

Product Attachment

Product Attachment

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1 Introducing Product Attachment

Three years ago, I bought a brand new convertible, a Citroën C3 Pluriel (see Figure 1.1). Since I own it, the car has shown several defects: The roof leaked several times, the brakes creaked, the window was dislodged, and I had problems with the battery and the gear. Also, it is not a very user-friendly car, as I repeatedly have had difficulties in removing the roof of the car. Due to these issues, I paid many visits to the garage. But do I regret that I purchased my Citroën C3 Pluriel? No, on the contrary, I love my car!!! I love it for its beautiful, extraordinary design and its eye-catching, green color. I love it for the fun and relaxation it provides me when I drive it with the top down during summer. I love it, for the fact that only few people own an identical car. And last but not least, I love it, because it makes me smile when I see it on the parking space after a long working day. As a result, my car has gained a



Figure 1.1 My Citroën C3 Pluriel

special meaning to me and I feel attached to it despite the utilitarian issues. This thesis is about why people develop strong relationships with certain products and how designers may influence the degree of attachment through product design.

Consumer behavior research has focused primarily on purchase behavior, whereas knowledge of all phases in the consumption cycle, from acquisition, through use, to disposition is valuable for understanding consumer behavior. As a result, the consumer-product relationship during ownership is less understood (Belk 1991). For designers of consumer durables, the consumer-product relationship during ownership is at least equally important, because this is the time when the product is used by the consumer to fulfill its primary purpose. In the design field, there is growing confirmation that, during a person's interaction with a product, this product should elicit positive feelings to create an optimal product experience (e.g., Hekkert 2001). Knowledge on the experience of attachment to products can contribute in achieving this goal.

In addition, the consumer-product relationship plays an important role in replacement purchases. People's tendency to replace the product they own by purchasing a new one depends in part on their experiences with and feelings toward their old product (Roster 2001). From an environmental perspective, the early replacement of consumer durables is generally detrimental. Accordingly, stimulating the experience of attachment to products is proposed as a design strategy to postpone product replacement (e.g., Cooper 2000, 2005; Van Hemel and Brezet 1997; Van Nes 2003). More knowledge on the construct of product attachment and the determinants that affect its strength can help designers in designing better and longer lived products and in reducing the negative environmental effects of early product replacement through product design.

1.1 Defining Product Attachment

In the literature on interpersonal relationships, it is proposed that an attachment is an emotion-laden target-specific bond between two persons (Bowlby 1979). Correspondingly, product attachment is defined as the strength of the emotional bond a consumer experiences with a specific product (Schifferstein, Mugge, and Hekkert 2004). First of all, the definition of product attachment suggests that when experiencing attachment to a product, a strong relationship or tie exists between the individual on the one hand and the object on the other hand.

Second, the definition implies that the object to which a person experiences attachment triggers one's emotions. Schultz, Kleine, and Kernan (1989) investigated which emotions are elicited by products to which people are

attached. In this study, a total of 83 different emotions were reported. Some of the most reported emotions were happiness, love, warmth, nostalgia, sadness, pride, security, comfort, excitement, and joy. Although a great deal of variety is present in the experienced emotions, people most often experience positive emotions to their objects of attachment. In contrast, products to which people do not experience attachment often do not elicit any emotions at all (Schultz et al. 1989). Also, negative emotions (e.g., boredom, frustration, and disgust) were mainly reported for objects to which people did not feel attached. An exception was the emotion sadness. Sadness may be elicited by products that are cherished for the memories associated with them. For example, a brooch that reminds someone of one's deceased mother can simultaneously elicit both love and sadness.

Third, this definition implies that experiencing attachment to products is a matter of degree (Kleine and Baker 2004; Schultz et al. 1989). People may experience relatively strong emotional bonds with their most favorite or special possessions, whereas other products are less significant to them.

Individuals do not deliberately seek to form attachments to objects (Schultz et al. 1989). The experience of attachment tends to develop over time as a result of recurring interactions between an individual and the attachment object (Baldwin et al. 1996; Kleine and Baker 2004; Thomson, MacInnis, and Park 2005). Typically, these recurring interactions occur during ownership of the product. For example, through possession rituals, such as using, displaying, cleaning, discussing, personalizing, and storing, products may gradually accumulate personal meaning (McCracken 1986). Past research suggested that such a personal and special meaning can bring about the experience of attachment to products (Csikszentmihalyi and Rochberg-Halton 1981; Wallendorf and Arnould 1988).

To obtain a personal and special meaning, a product should provide the owner with something exceptional over and above its utilitarian meaning (Schifferstein et al. 2004). A product can have a utilitarian meaning, because it enables a person to fulfill a certain need. For example, a watch can show a person the correct time and a lamp can shine light. Most products within the same product category can provide this meaning. Accordingly, the product just functions according to expectations and does not provide anything special. In that case, a replacement decision is made relatively easily. Products to which people become attached provide a special meaning and, therefore, exceed their merely utilitarian meaning to the owner. For example, a watch may serve as a reminder of one's father and a lamp may express a person's identity. Then, the replacement of the product is much more difficult, because other products may not provide this special meaning to the owner. The product thus ceased to be an ordinary object and has become extraordinary (Kleine and Baker 2004).

The former does not necessarily imply that a product needs to be expensive or rare to become an object of attachment. Ordinary objects may just as well elicit feelings of attachment, for instance, when the product is associated with an important memory.

Hierarchy of Attachments to Products

People may experience attachments to people (Bowlby 1979), pets (Hirschman 1994), brands (Fournier 1998; Thomson et al. 2005), places (Altman and Low 1992), experiences (Arnould and Price 1993; Kleine and Baker 2004), music (Montparker 1997), celebrities (Thomson 2006), sport teams (Funk and James 2006), and products (Kleine, Kleine, and Allen 1995; Wallendorf and Arnould 1988). For products, people may experience attachments at different levels of abstraction, ranging from the bond experienced with a product specimen to the attachment to products in general (see Table 1.1).

With respect to the construct of product attachment, we can distinguish between the experience of attachment to certain product variants or to specific product specimens (Schifferstein and Pelgrim 2004). Being attached to a product variant implies that this specific type of product has a special meaning to the owner. In that case, the attachment will not only hold for this specific object, but also for other products of the same type that are physically identical. For example, a person may be attached to a Citroën C3 Pluriel (see Figure 1.1, p. 11) because the car's innovative and eye-catching design supports one's identity. This special meaning is present in all physically identical Citroën C3 Pluriels, because they all have the same design. An identical-looking Citroën C3 Pluriel can thus also elicit feelings of attachment for this person. This does not mean that other variants are truly identical to the one that is owned. In time, most products show signs of use (e.g., stains or scratches). However, for the attachment to a product variant it is the overall design that all these specific product variants have in common that induces the special meaning, and not these personal signs of use.

Being attached to a product specimen implies that the attachment concerns one particular object. Another physically identical product cannot completely replace such a product, because the context in which the object was obtained or used is inimitable. Accordingly, the special meaning cannot be present in other products and the product is irreplaceable. "An irreplaceable possession is one that a consumer resists replacing, even with an exact replica, because the consumer feels that the replica cannot sustain the same meaning as the original" (Grayson and Shulman 2000, p. 17). For a product to become irreplaceable, the product's meaning should have a factual connection with the object itself (Grayson and Shulman 2000; Grayson and Martinec 2004; Verbeek and Kockelkoren 1997). The special meaning should be deeply anchored in that

specific object, and the product and its meaning have to become inseparable. Because other products cannot provide this special meaning, a person will feel that replacing such a product results in a loss of the special meaning. For example, a person may be attached to one's Citroën C3 Pluriel, because the car reminds him/her of all the pleasant trips made. This meaning is only present in this particular Citroën C3 Pluriel, because the trips were made in this product specimen. For the attachment to a product specimen, the signs of use on the product (e.g., stains or scratches) may be important for the product's special meaning, because they may serve as proof for certain events.

Object	Construct	Example
Product specimen	Product attachment - Irreplaceability	My Citroën C3 Pluriel
Product variant	Product attachment	A Citroën C3 Pluriel
Brand	Brand attachment	Citroën
Product category	Enduring involvement	Cars
Products in general	Materialism	All possessions: car, TV, furniture etc.

Table 1.1 Hierarchy of types of attachment to products

1.2 Differentiating Product Attachment

Table 1.1 suggests that product attachment is related to other constructs. To gain an understanding of the construct of product attachment, it is important to determine its boundaries. For this reason, we discuss how product attachment is conceptually distinct from several other constructs from consumer behavior research. Specifically, we focus on constructs regarding a person's bonding with material things and consumers' post-purchase behavior.

Self-Extension

Belk (1988; 1989; 1992) discussed how people can extend themselves into things, such as other people, places, experiences, beliefs, ideas, and material possessions. According to Belk, people have a need to support their sense of self, for example, by possessing material objects. Possessions can help us define and remind ourselves of whom we are. These objects can thus be regarded as parts of the self or self-extensions. Scholars suggested that people become attached to products that define and maintain their self-concept,

suggesting a relationship between self-extension and product attachment (Ball and Tasaki 1992; Kleine et al. 1995). Indeed, when a person experiences an attachment to a product, this product may be regarded as part of the self: What is considered as 'mine', becomes what is 'me' (Belk 1988, 1992; Sivadas and Venkatesh 1995). Nevertheless, self-extension and product attachment are distinct constructs (Kleine and Baker 2004; Schifferstein and Pelgrim 2004). The concept of self-extension covers more than product attachment, because it also includes persons, places, brands, and body parts (Belk 1988; Kleine and Baker 2004). Moreover, products can become self-extensions if they are appreciated for their utilitarian meaning, whereas this is insufficient to become attached to them. Examples of such self-extensions are a computer that extends a person's memory and calculation capacity, and scissors that serve as an extension of one's hands. These products thus literally extend a person's self and allow people to accomplish tasks which they would otherwise be incapable of doing (Belk 1988). However, as long as these products do not simultaneously provide a special meaning, it is unlikely that these products also elicit product attachment.

Brand Attachment

Product attachment is conceptually distinct from consumer-brand relationships (Aaker, Fournier, and Brasel 2004; Fournier 1998; Thomson et al. 2005), because the latter implies that consumers develop relationships with brands (e.g., Coca Cola, Philips), rather than with specific products (Kleine and Baker 2004; Schifferstein and Pelgrim 2004). Contrary to product attachment, brand attachment holds for different product variants of various product categories. For example, if a person feels attached to the brand Philips, this may affect his/her emotional responses for televisions, shavers, and coffeemakers, because they are all Philips products. Nevertheless, brand attachment and product attachment also show parallels. Brand attachment is conceptualized as an emotional bond (Kleine and Baker 2004; Thomson et al. 2005), is considered to be a self-extension (Belk 1988), and may develop as a result of interactions between a person and the brand (Thomson et al. 2005). Furthermore, product attachment and brand attachment are related, because experiencing a strong relationship with a consumer durable may affect consumers' feelings toward the product's brand (Davis 2002). The attachment to the product may in a way transfer to the brand and vice versa.

A construct related to brand attachment is brand loyalty (Solomon, Bamossy, and Askegaard 2002). Brand loyalty is a pattern of repeated product purchases accompanied by an underlying positive attitude toward the brand. However, brand loyalty may not necessarily be due to the experience of an emotional bond. For example, one may repeatedly buy the same brand out of sheer habit.

Involvement

Involvement is generally conceived as a property of the relationship between a person and a product category (Bloch 1982; Costley 1988), which makes it conceptually distinct from the attachment to a particular product (Ball and Tasaki 1992; Kleine and Baker 2004; Schifferstein and Pelgrim 2004). Past research distinguished between situational and enduring involvement (Richins and Bloch 1986). A person experiences situational involvement if specific circumstances bring about an increased interest in a certain product category. For example, when a television breaks down, a person may want to buy a new television, resulting in a temporarily increased interest in televisions. After the purchase is made, this interest decreases again. Enduring involvement implies that the importance of a product category to an individual is long-term. For example, a person can experience enduring involvement toward the product category jewelry. This implies that jewelry in general is important to him/her. It is likely that this person would like to keep informed about jewelry and, therefore, (s)he may read related magazines, and visit related websites and stores. In this case, a person experiences attachment to a whole product category, rather than to a specific product. If a person is enduringly involved with a certain product category, it is likely that (s)he also experiences attachment to his/her own product(s) belonging to this category. On the other hand, becoming attached to a specific product does not require enduring involvement with the respective product category. A person may not be interested in jewelry in general, but may feel deeply attached to a wedding ring, because it symbolizes the relationship with one's spouse.

Materialism

Materialism is defined as "the importance a person attaches to worldly possessions" (Belk 1985, p. 266). Although materialism may seem to be connected to product attachment, these constructs are not directly related. Materialism is a psychological trait, unconnected to any possession in particular, whereas product attachment is typically concerned with specific objects (Wallendorf and Arnould 1988). The fact that possessions are generally important to an individual does not imply that this person experiences an emotional bond with all these objects. Furthermore, non-materialistic consumers who do not consider their possessions important in general, may be attached to one or more special products. In line with these arguments, several scholars found empirical evidence that product attachment is unrelated to materialism (Ball and Tasaki 1992; Wallendorf and Arnould 1988).

Nostalgia

Nostalgia “refers to a longing for the past, a yearning for yesterday, or a fondness for possessions and activities associated with days of yore” (Holbrook 1993, p. 245). Objects of attachment may elicit feelings of nostalgia. For example, a person may be attached to a guitar that was made in the sixties, because it reminds him of the ‘good old days’. However, feelings of nostalgia are not necessarily present when a person experiences attachment to a product, because the product’s special meaning may not be related to the past. An example of product attachment that does not elicit feelings of nostalgia is the attachment to a guitar, because its beautiful sound provides the person with pleasure. Nostalgia and product attachment can thus be related, but only if a person is attached to a product that serves as a reminder of the past.

Attitudes

An attitude is defined as a lasting, general evaluation of people, objects, or issues (Solomon et al. 2002). Although people usually have positive attitudes toward the products to which they feel attached, several arguments can be given why research on favorable attitudes (e.g., Ajzen and Fishbein 1977) or product liking (e.g., Page and Herr 2002) is insufficient to understand the experience of attachment to a product (Kleine and Baker 2004).

First, stronger attachments are not always associated with positive emotions, nor are negative feelings always associated with weak attachments (Schultz et al. 1989). In most cases, consumers experience positive emotions to objects of attachment. However, these emotions may also be negative, for instance, when the object is a memento from hard times. Moreover, people can experience mixed feelings toward products to which they are strongly attached (Kleine et al. 1995; Schultz et al. 1989). Second, attachments usually develop bit by bit over the course of time. As a result of the multiple, recurring interactions between a person and the object, the object gains a personal meaning to the owner (Baldwin et al. 1996). In contrast, attitudes can develop without any direct contact with a product (Ajzen and Fishbein 1977). For example, you can immediately have a positive attitude toward an object based on a picture of this product, which can encourage you to purchase it. Third, products to which one feels attached are generally considered to be special and significant to the owner (Ball and Tasaki 1992; Richins 1994; Schultz et al. 1989), whereas people can have positive attitudes toward products that have little significance to them (Thomson et al. 2005). Finally, the experience of attachment results in specific protective behaviors (Ball and Tasaki 1992), because people cherish their relationship with the object and want to preserve it. Favorable attitudes do not necessarily bring about these protective behaviors (Thomson et al. 2005).

Satisfaction

A post-purchase behavior that has received a great deal of interest in marketing and consumer behavior research is satisfaction (e.g., Fournier and Mick 1999; Oliver 1997). Accordingly, it is valuable to conceptually distinguish product attachment from product satisfaction. Product satisfaction is conceptualized as “an attitude-like judgment following a purchase act or based on a series of consumer-product interactions” (Fournier and Mick 1999, p. 5). Following the expectation-disconfirmation paradigm, consumers form expectations of a product’s performance prior to purchase (Oliver 1980). Subsequently, the perceived performance of the product during ownership is compared to these expectation levels using a better-than (positive disconfirmation) or worse-than heuristic (negative disconfirmation). When the product’s performance is acceptable, the cognitive evaluations of the product’s utility result in the experience of satisfaction. People are more satisfied with a product performing better than expected than with one performing according to expectations or with one performing worse than expected (Oliver 1980).

In addition to this cognitive evaluation, several researchers proposed that the emotional responses elicited through consumption of a product may affect the experience of satisfaction as well (Mano and Oliver 1993; Oliver 1989; Phillips and Baumgartner 2002; Westbrook 1987; Westbrook and Oliver 1991). In conclusion, we consider satisfaction as an evaluative judgment of the product’s performance that develops as a result of both cognitive evaluations and affective reactions elicited in consumption. Whereas satisfaction has a cognitive component, product attachment is a solely emotion-laden bond that develops if the product has a special meaning to the owner (e.g., Wallendorf and Arnould 1988). A purely functional product that performs according to expectations can thus result in the experience of satisfaction. However, it is unlikely that a person becomes attached to such a product, because it does not convey a special meaning beyond its merely utilitarian one. Analogously, a malfunctioning product that reminds a person of important friends or family may elicit strong feelings of attachment, whereas the product’s performance is unlikely to result in satisfaction.

Endowment

Research on the endowment effect demonstrated that current ownership affects the valuation of an object (Kahneman, Knetsch, and Thaler 1990; Strahilevitz and Loewenstein 1998). Immediately following possession of an object, people value an object more and demand much more money if they are requested to give it up. However, this does not necessarily imply the presence of an emotional bond with this product. The endowment effect is based on people’s tendency to place greater weight on losses than on gains. This loss

aversion will hold for all possessions a person owns. Nevertheless, this does not imply that a person experiences attachment to all of these possessions. Some possessions will result in greater feelings of loss, and will thus require relatively more monetary compensation to give it up than others. Objects to which a person feels deeply attached may even become priceless (Belk 1991).

1.3 Consequences of Product Attachment

If a person is attached to a product, detaching from and ultimately abandoning this product is undesirable. People feel that when losing the product, the special meaning that is conveyed by the product is lost as well. So, people strive to maintain products to which they are attached and exhibit protective behaviors toward these products (Ball and Tasaki 1992; Belk 1988, 1991; Schultz et al. 1989). In extreme cases of attachment, such as in collections, people may even apply a self-imposed rule of 'never sell' (Belk, Wallendorf, and Sherry 1989).

When a person becomes attached to an object, (s)he is more likely to postpone its replacement or disposal. Replacement is a process that requires the abandonment of the relationship with an old product to be able to develop a new relationship with the replacement product (Roster 2001). On the one hand, a consumer is attracted to a new product (e.g., for its new features or styling), which pushes him/her away from the currently owned product. On the other hand, the old product exerts a pull on the person (e.g., because it is familiar or has a special meaning). As long as the product's special meaning is sufficiently important to the individual and cannot be substituted by a replacement product, a person will be reluctant to replace and dispose of these objects, because this implies that the product's special meaning is lost. Consequently, people may hang on to and continue to use products to which they feel attached for a longer period of time (Jacoby, Berning, and Dietvorst 1977; Schifferstein and Pelgrim 2004). In order to be able to dispose of these objects eventually, people demonstrate pre-dispositional behaviors, such as storage. By placing an object out of one's direct sight, it slowly loses its personal meaning to the individual (McCracken 1986; Young 1991). This cool-off period helps to make actual disposal possible.

Although product attachment and product lifetime are related, they are conceptually different. Consumers may keep certain products for a long time, although they may not feel attached to them. In addition, consumers may experience a strong bond with a product for only a short period of time. For example, a product's malfunctioning may elicit strong negative feelings, due to which premature detachment may take place.

Another consequence, which was already elaborated on at the start of this thesis is that objects of attachment trigger the owner's emotions (Schultz et al. 1989).

1.4 Relevance of Product Attachment for Designers

For designers, the construct of product attachment is valuable from two perspectives. First, strengthening the emotional bond can help designers to create emotional experiences with products during ownership. Second, product attachment can serve as an eco-design strategy to stimulate product longevity.

Creating Emotional Experiences

In today's markets, most consumer durables are comparable with respect to their features, quality, and user friendliness (Veryzer 1995). This makes it difficult for companies to differentiate their products from competitors. To gain a competitive advantage, companies and designers are focusing more on the 'emotional responses and experiences' that products can bring about rather than on their functional benefits. Figure 1.2 shows several advertisements of companies that suggest that people are attached to the advertised product. For example, the watches and jewelry company Breil uses the pay-off "Don't touch my Breil" in all of their communications, suggesting a special caring for the



Figure 1.2 Advertisements of Breil, Swatch, Patek-Philippe, and Toyota Yaris that suggest the experience of product attachment in their pay-offs

object. The growing interest of scientific research as well as design practice in the emotional impact of products is also illustrated by the conferences and events that were organized on this topic over the past few years (e.g., Design and Emotion conference, Eternally Yours conference, Designing Pleasurable Products and Interfaces (DPPI) conference).

Emotional responses to products can be a decisive factor in purchase decisions (Bagozzi, Gopinath, and Nyer 1999; Desmet 2002; Jordan 2000; Norman 2004). In addition, products can also elicit emotional responses during ownership (Hirschman and Holbrook 1982). In this respect, Desmet (2002) argued that studying emotional responses for a purchase situation may not be sufficient: “In the long run, it may be more fruitful to establish a long-term emotional relationship with the consumer” (p. 187). Emotions enrich a person’s life and can increase one’s general experience of well-being (Diener and Lucas 2000). Because part of a person’s day-to-day emotions are elicited by the products this person owns, designers need an understanding of the emotional impact of their designs over time. The construct of product attachment can be instrumental in achieving this goal (Mugge, Schoormans, and Schifferstein 2007).

Stimulating Sustainable Consumption

From a sustainability perspective, the replacement of consumer durables is often undesirable. Many of the replaced durables eventually end up in the waste stream, which creates an environmental burden. For illustration, in the UK at least 476 kilotons of household appliances, totaling 23 million units, were disposed of annually between 1993 and 1998 (Cooper and Mayers 2000). In addition, replacing products requires the production of new consumer durables. Because scarce resources are used up during production, replacement also has an indirect detrimental effect on the environment. Cooper (1994) and Von Weizsacker, Lovins, and Lovins (1997) suggested that a strategy toward product longevity is valuable to reduce the negative environmental effects of consumers’ product replacement.

Nowadays, product lifetime is not primarily determined by technical constraints (Stahel 1986), because many products are replaced while they are still functioning properly: Only 22% of the products are completely malfunctioning at the time of replacement (Van Nes 2003). Therefore, sustainable consumption asks for changes in the behavior of consumers (Cooper 2000). These findings suggest that it is especially worthwhile to lengthen the product lifetime by focusing on the product’s psychological lifetime: The time during which the product is perceived as valuable by the user. Accordingly, several scholars on sustainability proposed ‘ensuring a strong person-product relationship’ as one of the possible eco-design strategies to stimulate product longevity (Chapman 2005; Cooper 2000, 2005; Van Hemel and Brezet 1997; Van Hinte 1997; Van Nes

2003). By stimulating the experience of attachment to products, people will tend to keep a product for a longer period of time. Consequently, designers interested in stimulating sustainable consumption need to understand how product design can affect the strength of the emotional bond with a product.

1.5 Contribution of this Thesis

Past research on product attachment focused on understanding product attachment from a psychological perspective. Specifically, scholars in the field of consumer behavior investigated why people consider certain possessions as their most favorite or most special ones. The present doctoral thesis investigates the value of product attachment for designers. Based on this point of view, the research project addresses the following two research issues: 1) Experiencing attachment to ordinary products, and 2) Exploring design strategies to stimulate product attachment.

Attachment to Ordinary Products

In the literature, mostly qualitative studies can be found that uncover the reasons for people to consider a possession one's most favorite or one's most cherished (e.g., Csikszentmihalyi and Rochberg-Halton 1981; Dittmar 1991; Kamptner 1995; Schultz et al. 1989; Wallendorf and Arnould 1988). These studies provide a descriptive portrayal of people's bonds with material possessions and distinguish several possible determinants of product attachment. Although these qualitative studies are valuable to understand consumers' behavior toward products during ownership, they have some shortcomings.

First, the most special, treasured, or cherished possessions tend to be largely restricted to highly emotionally laden family heirlooms and jewelry. However, from a designer's perspective, research on these most treasured possessions is less interesting. People only have a few of these possessions and these products are generally not owned for their functionality. Think of a pocket watch that was inherited from one's father. Such a watch is above all a showpiece. Of course, in some cases the watch may also be used to show the correct time, but even when the watch breaks down, it will still be regarded as one of a person's most treasured possessions. Heirlooms tend to have deep, symbolic meanings of family and self-continuity that are passed from one generation to the next (McCracken 1986; Price, Arnould, and Curasi 2000). Accordingly, the experience of this type of emotional bond is often relatively static over time (Kleine and Baker 2004).

However, the majority of a person's possessions are usually ordinary consumer durables. These ordinary products are the ones that are most often used,

replaced, and discarded. For these consumer durables, the experience of product attachment is generally dynamic (Ball and Tasaki 1992; Schifferstein and Pelgrim 2004). The person-product relationship can change in time as a result of changes in the product (e.g., performance deficiencies), changes in the situational context (e.g., fashion changes), or changes concerning the owner (e.g., role transitions). These products offer designers much more opportunities to stimulate the long-term experience of attachment than heirlooms. Nevertheless, little empirical research has been conducted on people's long-term relationship with ordinary consumer durables. This thesis focuses on product attachment to ordinary products by investigating the determinants of product attachment, the changes in the degree of product attachment over time, and the relationship between product attachment and product lifetime.

Second, most research on product attachment has been explorative and qualitative. More quantitative work is necessary to detect patterns in the processes leading to product attachment (Belk, 1992). Specifically, quantitative studies can help to uncover whether the determinants distinguished in qualitative research affect product attachment in general. Moreover, quantitative studies allow us to investigate the combined effects of several determinants simultaneously and of their effects over time.

Design Strategies

The goal of past studies on product attachment was to understand consumer behavior. Up to now, the role of the product and its design in stimulating the degree of attachment experienced toward this object remains quite obscure. Do specific product attributes bring about the distinguished determinants and, therefore, stimulate product attachment? As the product is under the designer's direct control, understanding these issues is valuable for designers who are interested in stimulating product attachment. Kleine and Baker (2004) described a need to identify the properties of ordinary possessions that encourage or discourage attachment. Furthermore, Van Nes (2003) argued that so far, the eco-design strategy stimulating product attachment has remained elusive for designers. This thesis investigates product attachment by explicitly taking into account the product and its design. We strive to establish the role of the product for bringing about the possible determinants of product attachment and, thereby, propose several design strategies to strengthen the emotional bond between a person and his/her product.

1.6 Overview of this Thesis

This doctoral thesis is organized as follows. In this introductory chapter, I have defined the construct of product attachment and discussed its relevance for designers. The remaining chapters of this thesis deal with the two research issues that were specified in Section 1.5.

Chapter 2 is a theoretical chapter that provides an overview of the different determinants of product attachment for ordinary durables. Based on the literature on the meanings that products can convey, several determinants are distinguished and discussed.

In Chapters 3 to 6, seven empirical studies are presented that test the effects of several determinants on product attachment. In most studies, the product characteristics are systematically manipulated in order to examine the role of the product design for bringing about these determinants and for encouraging the experience of attachment to ordinary durables. Furthermore, a longitudinal study investigates changes in the experience of attachment over time.

Chapter 7 summarizes the main findings of the thesis. Based on these findings, several design strategies are presented for designers interested in stimulating product attachment. The thesis ends with the implications of stimulating product attachment and suggestions for further research.

2 Determinants of Product Attachment

People develop feelings of attachment to consumer durables, irrespective of their utilitarian meaning. Why do people become attached to certain objects? In Chapter 1, we concluded that people develop attachment to products that convey a special meaning to them. Due to this special meaning, the product becomes different and exceptional to the owner. In this chapter, we explore the different meanings that products can convey. Based on the literature on product meanings and on product attachment, we propose several determinants that may affect the strength of an emotional bond with ordinary durables.

2.1 Categorizations of Product Meanings

Several consumer behavior researchers explored the reasons for consumers to consider their possessions as treasured (Furby 1978; Kamptner 1991, 1995), special (Csikszentmihalyi and Rochberg-Halton 1981), important (Dittmar 1991; Hirschman and LaBarbera 1990; Richins 1994a, 1994b), or favorite (Dyl and Wapner 1996; Prentice 1987). In these mainly qualitative studies, several categorizations for the meanings of possessions to their owner are proposed. Describing a product as special or favorite may imply the presence of an emotional bond with the product. Consequently, the product meanings distinguished in these studies may be possible determinants of product attachment. Table 2.1 (p. 30-31) provides an overview of the different product meanings that were distinguished.

First, these studies concluded that a product can be considered special for its role in expressing and reinforcing a person's identity and distinguishing the

individual from others. Second, a product can be considered special, because it represents one's ties with other people. Third, products can symbolize one's personal history, by reminding the owner of a specific occasion or an important person. Fourth, the intrinsic qualities of a product include meanings related to the physical properties of a product, such as the product's design, style, or uniqueness. Fifth, products have a utilitarian meaning, if the product is valued for its usefulness, the convenience it provides, for its quality, or for its functional attributes. Sixth, a product can evoke enjoyment, if it is treasured for its capacity to enable some enjoyable activity or if it otherwise provides sensory pleasure. Seventh, a product can serve financial-related meanings, if it is an investment, provides financial security, or if it has cost a lot of money. Eighth, products can convey cultural-religious meanings. Finally, a product can be regarded as if it were a living creature with human qualities. In this role, the product may obtain the meaning of personification.

2.2 Product Meanings Affecting Product Attachment

To determine which product meanings may be relevant for stimulating the experience of attachment to ordinary durables, two prerequisites are taken into account. First, although describing a product as special or favorite implies that an emotional bond has developed, this does not necessarily suggest the presence of product attachment. Product attachment deals with the emotional bond with a specific product variant or specimen (Schifferstein and Pelgrim 2004), whereas describing a product as special may just as well imply the presence of an emotional bond with a product category. An investigation of all possible meanings that products can convey may be too general for the study of product attachment, because only some special meanings can strengthen the emotional bond that is experienced with a specific product.

Several studies proposed that products may be considered special for their utilitarian meaning (Dittmar 1991; Dyl and Wapner 1996; Hirschman and LaBarbera 1990; Kamptner 1995; Richins 1994a). An example is a person's emotional bonding with a television, because it provides him/her the utilitarian benefits of watching television programs. This meaning can be provided by all functioning televisions and is not unique for a specific product variant or specimen. Accordingly, the owner is not attached to the product itself, but more to the function it provides (Belk 1989). The loss of the product will give the owner functional and financial concerns, because the owner cannot use the product anymore and is forced to buy a new one. However, the product can be easily replaced by another product within its category, because all products provide the same utilitarian meaning. In the case of product attachment, the

product has obtained a special meaning that is distinctive for this particular variant or specimen. Then, it is much more difficult to replace the product. Second, this thesis takes a designer's perspective by investigating the experience of attachment to ordinary durables. As a result, some product meanings appear of little value for stimulating the strength of product attachment. For example, people are attached to Bibles and rosaries for their cultural-religious meaning (Csikszentmihalyi and Rochberg-Halton 1981; Dyl and Wapner 1996; Hirschman and LaBarbera 1990; Kamptner 1991). However, it is unlikely that ordinary durables will gain this special meaning. Furthermore, extremely expensive products, such as houses or boats, may be considered special for their financial meaning (Csikszentmihalyi and Rochberg-Halton 1981; Dittmar 1991; Kamptner 1995; Richins 1994a). These products often serve as a lifetime investment and people most often take many years to make up for this investment. Accordingly, the accompanying financial risks are relatively high (Cox 1967; Solomon, Bamossy, and Askegaard 2002). In comparison, many ordinary durables only cost a fraction of these lifetime investments and financial aspects will thus play only a limited role. Several scholars distinguished the product meaning personification for products that are represented as being a person (Csikszentmihalyi and Rochberg-Halton 1981; Dyl and Wapner 1996; Kamptner 1991). For example, people may give their houses, pets, boats, and musical instruments a name. Nevertheless, for most ordinary durables, it is unlikely that such personification takes place. Based on these arguments, we propose the following four product meanings as possible determinants of product attachment to ordinary durables (see Table 2.1, p. 30-31):

- Self-expression: the product expresses one's unique identity
- Group affiliation: the product expresses one's belonging to a group
- Memories: the product is a reminder of the past
- Pleasure: the product provides pleasure

In the literature on product attachment (Ball and Tasaki 1992; Kleine et al. 1995; Schifferstein and Pelgrim 2004; Schultz et al. 1989; Wallendorf and Arnould 1988), these four determinants have generally been acknowledged as reasons for becoming attached to products (see Table 2.2, p. 30-31). On the next pages, each determinant is explained in more detail.

