value-expression functions of attitudes influence replacement decisions to increase. We were able to draw the conclusion that replacement decisions for this particular consumer group are forced, however the sample is not large enough to make sure inferences to the whole population.

This study highlights the nature of replacement decisions and should serve as a source of knowledge into a market based on rapid consumption to guide a more critical approach to its elements.
# Table of Contents

1. Introduction .................................................................................................................. 1
   1.1 Main Research Question .......................................................................................... 2
   1.2 Purpose .................................................................................................................... 3
   1.3 Pre-understanding .................................................................................................... 3

2. Theory and Previous Research ...................................................................................... 5
   2.1 Consumer Behaviour ............................................................................................... 5
   2.2 Durable Goods ......................................................................................................... 7
   2.3 The Swedish Mobile Market .................................................................................... 8
   2.4 Planned Obsolescence ............................................................................................ 9
   2.5 Framework of the Replacement Decision Process ................................................ 12
   2.6 Model of Replacement Decisions of Durable Goods and Attitudes ...................... 13
   2.7 Consumer replacement decisions .......................................................................... 16
   2.8 Consumer Discount Rate ....................................................................................... 17
   2.9 Timing of Replacement .......................................................................................... 17

3. Method ........................................................................................................................... 18
   3.1 Theoretical Method ................................................................................................. 18
   3.2 Practical Method ..................................................................................................... 19

4. Results ............................................................................................................................ 26
   4.1 General Results ...................................................................................................... 26
   4.2 Results for the Research Questions ....................................................................... 32
   4.3 Summary of Results .............................................................................................. 36

5. Section of Analysis ........................................................................................................ 37

6. Conclusion ....................................................................................................................... 44
   6.1 Contribution ............................................................................................................. 44
   6.2 Quality of the Study ............................................................................................... 45
   6.3 Further Research ..................................................................................................... 46

Reference List .................................................................................................................... 47
Appendices .......................................................................................................................... 50
List of Figures
Figure 2.3 Mobile phone sales in Sweden................................................................. 9
Figure 2.4 Product obsolescence and the environment........................................ 11
Figure 2.5 Behavioural model of durables replacement decision-making............... 12
Figure 2.6 Model for Interpurchase Interval Influences ........................................ 16

List of Bar Charts
Bar chart 4.1. Replacement decision due to the mobile phone stopping to function ........ 26
Bar chart 4.2. Replacement decision due to the mobile phone being too expensive to repair .... 27
Bar chart 4.3. Replacement decision due to dissatisfaction of wear and tear of the mobile phone. 27
Bar chart 4.4. Replacement decision due to the preference of the new design of the currently owned mobile phone compared to the previously owned mobile phone ........................................ 28
Bar chart 4.5. Replacement decision due to the preference of new features of the currently owned mobile phone compared to the previously owned mobile phone ........................................ 28
Bar chart 4.6. Replacement decision due to none of the above statements or other reasons .... 29
Bar chart 4.7. Attitude that the practicality of the mobile phone is important when making a purchase decision........................................................................................................ 29
Bar chart 4.8. Attitude that when making a purchase decision the usefulness of the mobile phone is important .......................................................... 30
Bar chart 4.9. Attitude that the mobile phone should be reflective of one’s image ........... 30
Bar chart 4.10. Attitude that it is important that the mobile phone should be fashionable and the ability to proudly display the mobile phone .............................................................. 31

List of Tables
Table 4.1 T-test for question five to nine..................................................................... 32
Table 4.2 Spearman test question five to nine............................................................ 33
Table 4.3 T-test question eleven to fourteen............................................................... 34
Table 4.4 Spearman test question four and eleven to fourteen................................. 35
List of Pie-charts

Pie-chart 4.1. *The amount of mobile phones owned during the last five years* .................................. 31
1. Introduction

We are finding ourselves in a society where consumption of material things plays a prominent role. The technology industry is characterized by the common use of technology push strategies used by companies in this industry where the “potential market applications for a ‘technology push’ strategy are essentially unknown” (Herstatt & Lettl 2004 p. 156). In other words many of the products which are introduced to the market do not have an explicit demand from consumers.

Many argue that fast improvements in technology are extremely beneficial for the society as a whole. But it seems as though no one is taking on enough responsibility of electronics once they have been consumed and discarded. Companies do not provide consumers with enough information about their product’s lifetime and environmental effects, but if consumers did have the knowledge, would they alter their consumption patterns? Technology land-fills in Great Britain are soon used to their highest capacity and through various officially stated reasons; used electronics are sent to developing nations and are not being disposed properly (The Information Management Journal Jan/Feb 2006). When you buy a brand new mobile phone the thought of where it will end up does probably not get much attention. There seems to be a problem of consumer attitudes that lead to these problems together with the irresponsible conducts by companies. Cooper states that there is “a recent revival of interest in product life spans has taken place in the context of increasing waste generation” (Cooper 2004 p. 422).

A statement by Sibbell proclaims that “pure science and technology have developed according to different agendas and interests. Science has generally not been communicated in ways that allow consumers to make day-to-day decisions, fully informed of the implications” (Sibbel 2003 p.240). Through this statement there could be a spark of interest and perhaps agreement toward the lack of information between consumers and producers, especially for technological products such as the mobile phone. In a report from Swedish Konsumentverket about consumers and IT, it is noted that consumers are generally unsure about a product’s technological life-time (Konsumenterna och IT 2000:3 p. 19). We were curious to explore what values consumers have towards their mobile phones and why they choose to discard them. Sibbell is sharing her opinion that, to be able to establish any sustainable resource system, it is directly dependent on the encouraging of consumer decisions to include awareness of environmental issues (Sibbel 2003 p.240).

The term obsolescence refers to the situation where a product becomes out of date or non-functional after a period of time (Cooper 2004 p. 440). The consequence is that the product is discarded and a replacement is purchased. Planned obsolescence can refer to two basic concepts; that the product has a built-in time that it will function and the reverse that the product is still functioning but is outdated because of fashion or new versions added to the market. Firms use planned obsolescence, especially in mature markets, to stimulate sales and hence profits. Steward makes a statement that “in the past, businessmen – in particular marketing men – have claimed that rapid obsolescence based on arbitrary style changes is necessary in order to maintain high levels of consumer expenditures” (Steward 1959 p. 15).
We were interested in how planned obsolescence and student’s attitudes can influence their decision to replace a technological product such as the mobile phone which is a common possession today. No research study to date has been done on replacement decisions of mobile phones explicitly. There has been research done on other durable goods such as home appliances, cars and research studies that incorporate a group of different product categories. In many of the conclusions from previous explorations the authors have found that “The decrease in value that results from product obsolescence is not due to the product becoming less useful or productive, but by its being superseded by a superior product (Levinthal and Purohit 1989 p. 37). In a more recent research project by Cooper (2004) it was found that household appliances are influenced primarily by relative obsolescence rather than technical failure (Cooper 2004 p. 440).

We wanted to make a research on a specific product and its obsolescence because previous research has focused either on many product categories or other specific categories, but never on only mobile phones. This is an issue that should be investigated because mobile phones are so common to own today, especially among students. Hence, this product specific research can be of importance and interest to a wide variety of individuals, companies, governments and other groups. As it was found in Cooper’s (2004) study on replacement behaviour and attitudes towards obsolescence, consumers want more information on product life spans when choosing and comparing products. Although the fast replacement cycles are beneficial for company profits, an indication of demand for more durable mobile phones could give companies an incentive to meet this demand. As for governments in industrialized countries primarily, raising awareness of mobile phone waste could serve as a base for introducing policies which support durability (Cooper 2004:446).

The cellular telephone industry has had a rapid growth from the 1970’s until today, and the industry has become fiercely competitive (Totten 2005 p. 14). This industry is characterized by rapid introductions of new versions to the market. The business strategy companies are operating under is called technology-push and was first hypothesized by Joseph Schumpeter. The idea is that the department of research and development manufacture new products which are not necessarily based on consumer demand and needs. In this way new technology is ‘pushed’ into the marketplace. One can argue that the consumer does not have a strong influence of what is offered by producers. Gordon (2009) makes the statement that “As high-tech markets mature, replacement purchases inevitably become the dominant proportion of sales” (Gordon 2009 p. 846). Prince (2009) says that in the high technology sector of the economy, “/.../replacement is typically due to obsolescence rather than breakdown and replacement cycles are relatively short” (Prince 2009 p. 302).

What is driving this society where products are being consumed at such an extremely high pace? One might think that products today are being manufactured with less quality than before and hence have a shorter life-span. This is not necessarily the case, as many researchers have noted (Levinthal & Purohit 1989, Cooper 2004, Prince 2009). In line with this thinking we were eager to explore the forces behind our consumer society.

1.1 Main research question: How does planned obsolescence and attitude functions influence student’s replacement decisions of mobile phones?

In order to find an answer to this question the following research questions will be examined:
1. What is the most common form of obsolescence that acts as a basis for the decision to replace a mobile phone?
2. Is there a correlation between physical obsolescence and technical obsolescence?
3. What is the most common attitude that students have towards the product’s value?
4. Is there a relationship between obsolescence type and attitude functions?
5. Is there a relationship between rate of replacement and obsolescence?
6. Is there a relationship between rate of replacement and attitudes?

1.2 Purpose

The purpose with our study is to identify and understand the reason for student’s replacement of mobile phones based on technical and physical obsolescence and attitude functions.

1.3 Pre-understanding

The main reason for choosing this research topic was from an inspirational documentary named “The story of stuff” which emphasizes on the consumption driven society where consumers are encouraged to consume more than ever in order to sustain the economy. The eye opener for us in this particular documentary was the discussion about planned obsolescence, how manufacturers deliberately produce goods with the intention to break after a certain period of time. As two business administration students we found this subject to be relevant in today’s society where innovation takes place in such a fast pace causing products to become obsolete forcing the consumers to repurchase.

The first questions we asked each other were how aware consumers are about planned obsolescence and to what degree it causes or affect the reason for making a decision to replace. Not surprisingly we as authors have ourselves witnessed and been victims of this phenomenon. The fact that one of the authors previously owned an iPod that one day suddenly broke down and stopped working although there we no significant damages on the product. Furthermore this is backed up by hearings through the grapevine that it is a common experience by people that iPods suddenly ceases to function. As a result one could ask oneself if this is a strategy by the manufacturers to control and somehow forcing consumers to replace their products by repurchases. Therefore our goal was to get a more thorough understanding on how planned obsolescence affects the consumer’s attitudes and behaviors when facing a product replacement decision. However there is little empirical data that has been written about planned obsolescence and the effects of attitude functions on consumer replacement. Therefore the aim of our work was to the best of our ability reveal the kind of obsolescence that shapes a student willingness to replace their current mobile phone and the attitudes when making a replacement decision.

Additional inspiration was bestowed upon us when reading the section on further research written in the article Inadequate Life? Evidence of Consumer Attitudes to Product Obsolescence written by Cooper (2004). He discusses that “…/.../further academic research is needed to explore the influences upon appliance life spans during the successive phases of acquisition, use, and disposal. Consumer attitudes and behavior throughout the product life cycle need to be better understood if appliance life is to be optimized. Specific areas worthy of investigation include product-specific research comparing the influence of different forms of obsolescence, consumer information on the design life
of new products/...(Cooper 2004 p.447). This quotation serves as a directive in our research focus and design of survey method.

Up until now we have introduced why the subject was chosen and why we find it to be of importance. The next section presents the theories and previous research which are connected to consumer behavior, replacement decisions, planned obsolescence and attitude functions. Information about the market for mobile phones is provided and other concepts related to the subject.
2. Theory and previous research

Consumer behavior is at the core of our thesis because it has to do with consumer purchasing decisions which are the focus of our study. It is the umbrella from under which we study planned obsolescence and attitude functions. The theory of planned obsolescence is important to our subject because it highlights why replacement decisions occur. Planned obsolescence is a concept from which consumer behavior can be viewed and further understood. It forms the basis from which the reasons for replacement decisions can be highlighted. The theory of attitude functions is relevant since attitudes comprise an understanding from which decisions are based. The theory brings to focus how people’s attitudes influence replacement decisions. Information about the trend of the Swedish mobile phone market provides a comprehension of consumer behavior around the subject. We have included sections concerning the timing of replacement and consumer discount rates in order to give debt to replacement decisions.

2.1 Consumer Behaviour

Consumer behavior as a field of study is considered to be large and complex. It is an ongoing phenomenon and described by Solomon as the study of the process involved when individuals or groups select, purchase, use or dispose of products, services, ideas or experiences to satisfy needs and desires (Solomon, 2009 p. 33). Hoyer & MacInnis states that the common interpretation of consumer behavior is that it only involves people’s purchase of goods (Hoyer & MacInnis 2003). However as they later argue for is that consumer behavior involves many decisions: whether, what, why, when, how, where, how much, how long and how often. The question that needs to be asked is what are the components that affect consumer behavior. Hoyer & MacInnis states that there are four domains to the consumer behavior.

- Psychological core
- The process of making decisions
- The consumer culture
- Consumer behavior outcomes

The four domains are interrelated but our focus lies on the process of making decisions and the psychological core or more specifically the attitude formation within this area. Since our study is focusing on how physical obsolescence and attitude functions affects replacement decisions these theories are the foundation on which we later introduce the concepts we chose to further look into. The following section presents the process of making decisions and after a section on the psychological core and attitude formation is presented.

The process of making decisions

There are four stages which make up the process of making decisions; problem recognition, information search, decision making and post-purchase evaluation (Hoyer & MacInnis 2003). In our study we examine the replacement decisions students make about their mobile phone and the post-purchase evaluation does not receive attention in our study. The problem recognition phase would
then be about the identification of a consumption problem which then leads to a purchase of a mobile phone. The consumption problems we incorporated were whether there was a need to replace the mobile phone due to physical attributes and technological attributes. The consumer feels a motivation to make a purchase through the problem recognition of the perceived difference between the ideal state and the actual state. Hoyer & MacInnis states that “consumers can recognize problems such as needing to/.../replace an old appliance (Hoyer & MacInnis 2003 p. 199).

When there has been a problem recognition the consumer will search for information in order to begin the decision process to solve the problem. This can be done in two ways, internal and external search. The internal search is about what the information the consumer recalls about brands, attributes, evaluations and experiences (Hoyer & MacInnis 2003 p. 203). The consumer can undertake an external search to gain information which is not stored in memory, such as visiting a mobile phone shop to get more information on the brands, features and so on.

The consumer then makes an estimation of likelihood (Hoyer & MacInnis 2009 p. 223) which would correspond to the attempt to estimate the quality of the mobile phone and the likelihood of it satisfying his or her needs when purchasing the mobile phone.

The psychological core and attitudes

Hoyer & MacInnis defines attitudes “/.../as the overall evaluation that expresses how much we like or dislike an object, issue, person or action” (Hoyer & MacInnis 2009 p. 131). Solomon defines attitude as a lasting general evaluation of people, objects advertisement or issues (Solomon 2009 p. 282). Furthermore it is argued that attitude is something that is nurtured and that it reflects and individuals general evaluation of something, based on the associations that are linked to it, that is how we get attitudes towards brands, ads, people etc (Hoyer & MacInnis 2009 p. 130). Moreover we also hold attitudes because they help us to guide our thoughts, influence our feelings, affect our behavior and more interesting for our subject, it influences acquisition, consumption and disposition. In the case of our research, attitudes will play a prominent role in explaining the consumer’s behaviour when considering changing mobile phones. Accordingly to Hoyer & MacInnis attitudes are considered to have five characteristics or ways to be measured; favorability, accessibility, confidence, persistence and resistance. Nonetheless it does not end here, furthermore there are three ways in which attitudes are formed and changed with an individual; cognitions, emotions and elaboration. Cognition refers to thoughts or beliefs, emotions involve feelings consumers possess and finally elaboration refers to the amount of time spent on forming and changing attitudes (Hoyer & MacInnis 2003 p. 131). Moreover the authors distinguish between individuals who hold a high MAO and those who hold a low. Foremost MAO refers to:

- **Motivation** – personal relevance, consistency with values and goals, perceived risk, and moderate inconsistency with attitudes
- **Ability** – knowledge and experience, cognitive style, intelligence, and monetary recourses
- **Opportunity** – time, distractions, amount of information, complexity, and repetition

MAO basically refers to the degree consumers make a conscious effort to form or change an attitude. As previously mentioned above individuals with high MAO refers to those individuals who possess
high motivation, ability and opportunity when in the process of information gathering and decision-making. Additionally high MAO also constitutes for more personal involvement when forming and changing attitudes. Nevertheless individuals with low MAO stands for more simplistic beliefs and are less involved with attitude formation and change Hoyer (Hoyer & MacInnis 2003 pp131-133).

People hold various attitudes towards different objects. Like Solomon stated; “two people can each have an attitude toward some object for very different reasons” (Solomon, 2009 p. 35) Meaning in our case that individuals can share the same attitude towards a mobile phone, but their reasons for holding that attitude for that specific object is not shared. Further Solomon brings forward that attitudes mainly perform one function but there exist occasions or situations in which an attitude serves more than one function. Moreover it is more favorable by identifying the dominant function that a product serves for a consumer, will allow for those individuals studying consumer behavior help to recognize these benefits and apply them. For our study it would be merely impossible due to time and other constrains to focus and identify more than one attitude consumers hold towards their mobile phone. Therefore we agree with Solomon to only focus on the dominant attitude function that each respondent hold. In short consumer behavior will help us gain knowledge and to better understand the forces that constitute the decisions of replacing cell phones.

2.2 Durable Goods

The product we have chosen is intended to be corresponding to a durable good. Cox provides a definition of these types of goods in his dictionary of economics as any “goods which have a relatively long life, such as electronic goods, cars or machinery” (Cox 2006 p. 56). For our research we will examine an electronic good which is very common to own today, namely the mobile phone. There have been studies done on the replacement of durables, mainly on products such as washing machines, air conditioning, refrigerators and dishwashers. But, as Bayus (1991) states “All of these studies, however, focus on product disposition after a replacement decision has been made. None examine the consumer replacement decision and, in particular, the timing of replacement purchases” (Bayus 1991 p. 43) which makes this choice of subject very contemporary and current.

When reflecting on this matter it seems as though it would be beneficial to make an analysis of the replacement on cell phones since no such specific study has been done prior to this date. In recent years researchers have been examining the sustainability issues of companies operating under a profit maximization business strategy. Perhaps these supposed durable goods may in fact not be as durable as one might think. It would be beneficial for society today to receive proof of what the general behaviour is concerning these goods. Maybe the results of our study could highlight a need for a change in consumer replacement decisions and the consumer society at large. The issues that will have a focus in our thesis are planned obsolescence, consumer replacement decisions and attitude functions.

Studies have been made on the acquisition and disposal of durable goods, however not much weight has been placed on the actual replacement. Throughout this study we will use the definition of replacement as Roster & Richins (2009) defined it. Replacement takes place when a consumer replaces the primary role of his/her current product with another newly acquired product.
2.3 The Swedish Mobile Market 2005-2010

The mobile telephone industry is a vast market and enduring constant change, encountered by innovations and competitions from different areas. One could say that the consumers are living in a jungle that is characterized by chaotic change of mobile phone attributes such as, shape, size, functions, brand recognition etc. The Swedish mobile telephone market is no exception, filled with constant new innovations and trends. The Swedish mobile telephone market has during the last decade shown a general positive trend. However negative trends in the sales during some quarters are evident and might be due to the fast pace of innovations and novelty or other factors.

According to Lindgren & Jedbratt (2001) Sweden along with their neighboring Scandinavian countries, are considered to be highly developed in the mobile telephone area. A survey conducted in year 2000 revealed that eighty percent of the Swedish population between 16 and 25 years owned a mobile phone, thus indicating a trend towards a mature market (http://www.tekniskamuseet.se/mobilen/1990_2000.shtml).

Further down we present the events of the Swedish mobile phone market between the years of 2005 until 2010 provided by IT Sweden. This gives the reader a more detailed view of the general growth of the market in a 5-year period. We believe that the dynamics of the Swedish mobile phone market sales and trends will give us an insight of what influences students replacement decisions.

The development of the Swedish mobile telephone market between the years of 2005 and 2010 indicated a general positive growth. Initially the 2G (2 generation phones) mobile phones were still dominant. When the 3g (third generation phones with higher connectivity) phones were introduced into the Swedish market in 2003, it did not experience any significant growth until 2006. By the year of 2006 the 3G mobile phones had grown substantially and made up 43 per cent of the entire mobile phone market. Additionally, apart from the positive growth of 3g phones, the market also felt a substantial growth in smartphones. Smartphones are more technologically advanced with more functions and can be considered as small handheld computers. When in 2008 the entire Swedish mobile phone market experienced a negative growth, which can be a sign of a recession taking place. The following year of 2009 did not manifest anything noteworthy. However 2010 has shown to be a substantial growth in the sales of smartphones with a record high of 244 per cent growth than the previous year. As the trend indicates, more innovative, faster connectivity and more technologically advanced phone are incrementally introduced to the market.
Given the brief statistics of the Swedish mobile telephone market, one can agree that it is a mature market, moving towards a saturated market. The graph displays a trend, which shows high sales figures and in which one could draw the inference that Swedish consumers are highly active mobile phones users. In our case this would mean that there might be an evidence of product replacement at a grand scale. Furthermore given the graph, how many of these purchases are based on first time buyers or replacement buyers. But as the market becomes more mature the majority of the consumers will tend to be replacement buyers. Although we have included quite limited sales figures of the Swedish mobile market, one can see a significant trend of consumers changing from 2g to 3g phones. In 2005 the 3g mobile phones constituted approximately of 9 percent of the market, and today it is more than 73 percent of the total market. 3G phones compared to the 2G phones allows for a faster connectivity.

This technological push causing faster replacement cycle of phones can be an evidence of technological obsolescence or physical obsolescence which is examined in detail in the next section.

2.4 Planned Obsolescence

This section presents what planned obsolescence is. We are studying planned obsolescence as it can influence replacement decisions and therefore consumer behavior of mobile phones.
The most recent academic article which states a definition of planned obsolescence and its different meanings is from 2009 and written by Joseph Guiltinan. He presents the concept in the light of environmental ethics, and presents an objective view of the connection of planned obsolescence and the behaviour of consumers. The frame of reference has two categories with subcategories of each. The first one is defined as physical obsolescence and incorporates several reasons for why a replacement decision occurs. Imagine that your durable product is designed with a sleek and polished exterior which provides you with some form of satisfaction. When the product experiences everyday wear and tear it may lose the initial satisfaction you got from it. Here, we need to realize that this dissatisfaction may come sooner than expected, which makes consumers faster unhappy with their products and the environment having to deal with the consequences of fast product replacement cycles. This problem is defined by Guiltinan as “design aesthetics that lead to reduced satisfaction” (Guiltinan 2009a p. 20). The second form of physical obsolescence acknowledges that a product can be designed for limited repair. The author actually suggests that the disposal of electronics is encouraged by the price of the repair. The third, and last for this category, is referred to the notion of a product having a pre-assigned date of death, hence the product has a “limited functional life design” (Guiltinan 2009a p. 20). We, as consumers of most electronic goods, do not know how long our product will function before it breaks. As a result one may suggest that there is an information asymmetry between producers and consumers. Tim Cooper found in his study of consumer attitudes towards product obsolescence that “/.../many consumers have a desire for more information on product life spans to guide their choices [when making a purchase of a durable good]” (Cooper 2004 p. 447). However, it is remarkable what Guiltinan states about portable radios “at one point portable radios were designed to last for only 3 years” (Guiltinan 2009a p. 20).

The second category has two types of obsolescence, both of which represent technological obsolescence. Fashion trends are increasingly being used for electronic goods such as mobile phones, as compared to the first association one may have which is the clothing industry. Design for fashion represents the first subcategory of technological obsolescence. The second one is called “design for functional enhancement through adding or upgrading product features” (Guiltinan 2009 p. 20). It is about how firms are able to introduce upgraded products on the market through investing in technological development, an example being a mobile phone that has a GPS, wireless internet, or camera feature.