	Self-expression	Group affiliation
Dittmar (1991)	<ul style="list-style-type: none"> - Self-expression - Quality intrinsic (uniqueness) 	<ul style="list-style-type: none"> - Symbolic interrelatedness
Dyl and Wapner (1996) / Csikszentmihalyi and Rochberg-Halton (1981)	<ul style="list-style-type: none"> - Linking possession to self - Personal values - Accomplishment - Status among peers - Few others have one - Intrinsic quality (uniqueness) 	<ul style="list-style-type: none"> - Linking possession to other (e.g., friends, family, relatives) - Companionship
Furby (1978)	<ul style="list-style-type: none"> - Extensions of the individual - Social power and status 	<ul style="list-style-type: none"> - Social power and status
Hirschman and LaBarbera (1990)	<ul style="list-style-type: none"> - Self-identity - Symbols of accomplishment 	<ul style="list-style-type: none"> - Self-transcendence
Kamptner (1991)	<ul style="list-style-type: none"> - Self-expression - Personal accomplishment 	<ul style="list-style-type: none"> - Social
Kamptner (1995)	<ul style="list-style-type: none"> - Self - Intrinsic quality (uniqueness) 	<ul style="list-style-type: none"> - Social
Prentice (1987)	<ul style="list-style-type: none"> - Self-expressive (vs. instrumental) - Prestigious (vs. common) 	
Richins (1994a; 1994b)	<ul style="list-style-type: none"> - Identity (self-expression, represents achievement) 	<ul style="list-style-type: none"> - Interpersonal ties

Table 2.1 Overview of the literature on product meanings

	Self-expression	Group affiliation
Ball and Tasaki (1992) based on Greenwald (1988)	<ul style="list-style-type: none"> - Private self - Public self 	<ul style="list-style-type: none"> - Public self - Collective self
Kleine et al. (1995)	<ul style="list-style-type: none"> - It's me and I like it - It's not me anymore - Breaking away 	<ul style="list-style-type: none"> - Keeping memories of others
Schultz et al. (1989)	<ul style="list-style-type: none"> - Individuation 	<ul style="list-style-type: none"> - Integration
Schifferstein and Pelgrim (2004)		<ul style="list-style-type: none"> - Memories
Wallendorf and Arnould (1988)	<ul style="list-style-type: none"> - Expression of differentiation - Prestige value 	<ul style="list-style-type: none"> - Expression of integration - Association with a loved one

Table 2.2 Overview of the literature on product attachment

Memories	Pleasure	Unclassified
- Personal history	- Quality intrinsic (aesthetics, quality) - Other use-related features - Emotion-related features	- Quality intrinsic (monetary value) - Effort expended in acquiring/maintaining - Instrumentality
- Past experiences	- Style - Intrinsic quality - Utilitarian - Life experiences	- Monetary value - Associations (ethnic, religious) - Personification - Utilitarian
	- To make possible certain activities, convenience, or enjoyment - Positive affect	- To make possible certain activities, convenience, or enjoyment - Need for the object - Security
- Selfhood	- Hedonic/aesthetic escapist - Functionality	- Religious objects - Functionality
- Memories - Personal history	- Enjoyment - Intrinsic quality - Utilitarian value	- Cultural-religious association - Personification - Enjoyment - Activity - Utilitarian value
- Memories	- Enjoyment - Intrinsic quality (design, style, color) - Utilitarian	- Enjoyment - Intrinsic quality (monetary worth) - Utilitarian
	- Recreational vs. practical	- Cultured (vs. everyday) - Recreational vs. practical
- Identity (symbolizes personal history)	- Enjoyment - Appearance-related - Utilitarian (valued for performance characteristics)	- Financial aspects - Enjoyment - Utilitarian (provides a necessity)

Memories	Pleasure	Unclassified
	- Diffuse self	
- Keeping memories of others		- Utilitarian possessions
- Temporal orientation		
- Memories	- Enjoyment	- Enjoyment
- Personal memories - Shared history	- Functional utility - Aesthetic value	- Instrumental efficacy - Spiritual efficacy - Functional utility

Self-Expression

The determinant self-expression stems from a person's desire to differentiate oneself from others and to express his/her personal identity. People are motivated to establish and communicate a personal identity, distinct from that of others. By acquiring, displaying, and using products, an individual can symbolically display one's individuality to oneself and to others (Solomon 1983; Tepper Tian, Bearden, and Hunter 2001). For example, I experience an emotional tie with my couch because it expresses my identity of being a conscientious and modern woman (see Figure 2.1). The determinant self-expression also encompasses symbols of personal accomplishment and communicating status (e.g., diplomas) because these represent a person's achievements. Finally, self-expression covers the product meaning uniqueness, because unique products are better in expressing one's individuality (Lynn and Harris 1997; Tepper Tian et al. 2001).

If a product is used to define and maintain one's personal identity, this product gains a special meaning to the owner. Past research concluded that people tend to develop stronger attachment to products that are used to express and maintain a personal and unique identity (Ahuvia 2005; Ball and Tasaki 1992; Kleine et al. 1995; Schultz et al. 1989; Wallendorf and Arnould 1988). Moreover, self-expression is distinguished as a possible meaning of treasured possessions (Csikszentmihalyi and Rochberg-Halton 1981; Dittmar 1991; Dyl and Wapner 1996; Furby 1978; Hirschman and LaBarbera 1990; Kamptner 1991, 1995; Richins 1994a). Finally, research on role transitions concluded that when a person's identity changes in time (e.g., when a person graduates from university, changes one's job, starts a family, or gets a divorce), such a role transition may stimulate people to dispose of products that do not fit them anymore, suggesting a decrease in the strength of product attachment (McAlexander 1991; Young and Wallendorf 1989; Young 1991).



Figure 2.1 Self-expression:
The couch expresses that I am a conscientious and modern woman

Group Affiliation

Group affiliation is concerned with the relational side of the self. This determinant of product attachment stems from people's need to be connected, joined, associated, and involved with others. Products that support group affiliation define to what groups an individual belongs. They symbolize a person's desirable connections to family members, friends, or social groups. An example is my emotional bond with my wedding ring, because this particular ring symbolizes my connection to my husband (see Figure 2.2). People can also use products to enact one of their social identities (Kleine, Kleine, and Kernan 1993). For example, a sweater can show a student's connection to a fraternity. People become more attached to products that symbolize an important person or social group, because these products enhance that part of the self that needs to feel connected (Ball and Tasaki 1992; Kleine et al. 1995; Schultz et al. 1989; Wallendorf and Arnould 1988). Past research on product meanings also classified a person's connections to others as a possible reason to consider products as special or treasured (Csikszentmihalyi and Rochberg-Halton 1981; Dittmar 1991; Dyl and Wapner 1996; Kamptner 1991, 1995; Richins 1994a).

Although the determinant group affiliation seems to oppose the determinant self-expression at first glance, they can actually co-exist. Kleine et al. (1995, p. 328) commented on this issue that "People are motivated universally to establish and maintain a personal and unique identity, distinct from that of others (i.e., autonomy seeking), while at the same time they are motivated to maintain interpersonal connections that also define the self (i.e., affiliation seeking)". An example of a product that is used for both self-expression and group affiliation is a Harley-Davidson motorcycle. The motorcycle represents one's belonging to a particular group of motorcyclists. Because most Harley-Davidsons are customized by the owner, they simultaneously express the unique identity of the owner.



Figure 2.2 Group affiliation:
My wedding ring symbolizes my
connection to my husband

Memories

A product can remind a person of people, events, or places that are important to that particular individual. It can help him/her maintain a sense of the past, which is essential to define and maintain one's identity. Part of who we are today is the result of who we were in the past. For example, I am attached to a bear sculpture, because it is a souvenir that reminds me of my trip to Canada (see Figure 2.3). In the same way, an heirloom can serve as a reminder of one's family. Due to the physical association between the product and a special person or place in the past, these products have gained symbolic meaning to the owner (Belk 1988, 1990). Past research observed a relatively strong relationship between the memories associated with the product and the experience of attachment (Kleine et al. 1995; Schifferstein and Pelgrim 2004; Schultz et al. 1989; Wallendorf and Arnould 1988). Correspondingly, many treasured and special possessions are valued, because they convey memories (Csikszentmihalyi and Rochberg-Halton 1981; Dittmar 1991; Dyl and Wapner 1996; Kamptner 1991, 1995; Richins 1994a).

We acknowledge that in a way all products elicit memories. If people are asked to think of events that they encountered with a certain product, almost every product is associated with some memory of the past. However, most of these memories have little importance to a person. We believe that product-related memories can only encourage the degree of attachment to a product, if the memories are highly significant to the owner.



Figure 2.3 Memories:
The bear sculpture reminds me of
a past event

Pleasure

The last determinant involves the pleasure experienced during usage as a result of superior functionality and aesthetic pleasure derived from the product's appearance (Creusen and Snelders 2002; Jordan 1998). Accordingly, pleasure

has connections to the product meanings enjoyment and utility, and to the appearance-related meanings (intrinsic quality) that were distinguished in previous studies (Dittmar 1991; Dyl and Wapner 1996; Furby 1978; Hirschman and LaBarbera 1990; Kamptner 1991, 1995; Richins 1994a). An example of this determinant was given at the start of this thesis, when I elaborated on the feelings of attachment to my car (see Figure 1.1, p. 11): My car's extraordinary and attractive design evokes pleasure, due to which an emotional bond has developed. Several scholars advocated that the experience of pleasure during product usage is related to attachment (Davis 2002; Norman 2004; Savas 2004). Schifferstein and Pelgrim (2004) indeed found empirical evidence for the effect of pleasure on product attachment.

Feelings of pleasure for products can come about in two ways. First of all, pleasure may result from the product's primary function in cases where a product provides entertainment or relaxation. Examples of such products are televisions, stereos, and ski equipment. However, it is unlikely that the pleasure resulting from the product's primary function will bring about product attachment, because this meaning is delivered by all products in the category. For example, a stereo may provide a person with pleasure, because it offers him/her the benefit of listening to music. In this case, we cannot speak of product attachment, because the attachment concerns the product category stereos in general, rather than one particular object. Accordingly, the product meanings enjoyment and utility do not necessarily contribute to product attachment and may, therefore, be categorized in Table 2.1 (p. 30-31) as Unclassified. The category Unclassified covers all product meanings that do not affect the degree of product attachment to ordinary durables.

Second, feelings of pleasure for a product can also come about as a result of a product's superior utility (e.g., extra features, greater usability, or higher quality) (Jordan 1998, 2000). In this case, it is not the primary function that evokes pleasure, but the extras that are not necessarily delivered by other products in the category. Additionally, pleasure may be derived from the product design, without consideration of its utility. For example, seeing a product can evoke aesthetic pleasure (Creusen and Snelders 2002; Creusen and Schoormans 2005; Jordan 1998, 2000). Due to its superior utility and/or appearance, the product may evoke pleasure that other products belonging to the product category do not evoke, which may result in a special meaning to the owner. An example is a person who enjoys his/her high-quality stereo, because it provides a great sound or because it has a beautiful design. As a result of the product's special meaning, the owner may become attached to it. To illustrate this effect of pleasure on product attachment, the product meanings enjoyment and utility, and the appearance-related meanings are also categorized in Table 2.1 (p. 30-31) as the determinant Pleasure.

2.3 General Discussion

The current chapter provides a theoretical discussion of the determinants of product attachment. Based on the categorizations of the different product meanings and the literature on product attachment, the following four determinants of experiencing attachment are proposed: self-expression, group affiliation, memories, and pleasure. These determinants were selected, based on the criterion that the determinant should affect the experience of attachment to ordinary durables and is, therefore, relevant for designers of consumer durables.

The four determinants are discussed as separate elements that can stimulate product attachment. However, this does not imply that these determinants are completely independent. Products can simultaneously convey multiple meanings and these meanings can also become intertwined. For example, gifts can remind a person of the specific event when the gift was received (memories), but can also have a relational meaning (group affiliation), because the gift connects the recipient to the giver (Ruth, Otnes, and Brunel 1999; Sherry 1983).

Although all determinants are relevant for stimulating the experience of attachment to ordinary durables, they differ in the degree to which designers can influence them through product design. As a result, some determinants of product attachment may be more valuable for designers than others. Specifically, we believe that the determinants self-expression and pleasure provide designers with the best opportunities to stimulate the degree of product attachment. The product design plays a significant role in creating products that are self-expressive or pleasurable, whereas product-related memories or group associations often develop as a result of other factors beyond the direct influence of the designer. Accordingly, this research project primarily focuses on the determinants self-expression and pleasure. To establish the role of the product for bringing about these determinants, the studies reported in this thesis systematically manipulate particular product characteristics and investigate the effect on the determinants and on product attachment. Study 3 constitutes an exception, because this longitudinal study focuses on understanding the dynamic character of product attachment.

Overview of the Empirical Studies

In the following chapters of this thesis, seven empirical studies are presented in which the effects of the determinants on product attachment are investigated. Chapter 3 starts with an investigation of the effects of pleasure and memories on product attachment and on satisfaction to gain a better understanding of the concept of product attachment. Two studies (Studies 1 and 2) are reported,

which indicate that these determinants positively affect product attachment. Furthermore, the findings show that the pleasure a product evokes depends on the product's utility and its appearance.

Chapter 4 investigates how the emotional bond a consumer experiences with ordinary durables varies over time. A longitudinal study (Study 3) is reported, which shows that product attachment is affected by the determinants self-expression, memories, and pleasure. Over time, the determinants of product attachment can be added or lost, or their impact on product attachment can change.

Chapter 5 examines the determinant self-expression by exploring product personality as a means for designers to influence this determinant and, consequently, affect the experience of product attachment. Two scenario studies (Studies 4 and 5) show that consumers develop stronger attachment to products with a personality that is congruent to their own personality.

Chapter 6 elaborates on the determinant self-expression by investigating the effect of product personalization as another means to stimulate the degree of product attachment. In Study 6, we present and test a conceptual model for the relationships between the process of product personalization, self-expression, and product attachment. Furthermore, Chapter 6 is concerned with the implementation of product personalization by designers. Another study in this chapter (Study 7) investigates the dimensions underlying the different types of personalization in order to provide an overview of the various possibilities to implement personalization options.

3 Product Attachment and Satisfaction: The Effects of Pleasure and Memories

In Chapter 2, four determinants of product attachment were distinguished. For designers interested in stimulating product attachment, it is important to understand the role of the product for bringing about these determinants. The current chapter investigates the effects of the determinants pleasure and memories on product attachment. The experience of pleasure from a product is affected by a product's utility and its appearance (Bloch 1995; Jordan 1998; Mano and Oliver 1993). The determinant pleasure can thus be directly influenced through product design. So far, the relationship between product attachment and pleasure has received little research attention.

Past research concluded that the experience of satisfaction with a product is also affected by both a product's utility and appearance (Mano and Oliver 1993). Consequently, it is necessary to uncover how product attachment is conceptually distinct from the construct of product satisfaction. More knowledge on how these concepts relate to each other and in what aspects they are similar or distinct enhances the comprehension of consumers' post-purchase behavior (Bagozzi, Gopinath, and Nyer 1999).

Besides the determinant pleasure, we investigate the presence of memories associated with the product as a determinant, because memories have a relatively strong effect on the development of product attachment (Schiffstein, Mugge, and Hekkert 2004; Wallendorf and Arnould 1988). We include the determinant memories to investigate how the determinants pleasure and memories may interact with each other. Furthermore, incorporating this determinant may help us to better distinguish product attachment from satisfaction. Whereas the memories associated with a product are strongly related to product attachment, no effect on product satisfaction is expected.

In this chapter, we propose and test a conceptual model of the relationships between product attachment, product satisfaction, and the determinants pleasure and memories (see Figure 3.1). We explain the model in the next paragraphs.

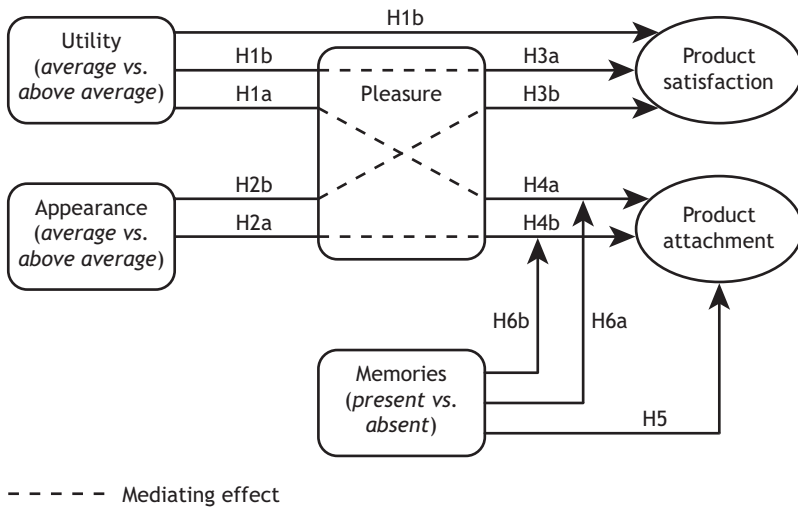


Figure 3.1 A conceptual model of product attachment and its relationships to satisfaction, pleasure, utility, appearance, and memories

3.1 Pleasure

To examine the relationships between product attachment, satisfaction, and pleasure, the processes by which a product’s utility and appearance affect these concepts are explored. We start with a discussion on the processes by which a product’s utility and appearance can bring about the experience of satisfaction.

An important conceptualization of satisfaction is based on the expectation-disconfirmation paradigm (E-D-paradigm) (e.g., Oliver 1980). According to this paradigm, the degree of satisfaction with a product is related to the confirmation or disconfirmation of prior expectations; that is the difference between the expected and the perceived performance of a product. When the product’s performance is acceptable, the cognitive evaluations of the product’s utility result in the experience of satisfaction. People experience more satisfaction with a product performing better than expected than with one performing according to expectations (Oliver 1980, 1997). Through the cognitive

evaluations, the product's utility directly affects the degree of satisfaction. In addition, Mano and Oliver (1993) found an indirect relationship through the affect elicited by the product. Their framework is based on the idea that satisfaction is not a purely cognitive evaluation. Emotional responses elicited through consumption of a product may affect the experience of satisfaction as well (Oliver 1989; Westbrook 1987; Westbrook and Oliver 1991). The utilitarian evaluations of a product can result in the experience of pleasure if the product performs extraordinarily well, and pleasure serves as a mediator for this effect on product satisfaction (Mano and Oliver 1993). In addition, people can derive pleasure from merely looking at a beautiful product (Creusen and Snelders 2002; Creusen and Schoormans 2005). Literature in the field of product design corroborates that pleasure is affected by utilitarian and appearance-related aspects of the product, and is related to product satisfaction (e.g., Jordan 1998). The pleasure experienced from a product positively affects the degree of satisfaction with this product. In conclusion, the determinant utility has a direct (via the cognitive evaluations of the E-D-paradigm) and an indirect effect (via the mediator pleasure) on satisfaction. Hence, pleasure serves as a partial mediator for the determinant utility (Mano and Oliver 1993). For the product's hedonic features (e.g., product appearance), pleasure serves as a perfect mediator (Mano and Oliver 1993), because these features elicit affective responses, and no cognitive evaluations (via the E-D-paradigm). Figure 3.1 displays these relationships.

Utility and appearance do not only affect satisfaction, but are also reasons for people to consider a product as treasured (Kamptner 1991, 1995), special (Csikszentmihalyi and Rochberg-Halton 1981), important (Dittmar 1991; Richins 1994), or favorite (Dyl and Wapner 1996; Kleine et al. 1995; Wallendorf and Arnould 1988). People develop attachment to products that have a special meaning to them. To obtain a special meaning, a product should provide the owner with more than just its basic function. Accordingly, we suggest that products with superior utility and/or a superior appearance can stimulate product attachment. A product with superior utility offers extra utilitarian benefits (e.g., extra features, greater usability, or higher quality). Due to these superior benefits, the product may elicit a state of pleasure that other products do not elicit. As a result of the experienced pleasure, the product obtains a special meaning to the owner, which can result in the development of an emotional bond with this product. On the contrary, products with average utility and average appearance do not evoke pleasure and are replaced much easier, because most other products in the category provide the same utilitarian and appearance-related benefits. Consequently, these products are less likely to result in feelings of product attachment.

Based on these arguments, we believe that pleasure serves as a perfect mediator for the effects of utility and appearance on product attachment (see Figure 3.1, p. 40). In contrast to the direct effect of utility on satisfaction, no direct effect of utility is expected for product attachment. When a product does not provide the owner with superior benefits, (s)he may be satisfied with it, due to the cognitive evaluations of the product's utility (Oliver 1997), but the product does not elicit pleasure or evoke feelings of attachment. Based on these arguments, we hypothesize:

- H1:** For a product with above average utility, the degree of product attachment (H1a) and the degree of satisfaction (H1b) are higher than for a product with average utility.
- H2:** For a product with above average appearance, the degree of product attachment (H2a) and the degree of satisfaction (H2b) are higher than for a product with average appearance.
- H3:** Pleasure evoked by a product partially mediates the effect of utility (H3a) and perfectly mediates the effect of appearance (H3b) on the degree of satisfaction.
- H4:** Pleasure evoked by a product perfectly mediates the effect of utility (H4a) and appearance (H4b) on the degree of product attachment.

The preceding arguments suggest that product attachment and satisfaction are both affected by the construct of pleasure, but are not directly related.

3.2 Memories

Products can remind the owner of a specific time, place, or person and can thus help to maintain a sense of the past (Belk 1988, 1990). Wallendorf and Arnould (1988) concluded that in the USA the explanation for valuing one's favorite possessions is most often the memories they evoke. Due to the physical association between the product and a special person or place in the past, the product has gained symbolic meaning to the owner (Belk 1988, 1990). If a product reminds the owner of the past, it evokes feelings of nostalgia.

Products can be associated with both positive and negative memories. An example of the latter is a product that serves as a memento from hard times. People are more likely to become attached to possessions that are associated with pleasant memories, because people want to preserve the happy moments in life (Belk 1988, 1990). In the case of negative product-related memories, two possible actions may take place. First, people may want to forget the negative memories as soon as possible by disposing of or stashing away the

object (Lastovicka and Fernandez 2005). On the other hand, people may also develop attachment to products that evoke negative memories, because these products help them to remember an unfortunate past event and make them appreciate their present prosperity (Schifferstein and Pelgrim 2004). For this research project, we focus on positive memories, because designers are generally interested in creating products that evoke pleasant feelings, while precluding negative ones, such as sadness or disappointment.

Past research observed a relatively strong relationship between the positive memories associated with the product and the experience of attachment (Kleine et al. 1995; Schifferstein et al. 2004; Wallendorf and Arnould 1988). This may have consequences for the effects of other determinants on the degree of product attachment. If the degree of attachment is high due to the memories a product is associated with, the other determinants become less relevant. For example, a person who inherited a clock from his/her parents experiences a strong attachment to this clock, because of the memories associated with it. The attachment is not likely to decrease when its functionality decreases or when it is scratched. The clock still has its most important asset: memories. The impact of utilitarian and appearance attributes on product attachment is thereby reduced. Accordingly, we hypothesize:

- H5:** When positive memories are associated with a product, the degree of product attachment is higher than when no important memories are associated with the product.
- H6:** Positive memories associated with a product moderate the effects of the product's utility (H6a) and the product's appearance (H6b) on product attachment. When positive memories are associated with a product, people experience product attachment regardless of the product's utility or the product's appearance. When no important memories are associated with the product, people experience a higher degree of product attachment when the product's utility or appearance is above average than when it is average.

The Present Studies

In the current chapter, we report two empirical studies testing the proposed conceptual framework. Study 1 (Section 3.3) is a test of the proposed conceptual model and examines the determinants' effects on product attachment. Study 2 (Section 3.4) extends Study 1 by examining appearance using improved stimulus material and a different product category. To investigate the effects of utility, appearance, and memories on product attachment and on satisfaction, we use written scenarios. A scenario or a vignette is a "short story about hypothetical characters in specified circumstances to which the interviewee

is invited to respond” (Finch 1987, p. 105). Scenarios are useful for the study of product attachment, because they allow studying processes that develop over a long period of time in a limited time span. In addition, they allow focusing on the topic of interest, while controlling for additional variables that would interact in a real-life situation (e.g., type of product, memories elicited by the product, financial aspects). This selective representation of the real world can help to disentangle the complexities and conflicts present in everyday life (Hughes and Huby 2002). An investigation on the validity of the use of scenarios demonstrated a large degree of correspondence between the emotions experienced in a real-life setting and the emotions subjects believed they were likely to experience in a scenario-setting (Robinson and Clore 2001). Moreover, asking people what a fictional other would do or think in a specific situation is a well-known projection technique in qualitative research (Gordon and Langmaid 1995). What respondents indicate as the experience of another may be interpreted as what they would do or think themselves if they were in a similar situation. As a consequence, scenarios can play a useful role in theory construction and scenarios are often used within research on post-purchase affect (e.g., Inman and Zeelenberg 2002; Tsiros and Mittal 2000).

3.3 Study 1: The Effects of Pleasure and Memories on Product Attachment and Satisfaction¹

Method

Subjects and Design

One hundred and eighteen students from the Delft University of Technology volunteered to participate in this study (50% males, 50% females; mean age = 21). Eight experimental conditions were generated following a 2 (product’s utility: average vs. above average) x 2 (product’s appearance: average vs. above average) x 2 (memories associated with the product: present vs. absent) between-subjects full factorial design. For example, one scenario described a person who owned a photo camera with average utility, average appearance, and that reminded him of an important person and an important past event. Each subject was assigned randomly to one of the eight conditions, resulting in a total of 14 or 15 subjects in each condition.

¹ With some alterations, Study 1 has previously been published as Mugge, Schifferstein, and Schoormans (2003) in the Proceedings of the 32nd European Marketing Academy Conference.

Stimulus Material and Procedure

The subjects were instructed to read the presented scenario carefully. The scenario portrayed a male person (named Joris), who owned a photo camera. To operationalize the product's utility, the scenario illustrated certain aspects of the camera's functions and its ease of use. Appearance was operationalized by describing the product's design and finishing. The determinant memories was operationalized by describing the manner in which the camera was obtained (received as a gift vs. an ordinary purchase). Appendix B illustrates the full text of all scenario elements. Subsequently, multi-item measures of expected product attachment, satisfaction, pleasure, as well as the product's utility, its appearance, and the presence of memories were obtained. The last three served as manipulation checks.

All items were rated on seven-point Likert scales (1 = "strongly disagree", 7 = "strongly agree"). Most of the items concerning product attachment, pleasure, and the independent variables were obtained from Schifferstein and Pelgrim (2004). Four self-generated items and the Delighted – Terrible scale (Westbrook 1980) were used to measure product satisfaction. Our measure of pleasure focused on the pleasure during usage, because Jordan (1998) argued that pleasure accrues from the interaction between a person and a product. All measurement scales together with the original items posed in Dutch can be found in Appendix A1. In the questionnaire, the items were presented in random order. Subjects took about 10 minutes to complete the questionnaire. After the experiment, they were thanked and debriefed.

Results

Measurement Properties of the Constructs

A confirmatory factor analysis (CFA) was performed in LISREL 8.50 (Jöreskog and Sörbom 1993) on the 15 items of product attachment, satisfaction, and pleasure to establish the convergent and discriminant validity of the measurement scales. To obtain an adequate fit, the modification indices were inspected, which resulted in the deletion of the following three items: "Joris is emotionally connected to this camera", the Delighted – Terrible scale, and "This camera does not move Joris". A CFA on the remaining 12 items demonstrated that a three-factor solution resulted in a good fit ($\chi^2 = 64.85$, $df = 51$, $p = .09$; GFI = .91; CFI = .97; RMSEA = .050).

Next, we considered the average variance extracted (AVE) of the constructs to assess their convergent validity using the 12 items resulting from the CFA. Because the AVE of pleasure was initially .43, which is significantly below the required threshold of .50 (Fornell and Larcker 1981), we decided to delete the item: "Joris likes to use this camera". As a result, the AVE increased to .50 and the three-factor solution resulted in a good fit ($\chi^2 = 45.39$, $df = 41$, $p = .29$;

GFI = .93; CFI = .99; RMSEA = .031), indicating acceptable convergent validity. Table 3.1 displays the factor loadings of the items for each construct for the current study as well as for Study 2 (see Section 3.4).

Concerning discriminant validity, we compared the baseline model (in which the correlations between related pairs of constructs were freely estimated) with a series of three alternative models (in which the correlations between pairs of constructs were constrained to unity) (Anderson and Gerbing 1988). In each case, the constrained model exhibited a statistically significant increase in chi-square (mean $\Delta\chi^2 = 77.99$, $df = 1$, $p < .01$), providing evidence of discriminant validity (Bagozzi and Phillips 1982). These results indicate

Items	Study 1		Study 2	
	Factor loading	<i>t</i>	Factor loading	<i>t</i>
Product attachment ($\alpha = .81$, AVE = .52)				
1. Joris is very attached to this camera	.72	8.08	.73	9.41
2. This camera has no special meaning to Joris*	-.61	- 6.53	-.60	- 7.28
3. This camera is very dear to Joris	.76	8.65	.84	11.37
4. Joris has a bond with this camera	.78	8.93	.68	8.50
5. This camera does not move Joris*	–	–	–	–
6. Joris feels emotionally connected to this camera	–	–	–	–
Satisfaction ($\alpha = .86$, AVE = .61)				
1. Joris is satisfied with this camera	.88	11.08	.80	10.90
2. Joris feels dissatisfied after his experiences with this camera*	-.61	- 6.68	-.44	- 5.23
3. Joris is pleased with this camera	.80	9.75	.68	8.72
4. Joris is content with this camera	.90	9.71	.83	11.49
5. Delighted – Terrible scale (Westbrook 1980)	–	–	–	–
Pleasure ($\alpha = .73$, AVE = .50)				
1. Joris enjoys this camera	.73	8.10	.79	10.56
2. It is a pleasure for Joris to use this camera	.77	8.65	.73	9.59
3. Joris feels good when he uses this camera	.60	6.30	.72	9.32
4. Joris likes to use this camera	–	–	–	–

Table 3.1 Construct measurement summary: confirmatory factor analysis and scale reliability. Note: * indicates a reversed item, – indicates a deleted item

that the multi-item scales demonstrated satisfactory levels of convergent and discriminant validity. In conclusion, product attachment, satisfaction, and pleasure are empirically distinct. The correlations between the constructs for Study 1 and Study 2 are displayed in Table 3.2.

Study 1			
Dependent variable	1.	2.	3.
1. Product attachment	–	.23**	.44**
2. Satisfaction		–	.52**
3. Pleasure			–

Study 2			
Dependent variable	1.	2.	3.
1. Product attachment	–	.37**	.55**
2. Satisfaction		–	.68**
3. Pleasure			–

Table 3.2 Correlations between product attachment, satisfaction, and pleasure
 Note: ** $p < .01$

Manipulation and Confounding Checks

Cronbach’s alphas for the constructs of the three independent variables were: utility: $\alpha = .70$; appearance: $\alpha = .88$; memories: $\alpha = .90$. To investigate the success of our manipulations, we tested the convergent and discriminant validity of our manipulations. Three separate 2 x 2 x 2 analyses of variance (ANOVAs) were performed using the measurement scales for utility, appearance, and memories as the dependent variables and the three manipulations as the independent variables. Evidence for the convergent validity of our manipulations is found if each treatment manipulation significantly affects scores on the measurement scale intended to measure this manipulation. The discriminant validity of our manipulation is supported if each treatment manipulation does not affect the other measures. The results supported the convergent validity of our manipulations. Significant main effects were found for the utility manipulation on the utility measure ($F(1, 110) = 104.41, p < .001$), for the appearance manipulation on the appearance measure ($F(1, 109) = 227.06, p < .001$), and for the memories manipulation on the memories

measure ($F(1, 108) = 116.15, p < .001$). Moreover, the corresponding effect sizes were substantial (utility, $\eta^2 = .49$; appearance, $\eta^2 = .68$; memories, $\eta^2 = .52$). Subjects in the “above average utility” condition perceived the utility of the product as superior to those in the “average utility” condition ($M_{+, ut} = 5.87$ vs. $M_{0 ut} = 4.44$). The product’s appearance in the “above average appearance” condition was perceived as superior to the product in the “average appearance” condition ($M_{+, app} = 5.85$ vs. $M_{0 app} = 3.51$). Subjects in the “memories” condition perceived the product more as a reminder of past experiences than those in the “no memories” condition ($M_{mem} = 4.98$ vs. $M_{no mem} = 2.47$).

Ideally, these three main effects should be the only significant effects in their respective ANOVAs. However, we also found a significant appearance main effect on the utility measure ($F(1, 110) = 14.09, p < .001$), and a utility \times appearance interaction effect on the memories measure ($F(1, 108) = 4.19, p < .05$). Fortunately, these factors had relatively small effect sizes ($\eta^2 = .11$ and $\eta^2 = .04$, respectively), suggesting that their impact on the experiment would be more or less negligible (Perdue and Summers 1986).

Effects of Utility, Appearance, and Memories

To test hypotheses 1, 2, 5, and 6, two separate $2 \times 2 \times 2$ ANOVAs were performed with either product attachment or satisfaction as the dependent variable and utility, appearance, and memories manipulations as the independent variables. In the analyses, the scores on the purified measurement scales (see Table 3.1) were used as the dependent variables. No effect was found for subjects’ gender (as a covariate) on either product attachment or satisfaction ($p > .05$) and, therefore, gender was excluded from the analyses. The means and standard deviations for the different conditions are presented in Table 3.3.

Both ANOVAs revealed a significant main effect of utility. As hypothesized, the subjects who read about the product that functioned above average predicted a higher degree of product attachment ($M_{+, ut} = 4.75$ vs. $M_{0 ut} = 4.13$; $F(1, 108) = 9.87, p < .01$) and satisfaction ($M_{+, ut} = 6.23$ vs. $M_{0 ut} = 5.05$; $F(1, 109) = 53.95, p < .001$) than those who read about the product with average utility. These results support hypotheses 1a and 1b: Consumers experience more attachment to and more satisfaction for a product with above average utility than for an average product.

Furthermore, a main effect of memories on product attachment was found ($F(1, 108) = 56.25, p < .001$), whereas no effect was found for satisfaction ($F(1, 109) < 1$). As hypothesized, the subjects in the “memories” conditions predicted more attachment than those in the “no memories” conditions ($M_{mem} = 5.18$ vs. $M_{no mem} = 3.70$). These results support hypothesis 5. The interaction effect between memories and utility on the dependent variable product attachment was also significant ($F(1, 108) = 4.00, p < .05$). Among the subjects

in the “no memories” conditions, those who read about the product with the above average utility predicted more attachment than those who read about the average product ($M_{no\ mem, +\ ut} = 4.21$ vs. $M_{no\ mem, 0\ ut} = 3.19$; $t(57) = 3.74$, $p < .001$). On the other hand, for the “memories” conditions, there was no difference in the degree of attachment among subjects who read about the product with the above average utility and those who read about the product with the average utility ($M_{mem, +\ ut} = 5.30$ vs. $M_{mem, 0\ ut} = 5.07$; $t(55) = .80$, $p > .20$). These results support hypothesis 6a. People become strongly attached to products that remind them of past experiences. As a consequence, memories moderate the effect of a product’s utility. When memories are present, they play a major role in the development of product attachment and any other determinants’ effects become negligible.

No effects were found for appearance on product attachment ($F(1, 108) = 1.89$, $p > .10$) and satisfaction ($F(1, 109) = 1.14$, $p > .20$) and for the appearance x memories interaction on product attachment ($F(1, 108) = 1.35$, $p > .20$). The results thus fail to support hypotheses 2a, 2b, and 6b.