Guiltinan (2009a) shows in the figure below two main reasons for replacement purchases. The first comes from corporate product strategy and influences the frequency of product upgrades. He states that “/.../frequent introductions of replacement products increase the opportunities and motivation to replace functioning durables” (Guiltinan 2009a p. 19). The second reason that influences faster replacement comes from design and engineering practices which make decisions on the attributes designed into replacement products.
Figure 2.4 Product obsolescence and the environment: decisions and influences

(Guiltinan 2009a p. 19)

However, Strausz (2009) says that a firm cannot ‘cheat’ by having planned obsolescence and provide consistent unobserved quality because the consumer has the ‘power’ over the firm because it is up to the consumer if a replacement purchase should be from that particular firm and in that the cycles of repurchasing become more frequent with planned obsolescence. But the question here is if any firm in a particular industry actually offers a choice with higher durability to consumers who want to support sustainable consumption and environmental protection. There is no mobile phone on the market or mobile phone service company which offers a commercially attractive mobile phone which is designed to be sustainable in the long run which makes his argument of consumer power rather weak. Ultimately we question his opinions; planned obsolescence does not have an incentive for unobserved quality, and does not give the consumer ‘power’ over producers. Cooper (2004) articulates that “more recently, the growing importance of sustainable product design, integrated product policy, and sustainable consumption has revived interest in product life” (Cooper 2004 p. 422). Cooper’s statement has a very positive outlook on the modern society, but the question is whether today’s consumers are merely interested in the subject but do not act accordingly.

Voluntary and involuntary replacement decisions

Antonides (1991) discovered in his economic-psychological model of scrapping behavior, that reasons for replacements are not only determined by the products physical or technical obsolescence. However, it can base on an individuals, “voluntary” (termed by Guiltinan 2009) choice in actually wanting something new. In order to facilitate for the reader, and us, we will use the term voluntary as a definition of replacement decisions that are purely made by the individual, and involuntary for the replacement decisions that are caused by physical and technological obsolescence.
2.5 Joseph Guiltinan’s (2009b) Framework of the Replacement Decision Process

A framework that incorporates recent scholarship on the topic of consumer durable goods replacement behavior was proposed by Guiltinan in 2009(b). He explains that the paper was an attempt “…to integrate the existing research base by offering a framework for conceptualizing the replacement decision process” (Guiltinan 2009(b) p. 163).

![Behavioural model of durables replacement decision-making](Figure 2.5)

The figure above illustrates a behavioral model of durables replacement decision-making. It will help us point out the main components that we will use as a base for our study. Guiltinan (2009) states that this model is an overview of all research up to date concerning consumer decision-making perspective to understand consumer behavior. He states that “These insights are especially relevant for understanding voluntary replacement decisions that are not motivated strictly by economic trade-offs” (Guiltinan 2009b p. 163). This model functions as a demonstration of an overall procedure an individual face when considering replacement. Not all of these components are used in our study, but it does in fact hold some key components that we cover under our paper. The expected future utility of the owned good, the book value of the owned good and consequently loss aversion are relevant to our study since it influences the decision to replace a mobile phone. This mainly corresponds to physical obsolescence. The perceived replacement product benefits and perceived gain in benefits can be analyzed both in relation to technological and physical obsolescence. The price of replacement is also used in our study in one of the questions of the questionnaire. We also see that marketing effort and rate of product development is affecting the consumer discount rate and ultimately the replacement decision. Another focus of our study is the role of functional attitudes as we believe that the main purpose of why individuals vary in replacement decisions and frequency is based on the grounds that individuals hold different attitudes for a durable good.
2.6 Model of Replacement decisions of durable goods and Attitudes

Katz 1960 developed a framework to explain the reasons why consumers hold or change their attitudes on a psychological level. In this Katz stated that, “the functional approach is the attempt to understand the reasons people hold attitudes”. Grewal et al (2004) applied the functional approach into a research conducted on the timing of repurchase of consumer durables. In this study a framework like Katz was presented which consisted of four different attitudes along with two contextual factors that would explain what influences the consumers inter-purchase intervals. The functional attitudes that first were mentioned by Katz 1960 and later adopted and somewhat altered by other scholars were the following four;

- Knowledge function: Helps consumer with organizing and structuring
- Value-Expressive function: Helps consumer to express values and self-recognition to others
- Social-Adjustive function: Helps consumer to feel accepted in social circles
- Utilitarian function: Helps consumer to maximize rewards

In our case the knowledge function would refer to individuals from the population who needs organizing and structuring of information before making any decisions about replacing their cell phone. This will later serve as a basis for similar situations in the future in which the individual then can make faster and easier decisions. The value Expressive function expresses the consumer’s central values. Simply put in our case it would mean an individual who forms an attitude towards the cell phone not simply because of the benefits derived from cell phone but because of what the cell phone says about the individual as a person. The social adjustsive-function is an attitude that would allow an individual to achieve social goals like settling into a social setting, or even conform to other peoples expectations in order to feel accepted. For example an individual purchasing a cell phone for the main purpose of feeling socially accepted. Finally the utilitarian function concerns the attitudes towards rewards and punishments. In our case this would be an individual who finds only a certain cell phone brand to please him or her and therefore sticks to this particular brand to maximize rewards.

Grewal et al (2004) explained consumers experience as the benefits and goals derived from the product differently and different product categories. Thus the functional attitudes are subjective to the consumer. Additional Bayus et al (1991) stated that consumers might find themselves in situations where the replacement purchase is either a forced or unforced decision. However the forced situation derives from a bad experience of reliability and durability such as a product failure. Whereas the unforced purchases comprise of innovations and enhancements that in turn motivates the consumer to consider a repurchase. These situations are basically the same as voluntary and involuntary replacements previously discussed. Additionally these terms are also called performance obsolescence and technical obsolescence respectively. Furthermore, results in the study showed that unforced formulation causes the interpurchase intervals to be less frequent while forced purchases does the opposite. This can be compared to Sultan & Winer (1993) notion, that consumers with high discount rate prefer current consumption whereas those with low discount rate prefer future consumption. Moreover Grewal (2004) argued that the higher importance of the knowledge function or the social adjusitve function brings about a decrease in the consumers interpurchase intervals.
However the opposite effects occur with the increased importance of value expressive function and the utilitarian function. Moreover accordingly to Solomon (2006), consumers who know that they will deal with similar information at a future time tend to be more likely to start forming attitudes as a preparation for the coming event (Solomon 2006 p. 139).

Closely related to Katz (1960) “The Functional Approach to the Study of Attitudes”, according to Allen et al (2000) Milton Rokeach established a framework of value attitude behavior system in which he made an attempt to link instrumental and terminal human values with attitude function theory. Also important to add is that according to Allen et al, human values and attitudes are different in nature whereas the latter refers to objects and the former does not. To get a comprehension of what terminal and instrumental values constitutes, Rokeach described the former to encompass “beliefs about desired end states such as, freedom, comfortable life” etc. While the latter value involves desired modes of action, for example being ambitious, broadminded, independent etc. (A functional approach to instrumental and terminal values…….) The results revealed a difference in the two types of human values consumers hold. Those who preferred instrumental values where driven by the utilitarian function. And consumers preferring terminal values were inclined to symbolic meanings. In our case, those who hold instrumental value to be true will refer to the consumers who replace their cell phone as a mean for maximizing intrinsic rewards in life and minimizing punishment (Katz 1960). On the other hand, consumers who hold terminal values will regard the cell phone as a vehicle for self-expression and posses attitudes more directed to the intangible/symbolic attributes of the cell phone.

In his research Antonides (1991) found that in situations when wear and tear was the main reason for replacement, it was most common that consumers choose to discard the incumbent good and replace it with a new one rather than repairing the old good. Furthermore Bayus (1991) noted that replacement interval purchases tend to be shorter when it is driven by physical obsolescence. Antonides (1991) further argues that there is a distinction between voluntary and declining performance decisions across different product categories when considering replacing durable goods. In the light of voluntary vs. involuntary Cooper 2004 conducted a research based on interviews and focus groups on replacement purchases of 15 durable goods categories. Findings revealed consumers held different opinions about lifetime of durable goods and that involuntary replacement was more common than voluntary. Interestingly the research revealed that mobile phones and computers were the goods that mostly faced voluntary replacements (Cooper 2004 p. 441). However we are not totally convinced by this result due to our own experiences with mobile phones.

Roster and Richins made an attempt to explain consumer replacement decisions and the influence of ambivalence in such a decision. According to their research, decision process makes up of two non-mutually exclusive decisions; decision 1 acquiring to replace and decision 2 what to do with the old product. Consequently, when integrating two alternatives to the decision process ultimately allows for mixed feelings or uncertainty, which in turn influences the replacement process. First Dhar, in 1997 and in Anderson, 2003 went further and identified three alternatives that manifest when a consumer considers replacing a product: discard the current product when purchasing a new, purchasing a new product and keeping the old one giving it a new role or simply postpone the replacement altogether causing no change. Nevertheless Roster & Richins claims that a better way to predict consumer replacement behavior is to include both decision platforms when examining the replacement intentions. Roster & Richins (2009) continues by arguing that relying simply on attitudes as a platform for explaining replacement is not sufficient since it does not usually reflect the
“full spectrum of choices”. The findings in the research revealed that disposition decision and acquisition decision where correlated. The article is a good source for a deeper understanding on the influences disposition and acquisition pose on replacement. Weight is placed on the disposition of the incumbent product mostly after a replacement has taken place and the potential ambivalence that manifest when facing these decisions. In the purpose of our study, it might be important to consider the presence of alternative decisions that act upon each other simultaneously during a replacement process. However the focus on disposition of the already possessed durable good before and after replacement is not relevant to our study nor the guilt or feeling of regret after acquisition, since we seek to reveal the kind obsolescence that pushes for replacement.

Grewal et al (2004) did a research on the timing of repurchases of consumer durables and attitude functions. The nature of the decision is one of the main focuses. The research tested hypothesis about purchase decisions. The results showed that attitude functions are related to interpurchase intervals which was suggested to be of benefit for product positioning to be able to shorten interpurchase intervals and hence profits. This is however not the stance we are focusing on but rather the ethical viewpoint of the nature of the replacement decision.

Grewal et al (2004) states that companies which sell consumer durables have two main challenges
1. Durable goods usually have a higher price than non-durables which creates a larger risk for consumers
2. Purchase intervals of durable products are longer than for non-durables

The argument that is put forth is that marketers have a difficult task of targeting and marketing their products to effectively acquire the right consumer at the right time. In the paper a model is put forward due to the fact that “Attitude functions that products perform play a critical role in explaining the interpurchase interval for consumer durables” (Grewal et al 2004 p. 111).
Their findings were that the interpurchase intervals are shorter for unforced replacement decisions “/…/fashion and technological obsolescence, which is primarily driven by organizational innovation activities, leads to shorter interpurchase intervals” (Grewal et al 2004 p. 107). The interpurchase interval decreases as the importance of the knowledge function or the social-adjustive function increases and also that the interpurchase interval increases as the importance of the value-expressive function increases.

2.7 Consumer replacement decisions

According to Brett R Gordon consumer replacement decision are of a dynamic nature and are motivated by product obsolescence (2009). In his study Brett developed a dynamic model of consumer demand in order to reveal the consumer replacement cycles in the PC Processor industry. The model was constructed in a way that it included both decisions of adoption and replacement in a situation when consumers are uncertain about the future price and quality. Gordon stresses that simply adding replacement process into the model would not be sufficient since it has no substance of the individual data and therefore yield non-satisfying results. However, incorporating information about ownership into the model would provide with better understanding on the essence of replacement. Findings in this study revealed that consumer replacement cycles varied substantially
both within a period and over time. Moreover results showed that those consumer with high valuation of a product where more inclined to purchase earlier that those who has lower valuation.

2.8 Consumer Discount Rate

The application of discount rate in consumer replacement behavior has recently been widely discussed. Sultan and Mayer (1993) started out with stating that individuals “discount rate is the marginal rate of time preference or the rate of impatience”. Joseph Guiltinan (2009) stress that replacement purchase interval is different depending on the product category. The main reason for this is that consumers discount their products differently and hold different believes about the benefits of the products. Furthermore individuals with high discount rates are more inclined to value current consumption more than future consumption. Thus consumers with higher discount rate choose to replace their current product with a new one regardless if the now possessed one still function or can be replaced (Fredrick, Lowenstein and O’Donoghue 2002). Winer et al (1997, p186) cited in John McCollough added that advertising has a greater impact on those consumers with high discount rate and are therefore more inclined to fashion obsolescence. (Winer, Russel. “Discounting and Its Impact on Durable Buying Decisions.” Marketing Letters 8, 1 (1997)

Okada 2001 conducted a study showing how replacement purchase decision can be explained through normative and psychological mechanism. According to Okada consumers tend to face two types of cost when considering a replacement: 1 the purchase price of the product and 2 a mental cost referring to consumers belief of what his current product is worth. The former refers to acquisition price of the new product in normative terms. However the latter cost is a “mental book value” when replacing a reusable product. Further explained as consumer’s process of mentally depreciating the initial purchase price of the old product. In this way, when a consumers is considering a replacement he or she makes a mental write off of the remaining book value of the old product. Furthermore according to Okada, the remaining book value tends to be lower for individuals who have a higher usage frequency than those who does not. However if the consumer recognizes that the good in use has not fulfilled for what the money is worth the consumer refrains from repurchase Okada 2001 cited in McCullough. The contrary would involve discard the functional product before it has paid for itself; thus causing a negative influence on the decision on repurchasing.