				Study 1		Study 2	
	Utility	Appearance	Memories	Mean	SD	Mean	SD
Product attachment	Average	Average	Present	5.07	1.58	4.29	.96
	Above average	Average	Present	5.25	.61	4.85	.82
	Average	Above average	Present	5.07	1.17	4.66	1.22
	Above average	Above average	Present	5.34	.70	4.89	.79
	Average	Average	Absent	2.85	.89	2.80	1.05
	Above average	Average	Absent	4.05	1.03	3.91	1.18
	Average	Above average	Absent	3.54	1.06	3.91	.97
	Above average	Above average	Absent	4.37	1.14	4.50	1.07
Satisfaction	Average	Average	Present	5.01	1.08	4.47	.89
	Above average	Average	Present	6.63	.28	5.46	.72
	Average	Above average	Present	4.93	.77	4.88	.91
	Above average	Above average	Present	5.92	1.21	5.96	.52
	Average	Average	Absent	5.11	.99	4.23	.92
	Above average	Average	Absent	6.13	.63	5.38	.72
	Average	Above average	Absent	5.14	.85	4.73	.82
	Above average	Above average	Absent	6.22	.77	6.01	.63

Table 3.3 Means and standard deviations (SD) of the variables product attachment and satisfaction for the different conditions

Mediation Analysis

Baron and Kenny's (1986) framework for mediation was used to investigate the role of pleasure in mediating the effect of utility on product attachment and satisfaction (hypotheses 3a and 4a). Hypotheses 3b and 4b could not be tested, because appearance did not have an effect on the two dependent variables. Baron and Kenny's (1986) test for mediation hinges on three statistical outcomes. First, the effect of the independent variables (i.e., utility) on the dependent variables (i.e., product attachment and satisfaction) must be significant without incorporating the effect of the mediator (i.e., pleasure), as was shown in the previous section.

Second, the effect of the independent variables on the mediator variable must be significant. This was tested by performing a 2 x 2 x 2 ANOVA using the scores on the pleasure scale as the dependent variable and utility, appearance, and memories manipulations as the independent variables. This ANOVA supported the role of pleasure as a mediator by revealing a significant main effect of utility on pleasure ($M_{+ut} = 5.22$ vs. $M_{0ut} = 4.25$; $F(1, 109) = 30.80, p < .001$). No other effects were found.

Third, when the mediator variable is added to the original analysis as a covariate, the effect of the covariate on the dependent variables must be significant. If the effect of the independent variable on the dependent variable becomes non-significant when the mediating variable is added, perfect mediation is demonstrated. If the effect of the independent variable remains significant but the effect size reduces, partial mediation is demonstrated. Two separate analyses of covariance (ANCOVAs) were performed with either product attachment or satisfaction as the dependent variable, and with utility, appearance, and memories manipulations as the independent variables (see Table 3.4). In both analyses, pleasure was included as a covariate. Pleasure significantly affected product attachment as well as satisfaction ($F(1, 107) = 21.49, p < .001$ and $F(1, 108) = 16.03, p < .001$, respectively). Importantly, as predicted by hypothesis 4a, the analyses revealed that the previously significant main effect of utility on product attachment was no longer significant, when pleasure was included as a covariate ($F(1, 107) < 1$). This finding demonstrated that pleasure perfectly mediated the effect of utility on product attachment, supporting hypothesis 4a. For satisfaction, the main effect of utility was reduced ($\Delta\eta^2 = 42\%$), but remained significant ($F(1, 108) = 25.70, p < .001$) when we added pleasure to the analysis as a covariate. This suggested both a direct and an indirect effect (through pleasure) of utility on satisfaction. Thus, partial mediation was observed for the effect of utility on satisfaction, supporting hypothesis 3a.

In conclusion, products with superior utility elicit pleasure, which serves as a mediator for the effect of utility on the attachment to and satisfaction with a product. For satisfaction, this mediation is partial, because utility can also

result in the experience of satisfaction through cognitive evaluations. The effect of utility on product attachment is perfectly mediated by the pleasure elicited: Consumers only become attached to a product for utilitarian reasons when the product elicits pleasure.

Relationships between Product Attachment, Satisfaction, and Pleasure

To test the relationships between product attachment, satisfaction, and pleasure (see Figure 3.1, p. 40), we estimated a structural model. The model resulted in a good fit to the data ($\chi^2 = 47.71$, $df = 42$, $p = .25$; GFI = .93; CFI = .99; RMSEA = .035). Pleasure had a significant effect on product attachment ($\gamma = .58$, $p < .01$) and on satisfaction ($\gamma = .66$, $p < .01$). A second model was estimated to explore the relationship between attachment and satisfaction. Specifically, we estimated whether product satisfaction had a direct effect on product attachment. The results showed that the fit of this model was not significantly better ($\Delta\chi^2 = 2.32$, $df = 1$, $p > .05$) than the original model and that satisfaction had no direct effect on product attachment ($\gamma = -.21$, $p > .05$).

Study 1

Independent variable	Covariate	Dependent variable							
		Product attachment				Satisfaction			
		F-value	p	η^2	$\Delta\eta^2$	F-value	p	η^2	$\Delta\eta^2$
Utility	None	$F(1, 108) = 9.87$	.002	.084		$F(1, 109) = 53.95$	.000	.33	
	Pleasure	$F(1, 107) < 1$	.350	.008	90%	$F(1, 108) = 25.70$	.000	.19	42%

Study 2

Independent variable	Covariate	Dependent variable							
		Product attachment				Satisfaction			
		F-value	p	η^2	$\Delta\eta^2$	F-value	p	η^2	$\Delta\eta^2$
Utility	None	$F(1, 149) = 14.73$	.000	.090		$F(1, 149) = 82.44$	.000	.36	
	Pleasure	$F(1, 148) < 1$	.620	.002	98%	$F(1, 148) = 31.41$	.000	.18	50%
Appearance	None	$F(1, 149) = 10.54$	.001	.066		$F(1, 149) = 16.67$	.000	.10	
	Pleasure	$F(1, 148) = 3.14$	.079	.021	68%	$F(1, 148) = 5.93$	.016	.04	61%

Table 3.4 ANOVA and ANCOVA results with pleasure as a covariate

Discussion

Study 1 provides partial support for our conceptual model of product attachment. All hypotheses were supported, except those concerning the effects of appearance. A possible explanation for the lack of significance of appearance is our operationalization. Appearance was operationalized by a written description of the product's design and finishing. The use of written scenarios may have been inappropriate to study appearance. Subjects may have experienced some difficulty in visualizing the product's appearance on the basis of the product's description only. The finding that the appearance manipulation affected ratings on the utility and memories variables in the confounding checks corroborates the assumption that the appearance manipulation was inadequate. Moreover, Vriens et al. (1998) concluded that pictorial representations improve subjects' understanding of a product's design attributes in comparison to written representations.

Another limitation of Study 1 is that the person in the scenario was male. Past research showed that gender affects the reasons for consumers to become attached to products (Csikszentmihalyi and Rochberg-Halton 1981; Dittmar 1991; Dyl and Wapner 1996; Kamptner 1991). For males, utilitarian related reasons are more important in the development of product attachment than for females. To generalize our findings concerning utility, it is relevant to replicate the study using a scenario in which a female is portrayed.

In conclusion, the main objective of the following study is to improve our stimulus material to further examine the effect of appearance. In Study 2, we also provide insights in the generalizability of the proposed conceptual model by replicating the study for a female person and for a second product category.

3.4 Study 2: Replication of Study 1

Method

Subjects and Design

One hundred and sixty students volunteered to participate in the second study (51% male, 49% female; mean age = 20). The study had a 2 (product's utility: average vs. above average) x 2 (product's appearance: average vs. above average) x 2 (memories associated with a product: present vs. absent) between-subjects full factorial design. Each subject was assigned randomly to one of the eight conditions, resulting in a total of 20 subjects in each condition.

Stimulus Material and Procedure

Similar to Study 1, scenarios were used to control the manipulated determinants of product attachment. The scenario portrayed a female person (named Susan), who owned a mobile phone. Appearance was operationalized using a set of pictures.

Although several fundamental rules, such as unity, proportion (e.g., ‘the Golden Section’), and symmetry affect aesthetic appreciation (Hekkert, Snelders, and Van Wieringen 2003; Muller 2001; Veryzer 1993; Veryzer and Hutchinson 1998), past research showed that individual differences exist for what people judge as a superior appearance, dependent on the person, culture, and fashion (Bloch 1995; Holbrook and Schindler 1994; McCracken 1986). Therefore, a scenario in which the product’s appearance is related to the owner’s taste seems preferable to study the effects of appearance. The role of individual preferences was incorporated in the scenarios by describing the person’s taste for the appearances of other consumer durables. This provided subjects with a frame of reference on the person’s preferences with respect to products’ appearances. Subjects were presented with color pictures of four different products that the person portrayed in the scenario liked for their design and color. All products were similar in style of design: They had rounded shapes and conspicuous colors (see Appendix C). Three professional designers of consumer durables selected these products as being similar in style of design by mutual agreement. Two color pictures of mobile phones were selected, for which the styles of design were either similar or dissimilar to the four products. The two selected mobile phones were similar in price. All pictures were digitally altered to hide brand identification as much as possible. We expected the subjects in the “similarity” group to perceive the product’s appearance as superior to those in the “dissimilarity” group, because only in the “similarity” group the product matched the person’s taste.

These visual scenario elements were combined with written scenario elements to operationalize utility and memories. We attempted to keep the written scenario elements equivalent to those used in Study 1. However, several changes were necessary, because the two product categories differed. The complete scenarios are included in Appendix C. The independent and dependent measures (i.e., product attachment, satisfaction, pleasure, utility, appearance, and memories) were identical to those in Study 1 (see Appendix A1).

Results

Manipulation and Confounding Checks

Cronbach’s alphas for the scales of the three independent variables were: utility: $\alpha = .77$; appearance: $\alpha = .94$; memories: $\alpha = .83$. Similar to Study 1, we tested the convergent and discriminant validity of our manipulations

by performing three ANOVAs. The results showed that all manipulations were successful (p 's < .001) and the corresponding effect sizes were substantial (utility, $\eta^2 = .52$; appearance, $\eta^2 = .60$; memories, $\eta^2 = .29$). Subjects in the "above average utility" condition perceived the utility of the product as better than those in the "average utility" condition ($M_{+ut} = 5.95$ vs. $M_{0ut} = 4.44$; $F(1, 145) = 155.76$, $p < .001$). In the "above average appearance" condition, subjects perceived the appearance of the product as superior than those in the "average appearance" condition ($M_{+app} = 5.74$ vs. $M_{0app} = 3.06$; $F(1, 151) = 228.77$, $p < .001$). Subjects in the "memories" condition perceived the product more as a reminder of past experiences than those in the "no memories" condition ($M_{mem} = 4.43$ vs. $M_{no\ mem} = 2.84$; $F(1, 150) = 61.37$, $p < .001$). No other effects were found ($p > .05$), providing evidence for the validity of our manipulations.

Replication Analysis

To test the dimensional structure of the dependent variables, we performed a strictly confirmatory factor analysis on the items of the adjusted scales derived from Study 1 ($\chi^2 = 67.77$, $df = 41$, $p < .01$; GFI = .92; CFI = .95; RMSEA = .068). Although the chi-square was significant, it was smaller than the rule of 2.5 to 3 times the number of degrees of freedom, as suggested by Bollen (1989). Both the CFI of .95 and the GFI of .92 satisfied the minimum requirements of .90 (Bollen 1989). Moreover, the lower bound of the RMSEA was below the value of .08 (Browne and Cudeck 1993). As in Study 1, the three-factor model provided a good fit to the data. Table 3.1 (p. 46) displays the factor loadings of the items for each construct. Based on these findings, we find further evidence that product attachment, product satisfaction, and pleasure are empirically distinct. The correlations between the dependent variables are displayed in Table 3.2 (p. 47).

Effects of Utility, Appearance, and Memories

Two $2 \times 2 \times 2$ ANOVAs were performed with either product attachment or satisfaction as the dependent variable and utility, appearance, and memories manipulations as the independent variables. Similar to Study 1, subjects' gender had no effect on both product attachment and satisfaction ($p > .05$), and this covariate was thus deleted from the analyses. The means and standard deviations for the different conditions are presented in Table 3.3 (p. 49).

As predicted, the results showed a main effect of utility on product attachment ($F(1, 149) = 14.73$, $p < .001$) and product satisfaction ($F(1, 149) = 82.44$, $p < .001$). When the product functioned above average, the subjects predicted higher degrees of product attachment ($M_{+ut} = 4.54$ vs. $M_{0ut} = 3.91$) and satisfaction ($M_{+ut} = 5.71$ vs. $M_{0ut} = 4.58$) than for a product with average

utility. These results support hypotheses 1a and 1b. Furthermore, significant main effects were found for appearance on the dependent variables product attachment ($F(1, 149) = 10.54, p < .002$) and satisfaction ($F(1, 149) = 16.67, p < .001$). Subjects predicted higher degrees of product attachment ($M_{+ \text{ app}} = 4.49$ vs. $M_{0 \text{ app}} = 3.96$) and satisfaction ($M_{+ \text{ app}} = 5.39$ vs. $M_{0 \text{ app}} = 4.89$) for the product with above average appearance, than for the product with average appearance. These findings support hypotheses 2a and 2b. A main effect of memories on product attachment was also found ($F(1, 149) = 30.02, p < .001$). As hypothesized, the subjects in the “memories” conditions predicted more attachment ($M_{\text{ mem}} = 4.67$ vs. $M_{\text{ no mem}} = 3.78$) than those in the “no memories” conditions, supporting hypothesis 5. No effect of memories was found for satisfaction ($F(1, 149) < 1$).

The results yielded a significant memories x appearance interaction for the dependent variable product attachment ($F(1, 149) = 3.96, p < .05$). Among the subjects in the “no memories” conditions, those presented with the product with superior appearance predicted more product attachment than those presented with the average appearance ($M_{\text{ no mem, + app}} = 4.21$ vs. $M_{\text{ no mem, 0 app}} = 3.36; t(76) = 3.20, p < .001$). However, among the subjects in the “memories” conditions, there was no significant difference between these groups ($M_{\text{ mem, + app}} = 4.77$ vs. $M_{\text{ mem, 0 app}} = 4.57; t(77) = .95, p > .20$), supporting hypothesis 6b. The data did not support the hypothesized memories x utility interaction (hypothesis 6a) ($F(1, 149) = 1.96, p > .10$).

Mediation Analysis

A 2 x 2 x 2 ANOVA was performed with pleasure as the dependent variable and utility, appearance, and memories as the independent variables. Significant main effects of utility ($M_{+ \text{ ut}} = 4.97$ vs. $M_{0 \text{ ut}} = 3.97; F(1, 151) = 46.62, p < .001$) and appearance ($M_{+ \text{ app}} = 4.73$ vs. $M_{0 \text{ app}} = 4.21; F(1, 151) = 12.47, p < .01$) on the mediator were found. No effect of memories was found ($F(1, 151) < 1$).

Subsequently, the original ANOVAs with product attachment or satisfaction as the dependent variables were performed with pleasure as a covariate (see Table 3.4, p. 51). Pleasure significantly affected both product attachment and satisfaction ($F(1, 148) = 47.43, p < .001$ and $F(1, 148) = 59.50, p < .001$, respectively). As hypothesized, the previously significant main effect of utility on attachment was no longer significant when pleasure was included as a covariate ($F(1, 148) = .24, p = .62$), whereas the main effect of utility on satisfaction was reduced ($\Delta\eta^2 = 50\%$), but remained significant ($F(1, 148) = 31.41, p < .001$). These results support hypotheses 3a and 4a: Pleasure perfectly mediates the effect of utility on product attachment and partially mediates its effect on satisfaction.

Furthermore, the main effect of appearance on product attachment and satisfaction was reduced ($\Delta\eta^2 = 68\%$ and $\Delta\eta^2 = 61\%$, respectively) when pleasure was included as a covariate, but remained significant for satisfaction ($F(1, 148) = 5.93, p < .02$) and marginally significant for product attachment ($F(1, 148) = 3.14, p = .08$). These results partially support hypotheses 3b and 4b: Pleasure appears to serve as a partial mediator for the effect of appearance on satisfaction, whereas perfect mediation was expected. For attachment, the main effect of appearance was only marginally significant and the effect size was not completely reduced. The reduction in effect size was similar to that for satisfaction. Based on these results, we interpret the mediation for product attachment also as partial.

Relationships between Product Attachment, Satisfaction, and Pleasure

The relationships between product attachment, satisfaction, and pleasure (see Figure 3.1, p. 40) were estimated for the data of Study 2 to provide further evidence for our conceptual model. The model resulted in a satisfactory fit to the data ($\chi^2 = 71.39, df = 42, p = .003$; GFI = .92; CFI = .95; RMSEA = .070). Pleasure had a significant effect on product attachment ($\gamma = .71, p < .01$) as well as on satisfaction ($\gamma = .85, p < .01$). Similar to Study 1, a second model was estimated in which satisfaction had a direct effect on attachment to explore the relationship between these constructs. This model did not provide a better fit than the original model ($\Delta\chi^2 = 3.62, df = 1, p > .05$; $\gamma = -.43, p > .05$).

Discussion

Study 2 provides additional support for the proposed conceptual model of product attachment. The relationships between product attachment, satisfaction, pleasure, utility, and memories as found in Study 1 are all replicated in this study, with the exception of the moderating effect of memories on utility (hypothesis 6a). Because Study 2 replicates Study 1 for mobile phones and for a female person, these findings largely support the generalizability of the proposed conceptual model over product categories and over gender. Furthermore, Study 2 extends Study 1 by using visual scenario elements instead of written scenario elements, and by including individual preferences in our operationalization of appearance by showing the person's taste concerning the appearance of other consumer durables. Due to this improvement of the stimulus material, Study 2 provided support for hypotheses 2, 3b and 4b.

The lack of significance for the memories x utility interaction on product attachment (hypothesis 6a) in Study 2 was unexpected. We believe this may be due to the strength of the manipulation of the determinant memories (Study 1: $\eta^2 = .52$; Study 2: $\eta^2 = .29$). The product in Study 1 is not merely a gift for one's graduation as in Study 2, but is also a reminder of a special weekend with the

person's father. As the manipulation of memories was stronger in Study 1, the memories x utility interaction was more likely to occur.

Our results suggest that pleasure is only a partial mediator for the effect of appearance on product attachment as well as on satisfaction, whereas perfect mediation was expected. A possible explanation for these findings on product attachment lies in the role the product's appearance plays in maintaining a person's identity (e.g., Burroughs 1991). Products possess symbolic self-defining functions, which consumers use to define and maintain their identities (Sirgy 1982; Solomon 1983). Consumers tend to prefer products and product appearances that are congruent with their self-concept (e.g., Sirgy 1982). In Chapter 2, we concluded that expressing a person's identity is also a determinant of product attachment (Ball and Tasaki 1992; Kleine et al. 1995; Schultz et al. 1989; Wallendorf and Arnould 1988). As a result, a product's appearance may not only have an indirect effect on the degree of product attachment through the determinant pleasure, but also through the determinant self-expression. For satisfaction, pleasure serving as a partial mediator for appearance seems inconsistent with the results of Mano and Oliver (1993), who found perfect mediation. However, Mano and Oliver (1993) investigated affect, of which pleasure is only one component. Probably, other emotional reactions (e.g., surprise) may serve as additional mediators for the effect of appearance on satisfaction.

3.5 General Discussion

This chapter contributes to our understanding of post-purchase behavior by exploring the relationships between product attachment, satisfaction, the determinant pleasure evoked by a product's superior utility and/or superior appearance, and the determinant memories. We propose and test a conceptual model in two experimental studies. For the most part, the data appear consistent with this model. Specifically, we find that product attachment and satisfaction are both affected by utility and appearance. Pleasure is a pathway through which utility and appearance increase product attachment and product satisfaction. Product satisfaction, in turn, does not relate directly to product attachment. These findings corroborate and extend Mano and Oliver's (1993) framework regarding the relationship between satisfaction and affect.

Our results suggest that product attachment is conceptually distinct from satisfaction on at least two accounts. First, the mediation processes through the mediator pleasure are different: The product's utility has a direct effect (via the E-D-paradigm) as well as an indirect effect (via the mediator pleasure) on satisfaction, whereas the effect on product attachment is only indirect (via

the mediator pleasure). These results support the notion that satisfaction is an evaluative judgment of the product's performance that develops as a result of both cognitive evaluations and affective reactions elicited in consumption (Mano and Oliver 1993). In contrast, product attachment is an emotion-laden bond that develops if the product has a special meaning to the owner (e.g., Wallendorf and Arnould 1988). An average performing product can result in the experience of satisfaction, because it is adequate and performs according to expectations. However, a person is not likely to become attached to an average performing product, because it has nothing special, and thus it does not elicit pleasure or stimulate emotional bonding.

Second, product attachment is directly related to memories, whereas satisfaction is not. If a product is associated with memories, the product helps the person to maintain his/her past, due to which it gains a special, symbolic meaning. A product's symbolic meaning is related to product attachment, but is not directly related to its performance and, hence, does not affect the degree of satisfaction. The presence versus absence of memories associated with a product moderates the effect of utility and appearance on product attachment (Schifferstein et al. 2004; Wallendorf and Arnould 1988). When positive memories are associated with a product, the impact of the product's utility and/or appearance on product attachment is reduced.

Limitations and Future Research

Many of the studies' limitations stem from the experimental context used to examine product attachment. We recognize the potential disadvantages of investigating a complex construct such as product attachment in a scenario setting. However, we feel this is offset by the valuable insights gained through exploration of the relationship between product attachment, satisfaction, pleasure, and memories. Scenarios allow for the control of intervening variables and enable the study of long-term effects. Nevertheless, future research should explore the external validity of the proposed conceptual model.

In this chapter, the determinant pleasure is investigated by considering a product's utility and appearance. Jordan (2000) distinguished the following four types of pleasure from products: physio-pleasure, socio-pleasure, psycho-pleasure, and ideo-pleasure. Physio-pleasure is the pleasure derived from the sensory organs. For example, a pencil with a soft rubber surround can give a pleasurable, tactile experience. Enjoyment derived from the relationship with others is labeled as socio-pleasure. For example, a Porsche shows a person's belonging to the social group of yuppies. Psycho-pleasure includes issues relating to the cognitive and emotional reactions of using a product. For example, a person may experience pleasure from a computer program that is easy to use. Ideo-pleasure refers to the pleasure derived from its aesthetics

and the values that a product embodies. From this perspective, Studies 1 and 2 focused on the psycho-pleasure and ideo-pleasure evoked by a product. The other types of pleasures Jordan (2000) described may also be relevant for stimulating product attachment. In fact, socio-pleasure is related to the determinant group affiliation. Products that evoke physio-pleasure as a result of their tactile or oral characteristics may also convey a special meaning and, therefore, become objects of attachment. Therefore, in subsequent studies, other ways to evoke the determinant pleasure may be explored.

Implications

The studies in this chapter suggest that designers can influence the emotional bond between consumers and their durables by stimulating the experience of pleasure from a product or by encouraging the memories associated with a product. Then, the product gains a special meaning to them. In the studies, the determinant memories was manipulated through the manner the product was acquired (e.g., gift for graduation), independent from the product itself. Such product-related memories are difficult to influence by the designer.

In contrast to the determinant memories, the determinant pleasure provides designers with relatively straightforward guidelines to affect product attachment. Consumers develop strong attachment to products that provide them with pleasure due to the product's superior utility or appearance (Csikszentmihalyi and Rochberg-Halton 1981; Richins 1994; Wallendorf and Arnould 1988). This suggests that designers should make products that perform better and/or are more beautiful.

However, it is questionable whether products that provide pleasure as a result of superior utility or appearance, continue to be pleasurable over time. New products with new features and designs are constantly introduced. These products may decrease the experienced pleasure and, therefore, the degree of attachment to the current product. From a sustainability perspective, it is essential that the attachment to a product is long-term. Only then, the experience of attachment can postpone replacement. Designers thus need an understanding of the factors that may bring about changes in the emotional bond with a product.

The next chapter will address the dynamic character of product attachment by investigating product attachment in a longitudinal study.

4 Development of Product Attachment over Time

Past research on product attachment investigated the degree of product attachment at one specific moment in time (e.g., Ball and Tasaki 1992; Kleine et al. 1995; Wallendorf and Arnould 1988). Although these studies are clearly valuable for understanding the concept of product attachment, they have some apparent shortcomings. Attachment theory in psychology has suggested that attachments between two persons grow over time and are based on interactions between an individual and the person to which one feels attached (Baldwin et al. 1996; Bowlby 1979). Analogously, experiencing attachment to a product or brand develops over time as well (Kleine and Baker 2004; Thomson, MacInnis, and Park 2005). The interactions between the person and his/her product encourage the development of meaning in reference to the object, due to which an emotional bond may develop. Accordingly, several scholars acknowledged the importance of longitudinal research to examine consumers' dynamic relationships to their possessions to deepen our understanding of product attachment (Ball and Tasaki 1992; Kleine and Baker 2004; Schifferstein and Pelgrim 2004). This chapter provides a first attempt to investigate the concept of product attachment using a longitudinal approach.

4.1 Dynamic Character of Product Attachment

In some cases, the experience of an emotional bond with a product can be relatively static over time (Kleine and Baker 2004). For example, heirlooms tend to have deep, symbolic meanings of family and self-continuity that are passed on from one generation to the next (Curasi, Price, and Arnould

2004; McCracken 1986; Price, Arnould, and Curasi 2000). However, for most possessions that are used on a daily basis, the experience of product attachment is dynamic.

Scholars in the field of sustainable consumption proposed a strong person-product relationship as an eco-design strategy to create product longevity. People are believed to experience more protective behaviors, such as product care and postponing replacement, toward objects to which they feel attached. A change in product attachment over time will have consequences for the occurrence of these protective behaviors. Accordingly, it is interesting to have an understanding of the dynamic character of product attachment.

In Chapter 2, we presented four possible determinants of product attachment to ordinary durables: self-expression, group affiliation, memories, and pleasure (Ball and Tasaki 1992; Csikszentmihalyi and Rochberg-Halton 1981; Kleine et al. 1995; Schifferstein and Pelgrim 2004). Over time, the experience of product attachment can change as a result of changes in these four determinants.

The dynamic character of product attachment can come about in two ways: 1) the degree to which a product brings about the determinants can change or 2) the importance of each determinant for the development of product attachment can change over time (i.e., the determinants' impact can vary).

Changes in the consumer-product relationship can influence the extent to which a product is used to define and maintain a person's self. A person's identity may evolve as a result of role transitions (e.g., graduating from school, changing jobs, or getting a divorce). Accordingly, the meaning associated with a product and its autobiographical function changes as well (Ball and Tasaki 1992; Young 1991). As a result, people psychologically outgrow products that symbolically reflect their 'old' identity and the degree of attachment to these products will decline. For example, after a promotion a person may feel that his/her car does not fit him/her anymore (a loss in the product's self-expressiveness) and, therefore, (s)he may decide to replace it by a more expensive one that conveys more status. In this case, the determinant self-expression remains important for this person, but this meaning is taken over by his/her new car. Accordingly, a new emotional bond is likely to develop with this car, whereas detachment occurs from the old one.

The product-related memories will not remain static either. The recurring interactions between the owner, the product, and other people can result in an accumulation of memories associated with the product. On the other hand, a person may also forget some product associations over time, resulting in a loss of memories. Determinants can also be added or lost due to changes in the target product (e.g., performance deficiencies, changes in appearance) or the situational context (e.g., fashion changes, technological improvements) (McCracken 1986; Roster 2001). For example, a product's malfunctioning or

the introduction of new products with extra features can reduce the pleasure gained from the currently owned product.

The importance of the determinants for the development of product attachment can change over time as well. In time, some determinants may gain impact, whereas others become less important. For example, if a product reminds the owner of someone special, the feelings of attachment toward the object may increase when this person deceases. Although the product still conveys the same memories, these memories have increased in importance. Likewise, a relationship break-up may decrease the impact of the determinant memories on the degree of product attachment.

We acknowledge that the two ways in which the dynamic character of product attachment can come about are not completely independent. As long as a determinant lacks any importance for a person, changes in the extent to which a product supports this determinant are irrelevant for the development of product attachment.

Based on these arguments, we present the following model for the development of product attachment over time:

$$(1) \quad \text{ATTACH}_{it} = b_0 + b_{1t} \text{SELF}_{it} + b_{2t} \text{GROUP}_{it} + b_{3t} \text{MEMORIES}_{it} + b_{4t} \text{PLEASURE}_{it} + e_{it}$$

ATTACH_{it} = subject i 's attachment to a product at time t

SELF_{it} = the degree to which a product is self-expressive for subject i at time t

GROUP_{it} = the degree to which a product symbolizes group affiliation for subject i at time t

MEMORIES_{it} = the degree to which a product elicits memories for subject i at time t

PLEASURE_{it} = the degree to which a product elicits pleasure for subject i at time t

b_{jt} = regression weights at time t

e_i = error terms

In this regression model, variations in the degree to which a product brings about the four determinants of product attachment over time are revealed by changes in the means of SELF_t , GROUP_t , MEMORIES_t , and PLEASURE_t . Variations in the impact of the determinants over time are revealed by changes in the regression weights b_{1t} to b_{4t} .

The Present Study

The aim of Study 3 is to investigate how the experience of attachment to ordinary consumer durables develops over time. We focus on ordinary consumer durables instead of special possessions. From a sustainability

perspective, these products are particularly interesting for designers, because they comprise the majority of the market and are often replaced before the technical lifetime has passed. Specifically, we test the assumption that variations in the experience of attachment to a product can come about in two ways (i.e., the determinants can be added or lost or the determinants' impact can change). We present a longitudinal study which comprises of two questionnaire waves separated by a five months interval.

4.2 Study 3: A Longitudinal Study of Product Attachment and its Determinants²

Method

Stimulus Product

The study investigates the development of attachment to a backpack that university freshmen received for free during their orientation week. This backpack was exclusively designed by a graduate student from the faculty of Industrial Design Engineering at the Delft University of Technology (DUT) in the Netherlands (see Figure 4.1).

Studying the development of attachment to this particular product makes it possible to control for several influencing factors. Different products, product categories, or situations may all induce different effects on the evolvement of product attachment. By choosing one product that is acquired at a specific occasion, we kept these variations to a minimum and were able to focus primarily on the effect of time. Second, by using an exclusively designed backpack, we could ascertain that the respondents did not have any previous interactions with the product. Consequently, the product could not have elicited any memories before the start of the research. Third, our approach enables us to study attachment to products from the outset. The first wave was conducted approximately two weeks after the students received the backpack. Fourth, the backpack was used in a natural setting for the study, which enhanced the study's external validity. Fifth, a backpack is an ordinary durable that can offer both functional and symbolic benefits. Accordingly, we assumed that all four determinants of product attachment are relevant for the backpack.

² With some alterations, Study 3 has previously been published as Mugge, Schifferstein, and Schoormans (2006a) in the Proceedings of the European Advances for Consumer Research Conference.



Figure 4.1 Exclusively designed backpack used as stimulus product

Questionnaires

The questionnaires explored the respondents' relationship with the backpack. Respondents reported the degree of usage and indicated whether or not they still owned the backpack. The following measures concerning the consumer-product relationship were obtained: the degree of product attachment (4 items; $\alpha_1 = .82$, $\alpha_2 = .77$), self-expression (5 items; $\alpha_1 = .76$, $\alpha_2 = .80$), group affiliation (3 items; $\alpha_1 = .75$, $\alpha_2 = .71$), memories (4 items; $\alpha_1 = .90$, $\alpha_2 = .95$), and pleasure (3 items; $\alpha_1 = .81$, $\alpha_2 = .78$). Several additional variables were included concerning the consequences of product attachment for consumer behavior (Ball and Tasaki 1992; Grayson and Shulman 2000; Schultz et al. 1989): disposal tendency (4 items; $\alpha_1 = .81$, $\alpha_2 = .74$), product care (4 items; $\alpha_1 = .88$, $\alpha_2 = .85$), expected life span (2 items; $\alpha_1 = .81$, $\alpha_2 = .86$), and irreplaceability (4 items; $\alpha_1 = .72$, $\alpha_2 = .76$). All variables were measured on seven-point Likert scales (1 = "strongly disagree", 7 = "strongly agree") and were randomly ordered. To measure product attachment and pleasure, the items of the adjusted scales derived from the confirmatory factor analysis in Study 1 (Section 3.3) were used. Most of the other items were obtained from past research in which the measures' internal consistency was established (Schifferstein and Pelgrim 2004) and some items were self-generated. The items are included in Appendix A2.

Sample and Procedure

In wave 1 (T1), the questionnaire was handed out to 754 university freshmen. These potential respondents were informed that they would take part in a lottery for five gift vouchers when completing the questionnaire. Initially, 35% of the students ($n = 261$) returned their questionnaire. Some respondents were

deleted from our sample, because they did not own the backpack anymore ($n = 22$) or because they did not complete the questionnaire ($n = 12$). This resulted in a sample of 227 respondents (62% males, 38% females, mean age = 18). Respondents were asked to supply their names and email addresses to be able to distribute the follow-up questionnaire by the Internet. Twelve respondents did not respond to these questions, and could not be contacted in the second wave. These respondents were classified as non-respondents at wave 2.

Wave 2 (T2) was conducted five months after the first questionnaire. To enhance participation, a small financial compensation was provided in the form of a gift voucher or a contribution to charity. A reminder was sent to students who had not responded after two weeks. One hundred and twenty-seven students returned their questionnaire at wave 2 (response rate = 59%). Six respondents were deleted, because they did not own their backpack anymore at wave 2. Consequently, we obtained a usable sample of 121 respondents (65% males, 35% females, mean age = 18) for T2.

Results

To gain sufficient statistical power for the analyses, we used mean substitution as an imputation method for handling the missing values (0.4% of the data points were missing).

Non-Response and Non-Usage Bias

Respondents and non-respondents at T2 were compared with respect to their scores on T1. No differences were found for the demographic variables, product attachment, and the four determinants ($p > .05$). However, independent-samples t-tests revealed significant effects for the control variables disposal tendency ($t(219) = 2.78, p < .01$), product care ($t(219) = -2.61, p < .05$), and expected life span ($t(219) = -2.11, p < .05$). In general, the non-respondents at T2 experienced less protective behaviors toward the backpack at T1. This non-response bias may affect our results. Therefore, we decided to consider the non-respondents at T2 as a separate group during all analyses of T1.

Forty-eight percent of the respondents indicated in the questionnaire at T2 that they had not used their backpack anymore after the orientation week. This may affect our results, because attachment develops as a result of recurring interactions (Baldwin et al. 1996; Kleine and Baker 2004; Thomson et al. 2005). Therefore, we subdivided the group of respondents into users ($n = 63$) and non-users ($n = 58$). The group of users had kept on using the backpack after the orientation week, whereas the group of non-users had not used it anymore. Figure 4.2 presents a summary of the different groups of respondents distinguished in this study.