2.9 Timing of Replacement

A study referred in Guiltinan 2009 was conducted trying to explain the timing of consumer durable good replacement purchase. Timing of replacement was juxtaposed along with attitudes, perceptions, characteristics and search behavior in order to find consistency. The results revealed that early replacement buyers were consumers who cared less about the price and more about styling and image. Conversely these were consumers’ with low educational background however having a high income. Late replacement buyers showed to have lower income but a higher educational background and where more keen on information gathering before replacement. These are the type of consumers our study is incorporating.
3. Method

3.1 Theoretical Method

Research Philosophy

When conducting a research it is important to choose what world perspective the research will be judged from. Thus, the chosen philosophical position will influence the methodological assumptions. There are two commonly held worldviews that influence a research; ontology and epistemology and within those there are 4 positions that will be mentioned further down.

View of knowledge

The ontological view itself is composed of two positions objectivism and constructionism; these are concerned with the nature of social entities (Bryman & Bell, 2007, p22). The former position, is concerned with whether a social entity should be regarded as an entity of its own, independent of the social actors. Meaning that a social entity is something tangible, with rules and regulations that act on its own therefore not a process of social actors (ibid). However in contrast, the latter position views a social entity to be a construct of the different actions caused by the social actors and that the social phenomenon is constantly changing (Saunders et al 2009). Finally, as cited by Remenyi in Saunders et al, an emphasis should be placed on the details of a situation in order to understand the reality.

We hold the belief that the social construct is a phenomenon that is independent of the individual. Therefore we have applied the objectivistic view in our study, which also allowed us to have an objective standpoint during the research progress. More specifically it prohibited us from influencing the research with our personal views. In the context of our study the approach gave us the capability to objectively observe our respondents results in order for use to make inference about their replacement behavior. Finally the objectivistic foundation is more suited for quantitative studies in which our study is based on.

The second view is epistemology, which deals with the question of what should be accepted as “real knowledge” within a field. However this dimension revolves around the problematic question whether same methods, principles and approaches and can be applied both in the social world as in the one of natural science (Bryman & Bell, 2007, p16). Positivism is the position that acknowledges the importance of applying the same procedure used in natural science with the one of the social reality (Saunders et al 2007). Positivism has its foundation on the explanation of human behavior and the understanding of human behavior (ibid). Positivism revolves around principles; 1, only things that can be perceived with our senses can be accepted as knowledge, 2, hypotheses is generated by theory, 3, knowledge is achieved by gathering facts, 4 science can only be conducted objectively, 5 there is a difference between scientific statements and normative statements in which the former is real deal. According to Darwin et “positivism assumes that there is foundation point at which an observer can stand and observe the external world objectively “( Darwin et Development of strategies 2001). This refers to the importance that the researcher conducts the study in a value free way and at no point try to affect or be affected by the study. In contrast to positivism, the position of interpretivism holds that the social world cannot be applied with the same logic as the natural science, therefore people and objects should be viewed upon differently (Bryman & Bell, 2007, p19). Interpretivism recognizes that it is social reality as it is, is a complex mechanism that cannot be
reflected in the natural science and should therefore be treated separately (Saunders et al 2009). In other words interpretivism advocates that the human mind and the reality should be studied separately (ibid).

Our interpretation of what real knowledge is derived from the positivistic position. Given that our study mainly focuses on the behavioral aspects of the mobile telephone consumers through an objective and empirical approach, we strongly agree with attributes of positivism. Furthermore we have conducted our study by using a sample of students at Umeå University in order to generalize it to a larger population, this would not be possible if used a different epistemological position. We could have applied interpretivism, which Saunders et al argues for is more suited for business and management studies. However regarding the application of this position to our study, would limit our findings since it deals with smaller samples, which would limit us to make generalizable inferences. An additional down turn is that it treats each consumption situation as unique thus making it non-predictive. Hence, interpretivism is more suited for a qualitative study and therefore not suited to our study.

3.2 Practical Method

Research Approach

At an early stage the authors of a study face the question of what design to use when considering the theoretical aspects. The two main approaches are deductive and inductive approach. The deductive approach is most commonly used within with natural science and is based on theory guiding the research. The researcher starts off by using theory that exist within the field and deduces a hypothesis that will through the process of the research be subjected to empirical data (Saunders et al 2009 p. 124). In contrary the inductive approach is more common within the human science. When using the inductive approach the researcher usually have less knowledge about the specific topic and uses the findings to build a theory. However a setback with this approach is that one could not go beyond and draw generalization more than what current collected data holds (Bryman & Bell, 2007, p581). Also the inductive approach is mainly interested in why certain things occur rather than how “Saunders et al, 2009 p. 119).

The purpose of our study is uncovered how planned obsolescence and attitude functions influence students’ replacement decisions. In order to answer our research question we will apply the deductive approach by using the theories we have found relevant to our subject and from there construct a survey based on those theories. The results that are revealed from the survey will be evaluated through the lights of the theories. Additionally we will confirm or modify theories depending on the empirical data.

Research strategy refers to the process in which one conducts a business research (Bryman & Bell 2004). In the world of research there are two research strategies that are dominant; quantitative and qualitative method. Within the research there is much discussion about the distinctive features of these two and which of them reflects the world we live in more accurately. However it is important to note what Saunders et al stated that, “we must emphasize that no research strategy is inherently superior or inferior to any other” (Saunders et al 2007). Thus the focus of the study should not only
lie on the choice of the research strategy but in congruence with the research question so that it can be answered in the most relevant and correct way. On a simple or a basic way there a several common characteristics that separate these two strategies. Depending on the nature of the study, the strategies can be used for exploratory, descriptive or explanatory research (Saunders et al, p135). These are usually contingent on the kind of approach that is taken, either deductive or inductive approach, further down these two concepts will be discussed a bit further. However the importance of understanding deductive and inductive approach is vital since it determines the role of the theoretical part of the study. Apart from the measurement being a characteristic in the quantitative research approach and not in the qualitative, their epistemological foundations also differs. This was briefly explained in the previous section titled view of knowledge. As mentioned before the quantitative research approach is mainly concerned with quantifiable data that is collected during the research in order to test existing theories. Qualitative approach takes a different road in which the focus does not lie on numerical data but instead emphasizes on the semantics and relies more on a subjective approach to the research. Moreover instead of testing existing theories as one do in a quantitative study, here one focus on developing new theories that will be tested.

The deductive approach is mainly used in quantitative research (Saunders et al 2007) but is not limited to it. The theory plays a important part within in these categories one can either Quantitative approach involve measurements and has a different relationship between theory and research. The method of research we have chosen is the quantitative approach due to its advantageous nature of measuring consumer attitudes and other market data. The quantitative method allowed us to classify features, count them and explain the observations in a statistically relevant manner (Gorard 2001). One of the common tools for collection of data is a questionnaire, which we chose as our of survey method. We have chosen this particular method because we are clear about our research objectives and based on the fact that our study is designed before the data collection is carried through. This method is advantageous for its’ consideration to low monetary cost and efficiency in terms of time constraints. This could be compared to an example of doing interviews on the same amount of people. Another important benefit here is that this method allowed us to draw a rather large sample which assisted us in making a generalization about the population and at the same time decreased the possibility of getting observations which contained random variations. Further more the quantitative approach will enable us to measure these concepts by using indicators. These indicators take the form of a series of questions in a self-completion questionnaire that we have constructed, which Bryman and Bell (2007) defines as being an“/.../indirect measure of a concept/../” “Sets of attitudes always need to be measured by batteries of indirect indicators” (Bryman and Bell 2007 p. 159). The statistical measures we will use are t-tests and Spearman’s correlation coefficient. “/.../if both variables are interval/.../we measure and test whether a relationship exists by employing a nonparametric technique, the Spearman rank correlation coefficient.

The cross sectional analysis is described as a research design that gathers data on more than one case at one point in time. The more data gathered allows for more variation (Bryman & Bell, 2007, p726). A survey is a type of cross sectional design that focuses on gathering data using two or more variables in order to find a potential correlation (Bryman & Bell,2007, p731). In a cross sectional design the researcher can only examine the correlation between variables but not having the possibility of manipulating them. According to Bryman & Bell the inability to manipulate variables is followed by the incapacity to know if there is any causal relationship between the variables. We have included 14 questions which corresponds to 12 different variables in which 4 of them represents
attitude functions, 4 corresponds to physical and technical obsolescence, 1 question focus on the amount of cell phones owned during a period of five years. Finally the remaining 3 variables can be considered as background variables and are merely a criterion for being a part of the population. Drawing a conclusion concerning the causal relationship between the variables is difficult given our research design. However we are confident that our variables will reveal correlations and that it will be sufficient in order to draw inference about replacement decisions.

Sampling refers to the process of reducing the amount of data that researchers need to collect by choosing a subgroup that will represent the entire population (Saunders et al,p204). Saunders et al announced 4 valid reasons for using sampling:

- Impracticable to survey the entire population
- Budget constraints
- Time constraints
- The need for quick results

Furthermore sampling can be conducted with a probability and non-probability sampling. Probability sampling allows for every unit in the population through a random selection to be equally chosen. However the non-probability sampling is the opposite with no regard to random selection. Therefore some units tend to have a bigger chance to be selected (Bryman & Bell, 2007, p182).

**Pilot Study**

According to Bryman & Bell (2004) it is always preferable to make a pilot study prior to administering a survey. The pilot study is there to assure that the correspondents interpret the questions in the same way as the authors (Dahmström 2005 p. 143-145). Simply put the main reason for this is to make sure that the questions are clear enough for the respondents to answer correctly as in truthful and complete. Thus by piloting allows for feedback about suggestions and improvements about structure and questions. Therefore we decided to use a pilot study, which was conducted 1 week prior to the real study. The result of the study was mostly positive in which our test subjects found it to be well articulated and structured. Apart from that, some small adjustments had to be made, such as adding more choices to question 10 and some minor change in the wording of some questions. Furthermore we had some comments on the aesthetical aspects, which were important to adjust so that the respondent could be more motivated to complete the questionnaire. What did we learn...

**Designing the survey**

We constructed a survey based on questions relating to the behavior for replacement decision on mobile phones from a student perspective. The surveys’ intent was to give us enough empirical data in order for us to draw conclusions and connect them to our theoretical framework, which in turn would lead to our analysis and finally conclusion. The population from which the sample was drawn was students, currently attending activities at Umeå University. We chose students at Umeå University for several reasons. Primary they were easy accessible and are generally more open to answer questionnaires. They are open to new information and have the ability to be critical.
Moreover they also have the habit of following trends or at least being aware of their surroundings. A negative aspect of using students may be of the same reason in which students are much to informed and aware which differentiates them from other individuals in the society. This would in turn not reflect the population when generalizing to it. Since we had limited recourses, money and mainly time, a non-probability convenience sample was conducted at the Student Library. The library was also a good place since it is the spot at the university that contains most versatility of students. I.e. students from different faculties and background occur here. Once again due to constraints (money and time) we decided 100 copies would be a sufficient sampling size. However we added an extra of 10 copies to compensate for potential sampling errors. According to Bryman & Bell there is no definitive answer how big the sampling size should be (Bryman & Bell 2007 p194). This decision is based on several other consideration, primary time and money as previously mentioned (ibid). However the students were approached with a survey at three different occasions during different hours of the day in order to assure enough diversification. We gave the students the instructions that after completing the survey, all they had to do was to turn the paper around and we would come and collect them. We were aware that this type of conducting a survey could limit our ability to draw generalization that would represent the entire population. However we are confident that the population and the results given was enough to see a pattern of replacement behaviors. The survey contained 14 questions that were related to Joseph Guiltinan’s five obsolescence mechanisms of physical and technological aspects and Grewal et als’ four attitude functions. These will be explained in the next section.

Non-Response

Bryman & Bell states that a non-response imply that individuals refuse to cooperate, cannot be contacted or lack the ability to supply the correct data. Saunders et al identify 4 explanations for a non-response:

- Refusal to respond
- Inability to respond
- Inability to locate respondent
- Respondent located but unable to make contact

We chose to use a sample of 110 students, and accounted for non response in the form of refusal and ineligibility to respond. However since we were certain that a vast majority of the individuals at the library were students who own a cell phone, we expected a very low amount of non-response error. Non-response can also come in other forms such as, skipping questions, stressful situation, lack of interest and etc. Therefore we constructed a pilot study to ensure the survey was clear, interesting, easy to understand and short enough for it to be completed. However we cannot with a 100 per cent assure that the student answers were truthful but we are confident that this is the case. Another approach to better assure non-responses is to conduct interviews with each students rather than using a survey. However this method is would be next to impossible given our sample size. Moreover it does not really comply with our research study.
**Sources of data**

The data collection method refers to the means how the data was attained. There are mainly two sets of data that can be used in answering a research question, primary or secondary data. Primary data is data collected specifically for the research by observations and experiences (Saunders et al, p. 606). Secondary data consist of both quantitative and qualitative data and refer to reanalyzing such data that have been collected for some other purpose in some other context (Saunders et al 2009 p. 246). Saunders et al created three subgroups of secondary data:

- Documentary data – consist of non-written and written materials in the form of notices, administrative records, books, journals, magazine articles and newspapers etc.
- Survey based data – data collected from questionnaires
- Multiple sources data - area and time series based data

We found it relevant to use a combination of both primary and secondary data to help us review theories and more importantly help us answer our research question. The secondary data will be compiled of documentary data and for the most part based on survey-based data. More specifically our data is consisting of books, magazine articles, journals, research papers. Nevertheless the majority of the data analyzed will be extracted from our survey.

**Literature Search**

The source of information required for driving this research forward was mainly acquired from Umeå University Library but search engines as Google was also used. Nevertheless we gained access to the Universities vast subscription to databases and journals around the world. We mainly relied on Business Source Premier and Emerald Fulltext, two of biggest databases for business students. When searching for relevant information we used keywords like: durable goods, planned obsolescence, consumer behaviour, replacement decision and sustainable consumption only to mention the most significant ones.

**Respondents**

The number of respondents was intended to be rather large to increase the versatility of the students in terms of their field of study, opinions, views, experiences and other extreme factors. In this way the representativeness of the sample can be kept to its maximum. We chose to include at least 110 respondents for it to be generalizable of the entire population. However due to time and money constrains a much larger sample than a 110 would not be feasible. We are attentive that a larger sample will potentially lead to a better representation of the population.

The next section will clarify the questions used in the design of the questionnaire and the theoretical departures of which it is comprised.
The questionnaire

To address the main research question we will focus on consumers’ replacement decisions and general attitudes related to their product consumption behaviour. Allen et al. (2002) explains that there are two forms of values a consumer can have; terminal values and instrumental values. A consumer with terminal values puts emphasis on the product’s symbolic meaning which facilitates self-expression whereas the instrumental values represent how a consumer has a utilitarian approach to consumption. These attitude functions together with Guiltinan’s (2009a) definition of the different types of obsolescence will be included in the questionnaire and will be analyzed through correlations to actual behavior of cell phone obsolescence. Initially we will introduce the questionnaire with background questions that fulfill the purpose of guiding the readers/respondents interest to the more significant questions. The questionnaire with is based on the design of 7-point Likert Scale questions, which are beneficial to rate the level of agreement and disagreement of respondents and the attitudes that they possess (Brace 2004 p.78).

**Question one to four are considered background questions and are included for the purpose of opening the questionnaire leading readers interest and focus to the obsolescence and attitude function questions.**

Question one “Are you a student at Umeå University?” This question refers to our sample frame, which represents the students at the university.

Question two “Are you a male or a female?” Just a demographic question which is not included significant for the purpose.

Question three “Do you currently own a cell phone?” We only wanted individuals who currently owned cell phones to be included in the sample frame.

Question four “How many cell phones have you owned the last five years?” This particular question is significant for the research question since we have theories regarding the frequency of replacement.

The clarification of what planned obsolescence, replacement decisions, and attitude functions that have been presented from the previous sections will aid the categorization of questions for the survey. The questions are produced through the careful revision of literature on the subject matters. The questions which are directly related to the theory are divided into sections as follows:

- **Questions five to nine are representative of Guiltinan’s (2009) definitions and discussion of the different planned obsolescence practices in the following way:**

  Question five “My previous phone stopped functioning, (e.g. system failure, strange behaviors, screen deviations etc.)” corresponds to what Guiltinan (2009) explains as limited functional life design or “death dating” (Guiltinan 2009 p. 20).

  Question six “My previous cell phone was too expensive to repair” was aimed to represent the second planned obsolescence practice called “design for limited repair” (Guiltinan 2009 p. 20).
Question seven “Dissatisfaction due to ‘wear and tear’ of the previous phone (damaged but still functioning, e.g. significant scratches and dents)” is the third and last type of physical obsolescence which is referred by Guiltinan as “design esthetics that lead to reduced satisfaction” (Guiltinan 2009 p. 20).

Question eight “I wanted/preferred the design of my current cell phone (e.g. screen size, colors, brand, buttons etc.)” was designed to embody “design for fashion” (Guiltinan 2009 p. 20).

The second question referring to technological obsolescence is question nine “I wanted/preferred the new features of my current cell phone (e.g. internet features, music features etc.)” and more specifically “Design for functional enhancement through adding or upgrading product features” (Guiltinan 2009 p. 20).

- The last four questions are intended to measure the attitude functions that Grewal (2004) and Allen (2002) make definitions of.

We designed four questions that would represent the four attitude functions that Katz developed in the 1960’s. With inspiration from Grewal et al (2004) who did a similar thing, we sought to implement these 4 attitude functions into 4 questions that would represent each function of attitude. We carefully designed the questions with the goal for the respondent to be able to easily understand and relate them to an everyday context. Each question is designed in such a way to characterize the attributes that hold each attitude function to be true. Given that the answers we receive are true, the measurement would help us identify what attitude functions the different respondents hold which in turn aids us with better understanding of the reasons for replacement.

We will also ask how many times the consumer has purchased a mobile phone in the last five years in order to make groups of frequent and non-frequent consumers. The most frequent buyers and the less frequent buyers will be compared as to what kind of obsolescence is the most common for the respective groups, i.e. frequent buyers of cell phones make replacement decisions based upon of technological obsolescence. We will also examine if and to what extent attitude functions (Grewal et al. 2004) can possibly be a driver of obsolescence type, and frequency of replacement.
4 Results

4.1 General results

We will start by presenting the general results for each question to get an overview of the answers from the questionnaire. The frequencies will be expressed as percentages utilizing bar-charts for question five to fourteen and for question four a pie-chart will be provided, and the means will be also be presented for each question.

Questions five to fourteen are based on a 7-point Likert scale because it gives an opportunity for the respondent to rate the response on a wide scale which gives more detailed information to the level of agreement or disagreement to the question. By doing this the mean of all the answers to a particular question will be more precise and facilitate a better comparison between the mean of the questions. Since the scale has seven points the middle value is four which is considered to be a response which is neutral to agreement or disagreement and therefore a value above or below can serve as an indication to agreement or disagreement.

Bar chart 4.1. Replacement decision due to the mobile phone stopping to function. 46 percent strongly agreed to the reason for replacement to be the physical breakdown of the mobile phone. 17 percent agreed to the statement, 9 percent agreed somewhat, 6 percent were undecided, 5 percent disagreed somewhat, 3 percent disagreed and 14 percent strongly disagreed. The mean is 5.32 which provide us with the information that the majority of the respondents agree to the statement (See table Table 4.5 in Appendix B).
Bar chart 4.2. *Replacement decision due to the mobile phone being too expensive to repair.* 15 percent of the respondents strongly agreed to the statement that the last phone was replaced due to expensive repair costs. 13 percent agreed, 6 percent agreed somewhat, 5 percent were undecided, 11 percent disagreed somewhat, 11 percent disagreed and 39 percent strongly disagreed. The mean for this question is 3.25 (See table Table 4.5 in Appendix B) which indicates that most of the answers fall below the neutral response of four and therefore disagreement to the statement is the most commonly held opinion.

Bar chart 4.3. *Replacement decision due to dissatisfaction of wear and tear of the mobile phone.* 9 percent strongly agreed to the statement, 12 percent agreed, 10 percent agreed somewhat, 11 percent were undecided, 11 percent disagreed somewhat, 18 percent disagreed and 29 percent strongly disagreed. The mean is 3.26 (See table Table 4.5 in Appendix B) and thus the majority of the respondents disagreed to the statement.
Bar chart 4.4. *Replacement decision due to the preference of the new design of the currently owned mobile phone compared to the previously owned mobile phone.* 17 percent strongly agreed, 12 percent agreed, 19 percent agreed somewhat, 12 percent were undecided, 4 percent disagreed somewhat, 12 percent disagreed and 24 percent strongly disagreed. The mean is 3.96 (See table Table 4.5 in Appendix B) hence the responses were very disperse to the statement.

**Mean: 3.96**

Bar chart 4.5. *Replacement decision due to the preference of new features of the currently owned mobile phone compared to the previously owned mobile phone.* 22 percent strongly agreed, 10 percent agreed, 14 percent agreed somewhat, 11 percent were undecided, 6 percent disagreed somewhat, 12 percent disagreed and 25 percent strongly disagreed. The mean is 3.95 (See table Table 4.5 in Appendix B) hence the responses to this question were both of agreement and disagreement.

**Mean: 3.95**
Bar chart 4.6. Replacement decision due to none of the above statements or other reasons. 14 percent strongly agreed, 3 percent agreed, 6 percent agreed somewhat, 4 percent were undecided, 3 percent disagreed somewhat, 24 percent disagreed and 46 percent strongly disagreed. The mean is 2.83 (See table Table 4.5 in Appendix B) and it is evident that most of the respondents disagreed to the fact that there were other factors influencing the replacement decision.

Mean: 2.83

Bar chart 4.7. Attitude that the practicality of the mobile phone is important when making a purchase decision. 24 percent strongly agreed, 31 percent agreed, 25 percent agreed somewhat, 12 percent were undecided, 3 percent disagreed somewhat, 3 percent disagreed and 2 percent strongly disagreed. The mean is 5.43 (See table Table 4.5 in Appendix B) and it is therefore evident that the majority of the respondents agree that practicality is important.

Mean: 5.43
Bar chart 4.8. *Attitude that when making a purchase decision the usefulness of the mobile phone is important.* 37 percent of the respondents strongly agreed, 33 percent agreed, 20 percent agreed somewhat, 4 percent were undecided, 2 percent disagreed somewhat, 3 percent disagreed and 1 percent strongly disagreed. The mean is 5.87 (See table Table 4.5 in Appendix B) and it is evident that the majority of the respondents agreed to the statement.

Mean: 5.87

Bar chart 4.9. *Attitude that the mobile phone should be reflective of one’s image.* 4 percent strongly agreed, 12 percent agreed, 14 percent agreed somewhat, 24 percent were undecided, 20 disagreed somewhat, 15 percent disagreed and 11 percent strongly disagreed. The mean is 3.65 (See table Table 4.5 in Appendix B) which means that most of the answers fall below four and therefore disagreement or being undecided is the most common.

Mean: 3.65
Bar chart 4.10. *Attitude that it is important that the mobile phone should be fashionable and the ability to proudly display the mobile phone.* 4 percent strongly agreed, 14 percent agreed, 20 percent agreed somewhat, 20 percent were undecided, 11 percent disagreed somewhat, 19 percent disagreed and 12 percent strongly disagreed. The responses were dispersed, however the mean is 3.75 (See table Table 4.5 in Appendix B) which shows that the general tendency is a slight disagreement to the question.