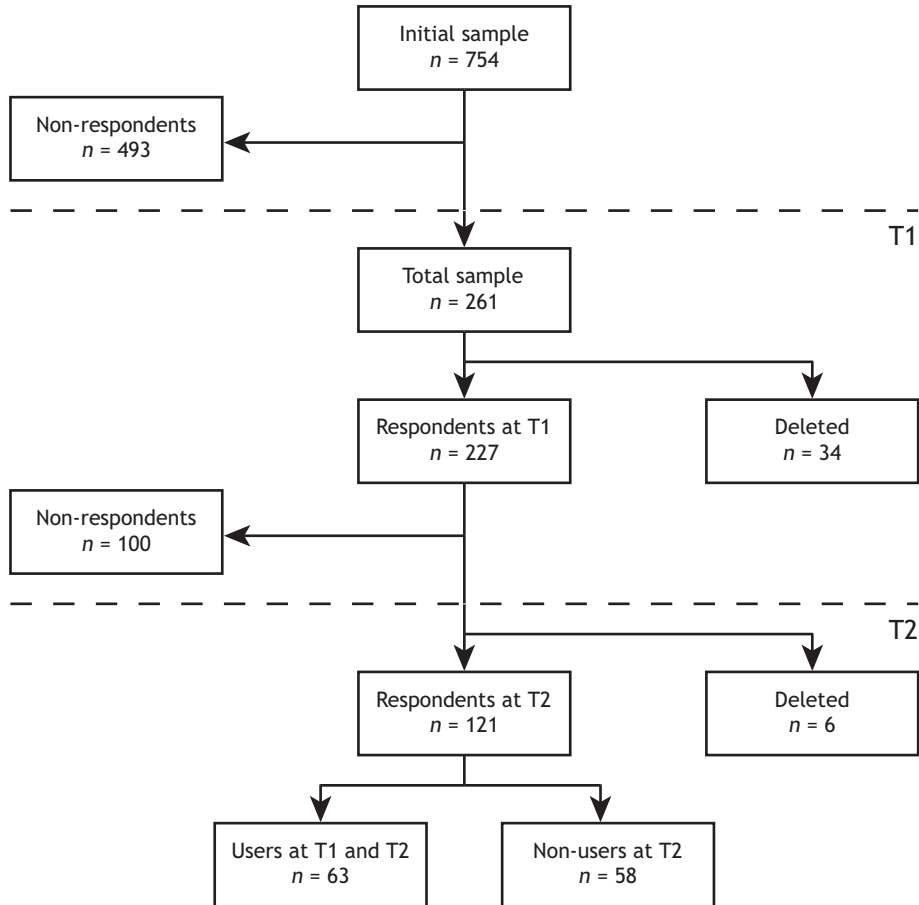


Figure 4.2 Respondent groups

Changes over Time

For the respondents at T2, we investigated whether the degree of product attachment and its determinants changed over time by five 2×2 repeated measures analyses of variance (ANOVAs). Product attachment and its four determinants were used as the dependent variables. Time (T1 vs. T2) served as repeated measure and Usage (users vs. non-users) as between-subjects variable. Means are provided in Table 4.1 (p. 68). The results showed significant main effects of Time on product attachment ($F(1, 119) = 4.51, p < .05$) and on memories ($F(1, 119) = 8.55, p < .01$). At T2, respondents indicated to be attached stronger to the backpack and to associate more memories with the backpack than at T1 (see Table 4.1).

	Non-Resp. (<i>n</i> = 100)		Respondents (<i>n</i> = 121)							
			Users (<i>n</i> = 63)				Non-users (<i>n</i> = 58)			
	T1		T1		T2		T1		T2	
	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>	Mean	<i>SD</i>
Product attachment	2.28	1.24	2.89	1.31	2.98	1.31	2.20	1.18	2.53	.94
Determinants										
Self-expression	2.27	1.17	2.64	1.17	2.76	1.16	2.05	.91	2.22	1.01
Group affiliation	3.97	1.48	4.26	1.49	4.25	1.26	3.73	1.49	3.91	1.45
Memories	2.77	1.58	3.41	1.91	3.61	1.90	2.76	1.78	3.56	1.81
Pleasure	2.53	1.33	3.16	1.12	3.14	1.14	2.24	.97	2.27	.90
Consequences										
Disposal tendency	3.65	1.48	2.65	1.25	2.80	1.16	3.61	1.41	3.31	1.11
Product care	3.68	1.49	4.56	1.48	4.26	1.51	3.82	1.33	3.91	1.10
Expected life span	3.41	1.56	4.55	1.27	4.20	1.40	3.08	1.24	2.92	1.37
Irreplaceability	2.43	1.29	2.81	1.28	3.02	1.31	2.58	1.39	2.59	1.17

Table 4.1 Means and standard deviations (*SD*) of the variables for the different respondent groups and for the different points in time

The ANOVA results also indicated a main effect of Usage on product attachment ($F(1, 119) = 8.75, p < .01$), self-expression ($F(1, 119) = 11.02, p < .01$), and pleasure ($F(1, 119) = 29.40, p < .001$). The respondents who still used the backpack after the orientation week were more attached to this backpack, perceived the backpack more as a means to express their individuality, and enjoyed it more than the non-users. No significant interaction effects were found ($p > .05$).

Impact of Determinants over Time

Regression analyses were performed for the groups of users and non-users at T1 and T2, and for the non-respondents at T1. In each regression analysis (Equation 1, p. 63), product attachment was used as the dependent variable and the determinants self-expression, group affiliation, memories, and pleasure as the independent variables (see Table 4.2). It is plausible that the determinants of product attachment are not totally independent. For example, the product-related memories may also encompass some group affiliation characteristics. To determine whether this potential dependency affected our results, we

	Non-Resp. (<i>n</i> = 100)	Respondents (<i>n</i> = 121)			
		Users (<i>n</i> = 63)		Non-users (<i>n</i> = 58)	
	T1	T1	T2	T1	T2
Self-expression	.26**	.29*	.48**	.35*	.21
Group affiliation	-.07	.02	-.13	-.10	-.08
Memories	.32***	.30***	.24**	.41***	.06
Pleasure	.31**	.32**	.22	.13	.62***
Adjusted <i>R</i> ²	.61	.65	.51	.50	.51

Table 4.2 Regression analyses for the determinants' effects on product attachment (*b* weights). Note: ****p* < .001, ***p* < .01, **p* < .05

checked for multicollinearity. Low Variance Inflation Factor scores ($VIF_{\max} = 2.25$) indicated that multicollinearity is not an issue for our data (Hair et al. 1998).

On the whole, we found significant effects for self-expression, memories, and pleasure, whereas group affiliation had no significant effect on product attachment (see Table 4.2).

To test whether the different respondent groups (users, non-users, and non-respondents) differed with respect to the results from the regression analyses at T1, we performed t-tests on the *b*-coefficients. No significant effects were found between the users, the non-users, and the non-respondents at T1 ($p > .05$). Although the effect of pleasure on product attachment is not significant for the non-users at T1, it does not differ significantly from that of the users or the non-respondents.

For T2, the t-tests revealed some interesting differences between the users and non-users for the variables memories ($t(116) = 2.06, p < .05$) and pleasure ($t(116) = -2.17, p < .05$). For the backpack users, the coefficient of memories was significantly higher than for the non-users ($b_{\text{users T2}} = .24, SE = .07$ vs. $b_{\text{non-users T2}} = .06, SE = .05$), whereas the coefficient of pleasure was significantly lower ($b_{\text{users T2}} = .22, SE = .14$ vs. $b_{\text{non-users T2}} = .62, SE = .12$). No effects were found for the determinants self-expression and group affiliation ($p > .05$).

Next, we compared the regression coefficients over time for each separate usage-group. For the group of users, the regression coefficients were comparable at both time periods (see Table 4.2). The effects of self-expression and memories were significant for both time periods, whereas the effect of group affiliation was not. Although the determinant pleasure only had a significant effect for T1, the regression coefficient was similar at T2 ($b_{\text{users T1}} = .32, SE = .11$ vs. $b_{\text{users T2}} = .22, SE = .14$).

For the group of non-users, however, shifts in the regression coefficients over time did occur. Whereas the effect of memories was significant at T1, the coefficient decreased to non-significance at T2 ($b_{\text{non-users T1}} = .41, SE = .07$ vs. $b_{\text{non-users T2}} = .06, SE = .05$). Furthermore, the coefficient of pleasure increased over time ($b_{\text{non-users T1}} = .13, SE = .14$ vs. $b_{\text{non-users T2}} = .62, SE = .12$). The determinants self-expression and group affiliation revealed similar results at both time periods.

Consequences of Product Attachment

To determine the value of striving for strong attachments from a sustainability perspective, we empirically tested the relations between product attachment and its consequences for all respondent groups (see Table 4.3). The Pearson correlations were similar for the different respondent groups. Overall, we found that the degree of attachment students experienced toward the product was negatively correlated with the disposal tendency, and positively correlated with the expected lifespan of the product, with product care, and with irreplaceability (all p 's < .01). These outcomes suggest that students, who were more attached to their backpack, tended to resist disposing of it and expected to keep it for a longer period of time. Also, these students took better care of the backpack than others and considered the backpack to be more irreplaceable. Apparently, the experience of product attachment not only results in more protective behaviors for a person's most cherished products, but also for more ordinary ones, such as a backpack.

	Non-Resp. (<i>n</i> = 100)	Respondents (<i>n</i> = 121)			
		Users (<i>n</i> = 63)		Non-users (<i>n</i> = 58)	
		T1	T2	T1	T2
Disposal tendency	-.42	-.44	-.40	-.56	-.56
Expected life span	.49	.43	.51	.51	.56
Product care	.38	.49	.54	.37	.55
Irreplaceability	.76	.71	.69	.66	.48

Table 4.3 Correlations between product attachment and its consequences

Note: All correlations are significant ($p < .01$)

4.3 General Discussion

This study investigated the experience of attachment to ordinary durables using a longitudinal approach. This enabled us to investigate the dynamic character of the experience of an emotional bond with a product. We found that product attachment was positively affected by the determinants self-expression, memories, and pleasure. These results support other work on product attachment in which these determinants of attachment were proposed (e.g., Ball and Tasaki 1992; Kleine et al. 1995). In addition, we extend and corroborate the study of Schifferstein, Mugge, and Hekkert (2004), who found significant effects of the determinants memories and pleasure on the degree of product attachment. The determinant group affiliation proved to be non-significant in our study. As the backpack was only given to freshmen of this university, we anticipated that the backpack symbolized the belonging to the group of students at our university. However, the exclusively designed backpack may not only convey that the student belonged to other students from the Delft University of Technology, but also that the owner is a university freshman. It is possible that these group affiliation associations may induce feelings of embarrassment, rather than a positive, special meaning. Another possible explanation is that the respondents were students for only a short time span, due to which there was not enough time to develop these associations. As a consequence, this new social identity may not have gained enough importance yet (Callero 1985). Probably, product attachment may only develop as a result of the determinant group affiliation, if the group or social identity has sufficient importance to the owner.

This research provides quantitative support for the assumption that the degree of product attachment changes over time (Ball and Tasaki 1992; Kleine and Baker 2004). Specifically, we found that the dynamic character of product attachment can come about in two ways. First, the determinants can be added or lost. Table 4.1 (p. 68) shows that the determinant memories grows over time, probably because respondents developed a personal history with the backpack. Because product-related memories are positively related to the degree of product attachment (see Table 4.2, p. 69), the attachment will also increase in time (see Table 4.1). These results are in line with Baldwin et al. (1996), who stated that attachment changes over time as a result of recurring interactions with an object.

Second, the impact of the determinants on product attachment can change over time. For the group of users, the impact of the determinants remained stable. For the non-users, however, the impact of memories decreased over time, whereas the impact of pleasure increased (see Table 4.2). This suggests that product usage is essential to remain attached to ordinary durables

through memories. For the group of non-users, pleasure-ratings were relatively low at both points in time (97% of the data points were below the scale's midpoint). We believe that during the first encounters with the backpack in the orientation week, these students became irritated by the bad performance of the backpack and, therefore, discontinued its usage. Although the number of memories increased, the absence of product usage reduced the importance of the product-related memories for the development of product attachment. Probably, interacting with the product is essential to constantly arouse the product-related memories and to keep its impact on product attachment intact.

If people stop using an ordinary product, the importance of these memories for experiencing product attachment diminishes, whereas the lack of pleasure gains impact. These results corroborate McCracken (1986), who argued that individuals employ divestment rituals to empty goods of their special meaning, so that meaning-loss will not take place at the moment when the product is disposed of. Due to these divestment rituals (e.g., cleaning, continued storage without use), the product is distanced from the owner and emptied of its special meaning. Usage seems essential to prolong the impact of a product's special meaning on product attachment and thus for sustaining the consumer-product relationship over time. Stopping the usage of a product can be considered as breaking off this relationship and thus as a forerunner of the actual disposal of the product (Roster 2001).

Whether product usage is also essential for special possessions with a deep, symbolic meaning, such as heirlooms is questionable. As discussed, the meaning of such possessions and the experience of attachment to them is relatively static over time (Kleine and Baker 2004) and, therefore, we believe that usage will play only a minor role. However, heirlooms are a very distinctive category of products, for which other principles may hold than for ordinary possessions. Probably, usage is particularly relevant for experiencing attachment to relatively ordinary products.

Limitations and Future Research

A limitation of the current study is that only two questionnaire waves were obtained. To gain a full understanding of the process of product attachment, it is necessary to investigate consumers over the total life span of the product, from purchase to disposal. Due to the high attrition rate, however, the number of respondents decreased considerably after two waves. This made it unfeasible to perform a third wave.

Another limitation of our research is that we investigate only one specific product (i.e., a specially designed backpack) and sample (i.e., university freshmen). This limits the generalizability of our findings. However, we

succeeded in showing that product attachment changes over time. Future research should substantiate the current findings with other samples and product categories.

The stimulus product can be considered a limitation of the study as well. We had selected this particular backpack based on strong arguments (see Section 4.2). Unfortunately, the backpack's utility performed noticeably below our expectations due to which it was not used by all respondents.

Implications

The results of Study 3 suggest that designers interested in stimulating product attachment should first of all strive for continued product usage. If a person stops using his/her product, it will gradually lose its special meaning. Consequently, the attachment to the product becomes weaker in time. From a sustainability perspective, stimulating the degree of product attachment is only valuable if the experienced emotional bond with a product is long-lived. Then, the replacement is postponed and the product lifetime extended.

A possible reason for people to stop using a product is that the product does not perform according to the owner's expectations anymore. In other words, the owner is dissatisfied with the performance of the product. In Chapter 3, we concluded that satisfaction with a product had no direct effect on the experience of product attachment (in addition to the indirect effect via the elicited pleasure). Nevertheless, the results of Study 3 suggest that satisfaction can be considered a necessary prerequisite for creating a *long-lasting* emotional bond with an ordinary durable. If the owner is dissatisfied, (s)he may stop using the product, due to which the product loses its special meaning. We believe that experiencing satisfaction is only a requirement for ordinary durables. Highly cherished possessions, such as family heirlooms, are generally not owned for their functional benefits (Curasi et al. 2004). Probably, dissatisfaction will not affect the attachment to these products.

5 Product Attachment and Personality Congruity

The use of products is one way by which an individual can symbolically define and express his/her self (Belk 1988; Levy 1959; Solomon 1983). Products serve as symbols of who people are, who they have been, and who they are attempting to become. As discussed in Chapter 2, people develop strong attachment to products that express who they are as an individual (Ball and Tasaki 1992; Belk 1988; Kleine, Kleine, and Allen 1995; Schultz, Kleine, and Kernan 1989; Wallendorf and Arnould 1988). If a product expresses a person's unique identity and helps to differentiate him/her from others, it conveys the symbolic meaning of self-expression. But how can designers create products that convey the symbolic meaning of self-expression?

Chapter 5 addresses the determinant self-expression by investigating the effect of congruity between the personality of the person and the personality of the product on the experience of attachment to this product. We focus on personality congruity, because product personality is believed to be a meaningful tool for designers of consumer durables to communicate symbolic meaning (Govers 2004; Janlert and Stolterman 1997; Jordan 2002). The product's shape, material, texture, and color affect the personality that consumers recognize in a product. In the design process, designers make choices regarding these product aspects (Bloch 1995; Muller 2001). By making these decisions, designers can create a product with a certain personality. Past research concluded that designers are able to translate personality characteristics into the product appearance in a way consumers understand (Govers, Hekkert, and Schoormans 2002).

5.1 Personality Congruity

People have a need to behave consistently with the view of one's self (Rosenberg 1979). Based on this self-consistency motive, scholars concluded that consumers prefer products that are congruent to their self-concept (Birdwell 1968; Dolich 1969; Landon 1974; Malhotra 1988; Sirgy 1982, 1985). People make a comparison between their self-concept and the product's image and prefer products with a congruent image, because these products validate and reinforce their self-concept. Possessing congruent products is also valuable to express one's self-concept to others, because it is common to make personality inferences about a person from the possessions they own (Burroughs 1991; Gosling et al. 2002).

Based on the theory of self-congruity, Aaker (1997) proposed the concept of brand personality. She found confirming evidence for a congruity effect based on personality (Aaker 1999): Consumers evaluate brands with a matching personality more positively than incongruent brands. In line with the concept of brand personality, the concept of product personality was introduced (Govers and Schoormans 2005; Jordan 1997). Product personality differs from brand personality, in that it refers to a specific product variant (e.g., Volkswagen Beetle or Nokia 6310), and not to a brand (e.g., Volkswagen or Nokia). Govers (2004) has defined product personality as "the profile of personality characteristics that people use to describe a specific product variant and to discriminate it from others" (p. 15). For example, a Volkswagen Beetle has a happy and friendly personality (see Figure 5.1). Furthermore, research found supporting evidence for a product-personality congruity effect (Govers and Schoormans 2005). People prefer products with a congruent personality, because these products enable them to communicate their individuality. In Chapter 2, we discussed that the determinant self-expression stems from people's need to differentiate oneself from others and to express one's personal identity. Consequently, a product with a congruent personality can convey the symbolic meaning of self-expression. Because self-expression is a determinant of product attachment, we believe that personality congruity can positively affect the experience of product attachment. Accordingly, we hypothesize:

- H1:** People experience stronger attachment to products with a personality that is congruent to their own personality, than to products with a personality that is incongruent.

The Present Studies

In this chapter, two studies are reported. Study 4 investigates the effect of personality congruity on product attachment for the personality trait conscientiousness using the product category toasters. Study 5 replicates these findings for a different personality trait (extraversion) and product category (watches), while controlling for several limitations of Study 4. In addition, Study 5 investigates whether personality congruity can also result in long-term product attachment.

Similar to Studies 1 and 2 (see Chapter 3), we used a scenario-approach to manipulate personality congruity. Each scenario included a color picture of a product and a written description, in which the personality of a hypothetical person was portrayed. To create conditions of high and low personality congruity, the personality of the product was either congruent or incongruent to the personality of the person. The stimulus personalities were based on the dimensions from the five-factor model of human personality; these are agreeableness, extraversion, conscientiousness, neuroticism, and openness to experience (Costa and McCrae 1992; Digman 1990; McCrae and John 1992). For the success of the manipulation of our studies, it was essential that subjects recognized both the personality of the person and the personality of the product. Accordingly, we selected the personality dimensions conscientiousness (Study 4) and extraversion (Study 5), because in person perception these dimensions were recognized best by observers (Kenny et al. 1992; Kenny et al. 1994).



Figure 5.1 Product personality: a happy and friendly Volkswagen Beetle

5.2 Study 4: The Effect of Personality Congruity on Product Attachment³

Method

Pretest 1: Manipulation of Person's Personality

An impression of a conscientious person was created using a written description. This description portrayed a 27-year-old woman named Susan, and described her as conscientious by unfolding her character traits (see Appendix D). The descriptions were based on the items from several well-established human personality tests (FFPI, Hendriks, Hofstee, and De Raad 1995; Hendriks, Hofstee, and De Raad 1999; NEO-PI-R, Hoekstra, Ormel, and De Fruyt 1996). Nineteen subjects (74% males, 26% females; mean age = 22) rated the person described on five items that are typical for the personality trait conscientiousness ("not precise"/"very precise", "not neat"/"very neat", "not consistent"/"very consistent", "not serious"/"very serious", and "not trustworthy"/"very trustworthy", $\alpha = .92$). All items were measured using five-point scales. The results showed that the person's personality was perceived as intended. The mean score on the conscientiousness trait was 4.46, which was significantly higher than the neutral midpoint of the scale ($t(18) = 16.64, p < .001$).

Pretest 2: Manipulation of Product's Personality

To select the products, we tested a set of five color pictures of toasters encompassing a variety of appearances. The toasters did not differ in functionality and were similar in price. Ninety-two subjects (58% males, 42% females; mean age = 22) each rated one toaster on the five conscientiousness items used in the first pretest ($\alpha = .75$). We selected only subjects that had not yet participated in the first pretest. The toasters and their mean scores on the conscientiousness trait are presented in Table 5.1. The toasters with the highest (toaster 4) and lowest mean (toaster 2) on the conscientiousness trait were selected as stimuli. A one-way analysis of variance (ANOVA) using a Bonferroni's test as a post hoc analysis showed that toaster 4 had a significantly higher score on the conscientiousness items than toaster 2 ($M_{\text{congr}} = 4.16$ vs. $M_{\text{incongr}} = 3.08; p < .001$).

Subjects and Design

For the main study, 90 subjects were selected from the Product Evaluation Laboratory (PEL) consumer household panel maintained by the Faculty of

³ With some alterations, Study 4 has previously been published as Mugge and Govers (2004) in the Proceedings of the Design and Emotion Conference 2004.






	Toaster 1	Toaster 2	Toaster 3	Toaster 4	Toaster 5
					
Mean	3.42	3.08	3.37	4.16	3.71
SD	.72	.52	.50	.60	.52
n	17	18	18	19	19

Table 5.1 Means and standard deviations (*SD*) of the toasters on the conscientiousness trait

Industrial Design Engineering. The consumer panel consists of a random sample of the population of Delft and the surrounding area (Tan 2002). Seventy-three subjects (45% males and 55% females) returned their questionnaire, a response rate of 81%. The ages of the subjects ranged from 23 to 70 years, with an average age of 50. Subjects were rewarded with a financial compensation. Two conditions were created, one resulting in high congruity between the personality of the person and that of the product and one resulting in low congruity. Each subject was assigned randomly to one of these conditions, resulting in a total of 36 subjects in one condition and 37 subjects in the other condition.

Procedure and Measures

Subjects were sent a scenario and a questionnaire. The scenario consisted of a written description of the person’s personality and a color photo-quality picture of a toaster. The toaster was presented as owned by the person. Subjects were instructed to read the description of the person carefully, to form an impression of the person described, and to take a look at the picture of the toaster. In the questionnaire, subjects were asked to predict to what degree Susan is attached to her toaster. Product attachment was measured with the four items ($\alpha = .86$) that resulted from the confirmatory factor analysis in Study 1. To minimize demand characteristics, seventeen filler questions were included in the questionnaire. All items were measured using five-point Likert scales (1 = “disagree”, 5 = “agree”).

Results

Manipulation Check

To check whether the two conditions resulted in respectively high and low personality congruity, we conducted a manipulation check. To minimize demand characteristics, this manipulation check was not included in the

main study, but performed separately. For this additional study, we used a convenience sample of 23 subjects (65% males, 35% females; mean age = 23). Subjects that had participated in any of the other pretests were excluded. The written description of the person's personality and the color pictures of the two toasters were presented to each subject. Personality congruity was measured with four items using five-point scales (Govers and Schoormans 2005): "This product is (not) like Susan", "Susan identifies (does not identify) herself with this product", "This product matches (does not match) Susan", and "This product is (dis-) similar to Susan's personality" ($\alpha = .80$). A paired-samples t-test showed that the manipulation was successful: The condition with Susan and the toaster having a congruent personality indeed resulted in the experience of high personality congruity, whereas the condition with Susan and the toaster having incongruent personalities resulted in low personality congruity ($M_{\text{congr}} = 4.01$ vs. $M_{\text{incongr}} = 2.01$; $t(22) = -7.43$, $p < .001$).

Effect of Personality Congruity on Product Attachment

It was expected that high personality congruity would result in a higher degree of product attachment than low personality congruity. To test this hypothesis, an independent-samples t-test was performed on the data of the main study with product attachment as the dependent variable. The results revealed a significant difference between the two conditions ($t(70) = -2.95$, $p < .01$). Subjects in the condition with the person and the toaster having a congruent personality predicted a higher degree of product attachment compared to those in the low personality congruity condition ($M_{\text{congr}} = 2.95$ vs. $M_{\text{incongr}} = 2.25$). These results confirm hypothesis 1.

Discussion

Our findings reveal that people become more attached to products with a personality that is similar, than to products with a personality that is dissimilar to their own personality. These findings correspond and extend the literature on self-congruity (Belk 1988; Malhotra 1988; Sirgy 1982). Products with personality associations similar to the personality of the owner allow him/her to express who (s)he is. As a result, this product gains a special and symbolic meaning to the owner and an emotional bond may develop. Product personality thus appears to be a valuable concept for designers interested in stimulating the experience of product attachment.

A limitation of Study 4 is that its design does not control for differences in subjects' attitudes toward the two products. The product with a congruent personality resulted in a higher degree of attachment than the incongruent product. However, the possibility that these findings are the result of differences in the subjects' attitude toward the two toasters cannot be excluded. To

overcome this limitation, both ends of a single personality dimension (e.g., extravert vs. introvert) should be investigated. In the latter case, each product can be used in both a congruent and an incongruent personality condition. Another limitation of Study 4 is that the results are merely based on the product category toasters and on the conscientiousness dimension of the five-factor model of human personality (Costa and McCrae 1992; Digman 1990; McCrae and John 1992). In order to validate and generalize our findings, it is interesting to test the hypothesis on another product category and personality trait as well. In Study 5, we try to resolve these shortcomings of Study 4. Furthermore, Study 5 provides insight in the relationship between product attachment and product lifetime. Human personality shows only minor changes over time (Costa and McCrae 1992). Similarly, product personality is believed to be a stable construct (Govers 2004). This suggests that products with a congruent personality maintain the symbolic meaning of self-expression over time, because they continue to express the owner's individuality. Accordingly, it is expected that the development of attachment to a product that has a congruent personality will endure over time and, therefore, result in product lifetime extension. In Study 5, we test this hypothesis and discuss the role of fashion as a moderator for the relationship between product attachment and product lifetime.

5.3 Study 5: The Effect of Personality Congruity on Experiencing Long-Term Product Attachment⁴

People become attached to products, because they convey a special and symbolic meaning to them (Csikszentmihalyi and Rochberg-Halton 1981; Kleine et al. 1995; Richins 1994). If a person feels attached to a product, detaching from and ultimately abandoning the old product seems undesirable, because this implies that the product's special meaning is lost. As a result, a stronger person-product relationship is reflected in more protective behaviors and can ultimately postpone product replacement (Ball and Tasaki 1992; Belk 1988; Mugge, Schoormans, and Schifferstein 2005; Schultz et al. 1989). Schultz et al. (1989) stated that our most cherished possessions are "things which we would loath to give up, things which would be difficult to replace - in short, things to

⁴ With some alterations, Study 5 has previously been published as Mugge, Schifferstein, and Schoormans (2006b) in the Proceedings of the European Advances for Consumer Research Conference.

which we have become strongly attached” (p. 359). This implies that product attachment and product lifetime are connected.

Based on these arguments, we believe that the product lifetime is a direct consequence of the experience of attachment to a product. Determinants of product attachment will thus also affect product lifetime indirectly. Product attachment can thus be considered as a mediator for the effect of its determinants on product lifetime (see Figure 5.2). Study 4 showed that personality congruity can positively affect product attachment, because congruent products can serve the symbolic meaning of self-expression. Accordingly, we hypothesize:

- H2:** People will keep products with a personality that is congruent to their own personality for a longer period of time than products with a personality that is incongruent.
- H3:** Product attachment mediates the effect of personality congruity on product lifetime.



Figure 5.2 Relationships between personality congruity, product attachment, and product lifetime

Method

Pretest 1: Manipulation of Person's Personality

Similar to Study 4, impressions of an extravert and an introvert person were created using written descriptions. Both descriptions portrayed a 27-year-old woman, named Susan, and depicted her as either extravert or introvert by unfolding her character traits (see Appendix E). Twenty-eight subjects (57% males, 43% females; mean age = 19) rated one of the persons portrayed on five items that are typical for the personality trait extraversion (“not conspicuous”/“very conspicuous”, “not exuberant”/“very exuberant”, “not sociable”/“very sociable”, “not defiant”/“very defiant”, and “not cheerful”/“very cheerful”, $\alpha = .88$). All items were measured using five-point scales. One-sample t-tests showed that the mean score of the extravert person was significantly higher than the scale's neutral midpoint ($M_E = 4.08$; $t(14) = 9.38$, $p < .001$), whereas the mean score of the introvert person was significantly lower ($M_I = 2.08$; $t(12) = -7.04$, $p < .001$). Furthermore, the results showed that the extravert person

was perceived as significantly more extravert than the introvert one ($t(12) = -11.53, p < .001$).

Pretest 2: Manipulation of Product's Personality

A second pretest was conducted to select an extravert and an introvert product. A set of eight color pictures of women's watches encompassing a variety of appearances was rated by 20 subjects (55% males, 45% females; mean age = 21) on the five extraversion items used in the first pretest ($\alpha = .90$). Subjects that had participated in the first pretest were excluded. The watches did not differ in functionality and were similar in price. The watches with the highest and lowest mean on the extraversion trait (watch 6 and watch 7) were selected as stimuli (see Table 5.2). The mean score of the extravert product (watch 6) was significantly higher than the neutral midpoint of the scale









	Watch 1	Watch 2	Watch 3	Watch 4
				
Mean	3.81	2.21	1.93	3.63
SD	.59	.67	.61	.66
	Watch 5	Watch 6	Watch 7	Watch 8
				
Mean	2.54	3.99	1.68	3.75
SD	.72	.69	.54	.74

Table 5.2 Means and standard deviations of the watches on the extraversion trait ($n = 20$)

($M_E = 3.99$; $t(19) = 6.38$, $p < .001$), whereas the mean score of the introvert product (watch 7) was significantly lower ($M_I = 1.68$; $t(19) = -10.29$, $p < .001$). Furthermore, a one-way ANOVA using a Bonferroni's test as a post hoc analysis showed that watch 6 had a significantly higher score on the extraversion items than watch 7 ($p < .001$).

Subjects and Design

For the main study, 160 subjects were selected from the PEL consumer household panel. Hundred-fifteen subjects (51% males and 49% females) returned their questionnaire in time, a response rate of 72%. Ages ranged from 26 to 73 years, with an average age of 50. Subjects were compensated financially.

The main study had a 2 (personality of the person: extravert vs. introvert) \times 2 (product personality: extravert vs. introvert) between-subjects full factorial design. Four experimental conditions were generated, two resulting in high congruity between the personality of the person and that of the product and two resulting in low congruity. Each subject was assigned randomly to one of the four conditions, resulting in a total of 23 to 32 subjects in each condition.

Procedure

Similar to Study 4, subjects received a scenario, including a written description of a person, a color photo-quality picture of a watch, and a questionnaire by mail. In the questionnaire, measures for the dependent variables and several covariates were obtained on seven-point Likert scales (1 = "strongly disagree", 7 = "strongly agree"), unless indicated otherwise (see Appendix A4). To minimize demand characteristics, nineteen filler questions were included in the questionnaire.

Dependent Variables

Product attachment was measured using the four items ($\alpha = .88$) that were selected in Study 1. To measure the expected product lifetime, we informed subjects that, on average, young women replace their watch after 3 years. Subjects were asked to indicate on an ordinal scale how long they expected Susan to keep her watch ("shorter than 3 years", "about 3 years", or "longer than 3 years").

Covariates

Four covariates were included in the questionnaire to control for possible side effects of the scenarios. First, subjects' attitude toward Susan was measured using three items on scales anchored with "negative"/"positive", "unfavorable"/ "favorable", and "dislike"/"like" ($\alpha = .89$). Second, subjects'

attitude toward the watch was measured using the same three items ($\alpha = .93$). Third, the degree to which subjects identified themselves with Susan was measured with three self-generated items (“I identify myself with Susan”, “Susan’s personality is similar to my own personality”, and “I am like Susan”, $\alpha = .93$).

A potential pitfall of the use of scenarios is that the scenario may not be considered credible by the subjects. If the scenario differs too much from the experiences of the subject, problems of validity may occur (Finch 1987; Hughes and Huby 2002). Therefore, the fourth covariate measured the scenario’s credibility with six items (“I find the story of Susan credible”, “The story of Susan seems artificial” (reversed item), “I think the story of Susan is plausible”, “I could empathize with the story of Susan well”, “I found it hard to imagine Susan’s situation” (reversed item), and “I could project myself in Susan’s situation well”, $\alpha = .83$).

Results

Manipulation Check

The manipulation check for personality congruity was not included in the main study to minimize demand characteristics, but performed separately. For this additional study, a convenience sample of 28 subjects (36% males, 64% females; mean age = 19) was used. Subjects that had participated in one of the pretests were excluded. This extra study had a 2 (personality of the person: extravert vs. introvert) \times 2 (product personality: extravert vs. introvert) factorial design. Personality of the person served as a between-subjects factor and product

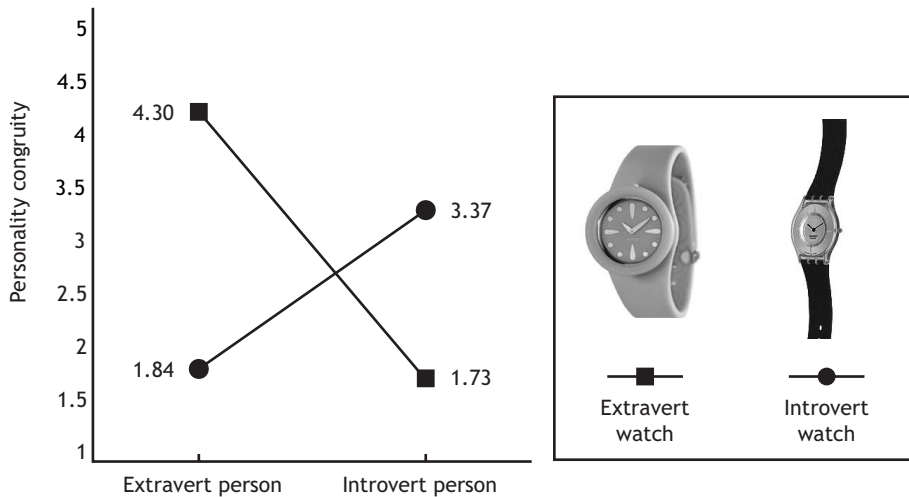


Figure 5.3 Manipulation check

personality as a within-subjects factor. One written description of the person's personality and color pictures of the two watches were presented to each subject. Personality congruity ($\alpha = .93$) was measured using the four items from Study 4 (Govers and Schoormans 2005). The results showed a strong and significant interaction effect between personality of the person and product personality ($F(1, 26) = 86.18, p < .001, \eta^2 = .77$). As shown in Figure 5.3 (p. 85), the two conditions with Susan and the watch having a congruent personality indeed resulted in the experience of high personality congruity ($M_{EE} = 4.30$ and $M_{II} = 3.37$), whereas the conditions with Susan and the watch having incongruent personalities resulted in low personality congruity ($M_{EI} = 1.84$ and $M_{IE} = 1.73$).

Credibility of Scenarios

The results of the main study revealed that the scenarios were judged as highly credible ($M = 5.44, SD = 1.02$). Ninety percent of the subjects had a mean score on the credibility measure that was equal or higher than the midpoint of the scale. No differences were found between the four conditions ($p > .20$).

Effect of Personality Congruity on Product Attachment

To control for effects of subjects' attitude toward Susan, subjects' attitude toward the watch, recognition in Susan's personality, and credibility of the scenario, these variables were used as covariates in an analysis of covariance (ANCOVA). None of the covariates proved to be significant and were, therefore, excluded from the final analysis ($p > .20$).

To investigate whether high personality congruity resulted in a higher degree of product attachment than low personality congruity, a 2×2 ANOVA was conducted on the data of the main study with product attachment as the dependent variable and the personalities of the person and the product as the independent variables. The results revealed a significant interaction effect between personality of the person and product personality ($F(1, 109) = 17.28, p < .001, \eta^2 = .14$). No main effects were found ($p > .05$). Subjects who read about the extravert person and were presented with the extravert watch predicted a higher degree of product attachment as compared to those presented with the introvert watch ($M_{EE} = 3.54$ vs. $M_{EI} = 2.73, t(50) = -2.09, p < .05$). Similarly, subjects who read about the introvert person and were presented with the introvert watch predicted a higher degree of product attachment as compared to those presented with the extravert watch ($M_{II} = 4.36$ vs. $M_{IE} = 2.93, t(59) = 3.86, p < .001$) (see Figure 5.4). This provides further support for hypothesis 1.

Effect of Personality Congruity on Product Lifetime

Product lifetime differed significantly between the four conditions (Kruskal-Wallis test: $\chi^2 = 52.92$, $df = 3$, $p < .001$). Although product lifetime was measured on an ordinal scale, we proceeded by analyzing these data by a 2×2 ANCOVA (Gaito 1980; Labovitz 1970), because this enabled us to investigate the role of product attachment in mediating the effect of product congruity on product lifetime. Product lifetime was recoded as follows (1 = “shorter than 3 years”, 2 = “about 3 years”, and 3 = “longer than 3 years”). All covariates proved to be insignificant and were excluded from the analysis ($p > .05$). The results showed a significant interaction between personality of the person and product personality ($F(1, 109) = 19.99$, $p < .001$, $\eta^2 = .16$). Furthermore, significant main effects for personality of the person ($F(1, 109) = 56.69$, $p < .001$, $\eta^2 = .34$) and product personality ($F(1, 109) = 30.64$, $p < .001$, $\eta^2 = .22$) were found. Figure 5.4 illustrates that these results differ considerably from the product attachment results: Subjects who read about the extravert person and were presented with the extravert watch did not predict a longer product lifetime as compared to those presented with the introvert watch ($M_{EE} = 1.13$ vs. $M_{EI} = 1.26$, $t(51) = .95$, $p > .20$). More specifically, for the extravert personality the expected product lifetime was rated below average for the incongruent as well as for the congruent product. For subjects who read about the introvert person, the outcomes were in line with those found when product attachment was the dependent variable. When they were presented with the introvert

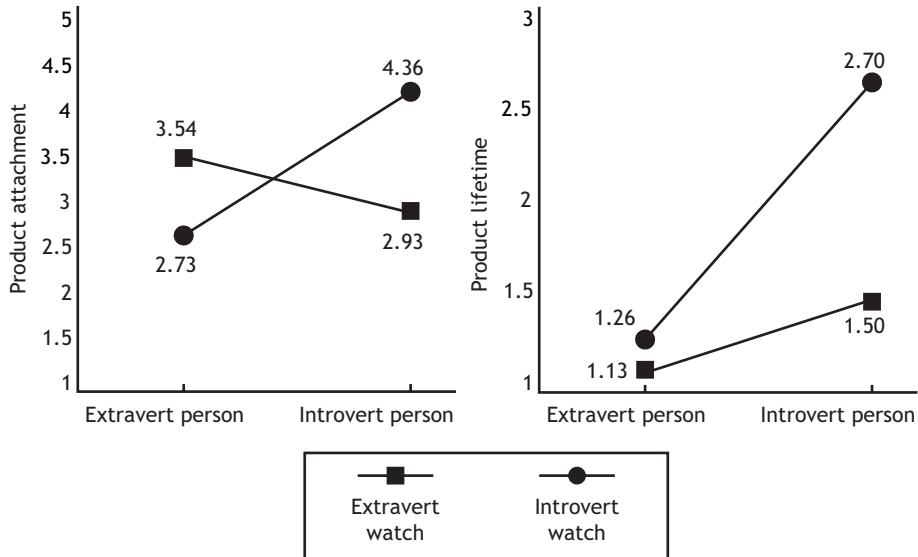


Figure 5.4 Effect of personality congruity on product attachment and product lifetime

watch, they predicted a longer product lifetime compared to those presented with the extravert watch ($M_{II} = 2.70$ vs. $M_{IE} = 1.50$, $t(58) = 6.28$, $p < .001$). Hypothesis 2 was thus only confirmed for the introvert personality.

Mediation Analysis

To test whether product attachment and product lifetime are positively related, the Spearman rank correlation between product attachment and product lifetime was computed (Spearman $\rho = .44$, $p < .01$). Higher degrees of product attachment go together with longer product lifetimes ($M_{<3yrs} = 2.91$, $M_{=3yrs} = 4.00$, $M_{>3yrs} = 4.36$).

To investigate the role of product attachment in mediating the effect of personality congruity on product lifetime, Baron and Kenny's (1986) framework for mediation was used. Hence, an ANCOVA was performed with product lifetime as the dependent variable and the mediator product attachment included as a covariate. Product attachment significantly affected product lifetime ($F(1, 106) = 10.94$, $p < .01$). The interaction effect between personality of the person and product personality reduced in effect size but remained significant, when product attachment was included as a covariate ($F(1, 106) = 8.72$, $p < .01$, $\eta^2 = .08$; $\Delta\eta^2 = 51\%$). These results support hypothesis 3: Product attachment serves as a partial mediator for the effect of personality congruity on product lifetime. Including product attachment as a covariate did not have a substantial impact on the main effects for personality of the person ($\Delta\eta^2 = 9\%$) and product personality ($\Delta\eta^2 = 5\%$).

Discussion

Study 5 shows that people become more attached to products that have a personality that is congruent to their own. This supports the findings of Study 4, while improving several shortcomings of this study. Moreover, Study 5 generalizes our findings for another personality trait and product category.

Self-congruent products are used to define and maintain a person's self. As a result, these products gain a special meaning to the owner and an emotional bond may develop. As replacing a self-congruent product implies the loss of this special meaning, we expected that personality congruity would positively affect product lifetime as well. However, our findings suggest that the development of an emotional bond does not necessarily result in a long-lasting relationship with the product. Although we found support for the role of product attachment in mediating the effect of personality congruity on product lifetime, personality congruity only resulted in a longer product lifetime for the introvert personality. For the extravert personality, the expected product lifetime was rated below average for the incongruent as well as for the congruent product. Thus, although personality congruity

resulted in the experience of product attachment for the extravert condition, subjects still expected that this product was discarded earlier than is common for the product category.

Role of Fashion as a Moderator

We believe that the observed differences may be related to fashion. Past research concluded that fashion changes can change a person's relationship with a product (Roster 2001) and encourage early product replacement (Bayus 1991; Bayus and Gupta 1992; DeBell and Dardis 1979; Van Nes 2003). Moreover, watches are considered fashion products. Based on a further analysis of the stimulus material, we propose that fashion may influence the effect of personality congruity.

According to McCracken (1986), the fashion system is an instrument used to transfer meaning to consumer goods. Consumers encode these meanings and use fashion to develop a personal identity (Thompson and Haytko 1997). A fashion is defined as "a style that is accepted and followed by the majority of a group at any particular time" (Jernigan and Easterling 1990, p. 7). Products follow different fashion styles that vary in their fashion cycle. Some fashion styles (short-lived fashion styles or fads) enjoy a sudden burst of popularity and disappear very quickly. Other fashion styles (long-lived fashion styles or classics) and the products in such a fashion style continue to be popular and remain to be in general acceptance over an extended period of time (Jernigan and Easterling 1990).

Consumers can become attached to products with a design following a short-lived fashion style, but most often only for a relatively short period of time. When the fashion cycle has reached the obsolescence phase, the product style goes 'out of fashion'. In general, people have a negative attitude toward products that are old-fashioned. This conflicts with people's self-enhancement motive. In addition to the self-consistency motive, people have a self-enhancement or self-esteem motive, which refers to the tendency to seek experiences that enhance one's view of the self (Rosenberg 1979). The self-enhancement motive encourages people to search for products with a positive image and to avoid products with a negative one (Sirgy 1982). If the product style becomes outdated, the former positive image of the product gradually turns into a negative one. Accordingly, an old-fashioned product does not fulfill a person's need for self-enhancement and is less valuable for maintaining a person's self. Consumers will thus try to replace this product for one that will fulfill both the self-consistency and the self-enhancement motive.

The extravert watch used as stimulus material in Study 5 has an eye-catching and colorful design, and the introvert watch follows a simple style with inconspicuous colors. In general, the design characteristics of the extravert

watch are associated with short-lived fashion styles, whereas long-lived fashion styles have design characteristics similar to the introvert watch (Jernigan and Easterling 1990). We believe that the extravert watch was expected to be discarded on the short term also by the extraverts, because it is more fashionable than the introvert one. To test this assumption, we performed a post hoc test. In this additional study, ninety-four subjects (49% males, 51% females; mean age = 22), who had not participated in the main study or pretests rated one of the two watches on three seven-point scales (“not fashionable”/“very fashionable”, “not trendy”/“very trendy”, and “not timeless”/“very timeless” (reversed item), $\alpha = .82$). In accordance with our expectations, the extravert watch was considered more fashionable than the introvert watch ($M_E = 5.19$ vs. $M_I = 3.16$; $t(92) = 9.60$, $p < .001$).

In conclusion, the findings of the post hoc test support the hypothesis that fashion can influence the product lifetime of a congruent product. Based on these results, we believe that personality congruity does not result in a longer product lifetime for the extravert condition, because the extravert watch is more fashionable. As a result, fashion changes encourage the extravert person to replace the extravert watch early, even though the product is congruent to his/her personality.

An alternative explanation for our results concerning product lifetime is that extravert persons replace products sooner than introverts do. To test this alternative explanation, the post hoc test also measured the correlation between the degree in which subjects were extravert using the five extraversion items ($\alpha = .75$) and their replacement behavior using three self-generated items on seven-point Likert scales (“I dispose of my products sooner than others”, “I replace my products only when they are really worn out” (reversed item), and “I become quickly tired of my products”, $\alpha = .72$). No correlation was found (Pearson $\rho = .09$, $p > .05$). Therefore, we stick to our previous conclusion that fashion moderates the effect of self-congruity (through product attachment) on product lifetime.

We also investigated the relation between the extraversion trait and the degree to which a person perceives himself/herself as fashion-conscious. Fashion-consciousness was measured using three self-generated items on seven-point Likert scales (“I am very fashion-conscious”, “I replace my products as soon as they go out of fashion”, and “I always want to keep up with the latest trends”, $\alpha = .77$). The results of the post hoc test revealed a significant positive correlation (Pearson $\rho = .23$, $p < .05$) between the extraversion trait and the degree to which subjects considered themselves as fashion-conscious. As extraverts are more outgoing and concerned with gratification from what is outside the self, it seems reasonable that they are also more fashion-conscious than introverts.

5.4 General Discussion

Research on human relationships revealed that similarity in personality positively influences the duration and quality of long-term relationships between two spouses (Antill 1983; Arrindell and Luteijn 2000; Barry 1970; Russell and Wells 1991). People are attracted to other people who are similar to themselves, because this validates and reinforces their self-concept. Analogously, similarity in personality is also relevant for the development of an emotional relationship between a person and a product. People become more attached to products with a personality that is congruent to their own, because these self-congruent products serve people's needs to differentiate from others and express their individuality. Hence, these findings support and extend other work on product attachment that suggested that people become more attached to products that are used to define and maintain a person's self (e.g., Ball and Tasaki 1992; Kleine et al. 1995; Schultz et al. 1989).

In addition, our findings show that personality congruity does not necessarily imply that the person-product relationship will be long-lasting. As discussed in Chapter 4, product attachment is not static, but changes over time due to dynamics of the product, the person, and the situational context (Ball and Tasaki 1992; Kleine and Baker 2004; Mugge, Schifferstein, and Schoormans 2006; Schultz et al. 1989). Fashion may serve as a moderator for the relationship between product attachment and product lifetime. A necessary condition for extending product lifetime appears to be that the product's design remains to be in general fashion acceptance. Otherwise, evaluation of the product as being old-fashioned will decline the product's value for maintaining a positive view of the self, resulting in early detachment and a premature replacement of the product.

The finding that the degree of attachment to a product with a congruent personality depends on fashion changes and thus on other competitive products, can be explained by the fact that these self-congruent products are considered to be replaceable (Mugge et al. 2005). If the product is replaceable, the strength of the person-product relationship strongly depends on the characteristics of competitive products. As long as the product and its meaning can be separated, other products can convey similar meanings and may thus take over the product's special meaning to the owner. Accordingly, the product may be prematurely replaced. For example, an extravert watch can serve as a sign to express one's extravert personality. However, this symbolic meaning is not exclusively related to this particular object. Other watches or consumer durables can communicate similar personalities and can thus serve as similar signs. Accordingly, the watch is replaceable. To stimulate long-term product attachment, products should thus convey a special meaning that is irreplaceable.

Limitations and Future Research

A limitation of this research is that we investigated the relationships between product attachment, fashion, and product lifetime for only one product category: watches. Watches are conspicuous, hedonic products for which congruity and fashion may be relatively important. More research is needed to establish the role of fashion for different product categories. Another limitation of the use of a watch as stimulus material is that it is presented as an ordinary possession. It is likely that the role of fashion on product lifetime is less important for products with deep, symbolic meanings, such as heirlooms (Curasi, Price, and Arnould 2004; Price, Arnould, and Curasi 2000). Future research should examine the relationships between product attachment, fashion, and product lifetime for these 'most cherished' products.

A second limitation is that we investigate a complex construct as personality in a simplified manner by focusing on only one personality dimension for a hypothetical person. More research is needed in real-life situations to fully understand the relationships between personality congruity, product attachment, product lifetime, and fashion.

The studies presented in this chapter are restricted to appearance as a means for designers to incorporate personality in products. Whereas product form is indeed important for a product's personality (Brunel and Kumar 2007; Govers et al. 2002; Jordan 2002), other aspects of the product design, such as sound, texture, and smell may be relevant as well (Ludden and Schifferstein 2006; Schifferstein, Otten, and Hekkert 2006). For example, a car that has a tough appearance, such as a Land Rover, may also sound tough while starting the engine or closing the door, and feel tough when holding the steering wheel. Person-product interaction (e.g., forces, movements) may influence and enhance the personality of a product as well (Ortiz Nicolas 2006). For example, a Land Rover may bring about a tough person-product interaction if opening its door requires a relatively great deal of force. In addition, past research concluded that computers can have personalities as a result of variations in their communication style with the user (Moon 2002; Nass et al. 1995). By changing the style of communication, Moon (2002) developed computers that were perceived as either dominant ("extravert") or submissive ("introvert"). Dominant messages express greater confidence and are more commanding of others, relative to submissive ones. People evaluated products presented by the computers as more positive if the communication style matched their own personality. Manipulating the person-product interaction to express a particular personality is especially useful for the design of smart products; that is consumer products equipped with information and communication technology (Rijsdijk 2006). An example is Sony's AIBO, a robotic dog that can reveal whether it feels sad or happy. Similarly, many digital devices (e.g.,

mobile phones, MP3-players, and DVD-recorders) may convey different personalities while interacting with the user. It is important for a designer to achieve correspondence between all relevant product characteristics to create a product with a consistent personality (Hekkert 2006; Janlert and Stolterman 1997; Norman 2004). Only then, all product characteristics coincide and deliver consumers the experience of a product with a certain personality. Future research should try to address the (combined) effects of other product characteristics on personality congruity and product attachment.

Implications

From the viewpoint of sustainability, it is interesting to create longer lasting products. Replacing and disposing of products creates an environmental burden, because it produces waste and uses up scarce resources. Scholars proposed product attachment as an eco-design strategy for designers to stimulate product longevity (Cooper 2000; Mugge et al. 2005; Van Hemel and Brezet 1997; Van Hinte 1997; Van Nes 2003). Our research shows that designing products with predetermined personalities that match the personality characteristics shared by the members of the target group can be valuable to stimulate product attachment and thereby extend the product lifetime. In order to design products with a predetermined personality, it is important to know which product characteristics people associate with a particular personality trait. For that reason, Govers (2004) developed the product personality scale that enables designers to systematically assess the personality profile of different product variants. In addition, companies should have an understanding of the personality characteristics that are shared within the target group. In some cases, a target group may consist of consumers with different personality traits. Then, it is probably worthwhile to create a range of products, each conveying a different personality. This enables consumers to select those products that fit their own personality best.

Our findings also suggest that product attachment only results in an extension of the product lifetime if the product is not fashionable. Manufacturers often deliberately accelerate product lifecycles by introducing new features or technological improvements and by stimulating fashion changes. This planned obsolescence negatively affects the experienced attachment to the currently owned product and induces a replacement need. As a result of this mechanism, the experience of a strong emotional bond with the product is likely to be only temporary. Consequently, to create long-lasting products the eco-design strategy to stimulate product attachment should be combined with the strategy to reduce a product's fashionability by creating a 'classic design' (Charter and Tischner 2001; Van Hemel and Brezet 1997). A classic design follows the principles of the designers from the Hochschule für Gestaltung

in Ulm (Germany). They believed that enduring aesthetic appreciation was achieved by making designs geometric, orderly, well-balanced, and with the use of inconspicuous colors, such as black and white. This strategy is also known as the modernist principle 'Less is More' (Hekkert 2001; Heskett 1987). An example of a product with a classic design is the Barcelona chair of Mies van der Rohe (see Figure 5.5). It is unlikely that designers can purposively create a truly timeless design, because all products are more or less susceptible to fashion cycles and can thus be traced back to the time they were made. Nevertheless, products with a classic design remain to be in general acceptance over a relatively longer period of time (Jernigan and Easterling 1990), due to which the strategy 'classic design' may extend the time until a product becomes outdated.



Figure 5.5 Barcelona Chair. Design: Mies van der Rohe (1929)

6 Product Attachment and Product Personalization

In Chapter 5, we concluded that people should consider a product to be irreplaceable for long-term attachment. From this perspective, an interesting avenue for designers is to enable consumers to personalize their products. Based on the definition of Blom (2000), product personalization is defined as a process that defines or changes the appearance or functionality of a product to increase its personal relevance to an individual. An example of product personalization is the mass customization service provided by the sports brand Adidas. MiAdidas (<http://www.miadidas.com>) enables consumers to design their own pair of personalized shoes by allowing consumers to specify the colors for the various shoe parts. Furthermore, the shoes are specially built to match the shape of one's feet. The result is a unique pair of Adidas shoes that matches the personal preferences of an individual with respect to fit and taste. Changing the cover and ringtone of a mobile phone or redecorating one's cupboard are examples of product personalization as well. These examples illustrate that the variation in personalization options in consumer durables is extensive.

Implementing product personalization options will require a different role from both the consumer and the designer. The designer is no longer an expert who imposes a design on the consumer. Instead, designers offer consumers more decision-taking powers that allow them to modify their products (Redström 2006; Siu 2003). In other words, consumers operate as co-designers to obtain a personalized product. This implies that designers have to give up part of their authority regarding the ultimate product. On the other hand, implementing product personalization makes designers responsible for the process by which the consumer personalizes his/her product.

During the personalization process, a person is actively involved in the design of his/her own product. The result is a product that gains a personal touch and becomes unique (Schreier 2006). Because this specific object resulted from the person's active participation in the design process, it is likely that this particular product specimen obtains a special meaning to the owner. The current chapter investigates how personalizing a product contributes to the degree of attachment a person experiences to his/her product.

6.1 Product Personalization and Self-Expression

By personalizing a product, a person directs time, effort, and attention to the product. In other words, (s)he invests effort in a product. Several scholars argued that product attachment is related to the 'psychic energy', that is the person's mental effort invested in a product (Belk 1988; Csikszentmihalyi and Rochberg-Halton 1981). While personalizing the product, the person needs to make (creative) choices (e.g., choosing the design and colors of the product's appearance), which requires his/her mental effort. In addition, product personalization can demand physical effort, when people alter the product themselves. For example, people are physically active when painting or assembling a product. If a personalization option requires a person's physical effort, (s)he is occupied with the product for an extended period of time, due to which the product may feel more personal, which may influence the experience of product attachment as well. Consequently, we take into account both types of effort.

The outcome of the personalization of a product is that the consumer adds a personal touch to the product. Depending on the extent to which the personalization was performed successfully, the personalized product may represent a personal accomplishment to the owner, because (s)he created it himself/herself (Bendapudi and Leone 2003; Franke and Piller 2004). Past research on product personalization concluded that personalized products are better in fitting one's individual needs and taste (Franke and Piller 2003), are more unique (Schreier 2006), and are more self-expressive of a person's unique identity (Blom 2000; Blom and Monk 2003; Kiesler and Kiesler 2005). We acknowledge that this may partly be triggered by a person's biased perception of the personalized product. As a result of the active participation, people may simply perceive the product as providing a better fit to their preferences (Simonson 2005).

In Chapter 2, we discussed that expressing the owner's self is a reason to consider a possession as treasured, favorite, or important (Dittmar 1991; Kamptner 1995; Richins 1994; Wallendorf and Arnould 1988), implying the

existence of an emotional bond. As a result of the personalization process, we expect that the person will consider the product to be expressing one's identity. In turn, self-expression may positively affect the degree of attachment that is experienced to this product. These arguments are summarized in a conceptual model (see Figure 6.1).

Chapter 6 presents two studies on product personalization. Study 6 tests the conceptual model concerning the relationships between product personalization, self-expression, and product attachment (see Figure 6.1). For designers interested in stimulating product attachment by implementing product personalization in the design of new products, it is also important to have knowledge of the various personalization options that are available. Therefore, Study 7 explores the different opportunities to realize product personalization.



Figure 6.1 Conceptual model for the relationships between product personalization, self-expression, and product attachment

6.2 Study 6: The Effect of Personalizing Product Appearance on Product Attachment⁵

Method

Respondents and Design

A convenience sample of 149 Dutch students (58% male and 42% female; mean age = 21) was used for this study. These students were approached at the university and all owned a bicycle. Two groups were distinguished: one in which the product's appearance was personalized by the owner ($n = 58$) and one in which it was not personalized ($n = 91$). Respondents were classified in one of the two groups ("personalization" vs. "no personalization") based on their response to the question whether they had altered their bicycle's appearance.

⁵ With some alterations, Study 6 has previously been published as Mugge, Schifferstein, and Schoormans (2004a) in the Proceedings of the Design and Emotion Conference and as Mugge, Schifferstein, and Schoormans (2004b) in the Proceedings of the Society for Consumer Psychology (SCP) Conference.

Product

In general, Dutch students own a bicycle, which they use daily to travel from their home to university. When Dutch students start university, they are likely to buy a second-hand bicycle or to use an old one, because these are less expensive and because bicycles are often stolen. Bicycles were chosen as the product category under study, because Dutch students frequently personalize these products' appearances by painting them in several (conspicuous) colors to make them personal. This results in a bicycle that is more distinctive and attracts attention, due to which it is easier to locate in bicycle stands with large numbers of bicycles, as is common in the Netherlands. Finally, painting a bicycle reduces the risk of theft. In Figure 6.2, an example of a painted bicycle is shown.



Figure 6.2
Personalized bicycle

Questionnaire

Respondents indicated their age and gender and responded to questions concerning their bicycle, regarding the manner of acquisition, the period of time the bicycle had been in possession, whether they had personally altered the bicycle's appearance, and the degree of usage of their bicycle.

Multi-item measures on seven-point Likert scales (1 = "strongly disagree", 7 = "strongly agree") were obtained to measure the dependent variables product attachment (four items: $\alpha = .79$), self-expression (five items: $\alpha = .86$), and effort invested (four items: $\alpha = .86$). In addition, the variable product uniqueness (four items: $\alpha = .94$), that is the degree in which the bicycle was regarded as unique, was incorporated in the questionnaire. Because the personalization of a product's appearance results in a more unique product (Schreier 2006), the latter variable served as a manipulation check. We included an eight-item scale to measure individual differences in the desire for unique consumer products

(Lynn and Harris 1997). During the analysis of our data, we deleted one item (“I rarely pass up the opportunity to order custom features on the products I buy”), to enhance the internal validity of the scale. For the remaining seven items, Cronbach’s α was .83.

Respondents filled out the questionnaire for the bicycle they already owned, due to which it was not possible to randomly assign respondents to experimental conditions. As a result, the two groups differ in size and possibly on other variables as well. To control for some possible effects, data were collected on a number of control variables related to the person-product relationship. These variables were chosen based on prior research on product attachment (Dittmar 1991; Kamptner 1995; Richins 1994; Schifferstein and Pelgrim 2004; Schultz, Kleine, and Kernan 1989; Wallendorf and Arnould 1988). Specifically, we assessed memories elicited by the bicycle concerning a person (three items: $\alpha = .87$), memories elicited by the bicycle concerning an event (three items: $\alpha = .85$), product utility (four items: $\alpha = .78$), product appearance (four items: $\alpha = .84$), satisfaction with the bicycle (four items: $\alpha = .86$), and financial value (three items: $\alpha = .85$). The items used to measure product attachment, self-expression, product appearance, and satisfaction are identical to those used in Studies 1 and 3. Appendix A5 shows the items used to measure the other variables. The items relating to the dependent variables, the manipulation check, and the control variables were presented in random order.

Results

Comparison of the Two Groups

The variables concerning the demographic variables (i.e., age and gender) and the ownership of the bicycle (i.e., how and when the bicycle was acquired) showed no significant differences between the two groups: “personalization” and “no personalization” ($p > .05$). Furthermore, no significant differences were found for the control variables ($p > .05$; see Table 6.1). Based on these results, we can conclude that no other important differences existed between the two groups in addition to the personalization of the product’s appearance.

The two groups did differ on the variable product uniqueness that served as a manipulation check ($t(145) = 8.13, p < .001$) and on the variable desire for unique consumer products ($t(144) = 2.98, p < .01$). Respondents in the “personalization” group perceived their bicycle as more unique ($M_{\text{pers}} = 5.28$ vs. $M_{\text{no person}} = 2.96$) and had a higher desire for unique consumer products ($M_{\text{pers}} = 4.58$ vs. $M_{\text{no person}} = 4.02$) than respondents who did not alter their bicycles. These findings confirmed our belief that the bicycle had become more unique due to the personalization of its appearance and that the respondents change their bicycle’s appearance to make it distinctive from other bicycles, which enables them to express their unique identity.

As expected, significant differences were also found for the variables effort invested ($t(145) = 10.88, p < .001$), self-expression ($t(144) = 5.01, p < .001$), and product attachment ($t(145) = 2.36, p < .05$). Respondents in the “personalization” group indicated to have invested more effort in their bicycle ($M_{\text{person}} = 3.70$ vs. $M_{\text{no person}} = 1.60$), considered the product more self-expressive ($M_{\text{person}} = 3.52$ vs. $M_{\text{no person}} = 2.43$), and experienced more product attachment ($M_{\text{person}} = 4.13$ vs. $M_{\text{no person}} = 3.53$) than those in the “no personalization” group (see Table 6.1).

	Personalization		No personalization		<i>df</i>	<i>t</i>
	Mean	<i>SD</i>	Mean	<i>SD</i>		
Control variables						
Satisfaction	5.35	1.16	5.31	1.32	143	.20
Memories concerning a person	2.11	1.40	2.04	1.50	144	.27
Memories concerning an event	2.64	1.52	2.14	1.48	144	1.96
Product utility	5.85	1.15	5.98	1.02	145	-.70
Product appearance	3.94	1.52	3.49	1.58	144	1.70
Financial value	2.57	1.34	2.74	1.59	145	-.69
Manipulation check						
Product uniqueness	5.28	1.42	2.96	1.84	145	8.13**
Dependent variables						
Effort invested	3.70	1.36	1.60	.98	145	0.88**
Self-expression	3.52	1.41	2.43	1.20	144	5.01**
Product attachment	4.13	1.49	3.53	1.53	145	2.36*

Table 6.1 Means and standard deviations (*SD*) of the variables for the two groups

Note: * $p < .05$; ** $p < .001$

Conceptual Model

To test the proposed conceptual model (see Figure 6.1, p. 97), we estimated the relationships between effort invested, self-expression, and product attachment in a structural equation model using LISREL 8.50 (Jöreskog and Sörbom 1993). Figure 6.3 displays the coefficients resulting from the LISREL-analysis. The proposed conceptual model resulted in a good fit to the data ($\chi^2 = 75.21, df = 63, p = .14$; GFI = .93; CFI = .98; RMSEA = .037). Effort invested

had a significant positive effect ($\gamma = .62, p < .01$) on self-expression, which in turn had a significant positive effect ($\gamma = .68, p < .01$) on product attachment. These results provide support for the conceptual model.

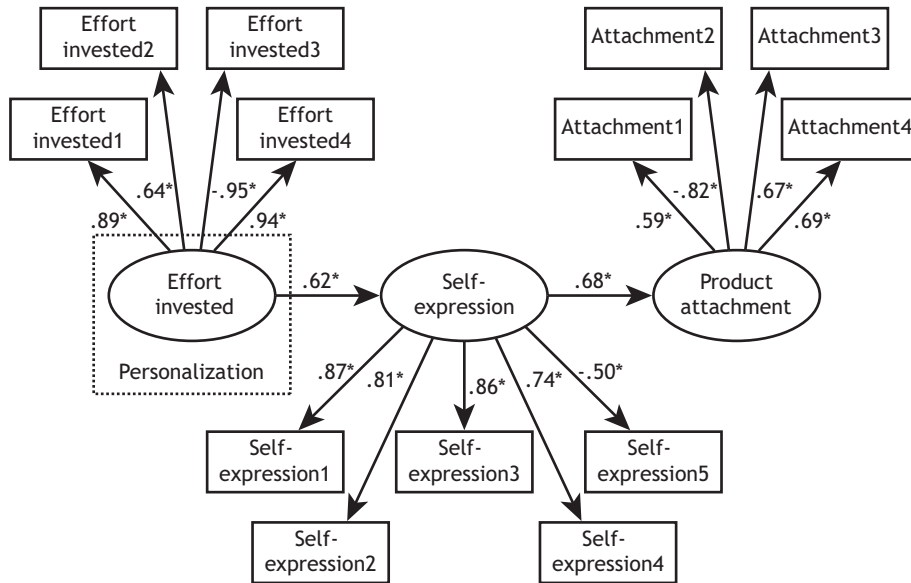


Figure 6.3 Parameter estimates for the relationships between effort invested during the personalization process, self-expression, and product attachment. Note: * $p < .05$

Discussion

Study 6 indicates that by personalizing a product, consumers invest effort in the product. The outcome of the personalization process is that the consumer obtains a more personal product. As a result, the product can fulfill the need for self-expression. Consumers use the product to show themselves and others who they are. Self-expression, in turn, has a positive effect on the degree of attachment to this product. In conclusion, product personalization positively affects the formation of an emotional bond with this product. We argued that personalizing a product can result in long-term product attachment, because the person is involved in the design process of this particular specimen. Although irreplaceability was not directly measured in this study, the finding that people perceive a personalized product as more unique supports the expectation that people consider the product to be irreplaceable (Grayson and Shulman 2000). Due to the active participation in the personalization

process, the product represents a personal accomplishment of the owner (Bendapudi and Leone 2003; Franke and Piller 2004). This special meaning is exclusively related to this particular object and cannot be replaced by other products.

A limitation of Study 6 is that it investigated the effect of one specific type of personalization that is changing the product's appearance by painting it. This particular personalization option is probably less interesting for designers, because it takes place on the consumer's own initiative without any involvement from the designer. Nowadays, designers have made many other personalization options available in consumer durables. It is likely that these options differ in their value for stimulating product attachment. Because one of the aims of this research project is to provide designers with guidelines to stimulate product attachment, it is important to delineate the various personalization options that can be used to design new consumer durables. This knowledge can help designers to realize those personalization options in the product design that are considered the most beneficial for stimulating the degree of attachment to products. Study 7 strives to fulfill this goal.

6.3 Study 7: Dimensions of Product Personalization

The personalization options that are present in today's markets differ considerably from each other. On the one extreme, people may be allowed to create products ad hoc, for one specific person and for one particular purpose (Jencks and Silver 1972). On the other extreme, consumers may only be able to choose among an increased number of alternatives and thus have relatively little freedom in the personalization process. These extremes show that the variation in product personalization options is extensive. Study 7 provides an overview of the various personalization options and presents a classification study to uncover the relevant dimensions of product personalization. This classification study uses existing examples of personalized products. Based on the arguments why these products are similar or different, the underlying dimensions of product personalization can be distinguished. We focus on dimensions, because dimensions can provide designers with an abstract view of the spectrum of product personalization. Accordingly, the classification study does not only result in an overview of the currently available product personalization options, but will provide designers with insight in new options as well.

Method

To uncover the dimensions of product personalization, participants performed a free classification task by sorting a set of stimuli into discrete groups. Participants were free to choose the number of groups and the number of stimuli in each group (Handel and Imai 1972).

Participants

Sixteen participants (44% males, 56% females, mean age = 26) with a Bachelor Degree in Industrial Design Engineering were asked to volunteer. These participants possess expertise regarding consumer durables and product design and are trained to distinguish products based on design-related issues. Because most personalization options are directly related to the product design, these participants were expected to make relevant distinctions between various product personalization options.