**Pie-chart 4.1.** *The amount of mobile phones owned during the last five years.* 5 percent had owned zero or one mobile, 84 percent had owned two to five mobile phones, 9 percent had owned six to ten mobile phones, 1 percent had owned eleven to twenty mobile phones and 1 percent had owned twenty-one or more mobile phones in the last five years. It is evident that the majority of the respondents had a replacement frequency of two to five mobile phones in the last five years.
4.2 Results for the research questions

**Research question one - What is the most common form of obsolescence that acts as a basis for the decision to replace a mobile phone?**

In order to answer to this research question we made t-tests to test the significance on the means for question five to nine which represent physical and technological obsolescence. By conducting these tests we are able to state which type of obsolescence is the most common for replacement decisions. The test value was set to four since it is the mean on the 7-point Likert scale and the confidence interval was set to 95 percent.

<table>
<thead>
<tr>
<th>T-test for question five to nine</th>
<th>Test Value = 4</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>95% Confidence Interval of the Difference</td>
</tr>
<tr>
<td></td>
<td>Mean Difference</td>
</tr>
<tr>
<td>t</td>
<td>df</td>
</tr>
<tr>
<td>---</td>
<td>----</td>
</tr>
<tr>
<td>Q5 Stopped functioning</td>
<td>6,269</td>
</tr>
<tr>
<td>Q6 Too expensive to repair</td>
<td>-3,294</td>
</tr>
<tr>
<td>Q7 Wear and tear dissatisfaction</td>
<td>-3,696</td>
</tr>
<tr>
<td>Q8 Preferred new design</td>
<td>-.172</td>
</tr>
<tr>
<td>Q9 Preferred new features</td>
<td>-.207</td>
</tr>
</tbody>
</table>

*Table 4.1 T-test for question five to nine*

For question five we see that the t-value is positive and that it is significant at the level 0.05. We can therefore state that the mean 5.32 presented in the previous section is accurate and that the majority of the respondents agreed to the fact that the replacement decision was based on the mobile phone stopping to function. Question six had a negative value at the significance level 0.05. It can be inferred that the mean 3.25 is accurate which leads to the conclusion that replacement decisions are not based upon the mobile phone being too expensive to repair. Question seven had also a negative value at the significance level 0.05 which facilitates the statement that dissatisfaction due to wear and tear of the mobile phone is not the basis of replacement decisions. Both question eight and nine had negative values but they were not significant at the significance level 0.05. Therefore we cannot state that the preference of new design or the preference for new features would influence replacement decisions.

As we have discussed previously in the section on the construction of the questionnaire, question five measures physical obsolescence. Thus we can make the conclusion that physical obsolescence constitutes the majority of replacement decisions at the significance level of 0.05.
Research question two – is there a correlation between physical obsolescence and technical obsolescence?

We wanted to test whether there was a correlation between replacement decisions based on physical obsolescence and technical obsolescence. It would be logical if the respondents who reported that physical obsolescence was the main reason for replacement had answered that technological obsolescence were not a reason for replacement. A Spearman correlation coefficient test was run in order to test the research question.

<table>
<thead>
<tr>
<th>Q8 Preferred new design</th>
<th>Correlation Coefficient</th>
<th>Q5 Stopped functioning</th>
<th>Q6 Too expense to repair</th>
<th>Q7 Wear and tear dissatisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-0.438**</td>
<td>-0.050</td>
<td>0.267</td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.000</td>
<td>0.608</td>
<td>0.125</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>107</td>
<td>107</td>
<td>107</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Q9 Preferred new features</th>
<th>Correlation Coefficient</th>
<th>Q5 Stopped functioning</th>
<th>Q6 Too expense to repair</th>
<th>Q7 Wear and tear dissatisfaction</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-0.401**</td>
<td>-0.086</td>
<td>0.288</td>
<td></td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.000</td>
<td>0.378</td>
<td>0.143</td>
<td></td>
</tr>
<tr>
<td>N</td>
<td>107</td>
<td>107</td>
<td>107</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.2 Spearman test question five to nine

There was one significant result from the test. Question five had a moderate negative correlation to question eight and nine with the significant values -0.438 and -0.401. This means that when respondents agreed to the fact that the replacement decision was due to the mobile phone stopping to function they were not likely to agree that the replacement decision was based upon the preference of new design and preference of new features is negative at the significance level 0.05. We can therefore state that there is a negative correlation between physical and technological obsolescence. This result gives more evidence to the results obtained for research question one, giving a more absolute sense to the fact that replacement decisions are affected mainly by physical obsolescence.

Research question three - What is the most common attitude that students have towards the products’ value?

In order to answer research question two we undertook the same procedure as for research question one. The variables that are being measured are questions eleven to fourteen which represent the attitude functions. These variables are measured in order to see if any of the attitude functions influence the replacement decision.
T-test for questions eleven to fourteen

<table>
<thead>
<tr>
<th></th>
<th>Test Value = 4</th>
<th>95% Confidence Interval of the Difference</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t</td>
<td>df</td>
</tr>
<tr>
<td>Q11 Importance of practicality</td>
<td>10,761</td>
<td>109</td>
</tr>
<tr>
<td>Q12 Importance of usefulness</td>
<td>15,626</td>
<td>109</td>
</tr>
<tr>
<td>Q13 Importance of self image</td>
<td>-2,226</td>
<td>109</td>
</tr>
<tr>
<td>Q14 Importance of fashion/display capabilities</td>
<td>-1,483</td>
<td>109</td>
</tr>
</tbody>
</table>

Table 4.3 T-test question eleven to fourteen

The knowledge function of attitudes, represented by question eleven, had at the significance level 0.05 a positive value. Question twelve represents the utilitarian function of attitudes and had a positive value at the significance level of 0.05 as well. Question thirteen and fourteen which represent the value-expression and social-adjustive functions of attitudes both had a negative value but were not significant. Since question twelve had a higher value than question eleven, we can make the inference that the most common attitude towards the products’ value is based on the utilitarian function of attitudes.

Research question four – Is there a relationship between obsolescence type and attitude functions?

We ran a Spearman’s correlation coefficient test in order to find out if any of the variables representing physical and technological obsolescence were correlated to the variables representing the attitude functions. The results showed that there was a significant relationship for question five and question nine (see table 4.6 in Appendix B). Question five had a negative correlation of -0.184 to question thirteen and a negative correlation of -0.164 to question fourteen. Since the perfect negative relationship is -1 (Keller 2005 p.117) these correlations are rather weak. However we can state with 95 percent confidence that when replacement decisions are based upon physical obsolescence it is not likely that the value-expressive and social-adjustive attitudes are held. The other correlation that we found concerned question nine which measured if replacement decisions were based on the preference of new features in a mobile phone. At the significance level 0.05 the variable had a positive correlation of 0.195 to the self-expressive function of attitudes and 0.263 positive correlation to the social-adjustive function of attitudes (see table 4.6 in Appendix B). Hence we can state at the significance level 0.05, technological obsolescence has a positive correlation to the value-expressive and social-adjustive function of attitudes.
Research question five - Is there a relationship between rate of replacement and obsolescence?

We wanted to check whether there was a correlation between the rate of replacement and the reason for replacement. It would be logical if early replacement buyers were basing the decision upon technological obsolescence and that late replacement buyers would base the decision upon physical obsolescence. We ran a Spearman rank correlation coefficient test, but there were no significant results, hence we cannot state that rate of replacement has a correlation to replacement decisions based on physical or technological obsolescence. This is probably due to fact that there were not many respondents who had owned a higher or lower amount than two to five mobile phones. As we presented earlier 84 percent of the respondents were in that category.

Results for research question six – Is there a relationship between rate of replacement and attitudes?

For this research question we wanted to test for a relationship between rate of replacement and the four attitude functions represented by question eleven to twelve. We ran a Spearman rank correlation coefficient test with the confidence interval of 95 percent.

<table>
<thead>
<tr>
<th>Q4 Frequency of replacement</th>
<th>Q11 Importance of practicality</th>
<th>Q12 Importance of usefulness</th>
<th>Q13 Importance of self image</th>
<th>Q14 Importance of fashion/display capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correlation Coefficient</td>
<td>-0.033</td>
<td>-0.005</td>
<td>0.265**</td>
<td>0.285**</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>0.731</td>
<td>0.959</td>
<td>0.005</td>
<td>0.003</td>
</tr>
<tr>
<td>N</td>
<td>110</td>
<td>110</td>
<td>110</td>
<td>110</td>
</tr>
</tbody>
</table>

*Table 4.4 Spearman test question four and eleven to fourteen*

There were no significant relationships between frequency of replacement and question eleven and twelve which represent the knowledge and utilitarian functions of attitudes since the p-values were over 0.05. We observe a moderate positive relationship between frequency of replacement and question thirteen and fourteen which represent the value-expressive and social-adjustive attitude functions at 0.05 significance level. We can state that we are 95% sure that there is a moderately positive correlation between these variables. So when frequency of replacement is high or increasing, it is likely that the social-adjustive and value-expression value of attitudes are being held. However these results are questionable since most of the responses were in the category of two to five mobile phones.
4.3 Summary of results

The key findings from the results of the research questions are summarized as below:

- **Physical obsolescence constitutes the majority of replacement decisions**
- **There was a negative correlation between physical and technological obsolescence.** When replacement decisions are based on physical obsolescence, the reason for replacement is less done due to technological obsolescence.
- **The most common attitude towards the products’ value is based on the utilitarian function of attitudes**
- When replacement decisions are based upon physical obsolescence it is not likely that the value-expressive and social-adjustive attitudes are being held. Technological obsolescence has a positive correlation to the value-expressive and social-adjustive function of attitudes. When replacement decisions are based on technological obsolescence the student’s attitudes when deciding on replacement are more social-adjustive and value-expressive.
- **Rate of replacement does not have a correlation to replacement decisions based on physical or technological obsolescence.** When frequency of replacement is high or increasing, it is likely that the social-adjustive and value-expression value of attitudes are being held.
5. Section of Analysis

This is the part where we provide the reader with what we are able to make statements of from the results section in relation to theories and previous studies which were introduced in the theory chapter.

The section is organized in a way which facilitates the clear distinctive outcomes and related discussions and analyses for each research question. The last part covers all of the issues on a wider spectrum and will provide an answer for the main research question.

What is the most common form of obsolescence that acts as a basis for the decision to replace a cell phone?

Based on the results from research question one, we observe that the most common form of obsolescence that influences a student’s decision to replace their cell phone was due to physical obsolescence. The mean is the strongest and is significant from the t-test and we are 95% certain that it is correct. None of the other factors which measured physical obsolescence had an impact on replacement decisions. Since the results for the variables on technological obsolescence were not significant we cannot make any accurate statements regarding them for this research question. The respondents reported that any other possible reasons for replacement do not play a prominent role in their decision.

The t-tests provide us with the indication that amongst our sample of students from Umeå University, their replacement decisions are as Grewal et al (2004) argues mainly of a forced nature. He argues that “/…/supply-side factors influence the nature of the decision because the pace of technological advances affects unforced purchase decisions, and durability and reliability influence forced purchase decisions” (Grewal et al 2004 p. 102).

Interestingly, these findings are contradictory to Cooper’s (2004) qualitative study on replacement decisions which found that cell phones were goods which were prone to be replaced due to voluntary consumer decisions. There are several factors which could be suggested as the cause for this difference, the most crucial one being the difference in consumer groups. In his study it was mainly medium to high income households, which leads to the consideration that the difference in income to our sample could be the explanation for this difference in findings. Students as a consumer group are characterized by its low income in comparison to many workers for example. The restricted level of income could be a reason for their choice in cell phones, not having much choice but to buy a new cell phone when the current one ceases to work rather than being able to indulge in new exciting models introduced to the market.

Furthermore the consumer discount rates for the sample could be relatively low for students. As Guiltinan (2009) states “/…/based on what we do know from the limited studies available, replacement buying behaviours are complex, heterogeneous, and perhaps based more on heuristics and extrinsic cues than on a calculative cost-benefit tradeoff process” (Guiltinan 2009 p.22).

These results that physical obsolescence is the most common replacement reason do seem unsustainable. Our study could be an indicator of how technology-push strategies should be looked
over for a serious improvement in the area of durability and sustainability. It seems as though the consumer is not the ultimate responsibility holder for the current consumption society due to the involuntary dimension of these replacement decisions.