Stimuli

Three designers with a Master or Bachelor Degree in Industrial Design Engineering collected more than a hundred examples of products that offer an opportunity for personalization. This collection was based on examples discussed in prior research (e.g., Blom and Monk 2003; Franke and Piller 2003; Gilmore and Pine 1997; Prahalad and Ramaswamy 2000; Vink 2003; Weightman and McDonagh 2003), analyzing different design books and magazines (e.g., Fiell 2001; Maurer 2000; Ramakers 2002; Rashid 2003; Van Hinte 1997; Von Vegesack and Eisenbrand 2004), and searching the Internet. Products were selected based on the criterion that the consumer could add a personal touch to the product. Due to this personal touch, the product became non-standard and different for individual consumers. To preserve the feasibility of the sorting task, a selected set of 42 personalized products were used as stimuli (Bettman 1979). The stimuli are included in Appendix F. To ensure that the complete range of product personalization options was present in the stimuli, those personalized products were selected for the study that differed most. In case of equivalent personalization options, we selected the most well-known ones, because people experience less difficulty in comprehending personalization options they have already encountered before. Some examples include the mass customization sites of miAdidas shoes (18) (<http://www.miadidas.com>), Nike shoes (37) (<http://nikeid.nike.com>), and Timbuk2 bags (9) (<http://www.timbuk2.com>), the Do Hit chair (15), the Do Cut vase (21), and the Do Scratch lamp (19) of the product line Do Create (Ramakers 2002), Maurer's lamp Zettel'z (10) (Von Vegesack and Eisenbrand 2004), and a mouse pad printed with one's photograph (27).

Each stimulus was presented as a plasticized card including a color picture of the personalization option and a written description in which the personalization process was explained. The pictures and written text were standardized as much as possible. The size and quality of the pictures were made uniform and the structure and exact wording of the descriptions were kept as objective and similar as possible. For example, the card of the Nike shoes displayed the following text: “These shoes can be ordered over the Internet. The consumer can determine the appearance of these shoes by choosing the colors for the various shoe parts from a number of options. It is possible to place a personal text at the backside of the shoe”.

Procedure

Participants were invited to the lab individually. On arrival, participants were asked to read a brief instruction that explained the sorting task. The stimulus set was presented in random order. The participants were instructed to sort the stimuli in groups based on their mutual similarities and differences with respect to the way the stimuli can be personalized and not with respect to the product category. The participants were asked to think aloud, while performing the task and to explain why certain stimuli did or did not belong together. If a participant just forgot to think aloud, (s)he was triggered by asking why these stimuli were (not) sorted in the same group. Participants were allowed to make changes during the sorting task. The complete task was recorded on video. Participation took 40 to 75 minutes. After the sorting task, the participants were asked whether they knew several additional examples of product personalization and the participant's age and gender were noted. Also, the researcher noted which stimuli were grouped together in the final sort.

Results

All participants but one experienced little trouble in performing the task. Sorts were made relatively quickly and only some incidental remarks were made about the difficulty of the task. Participants were not likely to change their final sort and indicated that they were satisfied with it. One participant deviated significantly from the others, because he had trouble in categorizing stimuli based on the manner of personalization and categorized stimuli predominantly on the similarities between the product categories. Consequently, he was deleted from the sample for the final data analysis, resulting in a total of fifteen usable categorizations.

When participants were asked to recall any other personalization options they were familiar with, no personalization options were mentioned that differed remarkably from the stimuli. These findings support our notion that the

complete range of product personalization options was present in the stimuli. Four stimuli (Dremel (26), Tivo (31), Thermostat (33), and Amazon (40)) were not included in our data analysis, because most participants agreed that these products did not entail product personalization. The participants in our study perceived product personalization as a process in which both producer and consumer are involved in the creation of a product. The consumer thus becomes co-designer of his/her product. Due to the consumer's involvement, the product gains a personal touch. This will in general also mean that the product is unique. Products that are either completely created by the producer (e.g., Dremel with different accessories) and products or systems that give consumers a personal advice (e.g., Tivo) were, therefore, not considered to be product personalization.

The data were analyzed both quantitatively and qualitatively. A multi-dimensional scaling analysis was used to examine the quantitative grouping data. Qualitative data analysis was used to analyze the participants' verbalizations during the sorting task.

Multi-Dimensional Scaling

We performed a multi-dimensional scaling analysis (MDS analysis) to investigate whether the categorizations were created consistent over the various participants (Hair et al. 1998). The result of the MDS analysis is a graphical representation of how participants perceive all stimuli relative to one another in a conceptual space. Based on this graphical representation, the researcher can derive the dimensions on which the stimuli differ from each other. To perform the MDS analysis, the individual grouping data were converted into fifteen co-occurrence matrices. The rows and columns of a co-occurrence matrix contain the stimuli and every cell in the matrix thus corresponds to one particular combination of two stimuli. In each cell, the number "1" indicated that this participant had grouped a pair of stimuli together, whereas "0" signified that two stimuli did not occur in the same group. The result is a symmetric matrix that represents the exact group structure for this particular participant. The co-occurrence matrices of all participants were aggregated to obtain one symmetrical 38 x 38 matrix needed for the MDS analysis. This total occurrence matrix is shown in Appendix G.

The MDS analysis was conducted on Euclidian distances using the ALSCAL algorithm, because our data consisted of one symmetric matrix of (dis)similarity data at the ratio level of measurement (Norusis 2004). To determine the best number of dimensions, the indices of fit at each dimension were considered. Table 6.2 (p. 106) shows that there was a substantial improvement in the amount of variance explained from two to three dimensions ($\Delta R^2 = 28\%$) and from three to four dimensions ($\Delta R^2 = 12\%$), after which the improvement remains

limited. Accordingly, three- or four-dimensional solutions were considered to be the most appropriate (Hair et al. 1998). Based on the interpretation of both solutions, the four-dimensional solution was chosen. The fit indices revealed that this solution provided a good fit to the data ($R^2 = .77$; Kruskal's stress = .18), supporting the notion that the categorizations were created relatively consistent over the participants.

# Dimensions	Kruskal's stress	R^2
2	.340	.486
3	.230	.679
4	.175	.768
5	.136	.830
6	.103	.886

Table 6.2 MDS fit indices

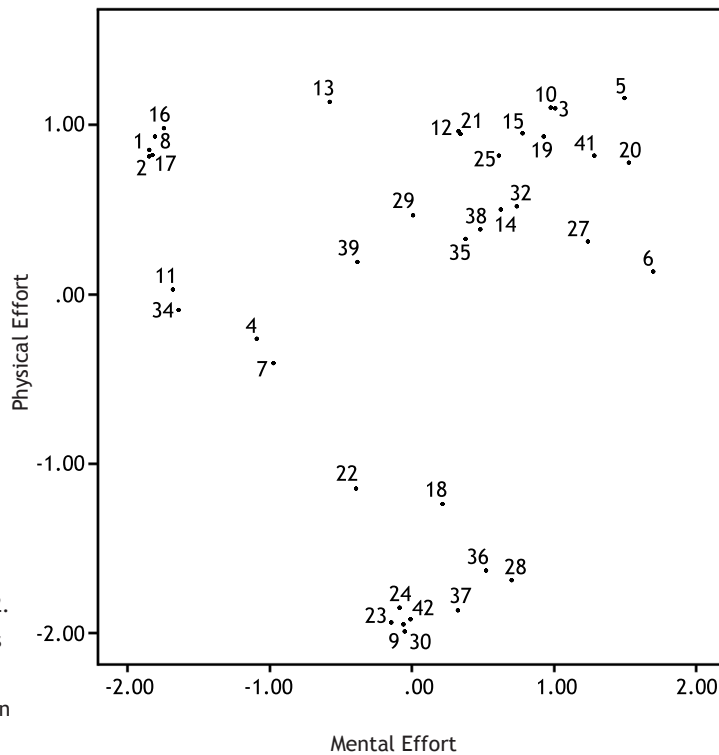


Figure 6.4
Perceptual map of the MDS analysis: Dimensions 1 and 2. Note: The numbers correspond to the stimuli presented in Appendix F

The four-dimensional solution is displayed in Figure 6.4 (Dimensions 1 and 2) and in Figure 6.5 (Dimensions 3 and 4). The first dimension in the MDS solution entails the consumer's mental effort. Concerning mental effort, high scores are obtained by the stimuli of the painted bicycle (20) and the self-made box (41), because these personalization options offer consumers a great deal of freedom in the choices they can make. In contrast, the watch with the interchangeable rim (34) and the adjustable lamp (17) required only little mental effort (see Figure 6.4). The second dimension that resulted from the MDS analysis is labeled Physical Effort. On this dimension, the Do Hit chair (15) and the self-assembled lamp (13) have a high score, because consumers are physically active during the personalization process. Personalization options that do not demand any physical effort, such as the mass customization sites of Nike shoes (37) and Timbuk2 bags (9) have a low score (see Figure 6.4). Third, the dimension Flexibility distinguishes between personalization options that can be personalized multiple times and options that can be personalized only once. The personalization of the mobile phone covers (4 + 25) and ringtones (29) are extremely flexible, as opposite to miAdidas shoes (18) and the Do Cut

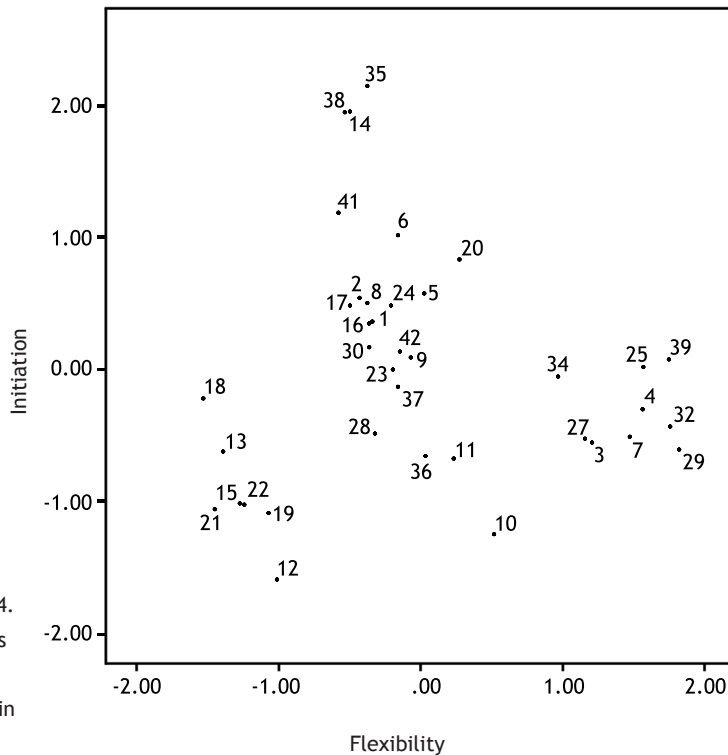


Figure 6.5
 Perceptual map of
 the MDS analysis:
 Dimensions 3 and 4.
 Note: The numbers
 correspond to the
 stimuli presented in
 Appendix F

vase (21) (see Figure 6.5). The last dimension is labeled Initiation. On this dimension, the self-made lamp (38) and the ring that was made to order (35) have a high score, because these personalization processes were completely initiated by the consumer. Opposing these options are the Do Scratch lamp (19) and the Zettel'z lamp (10) (see Figure 6.5) of which the personalization was premeditated beforehand by the designer.

Qualitative Data Analysis

Multidimensional scaling strives to obtain the best fit with the smallest possible number of dimensions (Hair et al. 1998). Consequently, differences in personalization options that are relevant for only a few stimuli are less likely to emerge in the MDS solution, whereas these dimensions may provide interesting opportunities for the design of new products. Accordingly, a qualitative data analysis was performed on the verbalizations made during the think aloud protocol to identify other potential dimensions of product personalization. The qualitative data analysis also provided a means to gain additional evidence for the research findings from the MDS analysis, which increases the reliability of these findings. Finally, the qualitative data analysis offered additional insight in the interpretation of each dimension.

All verbalizations were fully transcribed. A content analysis was performed, in which participants' verbalizations were coded and categorized in different dimensions using the computer program Max QDA (producer: VERBI Software). Two independent judges explored the transcriptions for analogous reasons to combine or separate two stimuli. If possible, the categories of reasons were combined until overall dimensions emerged from the data. During the content analysis, judges were urged to search for as much conformity as possible within each dimension, while preserving distinction between dimensions. The performance of the content analysis was straightforward and consensus between both judges was achieved relatively easily.

The result of this analysis was a set of seven dimensions of (the process of) product personalization. Of this final set, four dimensions corresponded to the dimensions resulting from the MDS analysis, which increases the reliability of our findings. Below, each dimension is clarified using product examples from our stimulus set. We first describe the four dimensions that were also found in the MDS analysis. Subsequently, three additional dimensions are described.

Dimensions

Dimension 1: Mental Effort

Mental Effort deals with the consumer's degree of design authority, that is the degree of creative involvement offered to the consumer (Fox 2001). At one end of the continuum, products are designed entirely by the designer, who thus has

total influence on the design process. At the other end, consumers design and create products completely themselves. Product personalization implies that the designer and the consumer share their design authority. Consumers become active, empowered partners that serve as co-designers of their own products (Fischer 2002; Prahalad and Ramaswamy 2000). Consequently, designers have to give up part of their authority regarding the final product. When a consumer is merely choosing among alternatives prepared by the designer, the degree of consumers' mental effort is minimal (e.g., choosing a standard cover for a mobile phone (4)). However, the designer may also offer consumers the possibility to be truly creative and add something themselves. An example of the latter is the NOKIA 3220 mobile phone (25) (see Figure 6.6) that allows consumers to personally design their own cut-out cover using their creativity, instead of merely choosing one among several predetermined covers. This provides consumers with the opportunity to create a more personal and unique product.

Figure 6.6 Nokia 3220 website



Dimension 2: Physical Effort

Product personalization may also differ in the degree of physical involvement required by the consumer. For mass customized products ordered over the Internet, the consumer is merely commissioning someone to make the product for him/her. However, the consumer can also be more actively and physically involved in personalizing the product. Examples of products that require much physical effort are products that are painted by the consumer, and Marijn van der Poll's Do Hit (15) of the Do Create product line (Ramakers 2002). Do Hit is

a cube of metal that is delivered with its own sledgehammer (see Figure 6.7). The consumer can transform it into a chair by hammering it in the desired shape.



Figure 6.7 Do Hit. Design: Marijn van der Poll (2000), Chair, steel, 100 x 70 x 75 cm

Dimension 3: Flexibility

The third dimension relates to the degree of flexibility that is present in a personalization option. Some products can be personalized only once (inflexible), whereas other personalization options may enable the consumer to personalize the product over and over again (flexible). For example, many consumers repeatedly change the cover of their mobile phone (4 + 25). In this case, the product is flexibly personalized by changing only one component. Other products can be personalized by rearranging a given set of components (Ulrich and Tung 1991). An example of the latter is a modular shelving system (2) consisting of several components that can be repeatedly rearranged (see Figure 6.8).

A high degree of flexibility provides consumers with an important benefit. It offers consumers the possibility to improve the product design later in time. This may reduce the perceived risk of spoiling the product during the personalization process. Furthermore, it allows consumers to repeatedly

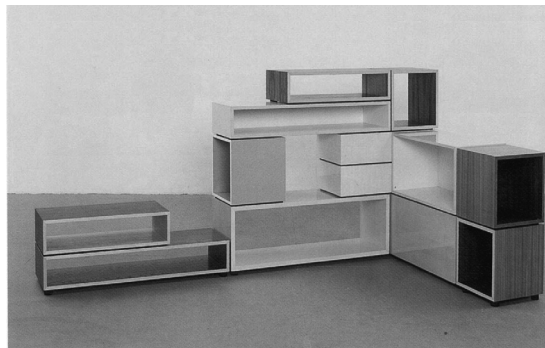


Figure 6.8 Modular shelving system. Design: RE, Nicole Hüttner, Nina Nicolaisen and Silke Warchold (2000), Reclaimed furniture/wood

adapt the product to fit their changing preferences. This may be beneficial if a product is susceptible to fashion changes and becomes outdated relatively soon (see Chapter 5). Implementing flexible personalization options requires the design of modular products (Stone and Wood 2000). Modular products consist of multiple modules that are functioning independently. Each module can be easily replaced by changing it for a new component without the need to change the remaining parts of a product.

The mass customization site miAdidas (18) is an example of inflexible personalization. From the moment the consumer finishes the personalization process and decides to order the personalized shoes over the Internet, the shape of the shoe and the colors for the various shoe parts are fixed. The consumer can only 'change' the personalized shoes by purchasing a new pair.

Dimension 4: Initiation

The dimension Initiation concerns the person, who initiates the personalization process: the consumer or the designer. A designer may initiate personalization by the design, for example, by incorporating a changeable component in the product. The consumer can personally decide whether (s)he wants to personalize the product by replacing this component with another one. An extreme case of initiation by the designer takes place when the personalization is obligatory in order to use the product. An example of this is Do Scratch (19) (see Figure 6.9) of the Do Create product line (Ramakers 2002). Do Scratch is an unfinished lamp. The lamp is covered in black paint and cannot be used



Figure 6.9 Do Scratch. Design: Martí Guixé (2000), Lighting armature, black coating, 27 x 27 x 5 cm

immediately, because it will not spread any light. Before use, the consumer has to scratch a personal drawing or message into the black surface, due to which the product becomes unique and personal. So, the consumer is forced to personalize the product. On the other hand, a product can also be personalized on the consumer's initiative, for example, when (s)he decides to paint his/her bicycle (20) or to design a personal ring (35).

A mixture of initiation by the designer and initiation by the consumer is possible as well. In this case, designers provide the opportunity to personalize a product, but leave the decision to do so to the consumer. An example is the personalization of a mobile phone by changing its ringtone (29). At purchase, one ringtone is selected as a standard. If desired, consumers can replace this ringtone by one of the other ringtones that are available or by ordering a ringtone over the Internet.

Dimension 5: Goal of Product Personalization: Utility or Appearance

Consumers can personalize products for utility-related and appearance-related goals (Blom and Monk 2003; Fox 2001; Piller and Müller 2004). Utility-related goals imply that the personalization is performed to improve the product's functionality. The result of the personalization process is a product that corresponds better to the particular, utilitarian needs of an individual. For example, on the Dell website (30) (<http://www.dell.com>), a consumer can create a computer that fits his/her individual requirements by selecting the different components (e.g., processor, internal memory, and video card) in a mass customization environment.

If the personalization takes place for appearance-related goals, the product's appearance is defined or changed in a way that it matches the personal taste and style preferences of the consumer. An example is the personalization of Timbuk2 bags (9). On their mass customization website (<http://www.timbuk2.com>).

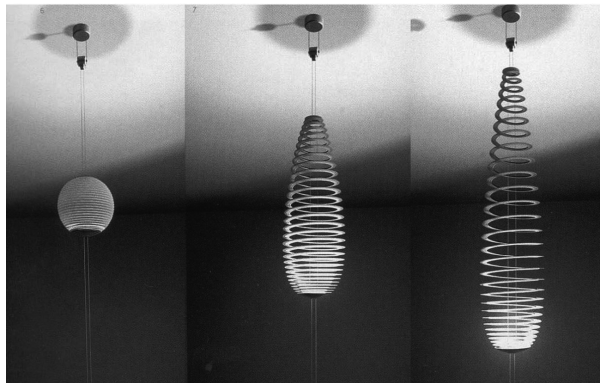


Figure 6.10 Ge-Off Sphere.
Design: Ron Arad (2000), Lamp

com), consumers can personally select the colors for the different parts of the bag.

We acknowledge that both ends (utility vs. appearance) of the dimension Goal of Product Personalization are not truly contradictory. In some cases, the personalization process may affect both utilitarian and appearance-related goals simultaneously. An example is the Ge-Off Sphere lamp (17) (see Figure 6.10). This lamp is personalized by pulling out the lamp's spiral shape, due to which its appearance changes, as well as the amount of light that is spread.

Dimension 6: Personalization Moment

When implementing product personalization, designers should not only design the product, but also the personalization process. The dimension Personalization Moment deals with the point in time this personalization process takes place. Consumers can be involved in the personalization process at different points in time: before purchase, before usage, and during usage. The timing of the personalization process has consequences for the achievable range of personalization options. If the personalization process happens before purchase, the range of possibilities to personalize products is the greatest. In theory, the product can then be perfectly adapted to fit every individual, because the personalization process takes place at the start of the product definition (Lampel and Mintzberg 1996). An example is a ring that is made to order (35).

In some cases, the personalization occurs after purchase, but before usage. Do Scratch (19) (see Figure 6.9, p. 111) of the Do Create product line is also an example of this personalization strategy, because this lamp cannot be used until the personalization process is executed.

The personalization can also take place after purchase and during usage. An example is the personalization of one's mobile phone by replacing its cover (4 + 25) or changing the ringtone (29). In this case, the fit between the personalized product and the consumer depends on the range of personalization possibilities that are offered by the designer.

Dimension 7: Deliberateness

Some products may become personal without the consumer's deliberate input. An example of the latter is a leather jacket (14) that starts showing wear and tear over time (Van Hinte 1997). During use, a leather jacket can shape to the owner's body and can show bare spots. The result is a unique jacket with a personal touch. Contradictory to most personalization processes, the wear and tear process of a leather jacket is in general not something the owner does intentionally. Most of the time, it is just something that happens indeliberately over time.

Although product personalization may occur unintentionally, manufacturers can indeed implement this personalization strategy in their products. Designers could create products that ‘age with dignity’ by implementing materials that have a tendency to form and wear gracefully in time (Chapman 2005; Van Hinte 1997, p. 127). An important condition for the success of ‘aging with dignity’ is that the signs of wear and tear are interpreted positively by the consumer.

Discussion

The present study provides an overview of the different personalization options for consumer durables. Personalization options can differ on one or more of the following dimensions: Mental Effort, Physical Effort, Flexibility, Initiation, Goal of Product Personalization, Personalization Moment, and Deliberateness. It is important to realize that the seven dimensions of product personalization are not necessarily independent. For example, Flexibility and Personalization Moment are naturally correlated. If a product can be personalized over and over again, this personalization process logically takes place during the time the consumer uses the product. Moreover, the dimensions Initiation and Deliberateness are related. If a consumer initiates the personalization process, it is unlikely that this process comes about without the consumer’s deliberate input.

In addition to providing an overview of the personalization options that are available in consumer durables, the findings of Study 7 also provide insight into new opportunities. By searching for new combinations on the seven dimensions of product personalization new personalization options may emerge. For example, the perceptual map resulting from the MDS analysis (see Figure 6.4 and 6.5, p. 106-107) shows that there are no current personalization options that require a high degree of consumers’ mental effort, but only a relatively low degree of physical effort. Designers could search for ways to offer consumers the opportunity to be mentally deeply involved in the design process, while restricting the necessary investment of physical effort. Another dimension that is neglected in present personalization options is Initiation. In our categorization, only the self-made products that were personalized without a designer’s input rated high on this dimension. This dimension seems irrelevant for designers, because they can only achieve product personalization in the design of new consumer durables, when they initiate it themselves. However, designers may give consumers the feeling that they have come up with the idea to personalize the product themselves, whereas it was actually invented beforehand. An example of a company applying this strategy is IKEA. IKEA presents some of their furniture together with cans of paint in their showrooms and advertisements to stimulate consumers to paint their IKEA furniture.

6.4 General Discussion

This chapter examines the effect of personalizing a product on the degree of attachment a person experiences toward this product. Study 6 shows that by personalizing the product's appearance, a person invests effort in the product, and the product is used to express his/her identity. The degree of self-expression, in turn, positively affects the degree of attachment to the product. Moreover, a personalized product is considered more unique, suggesting that the product is likely to become irreplaceable. These findings suggest that implementing product personalization is a valuable strategy for designers interested in stimulating long-lived product attachment. However, not all personalization options may be equally relevant to stimulate product attachment. To implement those personalization options in the product design that are the most valuable, a comprehensive overview of the spectrum of personalization options was necessary. Based on the findings of a categorization study (Study 7), we distinguish seven dimensions underlying product personalization. By choosing between various positions on the seven distinguished dimensions, designers can implement different personalization options in the design of new products and, thereby, stimulate product attachment.

Based on the findings of Study 6, we believe that the dimensions Mental Effort and Physical Effort are important dimensions for stimulating product attachment. The more a person is involved in the design process and can act as a co-designer of his/her own product, the more effort (s)he will invest in the product, and the more personal and self-expressive the product is likely to become.

We believe that consumers' mental effort is more important for stimulating product attachment than physical effort, because being creatively involved in the personalization process results in a more unique product with a personal touch (Fox 2001). In contrast, products that demand only physical effort, such as in many do-it-yourself tasks, may ultimately result in 'standard' products that lack a personal touch, because many other people can own these products as well.

In addition to the effort invested in the personalization process, the dimension Initiation may also be relevant for stimulating product attachment. We expect that when the personalization process is performed on the consumer's own initiative, the notion that the product represents a personal accomplishment is enhanced. Consequently, it is likely that the feeling that the product has gained a personal touch is stronger in comparison to personalization options, for which the designer was the initiator.

With respect to the dimension Goal of Product Personalization, it is likely that implementing appearance-related personalization will stimulate the

symbolic meaning of self-expression more than utilitarian adjustments. Product appearance has a stronger link to expressing a person's identity than the product's functionality, because functional desires are often similar for large groups of consumers. Correspondingly, some participants in the study even stated that utilitarian adjustments should not be considered product personalization. In addition, appearance-related personalization options are generally more observable to others than utilitarian adjustments.

In conclusion, products that require a high degree of mental and physical effort during the personalization process and that are personalized for appearance-related goals provide the best opportunities to result in the experience of product attachment.

The effect of other personalization dimensions on product attachment remains obscure. For example, the dimension Deliberateness may affect product attachment in two ways. First, past research suggested that consumers that actively participate in the design process perceive the personalized product as better fitting their preferences and taste than consumers that are unaware of the personalization process (Simonson 2005). Consequently, product personalization that takes place unintentionally will less likely result in a product with a special meaning than more deliberate types of product personalization. However, an opposite effect is also possible, because the non-deliberate wear and tear of a pair of jeans may convey the owner's personal history with the object and, therefore, positively affect the degree of product attachment (Van Hinte 1997).

The effect of the dimension Flexibility is also uncertain. If the personalization is flexible, the consumer may invest more time in it, suggesting a positive correlation to mental and physical effort, and a positive effect on product attachment. On the other hand, highly flexible product personalization has as a potential weakness that the personalization may become a gimmick. To bring about a feeling of product attachment, consumers should be sincerely involved in the design process of their product. More research is needed to investigate the effect of these dimensions on product attachment.

Finally, the positioning on the dimension Personalization Moment seems less relevant for stimulating product attachment. Nevertheless, the dimension strongly affects the personalization process, which makes it essential when product personalization is realized in the design of new products.

Market Opportunities of Product Personalization

It was not difficult to find over 100 examples of personalized products for our stimulus set. Nevertheless, personalized products take up only a small percentage of the total market of consumer durables. Although product personalization is not yet implemented often, the concept is not new. Jencks

and Silver argued in 1972 that manufacturers standardize and limit people's choices. They argued that products should be designed more ad hoc, resulting in unique products for different individuals (Jencks and Silver 1972). In 1980, Toffler also discussed the changing roles of consumers. He suggested that consumers will be replaced by 'prosumers'; individuals who are both the producer and the consumer of a product (Toffler 1980).

Due to recent developments, now the time seems right to implement product personalization in more products. Computer aided design (CAD) enables manufacturers to easily change the design specifications of a product to fit an individual's desires. Computer aided manufacturing (CAM) enables manufacturers to implement the various product designs in mass manufacture (Kaplan and Haenlein 2006; Weightman and McDonagh 2003). Second, the Internet has improved the opportunities for consumers to communicate their individual needs to companies. Third, due to their heterogeneous preferences, many consumers are willing to pay a premium price for personalized products (Franke and Piller 2004; Piller and Müller 2004; Schreier 2006). Accordingly, companies can now achieve a competitive advantage by taking into account the particular needs and desires of individual consumers in the product design (Whyte and Davies 2003).

Although the market opportunities seem abundant, product personalization may not be a worthwhile strategy for all product categories and groups of consumers. An important benefit of product personalization is that the consumer perceives the personalized product as more expressive of one's identity (Blom 2000; Blom and Monk 2003; Kiesler and Kiesler 2005). Product personalization is thus most valuable for products that are used to communicate one's identity. It is probably less valuable to personalize a lawn mower, because this is for most people a highly utilitarian and hardly identity-supporting product category. Analogously, consumers are more eager to personalize a product if the result of the personalization process is visible to others (Mugge, Schoormans, and De Lange 2007).

Furthermore, not all consumers may be interested in product personalization. The results of Study 6 suggested that people who have a high desire for unique products tend to personalize their products more. Furthermore, people who desire a high level of stimulation from the environment are more willing to use co-design services, because co-designing a product can offer them an exciting experience (Fiore et al. 2001; Fiore, Lee, and Kunz 2004). Product expertise is also relevant, because consumers with more expertise consider the personalization process to be less complex than consumers with low levels of product expertise do (Dellaert and Stremersch 2005; Huffman and Kahn 1998). Other personality characteristics, such as creativity (Burroughs and Mick 2004; Csikszentmihalyi 1996), innovativeness (Manning, Bearden, and Madden 1995), involvement (Bloch 1982), and centrality of visual product aesthetics (Bloch,

Brunel, and Arnold 2003) may also influence people's willingness to personalize products (Ulrich, Anderson-Connell, and Wu 2003). Before implementing product personalization, designers should determine whether their target group is indeed interested in personalized products.

Future Research on Product Personalization

The findings of this chapter suggest that product personalization may be a valuable design strategy for stimulating product attachment. Future research can use the dimensions distinguished to investigate which positions on the dimensions are more and less preferred by producers and consumers. From a producer's perspective, the costs for implementing different personalization options should be investigated. First, individualized and unique products may provide additional costs during production. Second, product personalization may deliver a company indirect costs as well. For example, if a company offers consumers a high degree of creative freedom during the personalization process, different consumers may create products with extremely distinct appearances. Because the identity of a brand is expressed visually in the appearance of products (Schmitt and Simonson 1997), these variations in the product design may come into conflict with a company's branding strategy (Fox 2001; Franke and Schreier 2002). Just imagine a BMW that is personalized by painting it pink with a yellow spoiler. A company that encountered a related issue is Nike. Rather than personalizing the shoes on the Nike-website with a name, someone ordered the mass customized shoes with the text "sweatshop", thereby attacking Nike's labor practices (Holt 2002). Nike decided to censor the shoe message, ultimately resulting in a stream of negative publicity on the Internet.

From a consumer's perspective, it is important to determine the positions on the different dimensions that offer (groups of) consumers the greatest benefits, while controlling the perceived risk and complexity of the personalization process. Before implementing product personalization, designers should weigh the benefits of product personalization against its drawbacks. Future research into the consequences of different personalization options for both consumers and producers would help designers to successfully implement product personalization in new consumer durables.

Another line of research concerns the toolkit to help consumers with the personalization process (Franke and Piller 2003). The design of the toolkit is of great importance for the success of product personalization, as is evident from Levi's Original Spin. Levi's closed its mass customization operations, because they lacked a functioning toolkit to help consumers (Franke and Piller 2004). Past research provided several guidelines for the development of a user-friendly toolkit for consumers (Vink 2003; Von Hippel 2001).

7

Discussion and Implications

This doctoral thesis investigates the concept of product attachment for ordinary consumer durables. Existing research on product attachment focuses on understanding why people develop attachment to highly emotionally laden products, such as heirlooms and jewelry (Csikszentmihalyi and Rochberg-Halton 1981; Kamptner 1995; Wallendorf and Arnould 1988).

Knowledge on experiencing attachment to ordinary durables and how designers may stimulate these emotional bonds through product design is valuable for manufacturers and society as a whole. Companies are more and more interested in establishing long-term relationships with their customers. The concept of product attachment can help achieve this goal. In addition, people are reluctant to dispose of products to which they are attached, suggesting that stimulating product attachment may be a valuable strategy for sustainable consumption.

Our research project fulfills two goals. The first goal is to provide insight in the concept of attachment to ordinary durables. Specifically, we strive to investigate which determinants may affect the strength of the emotional bond with products, how this bond develops over time, and the relationship between product attachment and product lifetime. The second goal of the project is to provide designers with an understanding of the role of the product and its design for bringing about the determinants of product attachment and, thereby, strengthen emotional bonding with products.

The current chapter first summarizes the key findings of the research project. Next, several design strategies are proposed that designers may use to stimulate the degree of attachment to a product. The chapter follows with

the implications of stimulating product attachment for consumers, companies, and society. Finally, suggestions for future research are discussed.

7.1 Summary of Key Findings

To clarify the concept of product attachment to ordinary durables, Studies 1 and 2 (Chapter 3) empirically distinguished it from product satisfaction. An important difference between the two concepts is that people can be satisfied with average performing products that do not provide the owner with something exceptional. For the development of product attachment, however, a product should convey a special meaning, over and above its utilitarian meaning.

In Chapter 2, we distinguished the following four product meanings as possible determinants: self-expression, group affiliation, memories, and pleasure. Several studies were performed to investigate the effects of these different determinants. The effect of the determinant self-expression on product attachment was investigated in Studies 3, 4, 5, and 6. The findings suggested that a product may become self-expressive of the owner's identity and, therefore, stimulate product attachment in different ways. First, products can be designed in such a way that they obtain a personality (Govers, Hekkert, and Schoormans 2002). If the product personality matches the owner's, the product can be used to express the self. Second, product personalization was investigated as a means to create a self-expressive product. When consumers personalize a product, they add a personal touch to it, due to which an emotional bond may develop. The effect of group affiliation on product attachment was investigated in Study 3. Although no support for this effect was found, we believe that group affiliation may be relevant in certain contexts. People may also experience attachment to products, because they are associated with memories (Studies 1, 2, and 3). Finally, the findings of Studies 1 and 2 (Chapter 3) showed that people are more likely to become attached to consumer durables that evoke pleasure as a result of superior utility and/or superior appearance.

A consequence of the experience of product attachment is that people display certain behaviors toward these objects. Study 3 (Chapter 4) showed that people who are attached to a product, take better care of this product, and are less eager to dispose of it. Consequently, experiencing an emotional bond with a product can result in an extension of product lifetime. Nevertheless, this longitudinal study also showed that the experience of attachment can change over time. Although people may feel attached to a product at one moment in time, this attachment may decrease. Our findings suggested that

to prolong the impact of a product's special meaning on product attachment, a person should continue to use the product.

The findings of Study 5 (Chapter 5) supported the dynamic character of product attachment by showing that the experience of product attachment is not necessarily positively related to product longevity. The experience of attachment to a product may only be short-lived, because the product's special meaning may be lost quite rapidly over time (e.g., due to fashion changes).

7.2 Attachment and Need Fulfillment

In the literature on interpersonal attachment, it is concluded that the main function of experiencing attachment to another person is to confer security, because the person to whom one feels attached helps to fulfill one's innate psychological needs (La Guardia et al. 2000). Ryan and Deci (2000) suggested that people have three innate psychological needs: autonomy, relatedness, and competence. Autonomy concerns people's feelings of volition and initiative. Associated with the fulfillment of this need is a person's perception that (s)he is able to express himself/herself as (s)he wishes (Thomson 2006). Relatedness concerns feeling connected with and cared for by another. Competence concerns people's feelings of curiosity and challenge. Of these needs, autonomy and relatedness positively affect the attachment to another person (La Guardia et al. 2000). In other words, intense attachments will develop if people give the other person the freedom to be who they are and if they make the other feel cared for. We have distinguished the determinants self-expression and group affiliation as determinants of product attachment, suggesting that the needs for autonomy and relatedness may also be relevant for experiencing attachment to certain consumer durables.

Nevertheless, interpersonal attachment and product attachment differ with respect to the manner in which they fulfill these psychological needs. In interpersonal relationships, people can directly fulfill their partner's needs for autonomy and relatedness by behaving and conversing in certain ways. Products can only fulfill these needs in an indirect way, because they merely symbolize certain associations related to one's needs for autonomy and relatedness. For example, a person can fulfill the partner's need for relatedness by being warm, loving, and nurturing to this person, whereas a wedding ring fulfills this need by being a symbol of the person's connection to the partner.

In addition to autonomy and relatedness, other needs may affect the experience of product attachment as well. This can be exemplified by analyzing other types of attachment people appear to engage in. Bhattacharya and Sen (2003) concluded that people become more attached to companies that serve their

need for self-continuation (transferring one's past into the present), which corresponds to the determinant memories that was distinguished in Chapter 2. Finally, in his research on human brands (i.e., well-known persona), Thomson (2006) hypothesized that next to autonomy and relatedness, additional needs, such as pleasure stimulation, may be relevant for strengthening the emotional bond with celebrities. Although no support for this hypothesis was found in this research, our findings suggest that fulfilling a person's need for pleasure can indeed affect the experience of product attachment.

7.3 Design Strategies

To stimulate a sustainable, long-lasting relationship with consumer durables, Walker (2006) suggested that designers could incorporate inspirational or spiritual meanings in more common, everyday products to contribute to a sustainable future. Although some special possessions (e.g., prayer-beads) may for this reason be passed down from one generation to another, we believe that this is extremely difficult to accomplish for most ordinary consumer durables, such as digital cameras or coffeemakers. Accordingly, this strategy's effectiveness for sustainability remains questionable. Nevertheless, our research corroborates Walker's argument that designers should make products with qualities that allow them to rise above the mundane (Walker 2006). In addition to spiritual meanings, we argue that consumer durables can provide meanings of self-expression, group affiliation, memories, and pleasure, which may stimulate product attachment and lengthen product lifetime as well. Below, several exploratory design strategies are proposed that may encourage these determinants of product attachment.

Self-Expression

One of the determinants that was investigated in our research project is self-expression. A possible design strategy to stimulate product attachment through the determinant self-expression is to let the personality of the product match with that of its owner. The personality of a product strongly depends on its shape, material, texture, and color and can thus be directly controlled by the designer (Govers 2004; Janlert and Stolterman 1997; Jordan 2002). In Studies 4 and 5, we found that if a person owns a product with personality associations similar to one's own personality, this product allows him/her to express individuality and to differentiate oneself from others, which positively affects the strength of the emotional bond with this product. This is even more relevant, because personality is by definition a stable construct that does not change much over time (Costa and McCrae 1988). A shortcoming

of this design strategy is that a product conveying such a special meaning is replaceable: A physically identical product conveys the same meaning. In addition, other products may take over a product's special meaning: Evoking a certain personality association is not limited to one particular product variant, because all products intentionally or unintentionally communicate particular personality characteristics. For example, many consumer durables can communicate the personality trait conscientiousness. Accordingly, for most consumer durables, it is relatively simple to replace the product in possession by purchasing a new one that communicates similar personality characteristics. For example, a couch to which one feels attached, because it expresses one's conscientious personality is replaced and disposed of without much difficulty, as long as the new couch evokes similar personality associations.

A design strategy that brings about the special meaning of self-expression, but cannot be readily replaced by another competitive product is to implement product personalization in the design of consumer durables. In Study 6 (Chapter 6), we concluded that people become more attached to products they have personalized themselves. To help designers to implement this strategy in their designs, Study 7 (Chapter 6) provided an overview of the dimensions underlying product personalization. The following seven dimensions were distinguished: Mental Effort, Physical Effort, Flexibility, Initiation, Goal of Product Personalization, Personalization Moment, and Deliberateness.

For stimulating product attachment, Mental Effort and Physical Effort are important dimensions. In Study 6, we concluded that the more effort is invested during the personalization process, the more personal the product will become. Accordingly, some personalization options may be more valuable to stimulate product attachment than others. A popular way for manufacturers to personalize durables is by offering mass customization services (Pine 1993). Norman (2004) argued that these products are better in satisfying our needs, but they do not guarantee emotional attachment. Probably, the degree of consumer effort in most mass customization services is relatively low. Mass customized products require no physical effort to be invested. In addition, the degree of mental effort is relatively low, because consumers are in general only allowed to make choices among predetermined alternatives. Because other consumers can easily create an identical product, mass customized products are probably not considered to be entirely unique. As a result, these personalized products are necessarily limited in providing the symbolic meaning of self-expression and in stimulating product attachment.

To stimulate product attachment, designers should implement those types of product personalization that demand a sufficient level of consumer effort. An example of the latter is the NOKIA 3220 mobile phone (see Figure 6.6, p. 109) that allows consumers to personally design their own cut-out cover using their

own creativity, instead of merely choosing one among several predetermined covers. This provides consumers with the opportunity to create a more personal and unique product. If consumers are greatly involved in the personalization process, the product may become irreplaceable, because only this specific object resulted from the person's involvement and it is difficult or in some cases even impossible to create an identical product again.

Although personalization options with higher degrees of consumers' effort can result in stronger attachments, these options also have a downside. Consumers may not have the know-how, experience, and practical skills to personalize their products. Furthermore, they may not have a clear impression of what they want (Bettman, Luce, and Payne 1998) or they may not fully understand what solutions correspond to their needs and desires (Thomke and Von Hippel 2002). Furthermore, consumers may spoil the product, because they are not sufficiently skilled to design their own products. Consumers may also become confused with the great number of options available (Dellaert and Stremersch 2005; Huffman and Kahn 1998; Zipkin 2001). It is the designer's task to create a context in which a balance is found between creating design opportunities and guaranteeing adequate product quality. Product personalization can only be a success if designers are able to design the personalization process in such a manner that the consumer can handle the consequences. Accordingly, designers could create a toolkit to support the consumers in their choice, while they may still take credit for the product design (Crabbe 2001; Franke and Schreier 2002; Thomke and Von Hippel 2002; Von Hippel 2001). For example, toolkits can offer consumers module libraries with a number of standards for several product parts. Consumers can creatively use these standards as a starting point to create one's own unique product, while restricting the risk.



Figure 7.1 Product personalization on Freitag's website

An example of a company that offers a toolkit with a satisfactory balance between the risks and benefits of product personalization is Freitag. Freitag sells personalized bags made out of recycled truck tarpaulins. On the website (<http://www.freitag.ch>), consumers can create their own personalized bag by positioning the various stencils on the tarpaulins that are available at that moment (see Figure 7.1). During the 'design process', the consumer can see which pieces of the tarpaulins are still available and which are already used for other bags. Because each part of each tarpaulin can only be used for one bag, every bag is different. Moreover, the bag becomes irreplaceable, because only this particular specimen resulted from the person's involvement. In comparison to most mass customization services, the input of the consumer is enhanced, while restricting the risks (Mugge and Schoormans 2005).

Another strategy to influence the determinant self-expression is to let a designer develop products that are highly unique (Mugge, Schoormans, and Schifferstein 2005). Unique or exclusive products appeal to the individual's desire to be different from others and are, therefore, superior in expressing a person's identity (Tepper Tian, Bearden, and Hunter 2001). Moreover, unique or exclusive products are scarce and cannot easily be replaced, suggesting that the products are irreplaceable. Designers and product developers may implement this strategy by producing limited series of products, or by producing series of products that are all slightly different. For example, Canon has produced several limited edition series (e.g., special colors) for its IXUS digital camera. It is also possible to produce products by hand, due to which each individual specimen is somewhat different from all others.

The strategy to create unique or exclusive products appears to resemble the strategy of product personalization, because both result in unique products. Nevertheless, we believe that personalization may be more valuable to stimulate long-lasting product attachment. Product personalization does not merely bring about a more unique product, it also represents a personal accomplishment, due to the consumer's active participation in the personalization process. As a consequence of this active participation, the product is perceived as better fitting to one's preferences and thus as more self-expressive (Simonson 2005).

Group Affiliation

In addition to a need to distinguish oneself from others, people simultaneously want to feel connected to specific others (Kleine, Kleine, and Allen 1995; Kleine and Baker 2004). As a result, people may experience attachment to products that represent their connection to others. The determinant group affiliation was investigated in Study 3 (Chapter 4). However, in this longitudinal study no support was found for the effect of this determinant on product attachment.

For the particular product and context that were investigated, a feeling of being connected to other people did not contribute to the development of product attachment. In contrast, past research showed that group affiliation is indeed relevant for certain possessions, such as furniture, silverware, and paintings (Kleine et al. 1995; Schultz, Kleine, and Kernan 1989). The determinant group affiliation may thus affect the degree of product attachment in other contexts.

A design strategy to stimulate the determinant group affiliation is to encourage social contact with and through products by designing products that are shared with others or used in a group setting (Mugge et al. 2005). In that case, a co-experience occurs, which is the blend of user experience of products and social interaction (Battarbee 2003a, 2003b). As a result of the shared use, the owner may associate the product more and more with certain people or events. In time, the associations and the product become inseparable to the owner, and the product becomes irreplaceable. For example, a guitar may become irreplaceable, because it symbolizes a person's belonging to a rock band.

Memories

Past research concluded that the determinant memories is an important reason for people to become attached to products (Kleine et al. 1995; Schifferstein and Pelgrim 2004; Wallendorf and Arnould 1988). Obviously, this determinant is of great importance for the development of emotional bonds with highly emotionally laden family heirlooms. In addition, we found in Studies 1, 2, and 3 (Chapters 3 and 4) support for the effect of memories on experiencing attachment to products that serve above all a utilitarian meaning to the owner. Although product-related memories usually develop independent from the product design and are difficult to influence by the designer, we would like to propose two exploratory design strategies that may stimulate the formation of product-related memories (Mugge et al. 2005).



Figure 7.2 Alessi's Mary Biscuit.
Design: Stefano Giovannoni (1995),
Biscuit box in PMMA and thermoplastic
rubber

The first strategy is to encourage product-related memories by implementing odors in products. Odors may elicit associations that are resistant to change (Aggleton and Waskett 1999) and that are more effective in arousing consumers' mood or feelings than other sources of sensory stimulation (Herz 1998). In cases that an odor is likely to evoke a similar, pleasant association among a large group of people, implementing this odor in a product may be used effectively to let consumers experience this pleasant feeling again. For example, Alessi's Mary Biscuit (see Figure 7.2) is a biscuit box that releases a vanilla biscuit smell upon opening, which is likely to elicit a feeling of nostalgia (Holbrook, 1993) by reminding a person of the past (e.g., my grandmother's cookies). A potential difficulty of this strategy is that a good fit is required between the scent and the product. Moreover, the use of particular scents will decrease the general applicability of a product. For example, the use of a coconut smell for a biscuit box makes it appropriate to preserve coconut cookies, but probably less suited for chocolate cookies.

Another opportunity to stimulate product attachment through the determinant memories is to design products that 'age with dignity'. Such products are made of materials that form and wear gracefully in time (Chapman 2005; Van Hinte 1997, p. 127). Examples are leather jackets and jeans that start showing wear and tear. During use, a leather jacket can shape according to the owner's body and can show bare spots. The result is a unique jacket with a personal touch that symbolizes the shared history of the person with the product. When implementing this design strategy, designers should bear in mind that 'aging with dignity' can only be a success if the signs of wear are interpreted positively by the owner. The signs of wear should thus make the product more attractive. For example, wooden furniture is generally considered to be more lively and natural if it has some scratches and bumps.

Pleasure

The last determinant that was investigated in our research project is pleasure. Studies 1 and 2 (Chapter 3) indicate that products may evoke pleasure as a result of their superior utility and/or superior appearance. Based on these findings, a potential design strategy to stimulate product attachment is to make products that perform better and/or are more beautiful than comparable products. These particular products may gain a special meaning to the owner and an emotional bond may develop. We acknowledge that this is no easy task for designers, because many companies already have a strategy to renew their product portfolio by making adjustments on the product characteristics, such as enhancing product quality, adding new features, and by improving the product's style (Kotler et al. 2003). Another difficulty of this design strategy is that technological improvements in new products may quickly reduce the pleasure

gained from the product in possession. Due to this planned obsolescence, the experience of pleasure from the currently owned product is reduced and the special meaning and the experience of product attachment will only be short-lived (Davis 2002). For example, a person can experience pleasure from one's mobile phone, because it includes a high-quality digital camera. If other mobile phones are introduced with even better digital cameras, the pleasure is reduced. These arguments are corroborated by the findings from Schifferstein and Pelgrim (2004). They found that the experienced degrees of product attachment and pleasure are relatively high for products that are owned for less than a year. However, after the first year of ownership, the experienced attachment and pleasure already decreased.

To evoke long-lived pleasure, designers should try to incorporate pleasure-eliciting attributes that are more or less exclusive for a particular product variant. Then, it is less likely that other products can take over the special meaning of pleasure. Accordingly, people have a stronger tendency to continue such a relationship and the experience of attachment to the product will persist for a longer period of time.

An opportunity to achieve this is to create products that surprise the consumer. Past research concluded that surprising products are more enjoyable (Vanhamme and Snelders 2003). Although it is unlikely that the product continues to strongly surprise the consumer over time, implementing a surprise in the product design can still have a long-term effect on pleasure and on product attachment. Being surprised brings about physiological (e.g., changes in heart rate) and behavioral (e.g., special facial expression) changes, which encourages the surprised person to focus their attention on the product. As a result of this heightened awareness, a surprise is better stored in one's memory (Derbaix and Vanhamme 2003; Lindgreen and Vanhamme 2003). Consumers may think back of the pleasantly surprising event while using the product and may, therefore, continue to experience pleasure from the product over an extended period of time. Ludden, Schifferstein, and Hekkert (2006) presented several design strategies to create surprising products. These strategies are based on a combination of new and familiar elements in the product design. An example of such a design strategy is the use of new materials that look like a familiar material. This strategy creates a Hidden Novelty surprise type, because the surprising product seems to be familiar to the perceiver, but has unexpected tactual properties (e.g., weight, flexibility). An example is a lamp that looks as if it is made out of matt glass, whereas it is actually made out of a flexible rubber. In addition, products may evoke a Visual Novelty surprise type if they seem unfamiliar to the owner. A possible design strategy for this surprise type is to use a new appearance for a known product or material, which may lead to an uncertain and incorrect feel expectation.

Discussion

Based on an understanding of the four determinants of product attachment, several design strategies were proposed for stimulating the experience of attachment to products. Nevertheless, we do not claim that the presented strategies are exhaustive. Other opportunities may exist to design products in such a way that they are more likely to bring about one or more of the determinants of product attachment. We believe that the presented strategies may serve as inspiration for designers to design products that convey a special meaning.

Past research concluded that consumers can develop many different relationships with brands that differ in their intensity, their affective character, and their behaviors toward the object of attachment over time (Aggarwal 2004; Aggarwal and Law 2005; Fournier 1998; Whang et al. 2004). Similarly, people can experience different relationships with their consumer durables, resulting in different behaviors toward these products. To understand the impact of product design during ownership, designers need to consider which type of relationship is likely to occur when they encourage a certain special meaning in a product. We suggest that the type of person-product relationship that develops depends on the extent to which it is possible for other competitive products to take over the product's special meaning. If other products in the market can convey a similar meaning to the owner, replacing and disposing of the product can be relatively painless and the experience of product attachment may only be short-term. On the other hand, if the special meaning only holds for a particular object, the experience of attachment to the product is likely to last over time, resulting in product longevity. From a sustainability perspective, design strategies that encourage the product's irreplaceability are thus more valuable. A product with a replaceable product meaning can only provide good opportunities to lengthen the product's lifetime, if the special meaning is specific to the product variant. A shortcoming of the encouragement of such a person-product relationship is that other companies may copy the design and utilities and may thus provide products with similar meanings (Loken, Ross, and Hinkle 1986; Miaoulis and D'Amato 1978).

Although our research project suggests that designers may stimulate product attachment in the product design, it is questionable whether designing products that are likely to convey a special meaning to the owner is sufficient to stimulate long-term product attachment. Based on the results of Study 3 (Chapter 4), we propose that designers should first of all strive for continued product usage: For the people who stopped using their product, the product's special meaning lost its impact on the experience of product attachment. A possible reason for people to stop using a product is that the product does not perform according to the owner's expectations anymore. In other words,

to continue product usage the owner should feel satisfied with the product's performance. In addition to incorporating a special meaning, designers should thus take into account consumers' current and future expectations of the product's performance in the product design.

Designers should also be aware that despite of all their efforts, it is eventually the individual consumer who gives a product its meaning. People may give the same product very different meanings as a result of cultural, social, and personal influences (Chapman 2005; Kazmierczak 2003; McCracken 1986; Siu 2003). Therefore, the exact meaning a product will obtain to an individual consumer remains hard to predict.

Another potential difficulty of stimulating product attachment through product design is that consumers do not actively search for it at purchase. Consumers focus on the present (Ratchford 2001; Thompson, Hamilton, and Rust 2005), whereas experiencing an emotional bond with a product develops bit by bit over the course of time. Accordingly, the possibility to develop an emotional bond with the product will not affect consumers' purchase decision. Stimulating product attachment can thus only serve as an indirect strategy and additional strategies are needed to encourage the purchase of such a product. Past research concluded that when consumers decide which product to acquire, they are mostly cognitively oriented and focus on utilitarian features (Dhar and Wertenbroch 2000; Thompson et al. 2005). Although our findings suggest that these features are less useful for stimulating long-term product attachment, designers should thus design a product that is also attractive based on its utilitarian features to initiate the person-product relationship.

7.4 Implications

Experiencing attachment to consumer durables can have consequences for the person who uses the product, but also for the company that sells the product. Below, these implications are elaborated on. Furthermore, the value of stimulating product attachment for sustainable consumption is discussed.

Implications for Consumers

In Chapter 1, several consequences of product attachment for the person who owns the product were discussed. If a person feels attached, (s)he experiences more protective behaviors to the product and is less likely to dispose of it (Ball and Tasaki 1992; Belk 1988; Mugge et al. 2005). Furthermore, the object of attachment triggers the person's positive emotions (Schultz et al. 1989) and can, therefore, enhance a person's well-being (Diener and Lucas 2000). However, if the experience of attachment to a product results in an extension

of the product lifetime, this may also have a downside, because this may bring about several risks for the consumer (Cox 1967; Roselius 1971). If a person owns and uses a product for an extended period of time, this restrains him/her from following the latest fashion or technology trends. Accordingly, a person may be perceived as old-fashioned by other people, suggesting a potential social risk. Another potential risk of product longevity is that products may become less safe over time or become perceived as such, because the products' components become less reliable or because new products with additional safety measures (e.g., introduction of side airbags in cars) are introduced.

Although in some cases it may be financially beneficial to repair the product in possession rather than to purchase a new one, people may perceive the increasing need for repair of a product that is owned for a longer period of time as a financial risk, resulting in a bias toward replacement (Antonides 1990). When implementing design strategies to stimulate product attachment, designers should try to keep these perceived risks to a minimum.

Implications for Companies

A potential problem for companies interested in stimulating the degree of product attachment is that it may postpone consumers' product replacement and, therefore, reduce sales. In general, companies are reluctant to implement (sustainable) design strategies if these are potentially detrimental to financial profit. However, several commercial opportunities can be indicated for businesses willing to develop long-lasting products by stimulating the experience of attachment to the product.

If a product performs well, a stronger person-product relationship and an extended product lifetime can increase consumers' loyalty to the brand (Chapman 2005; Davis 2002). In other words, the attachment to the product is transferred to the brand, resulting in brand attachment. This can affect consumers' future purchases, because consumers will be more eager to buy other products bearing the same brand. For example, being attached to a Philips shaver may lead to the purchase of a Philips television. Moreover, attached consumers are likely to be more vocal in recommending the same product or brand to others. Product-service combinations may provide a promising area for firms' profitability and growth, especially in saturated markets (Chapman 2005; Kostecki 1998; Van Nes 2003). Companies may gain profit from the services that are delivered with a product. For example, a company can provide additional components, upgrades of a product, or a good repair system. In that case, extending the usage period and thereby delaying the replacement moment of the product is worthwhile: The longer the consumer uses the product, the longer (s)he will make use of the services provided. Of course, it is unlikely this is a worthwhile strategy for all product

categories. Nevertheless, at present many companies that produce products, such as mobile phones, PDAs, cars, computers, and printers already benefit from the services or additional components that are provided, and much more opportunities are available (Chapman 2005; Kostecki 1998; Van Nes 2003).

Implications for a Sustainable Society

Encouraging product attachment is valuable for a sustainable society, because it may result in product longevity, which is generally recognized as an important eco-design strategy. Nevertheless, in some cases, it may be better to refrain from extending the product lifetime. For products with a relatively low material investment and a relatively high energy-efficiency improvement, early replacement is preferred over product longevity (Van Nes 2003). For most consumer durables, however, product longevity is beneficial for sustainability. In addition to product attachment, several other eco-design strategies have been proposed to tackle the reasons for people to replace their products and, therefore, extend the product lifetime (Charter and Tischner 2001; Van Hemel and Brezet 1997; Van Nes 2003). An advantage of the strategy to strengthen the person-product relationship compared to the other strategies is that it does not require consumers' pro-environmental behavior. Due to the emotional bond with a product, a person will take better care of this product and postpone its replacement for his/her own personal benefit. In contrast, other sustainability strategies (e.g., separation of waste) demand consumers' explicit involvement with a sustainable society, while the public opinion with respect to environmental issues is difficult to influence (Sociaal en Cultureel Planbureau 2000).

Several eco-design strategies to stimulate product longevity focus on the product's technical lifetime: The time during which the product functions well. For example, the strategies to increase the product's reliability and durability, to provide easy maintenance and repairs, and to implement a 'long-life' guarantee all assist consumers in extending their products' technical lifetime. However, many products are replaced, while they are still functioning well (Stahel 1986; Van Nes 2003). Besides product malfunctioning, consumers have many other reasons to replace their products (Bayus 1991; Bayus and Gupta 1992; DeBell and Dardis 1979; Jacoby, Berning, and Dietvorst 1977; Van Nes 2003). An important reason to develop a replacement need is that consumers become more demanding over time due to technological progress (e.g., additional features, newer technologies) or fashion changes.

Therefore, other eco-design strategies tackle the psychological lifetime of products: The time during which a person perceives his/her product to be valuable. Examples of such eco-design strategies are to implement a modular or adaptable product structure that allows consumers to incorporate the

benefits of a new technology or to renew the product aesthetically, to offer variation in the product design to keep the product interesting, or to reduce the product's fashionability by creating products with a 'classic design'. All these strategies try to enhance the attraction of the product in possession compared to that of new products.

To stimulate sustainable consumption, it may be interesting for designers to combine various eco-design strategies to address multiple consumers' replacement motives. Although people tend to hold on to products to which they feel attached, it is probable that an object of attachment will still be replaced if it is malfunctioning. If different strategies are mixed, it is important to determine in what way they may influence each other. For example, if the strategy to stimulate the experience of attachment to products is combined with a strategy for modular design, the replacement of certain modules should not decrease the strength of the emotional bond. This implies that the replacement of modules should not change the meaning of the 'core' product to the owner. More research is necessary to determine what product changes are tolerable. Additionally, it is important to implement other end-of-life strategies (e.g., recyclability) in the product design, because eventually all product life cycles end in the disposal of the product.

7.5 Suggestions for Future Research

This research project focuses on the emotional relationship between an individual consumer and his/her product. Nevertheless, many products are not owned and used by only one person, but by groups of people (e.g., families) (Price 2007). This joint ownership may affect consumers' relationships with products. For example, a person may consider a vase that was inherited from her spouse's grandfather as special, because her spouse experiences a strong emotional bond with it. To gain a complete understanding of the relationships that people experience with products, more research on the joint ownership of products is necessary.

Another topic for further research concerns the investigation of product attachment during the whole lifespan of a product. The present research project has provided a first step to investigate product attachment in a longitudinal setting. However, for this research project, it was only feasible to perform two waves in a relatively limited time span. An investigation of the full process of ownership, from purchase, through the development of product attachment, to detachment, and ultimately, the disposition of the product could deliver valuable insights in the reasons why people dispose of products to which they once felt attached.

So far, the effect of experiencing product attachment on the life of the people who own the product remains relatively unclear (Kleine and Baker 2004). On the one hand, people generally experience more positive emotions to objects of attachment (Schultz et al. 1989), due to which product attachment may be beneficial for a person's well-being. On the other hand, if product attachment results in product longevity, it may also bring about certain risks as explained in Section 7.4. Research into the advantages and disadvantages of long-term product attachment for consumers could provide interesting new insights.

The design strategies proposed in this chapter warrant additional research attention as well. Although these design strategies can be justified theoretically, it remains difficult to determine the actual effect of implementing these strategies in the product design. To test the impact of the design strategies on the experience of product attachment, more research is necessary.

An additional issue of the presented design strategies is that some strategies are relatively specific and probably only feasible in certain contexts. More research is needed to investigate the generalizability of our findings and to explore what preconditions or limitations the design strategies may depend upon. For instance, past research revealed age and gender differences in the reasons why people consider certain products as treasured, special, or favorite (Csikszentmihalyi and Rochberg-Halton 1981; Dyl and Wapner 1996; Furby 1978; Kamptner 1991, 1995). For women and older consumers, the determinants group affiliation and memories appear to be more relevant, whereas men and younger consumers treasure products for the pleasure that is provided as a result of utilitarian-related aspects. Furthermore, cultural differences may exist with respect to the determinants of product attachment (Mehta and Belk 1991; Wallendorf and Arnould 1988). The current research project focuses on the experience of product attachment in Western cultures. It is likely that the determinant self-expression is less important in cultures that are oriented toward one's belonging to a group (e.g., in Asian countries), rather than the individual. In contrast, in these cultures the determinant group affiliation may have a relatively larger impact on product attachment.

It is also questionable whether all people are equally likely to develop attachment to products. Thomson and Johnson (2006) investigated how individual differences in personal relationship attachment style can predict the relationship this person will experience with brands and with service providers. Two contradictory effects are plausible. First, a person's attachment style for interpersonal relationships may also hold for one's relationships with service providers, brands, or objects. For example, if a person has an avoidant (i.e., lack of trust in relationship partners and a lack of comfort with intimacy) or anxious attachment style (i.e., fear of abandonment in relationships), a similar relationship may develop with a brand or object. Thomson and Johnson (2006)

found support for this hypothesis in a service and brand context. On the other hand, we could also hypothesize that people who routinely have problems forming meaningful interpersonal bonds (e.g., people with an avoidant or anxious attachment style), may become more attached to brands or objects to compensate for unanswered social needs without having to trust or become intimate with a real person.

Based on the findings of Study 5, we conclude that the consumers' fashion consciousness may be an additional influencing factor for their relationships with products. Because fashion-conscious consumers want to follow the latest trends, their attachment to consumer durables is often short-lived.

The determinants of product attachment may also be more or less relevant for certain product categories. For example, highly utilitarian products (e.g., lawn mower, washing machine) are less likely to be used for self-expression. Future research should provide designers with a better understanding of the design strategies that provide the best opportunities to encourage the degree of product attachment for a particular product category, situation, and target group.

Summary

Product Attachment – Ruth Mugge

This doctoral thesis investigates the concept of product attachment for ordinary consumer durables. Product attachment is defined as the strength of the emotional bond a consumer experiences with a specific product. This definition implies that a strong relationship or tie exists between the individual on the one hand and the object on the other. Companies are more and more interested in establishing long-term relationships with their customers. The concept of product attachment can help achieve this goal. Furthermore, people are reluctant to dispose of products to which they are attached, suggesting that stimulating product attachment may result in an extension of the product lifetime. Consequently, stimulating product attachment may be a valuable strategy for sustainable consumption. Knowledge on experiencing attachment to ordinary durables and on how designers may stimulate these emotional bonds through product design is thus valuable for manufacturers and society as a whole.

This research project fulfills two goals. The first goal is to provide insight in the concept of attachment to ordinary durables. Specifically, we strive to investigate which determinants may affect the strength of the emotional bond with products, how this bond develops over time, and the relationship between product attachment and product lifetime. The second goal of the project is to uncover the role of the product and its design for bringing about the determinants of product attachment. This knowledge provides designers with opportunities to strengthen the emotional bonding with products.

Chapter 1 defines the concept of product attachment and conceptually differentiates it from other constructs regarding a person's bonding with material things and consumers' post-purchase behavior, such as brand attachment, materialism, and product involvement. In contrast to other constructs, product attachment encompasses the emotional bonding with certain product variants or with specific product specimens. As a consequence, the concept of product attachment is especially relevant for designers of consumer durables.

Chapter 2 is a theoretical chapter that provides an overview of the different determinants of product attachment for ordinary durables. Based on the literature on product meanings and on product attachment, the following four determinants were distinguished: self-expression, group affiliation, memories, and pleasure. The determinant self-expression stems from a person's desire to differentiate oneself from others and to express his/her personal identity. Group affiliation is concerned with people's need to be connected to others. The determinant memories covers products that remind a person of important people, events, or places and, therefore, help to maintain a sense of the past. The last determinant involves the pleasure experienced during usage as a result of superior functionality and aesthetic pleasure derived from the product's appearance.

Chapter 3 provides a better understanding of the concept of product attachment to ordinary durables by empirically distinguishing it from satisfaction. Experiencing satisfaction with products has received a great deal of research attention. Moreover, product attachment and satisfaction are both affected by the pleasure a product evokes as a result of its superior utility or appearance. Our findings suggested that an important difference between the two concepts is that people can be satisfied with average performing products, because these products function according to expectations, but it is unlikely that people develop attachment to these products. For the development of attachment, a product should provide the owner with a special meaning, over and above its utilitarian meaning. Furthermore, in contrast to satisfaction, the experience of attachment to a product may also develop as a result of the product's symbolic associations (e.g., the product-related memories).

Chapter 4 provides insight into the consequences of product attachment. People who are attached to a product, take better care of this product, and are less inclined to dispose of it. Consequently, experiencing an emotional bond with a product can result in an extension of product lifetime. Nevertheless, Chapter 4 also showed that product attachment can change over time due to dynamics in the product, the person, and the situational context. Although people may feel attached to a product at one moment in time, this attachment may decrease, because the degree to which the product conveys a special meaning

decreases as well. Moreover, the determinants' impact on product attachment can change. In time, some determinants may become more important for stimulating product attachment, whereas others lose their impact. To prolong the impact of a product's special meaning on product attachment, a person should continue to use the product. If a person has no regular interaction with a product, the product and its meaning become more and more separated and the product gradually loses its meaning. Therefore, stopping the usage of a product is a first step in breaking off a person's relationship with a product. In Chapters 5 and 6 two different ways to encourage the determinant self-expression are examined. In Chapter 5, product personality is explored as a means to influence this determinant and, consequently, affect the experience of product attachment. The personality of a product strongly depends on its shape, material, and color and can thus be directly controlled by the designer. Two studies revealed that consumers develop stronger attachment to products with a personality that is congruent to their own personality. However, being attached to a congruent product does not necessarily imply that the consumer-product relationship will be long-lasting. Fashion may serve as a moderator for the relationship between product attachment and product lifetime. To extend the product lifetime, the product's design should remain to be in general fashion acceptance. Otherwise, evaluation of the product as being old-fashioned will decline the product's value for maintaining a positive view of the self, resulting in early detachment and a premature replacement of the product.

Chapter 6 elaborates on the determinant self-expression by investigating the effect of product personalization as another means to stimulate the degree of product attachment. Implementing product personalization requires that consumers operate as co-designers of their own personalized product. By personalizing a product, a person invests effort in the product, and the product is used to express his/her identity. The degree of self-expression, in turn, positively affects the degree of attachment to the product. To implement those personalization options in the product design that are the most valuable for strengthening product attachment, a comprehensive overview of the spectrum of personalization options was useful. Based on a categorization study, the following seven dimensions underlying product personalization were distinguished: Mental Effort, Physical Effort, Flexibility, Initiation, Goal of Product Personalization, Personalization Moment, and Deliberateness. By choosing between various positions on the seven distinguished dimensions, designers can implement personalization options in the design of new products and, thereby, stimulate product attachment.

Chapter 7 summarizes the key findings and discusses the implications of stimulating product attachment for consumers, companies, and society. Also,

several design strategies are proposed that designers may use for influencing the determinants and thereby stimulating the degree of attachment to a product. For example, designers may implement product personalization in the product design to encourage the determinant self-expression. Another possibility is to design products that 'age with dignity' to stimulate product attachment through the determinant memories. From a sustainability perspective, design strategies that encourage the product's irreplaceability are more valuable. If the product and its meaning are irreplaceable, other products in the market cannot convey a similar meaning to the owner. Replacing and disposing of such a product is thus perceived as a loss of its special meaning. As a result, the experience of attachment to the product is likely to last over time, resulting in product longevity.