**Is there a correlation between physical obsolescence and technical obsolescence?**

Question five had a moderate negative correlation to question eight and nine with the significant values -0.438 and -0.401. This means that when respondents agreed to the fact that the replacement decision was due to the mobile phone stopping to function they were not likely to agree that the replacement decision was based upon the preference of new design and preference of new features is negative at the significance level 0.05. We can therefore state that there is a negative correlation between physical and technological obsolescence. This result gives more evidence to the results obtained for research question one, giving a more absolute sense to the fact that replacement decisions are affected mainly by physical obsolescence.

**What is the most common attitude that students have towards the product’s value?**

As to answer research question two we found the results of the survey to indicate that with a significance level of 0.05 the utilitarian attitude towards the product value was the most common of the sample. This means according to Grewal et al (2004) that the bigger part of the sample sought this attitude for maximizing rewards as being a result of consumption experience. By also taking into consideration that majority of the sample units had previously owned two or more cell phones actually helps to strengthen the results given that maximizing rewards results from consumption experience. However one should keep in mind what the authors stated about experiences as the benefits being different amongst individuals and also amongst different products. Although the product in this case was uniform for all participants, we should still bear in mind that the functional attitudes are subjective to the user and may depend on many other factors. However another possible explanation for why the majority of the sample holds the utilitarian values is that simply because the sample was limited to students only. This is based on Allen et al’s statement about the utilitarian function serving the instrumental human value, which implies “desired modes of action such as being independent, ambitious and broad minded” (Allen 2004 p. 132). Note the three adjectives that describe the instrumental value, one could say that these adjectives typically describe attributes of a student. In addition applying Hoyer & MacInnis concept of MAO it would also allow explaining the outcome. For a brief explanation MAO refers to the degree in which consumers make conscious effort to form or change attitudes. Remember Hoyer & MacInnis distinguish between two types, those who hold high MAO and those who hold low MAO. We believe that the majority of our sample consisted of high MAO which refers to a high motivation, ability and opportunity.

Moreover, the knowledge function was the second largest attitude function the respondents held. Interestingly this particular function helps individuals to organize, structure and handling complex information which is also similar to a high MAO which Hoyer & Macinnis (2003) stated being “individuals who possesses high motivation, ability and opportunity when in the process of information gathering and decision making” (Hoyer & Macinnis 2003 p.) Finally, according to the results, we can state that our sample who entirely consisted of students where more inclined to hold one of these two attitudes due to their attributes as students.
The value expressive function had no significant results which results in the inability to make any sure inferences. However, the social adjustive attitude function had a significant result at the level of 0.05 and indicated a value below the mean. This leads to the conclusion that the students did not think that a cell phone is important to serve a function to achieve social goals (Grewal et al 2004 p. 104).

**Is there a relationship between obsolescence type and attitude functions?**

As stated previously, the most common obsolescence type is physical obsolescence and more specifically what Guiltinan (2009) defines as “limited functional life design” (Guiltinan 2009 p. 20). This type of obsolescence was investigated with a possible relation to any of the attitude functions. The value-expressive and social adjustive function of attitudes had significant results showing a low negative relationship. Hence, when physical obsolescence is increasing, these attitudes are decreasing. This means that respondents who score higher on the scale saying that they agree to the fact that physical obsolescence is a reason for the replacement decision, answers are less likely to be agreeing to the value-expressive and social-adjustive functions of attitudes.

Hence the people who stated that their previous replacement purchase was made due to the cell phone stopping to function, there was a tendency to not seek an expression of their central values of self identity to others. They did not make the decision based on their expectations on how others would perceive them. Furthermore they tend to not make their decision to gain approval in social settings. This makes sense because as Grewal et al (2004) states;”As concern about social approval increases, the desire to replace outdated durables with prestigious new models should increase” (Grewal et al 2004 p. 104).

One may make the conclusion that through these results the fact that the evidence of replacement decisions being of a forced nature are supported. The decision is not influenced by attitudes which are somewhat evolving around personal gain in social settings and means of expression.

Technological obsolescence has a positive correlation to the value-expressive and social-adjustive function of attitudes. When replacement decisions area based on technological obsolescence the student’s attitudes when deciding on replacement are more social-adjustive and value-expressive.

**Is there a relationship between rate of replacement and type of obsolescence?**

Rate of replacement does not have a correlation to replacement decisions based on physical or technological obsolescence. We were hoping to find evidence what early or late replacement buyers were basing their replacement reason on. This could have supported for instance that early replacement buyers were basing the decision on technological obsolescence. But unfortunately since the majority of the answers fell into the middle category of rate of replacement we could not find any significant results to examine.
Is there a relationship between rate of replacement and attitudes?

When frequency of replacement is high or increasing, it is likely that the social-adjustive and value-expression value of attitudes are being held. The significant results acquired through the data were concerning the value expressive and social-adjustive function of attitudes. There was a moderate positive relationship between the variables which indicate that when replacement rate is high these attitudes are held. So it can be concluded that when replacement rate is fast the consumer can put value in the fashion of the product or the self-expression factor.

The research Grewal et al (2004) did point towards the conclusion that when interpurchase intervals are decreasing, the importance of the importance of the knowledge function or the social-adjustive function increases. The latter is in accordance with our results. However the research showed that when the interpurchase interval increases the importance of the value-expressive function increases which is not what was evident through our findings. Bayus (1991) found evidence that early replacement buyers were consumers who cared less about the price and more about styling and image. Conversely these were consumers’ with low educational background however having a high income.

Main research question: How does planned obsolescence and attitude functions influence student's replacement decisions of mobile phones?

Based on the results from our survey we can state that student’s replacement decisions are influenced by planned obsolescence and attitude functions in the following ways. Replacement decisions are mainly due to what Guiltinan (2009a) explains as limited functional life design or “death dating” (Guiltinan 2009a p. 20). We can also state that when replacement decisions are based on physical obsolescence, the reason for replacement is less done due to technological obsolescence. Furthermore we found that replacement decisions are mainly influenced by the utilitarian function of attitudes. When replacement decisions are based on physical obsolescence it is not likely that that the value-expressive and social-adjustive attitudes are being held. We also saw that when replacement decisions area based on technological obsolescence the student’s attitudes when deciding on replacement are more social-adjustive and value-expressive. The social-adjustive and the value-expression functions of attitudes influence replacement decisions to increase

Physical obsolescence, more specifically the cell phone actually breaking down, was the most common reason to purchase a replacement. Therefore we can conclude that the majority of replacement decisions are in fact involuntary. In their research paper from 1989, Levinthal and Purohit state that “The decrease in value that results from product obsolescence is not due to the product becoming less useful or productive, but by its being superseded by a superior product (Levinthal and Purohit 1989 p. 37). Their statement does not comply with the results from our research which could stem from a too general approach to consumer groups on their behalf.

Steward’s statement that “in the past, businessmen – in particular marketing men – have claimed that rapid obsolescence based on arbitrary style changes is necessary in order to maintain high levels of
consumer expenditures” (Steward 1959 p. 15), seems to be just one part of how the reality works today. The highest stated reason for replacement was not technological obsolescence; actually the cell phones were merely breaking down, forcing the consumer to repurchase. The results from our research indicate that in the mature market within the cellular phone sector, there are not only rapid new introductions to the market to stimulate demand, but a limited life-time of the products being sold.

A durable product has a “relatively long life” according to Cox (2006) which puts forward the possibility of interpretation or a matter of personal interpretation. The majority in our study reported that they had owned 2-5 cell phones during the last five year period. It was also reported that the most recent discarded cell phone was due to the phone seizing to function. Is this the typical characteristics of a durable good? This is an excellent opportunity to question whether the classification of durables and non-durables are sufficiently accurate in today’s modern society. Judging from the evidence from our study there are indications to whether cell phones should be considered to be as durable as one might think.

Prince (2009) says that in the high technology sector of the economy, “/.../replacement is typically due to obsolescence rather than breakdown and replacement cycles are relatively short” (Prince 2009 p. 302). One can question the ethical nature of the ways in which the technological market is working today. Cooper’s (2004) study indicated that for households it was common that those mobile phones were replaced before technical failure and that it was not considered to be unsatisfying. However for the consumer group we have studied the results indicated that technical failure was the most common reason for replacement. As we have discussed earlier these are involuntary decisions which could be argued to be on a questionable moral ground upon the producer’s and manufacturer’s behalf. Since students usually have limited monetary resources due to their occupation our research is highlighting the need for their choices as consumers to be increased.

The two common obsolescence types that dwell in today’s market is a product or more specifically a byproduct of the rapid growth market. In our case it refers to the Swedish mobile telephone market. By having such a mature market and in that intense speed, the chances of information flowing equally much between the two parties, producers and consumers is unlikely. Therefore the existence of asymmetry between these two parties prevails not only in this specific market but also in many others to. From previous studies by Levinthal & Purohit and our personal experiences we know that people not only want but need more information about the products. The effect of obsolescence in a grand scale can be mind-blowing and questionable. By looking into the Swedish mobile market we may get some insight which may answers why these replacements takes place. As previously shown about the state of the Swedish mobile telephone market, the indications show a very rapid growth of the market with no sign of deterioration. However the graph illustrates a positive trend in the sales of the mobile phones and a positive trend in the quantity of mobile phones in Sweden. The ongoing positive trend is rooted in the consumer’s willingness to purchase and repurchase new phones. However many inferences can be made about this assumption. One in particular that concerns our thesis, is why do consumers “choose” continue purchasing? The question has been asked before and we think a cause for the phenomenon is evident by simply looking at the graph. As a sale increases so does the quantity of mobile phones in the market but the increase is not periodically. It has a steady constant flow that we think is an unstoppable force directed to the consumers and is some cases is called technology push. This phenomenon has a deceiving look in which it seems as the consumer
has control over the market/consumption however the truth is that the manufacturers constantly introduce new designs with newer and better features. The effect of this process causes the older phones to become obsolete and loose value. At this stage when obsolescence is current we believe that consumers tend to form attitudes of behavior helping them to make the best choice of replacement.

For the consumer group we have studied it is evident that the increase in sales on the Swedish mobile phone market does not constitute technological obsolescence, the want to replace due to new design or features. As we have found the physical breakdown of the product constitutes the majority of why replacement decisions are made.

Figure 2.5 Behavioural model of durables replacement decision-making
(Guiltinan 2009b p. 163)

Our research has shown indications of this model created by Guiltinan (2009b) to be appropriate under the discussion of durables replacement decision-making. For the consumer group we studied the main influences for the replacement decision was mainly to the left side of the model. There was a slight relationship between two of the functional attitudes and the rate of replacement. The book value of the owned good was mainly influenced by the deteriorating physical traits in the product which comes from the expected future utility from the owned good. Marketing efforts and rate of product development is high for the market under study. This in turn influences the consumer discount rate and perceived gain in benefits. The most common attitude towards the product value was the importance of how practical and useful the product was perceived to be but did not generate any significant relationships with rate of replacement. However one can argue that these attitude functions are consistent with the reason of replacement and hence the perceived gain in benefits and loss aversion of the product comprise these factors.

We suggest that the model should incorporate another dimension to the marketing effort and rate of product development. Since replacement decisions are based upon physical obsolescence, it should be added that the level of quality of the good is important for replacement decision making.
Figure 2.4 Product obsolescence and the environment: decisions and influences

(Guiltinan 2009a p. 19)

Referring back to Guiltinan’s paper on planned obsolescence, he provides a figure that maps the factors which play prominent roles in affecting replacement purchasing behaviour (Guiltinan 2009 p. 20). It is evident through our study that the design and engineering practices of cellular phones are at the core of replacement decisions. The choice is made due to a failure of the product and puts the responsibility of disposal upon the consumer. As the sales figures presented earlier shows, the frequency of upgrades are frequent. We have found evidence to Guiltinan’s statement that “/.../frequent introductions of replacement products increase the opportunities and motivation to replace functioning durables” (Guiltinan 2009a p. 19). But even more important we have found that most of the replacement decisions are on the replacement of non-functioning durables. The way the market is operating is highly supportive of excess waste of technology products and puts a strain on the environment. Our research shows that the consumer group being students are being forced to unethical decisions of discarding electronics at a rather high pace. We believe that the responsibility should be moved from the consumer to the suppliers.
6. Conclusion

The purpose with our study was to identify and understand the reason for student’s replacement of mobile phones based on technical and physical obsolescence and attitude functions. The research question that guided the study was “How does planned obsolescence and attitude functions influence student's replacement decisions of mobile phones?” We have found evidence that physical obsolescence affects student’s replacement decisions. We can also state that when replacement decisions are based on physical obsolescence, the reason for replacement is less done due to technological obsolescence. Furthermore we found that replacement decisions are mainly influenced by the utilitarian function of attitudes. When replacement decisions are based on physical obsolescence it is not likely that that the value-expressive and social-adjustive attitudes are being held. We also saw that when replacement decisions area based on technological obsolescence the student’s attitudes when deciding on replacement are more social-adjustive and value-expressive. The social-adjustive and the value-expression functions of attitudes influence replacement decisions to increase.

Through the outcome of our study it can be stated that the majority of replacement decisions being made from our sample, are in fact involuntary. Physical obsolescence was reported as, not exclusively, as most common reason why the person felt a need to replace ones cell phone. We could actually go so far as to say that there is evidence to suggest that this throw-away society has its main responsibility on the behalf of the producers of cell phones because most of repurchases are made because phones are not functional very long. The consumer has to make an involuntary decision to repurchase and hence is forced to generate waste and support the producers who made the product obsolete in the first place. Based on our study the evidence points out that most of our respondent’s keeps their phones until a physical break-down.

Finally, integrating the four different attitude functions allowed us to better comprehend the respondents attitudes towards their products. Thus it can be considered as an instrument that helps identifying the incentives for repurchasing and replacing. These four attitudes along with the obsolescence types identified the most common trend from our sample.

We have argued that durable products such as cellular phones should be re-evaluated in terms of their actual durability and therefore change the definition of what a durable product actually is. Manufacturers should put more effort in prolonging the life span and enhance the durability of their products. This was quite obvious from the evidence of our results thus referring to research question one, which is the dominating obsolescence.

6.1 Contributions

Our study has made contributions of knowledge within the field of consumer decision making and serves as a queue for a restructuring of responsibility. For this particular consumer group it is evident that corporate product strategies and engineering practices have different agendas. Students at Umeå University value the practicality and the usefulness of the product but are forced to discard them due
to technical failure. There is an opportunity here for suppliers to be more responsible in their practices to target these consumers with products which last longer and serve the consumption goals. Today there is just a small fraction of consumers who have a high replacement frequency and value the ability to reflect one’s self-image and fashion.

The results are also useful for governmental institutions which focus on the quality of life of the population. Consumer choices in the electronic market are unethical which should serve as a new view on how the market should be controlled. Our study is also of benefit for Universities, bringing to light questions of whether the traditional theory of supply and demand is not always based on healthy considerations for consumers, the environment and in many cases workers who produce parts of the products. Professors should more frequently include in their teaching all aspects of conducting business to facilitate a wider knowledge base for students which are indeed the future of our society. Marketers may benefit from our information in terms of what this consumer group could see as valuable; durability of the product.

This study is unique in its design and use of subject matter which opens up many new ways of analyzing and discovering our surroundings today. We hope that our thesis has made an impact on the reader in a way that creates an interest in business culture and how the mind interprets factors, which are perhaps not thought to be of importance.

A notion should be placed on the sampling method we used. A different method might have developed different results, sequentially affecting the analysis and the contribution.

### 6.2 Quality of the study

Two common measurements of a study are reliability and validity, which specifically measures the quality of a research. Reliability concerns about to what degree the results from the study are repeatable, that is if the study would be repeated would the results then be the same. There are possibilities in which the outcome turns out to be different and can be a result from random or temporary variables that were not expected (Bryman & Bell). Validity however refers to the integrity of the conclusions that the authors make during the research. I.e. validity measures how well the intended questions has been answered.

Saunders et al recognizes 4 stages that they recommend a research should follow in order for the questions to be valid and reliable. The question has to be constructed in such a way that the respondent understands the question as researcher intended it to be understood and the researcher has to thoroughly understand the answer given by the respondent (Saunders et al, 2007).

Now applying it to our study, we believe that we throughout the research have established a fairly strong ground for reliability and validity. We believe that we have completed this trough several steps. By creating a pilot study and allowing for the survey to be tested and commented on before officially handing it out, assured us that it was feasible and comprehensible. Additionally we focused
on the wordings of the questions and as well the layout of questionnaire. We also avoided making the questionnaire long and time consuming in order to be certain that the respondents answered correctly and honestly. Although we are certain that the results the study revealed to be highly repeatable we cannot be 100 percent accurate that the results would be identical. This is mainly due to the fact that it is merely impossible to achieve same results this given that the attitude functions are highly subjective and that they do alter depending on other factors.

A different approach from our current one would be to alter the size of the sample. Instead of a 100 students, which in turn represents the whole population, could instead have been substantially bigger in size. Furthermore changing the sampling method could also yield different results. Instead of limiting our sampling to the University library during certain hours at three different occasions we could have turned to the different faculties around campus. However considering the different constraints in our assignment, such as time, would not allow for a much bigger sample than the one we used. The study could have become more reliable if a small qualitative interview with students had been done together with the quantitative approach.

Concerning the wording of the questionnaire, the last four questions were perhaps quite tricky to understand for the respondents. This was mainly due to the difficulty of translating the literature concerning these concepts which were intended to be measured. We tried to keep the questionnaire as short and comprehensible as possible in order to keep the respondent motivated to answer all the questions in an honest matter.

### 6.3 Further Research

If our sample’s results are in fact representative of the population, it would be interesting to do research on why students replace cell phones due to physical obsolescence as compared to the large amount of studies stating that technological obsolescence is the most common (Levinthal & Purohit 1989, Cooper 2004, Prince 2009). Factors to be considered as influential could be for example income, subject of study and comparisons to other consumer groups such as parents with children, high-income workers etcetera. On another note it would definitely be of interest for further research to include companies’ and governmental opinions about the subject matter, which could enrich comprehension on a larger societal level.
Reference List

Articles

Allen W. Michael, Sik Hung Ng, Marc Wilson (2005) A functional approach to instrumental and terminal values and the value attitude behaviour system of consumer choice, European Journal of Marketing


Totten, Jeff W., Lipscomb, Thomas J., Cook, Roy A. andLesch, William (2005) 'General Patterns of Cell Phone Usage Among College Students', *Services Marketing Quarterly*, 26: 3, 13 — 39


**Books**


**Other**

Rapport 2000:3 Konsumenterna och IT - Problem och kunskapsbehov
http://www.konsumentverket.se/sv/Publikationer/?WT.ac=int-press-rapporter (retrieved 2010-04-15)
Appendices

Appendix A
The Questionnaire

We are conducting a research on replacement habits on cell phones, which is intended to serve as data for our bachelor thesis. The aim is to create a greater knowledge on consumer behavior within this particular area. Your participation will be greatly appreciated! Please answer the following question as accurately as possible, and your answers will be strictly anonymous. *(It will not take more than 5 minutes)*

Q1. Are you a student at Umeå University?
☐ Yes  ☐ No

Q2. ☐ Female  ☐ Male

Q3. Do you currently own a cell phone?
☐ Yes  ☐ No

Q4. How many mobile phones have you owned during the last five years?
☐ 0<1
☐ 2<5
☐ 6<10
☐ 11<20
☐ 21 or more

Please circle the number which corresponds to your decision to purchase your current cell phone.  1= Strongly disagree 7= Strongly agree

Q5. My previous phone stopped functioning, (e.g. system failure, strange behaviors, screen deviations etc.)
1  2  3  4  5  6  7
Q6. My previous cell phone was too expensive to repair
1 2 3 4 5 6 7

Q7. Dissatisfaction due to ‘wear and tear’ of the previous phone (damaged but still functioning, e.g. significant scratches and dents)
1 2 3 4 5 6 7

Q8. I wanted/preferred the design of my current cell phone (e.g. screen size, colors, brand, buttons etc.)
1 2 3 4 5 6 7

Q9. I wanted/preferred the new features of my current cell phone (e.g. internet features, music features etc.)
1 2 3 4 5 6 7

Q10. None of the above/Other (e.g. subscription, operator, ‘I lost it’, ‘I got it as a gift, warranty reasons etc.)
1 2 3 4 5 6 7

For these last questions, please circle the number which corresponds to your attitude in general
1= Strongly disagree 7= Strongly agree

Q11. I think it is important to select the most practical mobile phone
1 2 3 4 5 6 7

Q12. When deciding on whether or not to buy a cell phone I think about how useful it will be
1 2 3 4 5 6 7

Q13. To what extent would you want your chosen mobile phone to be the most reflective of the image you have of yourself?
1 2 3 4 5 6 7

Q14. To what extent would you want your mobile phone to be in fashion and/or to be a product you can proudly display?
1 2 3 4 5 6 7

Thank you for your participation!

Please do not hesitate to contact us if you have any questions
kaly0002@student.umu.se
### Appendix B

**SPSS output**

#### Descriptive Statistics

<table>
<thead>
<tr>
<th>Q11 Importance of practicality</th>
<th>Q12 Importance of usefulness</th>
<th>Q13 Importance of self image</th>
<th>Q14 Importance of fashion/display capabilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Spearman's rho</td>
<td>Correlation Coefficient</td>
<td>.012</td>
<td>-.027</td>
</tr>
<tr>
<td>Sig. (2-tailed)</td>
<td>.903</td>
<td>.784</td>
<td>.045</td>
</tr>
</tbody>
</table>

Table 4.5 Summary of means
<table>
<thead>
<tr>
<th>Q</th>
<th>Correlation Coefficient</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>Q6</td>
<td>Too expensive to repair</td>
<td>107</td>
</tr>
<tr>
<td></td>
<td>Correlation Coefficient</td>
<td>0.050, 0.047, -0.017, -1.22</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>0.608, 0.630, 0.861, 0.211</td>
</tr>
<tr>
<td></td>
<td></td>
<td>107, 107, 107, 107</td>
</tr>
<tr>
<td>Q7</td>
<td>Wear and tear dissatisfaction</td>
<td>107</td>
</tr>
<tr>
<td></td>
<td>Correlation Coefficient</td>
<td>-0.008, -0.185, 0.170, 0.077</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>0.937, 0.056, 0.080, 0.429</td>
</tr>
<tr>
<td></td>
<td></td>
<td>107, 107, 107, 107</td>
</tr>
<tr>
<td>Q8</td>
<td>Preferred new design</td>
<td>109</td>
</tr>
<tr>
<td></td>
<td>Correlation Coefficient</td>
<td>-0.004, 0.073, 0.146, 0.177</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>0.965, 0.451, 0.130, 0.065</td>
</tr>
<tr>
<td></td>
<td></td>
<td>109, 109, 109, 109</td>
</tr>
<tr>
<td>Q9</td>
<td>Preferred new features</td>
<td>109</td>
</tr>
<tr>
<td></td>
<td>Correlation Coefficient</td>
<td>-0.123, 0.093, 0.195, 0.263**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>0.202, 0.336, 0.043, 0.006</td>
</tr>
<tr>
<td></td>
<td></td>
<td>109, 109, 109, 109</td>
</tr>
<tr>
<td>Q11</td>
<td>Importance of practicality</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td>Correlation Coefficient</td>
<td>1.000, 0.671**, -0.037, -0.005</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>. , 0.000, 0.703, 0.962</td>
</tr>
<tr>
<td></td>
<td></td>
<td>110, 110, 110, 110</td>
</tr>
<tr>
<td>Q12</td>
<td>Importance of usefulness</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td>Correlation Coefficient</td>
<td>0.671**, 1.000, -0.008, 0.014</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>. , 0.000, 0.937, 0.885</td>
</tr>
<tr>
<td></td>
<td></td>
<td>110, 110, 110, 110</td>
</tr>
<tr>
<td>Q13</td>
<td>Importance of self image</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td>Correlation Coefficient</td>
<td>-0.037, -0.008, 1.000, 0.691**</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>0.703, 0.937, . , 0.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>110, 110, 110, 110</td>
</tr>
<tr>
<td>Q14</td>
<td>Importance of fashion/display capabilities</td>
<td>110</td>
</tr>
<tr>
<td></td>
<td>Correlation Coefficient</td>
<td>-0.005, 0.014, 0.691**, 1.000</td>
</tr>
<tr>
<td></td>
<td>Sig. (2-tailed)</td>
<td>0.962, 0.885, . , 0.000</td>
</tr>
<tr>
<td></td>
<td></td>
<td>110, 110, 110, 110</td>
</tr>
</tbody>
</table>

Table 4.6 Spearman test question five to fourteen