Samenvatting

Producthechting – Ruth Mugge

In dit proefschrift wordt de hechting aan gewone, duurzame producten onderzocht. Producthechting is gedefinieerd als de sterkte van de emotionele band die een consument met een specifiek product ervaart (Schifferstein, Mugge en Hekkert 2004). Producthechting betekent dat een individu een relatie met een object is aangegaan. Bedrijven zijn steeds meer geïnteresseerd in het creëren van langdurige consumentenrelaties. Het concept van producthechting kan hier een bijdrage aan leveren. Doordat personen producten, waar ze aan gehecht zijn, niet snel wegdoen, kan het stimuleren van producthechting ook leiden tot een langere productlevensduur en zo dienen als een waardevolle eco-designstrategie voor duurzame consumptie. Kennis over het ervaren van hechting aan duurzame producten en over de wijze waarop ontwerpers deze emotionele band kunnen versterken door middel van het productontwerp is derhalve waardevol voor fabrikanten en de maatschappij.

Dit onderzoeksproject vervult twee doelen. Het eerste doel is het verschaffen van inzicht in het concept van hechting aan duurzame producten. In het bijzonder wordt onderzocht welke determinanten de sterkte van de emotionele band met producten beïnvloeden, hoe deze band zich ontwikkelt over de tijd heen en hoe producthechting en de productlevensduur gerelateerd zijn. Het tweede doel van dit project is te achterhalen wat de rol van het product en zijn ontwerp is in de totstandkoming van de determinanten van producthechting. Deze kennis geeft ontwerpers mogelijkheden om de emotionele band met producten te versterken.

In Hoofdstuk 1 wordt producthechting gedefinieerd en conceptueel onderscheiden van andere constructen uit de consumentengedragliteratuur, zoals merkhechting, materialisme en productbetrokkenheid. In tegenstelling tot andere constructen betreft producthechting de emotionele band met bepaalde productvarianten of met specifieke exemplaren.

Hoofdstuk 2 is een theoretisch hoofdstuk waarin een overzicht wordt gegeven van de verschillende determinanten van producthechting aan gewone producten. Op basis van onderzoek naar productbetekenissen en naar producthechting zijn de volgende vier determinanten onderscheiden: zelfexpressie, groepsverwantschap, herinneringen en plezier. De determinant zelfexpressie komt voort uit de wens van een persoon om zichzelf te onderscheiden van anderen en om zijn/haar persoonlijke identiteit te uiten. Groepsverwantschap betreft de behoefte van mensen om zich verbonden te voelen met anderen. De determinant herinneringen omvat producten die een persoon herinneren aan belangrijke personen, gebeurtenissen of plaatsen, en die daardoor bijdragen aan het behoud van iemands verleden. De laatste determinant betreft het plezier dat een product tijdens gebruik kan verschaffen als gevolg van zijn superieure functionaliteit en het esthetische plezier dat voortkomt uit het productuiterlijk.

In Hoofdstuk 3 wordt een beter begrip van het concept van producthechting aan gewone producten verkregen door het empirisch te onderscheiden van producttevredenheid. Het ervaren van tevredenheid met een product heeft veel onderzoeks aandacht gekregen. Zowel producthechting als tevredenheid worden beïnvloed door het plezier dat een product opwekt als gevolg van zijn superieure functionaliteit of uiterlijk. Onze resultaten toonden aan dat een belangrijk verschil tussen de twee concepten is dat personen tevreden kunnen zijn met een gemiddeld functionerend product, omdat dat product aan de verwachtingen voldoet. Daarentegen is het onwaarschijnlijk dat personen gehecht raken aan dergelijke producten. Voor de ontwikkeling van hechting moet een product, naast zijn standaard utilitaire betekenis, voor de eigenaar een speciale betekenis bezitten. Producthechting kan bovendien ontstaan als gevolg van de symbolische associaties van een product (bv. de productgerelateerde herinneringen). Deze symbolische associaties hebben geen directe relatie met het functioneren van een product en beïnvloeden daardoor niet producttevredenheid.

Hoofdstuk 4 verschaft inzicht in de consequenties van producthechting. Personen die sterk gehecht zijn aan een product, zorgen beter voor dit product en zijn minder geneigd om dit product af te danken. Dientengevolge kan het ervaren van een emotionele band met een product resulteren in een verlenging van de productlevensduur. Hoofdstuk 4 laat ook zien dat de sterkte van de hechting kan variëren in de tijd door veranderingen in het product, de

persoon en de situationele context. Wanneer personen op een zeker moment gehecht zijn aan een product, kan deze hechting afnemen, doordat het product geleidelijk zijn speciale betekenis verliest. Daarnaast kan de invloed van de determinanten op producthechting veranderen. Gedurende de periode dat een product in bezit is, kunnen sommige determinanten belangrijker worden, terwijl andere hun invloed verliezen. Om de invloed van de speciale betekenis van een product te handhaven, dient de consument zijn product te blijven gebruiken. Wanneer een persoon geen regelmatig contact met een product heeft, wordt het product steeds meer gescheiden van zijn betekenis en verliest het product geleidelijk zijn speciale betekenis. Stoppen met het gebruik van een product is daarmee de eerste stap in het verbreken van de relatie met dit product.

In Hoofdstukken 5 en 6 worden twee verschillende manieren om de determinant zelfexpressie te bevorderen onderzocht. In Hoofdstuk 5 wordt productpersoonlijkheid bestudeerd als een manier om de determinant zelfexpressie te beïnvloeden en daarmee de hechting met een product te stimuleren. De persoonlijkheid van een product wordt sterk bepaald door zijn vorm, materiaal en kleur en kan dus direct door de ontwerper worden beïnvloed. Twee studies toonden aan dat consumenten sterker gehecht raken aan producten met een persoonlijkheid die overeenkomt met hun eigen persoonlijkheid. Desalniettemin leidt het gehecht zijn aan een product met een overeenkomstige persoonlijkheid niet noodzakelijkerwijs tot een langdurige relatie met een dergelijk product. Modeveranderingen beïnvloeden de relatie tussen producthechting en de productlevensduur. Om de productlevensduur te verlengen dient het productontwerp het algemene modebeeld te blijven volgen. Indien dit niet het geval is, zal het product als 'ouderwets' worden beoordeeld, wat de waarde van dit product voor het onderhouden van een positief zelfbeeld doet afnemen. Dit zal resulteren in onthechting en voortijdige vervanging van het product.

In Hoofdstuk 6 wordt de determinant zelfexpressie nader onderzocht door de invloed van productpersonalisatie op de mate van producthechting te bepalen. De implementatie van productpersonalisatie vereist dat consumenten als co-designers van hun eigen gepersonaliseerde product opereren. Door een product te personaliseren investeert een persoon inspanning in het product en wordt het product gebruikt om zijn/haar identiteit tot uiting te brengen. Zelfexpressie heeft op zijn beurt een positief effect op de mate van hechting aan het product. Om die personalisatie-opties te implementeren die het meest waardevol zijn voor de bevordering van producthechting, is een uitgebreid overzicht van het spectrum van personalisatie-opties nuttig. In een categorisatiestudie zijn de volgende zeven dimensies onderscheiden: Mentale Inspanning, Fysieke Inspanning, Flexibiliteit, Initiatie, Doel van

Productpersonalisatie, Personalisatiemoment en Doelbewustheid. Door een keuze te maken uit de verschillende posities op de zeven onderscheiden dimensies kunnen ontwerpers personalisatie-opties in het ontwerp van nieuwe producten implementeren en daarmee producthechting stimuleren.

Hoofdstuk 7 vat de belangrijkste bevindingen samen en bediscussieert de implicaties van het stimuleren van producthechting voor consumenten, bedrijven en de maatschappij. Daarnaast worden diverse ontwerpstrategieën voorgesteld, waarmee ontwerpers de determinanten kunnen beïnvloeden en zo de mate van producthechting kunnen stimuleren. Ontwerpers kunnen bijvoorbeeld productpersonalisatie in het productontwerp implementeren om op die manier de determinant zelfexpressie te bevorderen. Een andere mogelijkheid is het ontwerpen van producten, die ‘waardig verouderen’ om zo producthechting te stimuleren door middel van de determinant herinneringen. Vanuit een milieuperspectief zijn ontwerpstrategieën, die leiden tot onvervangbare producten, meer waardevol. Indien een product met zijn betekenis onvervangbaar is, kunnen andere producten in de markt niet exact dezelfde betekenis voor de eigenaar vervullen. Daardoor zal het vervangen en weggooien van een dergelijk product als een verlies van deze speciale betekenis worden ervaren. Het resultaat hiervan is dat de hechting aan het product langer zal blijven bestaan, wat leidt tot een verlenging van de productlevensduur.

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Appendices

Appendix A1: Measurement Scales used in Studies 1 and 2

All items are reported in English and Dutch (*italics*). An asterisk following an item denotes a reversed item.

Product Attachment

1. Joris is very attached to this camera
Joris is erg gehecht aan dit fototoestel
2. This camera has no special meaning for Joris*
*Dit fototoestel heeft geen speciale betekenis voor Joris**
3. This camera is very dear to Joris
Dit fototoestel is Joris erg dierbaar
4. Joris has a bond with this camera
Joris heeft een band met dit fototoestel
5. This camera does not move Joris*
*Dit fototoestel doet Joris niets**
6. Joris feels emotionally connected to this camera
Joris voelt zich emotioneel verbonden met dit fototoestel

Satisfaction

1. Joris is satisfied with this camera
Joris is tevreden met dit fototoestel
2. Joris feels dissatisfied after his experiences with this camera*
*Joris voelt zich ontevreden na zijn ervaringen met dit fototoestel**

3. Joris is pleased with this camera
Dit fototoestel bevalt Joris
4. Joris is content with this camera
Joris is content met dit fototoestel
5. Delighted - Terrible scale (Westbrook 1980)
How does Joris feel about his camera?
Hoe voelt Joris zich ten aanzien van zijn fototoestel?
1 = terrible (*verschrikkelijk*)
2 = unhappy (*ongelukkig*)
3 = mostly dissatisfied (*behoorlijk ontevreden*)
4 = mixed; about equally satisfied as dissatisfied (*gemengde gevoelens; even tevreden als ontevreden*)
5 = mostly satisfied (*behoorlijk tevreden*)
6 = pleased (*blij*)
7 = delighted (*verrukt*)

Pleasure

1. Joris enjoys this camera
Joris geniet van dit fototoestel
2. It is a pleasure for Joris to use this camera
Het is voor Joris een genot om dit fototoestel te gebruiken
3. Joris feels good when he uses this camera
Joris voelt zich prettig wanneer hij dit fototoestel gebruikt
4. Joris likes to use this camera
Joris gebruikt dit fototoestel graag

Product Utility

1. Joris thinks this camera functions very well
Joris vindt dat dit fototoestel erg goed functioneert
2. Joris thinks this camera is difficult to use*
*Joris vindt dit fototoestel moeilijk te gebruiken**
3. Joris thinks this camera is very useful
Joris vindt dit fototoestel erg nuttig
4. Joris thinks this camera is very practical in its daily use
Joris vindt dit fototoestel erg handig in het dagelijks gebruik

Product Appearance

1. Joris thinks this camera is beautiful
Joris vindt dat dit fototoestel er mooi uitziet
2. Joris thinks this camera has an exquisite design
Joris vindt dat dit fototoestel een prachtige vormgeving heeft

3. Joris thinks this camera is ugly*
*Joris vindt dit fototoestel lelijk**
4. Joris thinks this camera looks attractive
Joris vindt dat dit fototoestel er aantrekkelijk uitziet

Memories

1. This camera reminds Joris of persons who are important to him
Dit fototoestel herinnert Joris aan personen die belangrijk voor hem zijn
2. For Joris, this camera is proof of something that has happened
Dit fototoestel getuigt voor Joris van iets dat gebeurd is
3. For Joris, this camera symbolizes a bond with friends or family
Dit fototoestel symboliseert voor Joris een band met vrienden of familie

Appendix A2: Measurement Scales used in Study 3

Self-Expression

1. My backpack reflects who I am
Mijn rugzak laat zien wie ik ben
2. Other people can tell by my backpack what kind of person I am
Andere mensen kunnen aan mijn rugzak zien wat voor soort persoon ik ben
3. My backpack fits my identity
Mijn rugzak sluit aan bij mijn identiteit
4. My backpack suits me
Mijn rugzak past bij me
5. My backpack says nothing about me as an individual*
*Mijn rugzak zegt niets over mij als individu**

Group Affiliation

1. My backpack indicates that I am a DUT student
Mijn rugzak geeft aan dat ik een TU-student ben
2. Through my backpack I feel connected to other DUT students
Door mijn rugzak voel ik me verbonden met andere TU-studenten
3. Through my backpack I belong to the group of DUT students
Door mijn rugzak hoor ik bij de groep TU-studenten

Memories

1. My backpack reminds me of persons or events that are important to me
Mijn rugzak herinnert mij aan personen of gebeurtenissen die belangrijk voor mij zijn

2. My backpack calls to mind someone or something that has happened
Mijn rugzak doet mij denken aan iemand of iets dat gebeurd is
3. I regard my backpack as a reminder of certain persons or events
Ik zie mijn rugzak als een herinnering aan bepaalde personen of gebeurtenissen
4. Through my backpack I think back to certain persons or events
Door mijn rugzak denk ik terug aan bepaalde personen of gebeurtenissen

Disposal Tendency

1. I would like to get rid of my backpack
Ik wil mijn rugzak graag kwijt
2. If it was possible, I would sell my backpack
Als het zou kunnen, zou ik mijn rugzak verkopen
3. I expect to have my backpack in possession for a long time*
*Ik verwacht dat ik mijn rugzak nog lang in bezit zal hebben**
4. I will soon discard my backpack
Ik ga mijn rugzak snel afdanken

Product Care

1. I am careful about my backpack
Ik ben zuinig op mijn rugzak
2. I take good care of my backpack
Ik zorg goed voor mijn rugzak
3. I treat my backpack properly
Ik behandel mijn rugzak netjes
4. I handle my backpack in a sloppy way*
*Ik ga slordig om met mijn rugzak**

Expected Life Span

1. I hope that my backpack will last for a long time
Ik hoop dat mijn rugzak nog lang mee zal gaan
2. I want to use my backpack for a long period of time
Ik wil mijn rugzak nog voor lange tijd gebruiken

Irreplaceability

1. My backpack is irreplaceable to me
Mijn rugzak is voor mij onvervangbaar
2. Even a completely identical backpack cannot replace my backpack for me
Zelfs een volledig identieke rugzak kan mijn rugzak niet voor mij vervangen
3. For me, another identical backpack has the same value*
*Een andere identieke rugzak heeft voor mij dezelfde waarde**

4. For me, this backpack is different than other backpacks of this type
Mijn rugzak is voor mij anders dan andere rugzakken van dit type

Appendix A3: Measurement Scales used in Study 4

Conscientiousness

1. not precise / very precise (*niet precies / erg precies*)
2. not neat / very neat (*niet netjes / erg netjes*)
3. not consistent / very consistent (*niet consequent / erg consequent*)
4. not serious / very serious (*niet serieus / erg serieus*)
5. not trustworthy / very trustworthy (*niet betrouwbaar / erg betrouwbaar*)

Personality Congruity

1. This product is (not) like Susan
Dit product lijkt (niet) op Susan
2. Susan identifies (does not identify) herself with this product
Susan herkent zich (niet) in dit product
3. This product matches (does not match) Susan
Dit product past (niet) bij Susan
4. This product is (dis-)similar to Susan's personality
Dit product komt (niet) overeen met het karakter van Susan

Appendix A4: Measurement Scales used in Study 5

Extraversion

1. not conspicuous / very conspicuous (*niet opvallend / erg opvallend*)
2. not exuberant / very exuberant (*niet uitbundig / erg uitbundig*)
3. not sociable / very sociable (*niet gezellig / erg gezellig*)
4. not defiant / very defiant (*niet uitdagend / erg uitdagend*)
5. not cheerful / very cheerful (*niet vrolijk / erg vrolijk*)

Attitude toward Susan / Product

1. negative / positive (*negatief / positief*)
2. unfavorable / favorable (*ongunstig / gunstig*)
3. dislike / like (*niet leuk / leuk*)

Identification with Susan

1. I identify myself with Susan
Ik herken mezelf in Susan

2. Susan's personality is similar to my own personality
Het karakter van Susan komt overeen met mijn eigen karakter
3. I am like Susan
Ik lijk op Susan

Credibility of Scenario

1. I find the story of Susan credible
Ik vind het verhaal over Susan geloofwaardig
2. The story of Susan seems artificial*
*Het verhaal over Susan komt kunstmatig over**
3. I think the story of Susan is plausible
Ik vind het verhaal over Susan aannemelijk
4. I could empathize with the story of Susan well
Ik kon mij goed inleven in het verhaal van Susan
5. I found it hard to imagine Susan's situation*
*Ik kon mij de situatie van Susan moeilijk voorstellen**
6. I could project myself in Susan's situation well
Ik kon mij goed verplaatsen in de situatie van Susan

Fashionability of Product

1. not fashionable / very fashionable (*niet modegevoelig / erg modegevoelig*)
2. not trendy / very trendy (*niet trendy / erg trendy*)
3. not timeless / very timeless* (*niet tijdloos / erg tijdloos**)

Replacement Behavior

1. I dispose of my products sooner than others
Ik doe mijn producten sneller weg dan anderen
2. I only replace my products when they are really worn out*
*Ik vervang mijn producten pas als ze echt op zijn**
3. I become quickly tired of my products
Ik raak snel op mijn producten uitgekeken

Fashion-Consciousness

1. I am very fashion-conscious
Ik ben erg modebewust
2. I replace my products as soon as they go out of fashion
Ik vervang producten zodra ze uit de mode zijn
3. I always want to keep up with the latest trends
Ik wil altijd de laatste trends volgen

Appendix A5: Measurement Scales used in Study 6

Effort Invested

1. The appearance of my bicycle took me a lot of trouble
Het uiterlijk van mijn fiets heeft mij veel moeite gekost
2. I have devoted much time to altering the appearance of my bicycle
Ik heb veel tijd besteed aan het aanpassen van het uiterlijk van mijn fiets
3. The appearance of my bicycle did not cost me any effort*
*Het uiterlijk van mijn fiets heeft mij geen inspanning gekost**
4. I have spent a lot of energy on changing the appearance of my bicycle
Ik heb veel energie gestoken in het veranderen van het uiterlijk van mijn fiets

Product Uniqueness

1. My bicycle has a unique appearance
Mijn fiets heeft een uniek uiterlijk
2. The appearance of my bicycle is the only one of its kind
Het uiterlijk van mijn fiets is enig in zijn soort
3. There is no second bicycle with the same appearance as mine
Er is geen tweede fiets met hetzelfde uiterlijk als dat van mijn fiets
4. My bicycle has a standard appearance*
*Mijn fiets heeft een standaard uiterlijk**

Memories Concerning a Person

1. I regard my bicycle as a reminder of certain persons
Ik zie mijn fiets als een herinnering aan bepaalde personen
2. My bicycle symbolizes a bond with friends or family
Mijn fiets symboliseert een band met vrienden of familie
3. My bicycle reminds me of persons who are important to me
Mijn fiets herinnert mij aan personen die belangrijk voor mij zijn

Memories Concerning an Event

1. My bicycle is proof of something that has happened
Mijn fiets getuigt van iets dat gebeurd is
2. My bicycle calls to mind something that has happened
Mijn fiets doet mij denken aan iets dat gebeurd is
3. Through my bicycle I think back to a particular event
Door mijn fiets denk ik terug aan een bepaalde gebeurtenis

Product Utility

1. My bicycle is very useful
Mijn fiets is erg nuttig

2. My bicycle functions well
Mijn fiets functioneert goed
3. My bicycle is very practical in its daily use
Mijn fiets is erg handig in het dagelijks gebruik
4. My bicycle performs in the way a bicycle should perform
Mijn fiets doet wat een fiets moet doen

Financial Value

1. My bicycle is worth a lot of money
Mijn fiets is veel geld waard
2. My bicycle has cost a lot of money
Mijn fiets heeft veel geld gekost
3. My bicycle is very expensive
Mijn fiets is erg kostbaar

Desire for Unique Products (Lynn and Harris 1997)

1. I am very attracted to rare objects
Ik voel me erg aangetrokken tot zeldzame objecten
2. I tend to be a fashion leader rather than a fashion follower
Ik ben eerder een trendsetter dan een trendvolger
3. I am more likely to buy a product if it is scarce
Ik ben eerder geneigd om een product te kopen als het schaars is
4. I would prefer to have things custom-made than to have them ready-made
Ik heb liever dingen die op maat gemaakt zijn dan kant-en-klare producten
5. I enjoy having things that others do not
Ik geniet ervan dingen te hebben, die anderen niet hebben
6. I rarely pass up the opportunity to order custom features on the products I buy
Ik laat zelden de gelegenheid voorbij gaan om persoonlijke accessoires te bestellen bij de producten die ik koop
7. I like to try new products and services before others do
Ik houd ervan als een van de eersten nieuwe producten en diensten uit te proberen
8. I enjoy shopping at stores that carry merchandise which is different and unusual
Ik winkel graag in zaken, die andere en ongewone producten verkopen

Appendix B1: Scenario Elements used in Study 1 in English

Memories

Product-Related Memories are Present

Two years ago, Joris went away for a weekend with his father to celebrate Joris's graduation. This weekend was very special to both of them and they remember it with great pleasure. Before they left, Joris had received a new camera from his father, which he immediately used a lot during that weekend. Joris still owns this camera and uses it regularly.

Product-Related Memories are Absent

Two years ago, Joris's old camera broke down. Shortly thereafter, he passed a camera shop and realized that he could use a new camera. On that occasion, he bought a new camera. Joris still owns this camera and uses it regularly.

Utility

Average Utility

The camera takes fine photographs, but now and then a photograph from the film is spoiled. The camera can take only one size of photographs. Therefore, it is not possible to take panorama photographs. When Joris just owned the camera, he had to become accustomed to its operation. However, now that he has used the camera for a while, this is fine. The camera cannot zoom in and out.

The guarantee on the camera was only short-lived, namely half a year. If something should happen to the camera now, Joris would have to pay for the repairs himself. No extras, like a cover, were provided with the camera at purchase.

Above Average Utility

The camera always takes pinpoint-sharp photographs and not a single one was ever spoiled, since Joris is in possession of the camera. The camera can be set to take different photograph sizes; for example, it can also take panorama photographs. The camera's operation is straightforward, due to which the use of the camera immediately went well. Zooming in and out can be done very accurately, fast, and easily.

The guarantee on the camera is still in force, because it lasts for three years. If something should happen to the camera now, Joris would not have to pay for the repairs himself. Whenever Joris takes the camera somewhere, he always puts it in the special cover that he received for free at purchase.

Appearance

Average Appearance

The camera has no exceptional color or appearance; it looks just like most cameras. The design is standard, just like the finishing of the buttons and the other details.

Above Average Appearance

The camera has a magnificent silver metallic polish and the design is very special. The finishing of the buttons and the other details is very attractive. It really looks perfect.

Appendix B2: Scenario Elements used in Study 1 in Dutch

Memories

Product-Related Memories are Present

Twee jaar geleden is Joris een weekendje weg geweest met zijn vader om te vieren dat Joris afgestudeerd is. Dit weekend vonden ze beiden erg bijzonder en ze denken er met veel plezier aan terug. Voor ze vertrokken had Joris van zijn vader een nieuw fototoestel gekregen, wat hij gelijk dat weekend veel gebruikt heeft. Joris heeft dit fototoestel nog steeds en gebruikt het toestel nog regelmatig.

Product-Related Memories are Absent

Twee jaar geleden is het oude fototoestel van Joris stuk gegaan. Toen hij kort daarna langs een fotozaak liep, bedacht hij zich dat hij wel een nieuw fototoestel zou kunnen gebruiken. Hij heeft toen een nieuw fototoestel gekocht. Joris heeft dit fototoestel nog steeds en gebruikt het toestel nog regelmatig.

Utility

Average Utility

Het toestel maakt goede foto's, maar af en toe mislukt er ook wel eens een foto van het rolletje. Het fototoestel kan maar één formaat foto's maken. Panoramafoto's maken is dus niet mogelijk. Toen Joris de camera net had, moest hij wel even aan de bediening wennen, maar nu hij de camera al een tijdje gebruikt, gaat het prima. Het toestel kan niet in- en uitzoomen. De garantie op het toestel was maar van korte duur, namelijk een half jaar. Als er nu iets met de camera zou gebeuren, zou Joris de reparatie zelf moeten

betalen. Er zaten geen extraatjes bij het toestel toen hij het kocht, zoals bijvoorbeeld een hoesje.

Above Average Utility

Het toestel maakt altijd haarscherpe foto's en er is er nog nooit één mislukt, zolang Joris de camera bezit. Er zijn allemaal verschillende formaten foto's in te stellen, zo kan hij bijvoorbeeld ook panoramafoto's maken. De bediening van de camera sprak voor zich, zodat het gebruik van de camera meteen goed ging. In- en uitzoomen kan heel nauwkeurig, gaat erg snel en is erg makkelijk.

De garantie op het toestel loopt nog steeds, want die was namelijk drie jaar. Als er nu iets met de camera zou gebeuren, hoeft Joris de reparatie dus niet zelf te betalen. Als Joris het toestel ergens mee naar toe neemt, stopt hij het altijd in het speciale hoesje, dat hij er gratis bij gekregen heeft.

Appearance

Average Appearance

Het toestel heeft geen opvallende kleur of uiterlijk; het ziet er net zo uit als de meeste toestellen. De vormgeving is standaard, net als de afwerking van de knopjes en andere details.

Above Average Appearance

Het toestel heeft een schitterende zilvermetallic glans en de vormgeving is erg bijzonder. De afwerking van de knopjes en andere details is zeer mooi. Het ziet er echt perfect uit.

Appendix C1: Scenario Elements used in Study 2 in English

Memories

Product-Related Memories are Present

Last year, Susan graduated from high school. To celebrate this event, she went downtown to have a drink together with her parents. It was truly enjoyable. As a surprise, she had received a new mobile phone from her parents. Susan still owns this phone and uses it regularly.

Product-Related Memories are Absent

Last year, Susan's old mobile phone broke down. Shortly thereafter, she passed a telephone shop and realized that she could use a new mobile phone. On that occasion, she bought a new mobile phone. Susan still owns this phone and uses it regularly.

Utility

Average Utility

Making phone calls with the mobile phone works ok, but since she has owned the phone, the phone also lost signal a couple of times. The mobile phone can make phone calls and send SMS text messages, but extra features, such as Internet functions and creating your own ringtones are unavailable. When Susan just owned the mobile phone, she had to become accustomed to its operation. However, now that she has used it for a while, this is fine. The mobile phone's talk time is 3 hours and the standby time is 150 hours.

The guarantee on the phone was only short-lived, namely half a year. If something should happen to the mobile phone now, Susan would have to pay for the repairs herself. No extras, like a cover, were provided with the mobile phone at purchase.

Above Average Utility

Making phone calls with the mobile phone always works excellently and since Susan is in possession of the phone, it has always provided satisfactory signal strength. In addition to making phone calls and sending SMS text messages, the mobile phone offers extra features, such as Internet functions and creating your own ringtones. The mobile phone's operation is straightforward, due to which the use of the mobile phone immediately went well. The mobile phone's talk time is 12 hours and the standby time is 400 hours.

The guarantee on the phone is still in force, because it lasts for two years. If something should happen to the mobile phone now, Susan would not have to pay for the repairs herself. Whenever Susan takes the mobile phone somewhere, she always puts it in the special cover that she received for free at purchase.

Appearance

Together with this questionnaire, you have received a page with a black frame. In this frame four products are presented of which Susan considers the design and color beautiful. Take a good look at these products and try to form an impression of Susan's taste.

Four products of which Susan considers the design and color beautiful:



Susan's mobile phone:



Average appearance
(Dissimilar to the four
products presented above)



Above average appearance
(Similar to the four
products presented above)

Appendix C2: Scenario Elements used in Study 2 in Dutch

Memories

Product-Related Memories are Present

Vorig jaar is Susan geslaagd voor haar VWO diploma. Om dit te vieren is ze samen met haar ouders de stad ingegaan om iets te gaan drinken. Het was heel gezellig. Als verrassing kreeg ze van haar ouders een nieuwe mobiele telefoon. Susan heeft deze mobiele telefoon nog steeds en gebruikt deze nog regelmatig.

Product-Related Memories are Absent

Vorig jaar is de oude mobiele telefoon van Susan kapot gegaan. Toen ze kort daarna langs een telefoonzaak liep, bedacht ze zich dat ze wel een nieuwe mobiele telefoon zou kunnen gebruiken. Zij heeft toen een nieuwe mobiele telefoon gekocht. Susan heeft deze mobiele telefoon nog steeds en gebruikt deze nog regelmatig.

Utility

Average Utility

Het bellen met de mobiele telefoon gaat wel goed, maar Susan heeft, sinds ze de telefoon in bezit heeft, ook een paar keer geen bereik gehad. De mobiele telefoon kan bellen en sms-en, maar extra functies, zoals internetfuncties en je eigen ringtones instellen zijn niet mogelijk. Toen Susan de mobiele telefoon net had, moest zij wel even aan de bediening wennen, maar nu zij deze een tijdje gebruikt, gaat het prima. De beltijd van de mobiele telefoon is 3 uur en de standbytijd 150 uur.

De garantie op de telefoon was maar van korte duur, namelijk een half jaar. Als er nu iets met de mobiele telefoon zou gebeuren, zou Susan de reparatie zelf moeten betalen. Er zaten geen extraatjes bij de telefoon, toen ze het kocht, zoals bijvoorbeeld een beschermhoesje.

Above Average Utility

Het bellen met de mobiele telefoon gaat altijd uitstekend en Susan heeft, sinds ze de telefoon in bezit heeft, nog altijd bereik gehad. De mobiele telefoon heeft naast bellen en sms-en ook extra functies, zoals internetfuncties en je eigen ringtones instellen. De bediening van de mobiele telefoon sprak voor zich, zodat het gebruik van de mobiele telefoon meteen goed ging. De beltijd van de mobiele telefoon is 12 uur en de standbytijd 400 uur.

De garantie op de telefoon loopt nog steeds, want die was namelijk twee jaar. Als er nu iets met de mobiele telefoon zou gebeuren, hoeft Susan de reparatie

dus niet zelf te betalen. Als Susan de mobiele telefoon ergens mee naar toe neemt, doet ze hem altijd in het beschermhoesje dat zij er gratis bij gekregen heeft.

Appearance

Op de pagina die je bij deze vragenlijst hebt gekregen staan in het zwarte kader vier producten waarvan Susan de vormgeving en kleur mooi vindt. Kijk goed naar deze producten en probeer je in te leven in de smaak van Susan.

Appendix D1: Scenario used in Study 4 in English

Conscientious Person

Susan is 27 years old and married to Stephan. She works as a lawyer for a large law firm. For her job, she always has to look representative and she loves that; a suit is her favorite outfit. Her job is very demanding, but she is very ambitious, so it pleases her to do it. Her goal is to be at the top of the world of law in five years, and she works hard to achieve this goal. In her leisure time, she likes to cook and read a good book. She likes to go on holiday as well. Then, she maps out the route in advance and makes lists of all the things she should bring along. Her house always looks neat and tidy; everything has its place so she can quickly locate things. Stephan always calls her a fusspot, because she is really punctual and scrupulous. She personally thinks it is not that bad, she just likes to dot the i's and cross the t's. Her friends would characterize her as a real go-getter, someone who they can rely on and who always keeps her promises. They often ask her for help with difficult decisions, because she is good at weighing the pros and cons.

Appendix D2: Scenario used in Study 4 in Dutch

Conscientious Person

Susan is 27 jaar en getrouwd met Stephan. Ze werkt als advocate bij een groot advocatenkantoor. Voor haar werk moet ze er altijd representatief uitzien en dat vindt ze heerlijk; een mantelpakje is haar favoriete outfit. Het werk vraagt veel van haar, maar ze is erg ambitieus dus ze doet het met plezier. Haar doel is om over 5 jaar tot de top van de advocatenwereld te behoren, en ze werkt er hard aan om dat doel te bereiken. In haar vrije tijd houdt ze van lekker koken en een goed boek lezen. Ook gaat ze graag op vakantie, ze stippelt dan van tevoren de route uit en maakt lijstjes van alle dingen die ze mee moet nemen. Haar huis ziet er altijd keurig en opgeruimd uit; alles

heeft zijn eigen plek zodat ze dingen snel kan vinden. Stephan noemt haar altijd Suusje Precies, omdat ze erg stipt en nauwgezet is. Zelf vindt ze dat wel meevallen, ze houdt er gewoon van om de puntjes op de i te zetten. Haar vrienden zouden haar typeren als een echte doorzetter, iemand waar ze op kunnen bouwen en die altijd haar beloftes nakomt. Ze vragen vaak haar hulp bij moeilijke beslissingen, zij kan namelijk goed alle voors en tegens tegen elkaar afwegen.

Appendix E1: Scenarios used in Study 5 in English

Extravert Person

Susan is 27 years old and married to Stephan. She works as a pr-employee for a large media-company. When Susan enters a room, she will not remain unnoticed due to her enormous enthusiasm and liveliness. She cannot bear to think of leading a dull life. She likes her colleagues and she will never refuse to have a drink with them on Fridays as is customary to do. According to Stephan, the sun starts shining when she walks in, but she can irritate some people by her exaggerated presence. She spends a lot of time on her social life: She has many friends and she likes to be in the company of people. “The more, the merrier” is one of her mottos. For her hobby, her need for attention is convenient: She is a singer in a band. Her friends would describe her as someone who is always in for everything and who does not mince her words. Her ideal holiday is an active one in a crowded area. It is not like her to stay in a remote cabin in the woods.

Introvert Person

Susan is 27 years old and married to Stephan. She works as a chemical laboratory assistant. When Susan enters a room, she feels unpleasant and would prefer not to be noticed by anyone. She cannot bear to think of being the center of interest. Although she likes her colleagues, she will not readily have a drink with them on Fridays as is customary to do, because she feels uncomfortable in a large group. According to Stephan, still waters run deep, but some people will typify her as distant. Susan has a few really close friends, whom she has known for a very long time. She does not like parties a lot, especially when she knows only a few people. She finds it hard to make contact and to engage in a conversation. She prefers to stay at home on the couch with a good book or magazine. Her friends would characterize her as someone, who only speaks her true mind, if you know her well. Her ideal holiday is a hiking holiday with her husband to a remote cabin to enjoy the tranquility. A holiday in a crowded area is not like her.

Appendix E2: Scenarios used in Study 5 in Dutch

Extravert Person


Susan is 27 jaar en getrouwd met Stephan. Ze heeft een baan als pr-medewerkster bij een groot media-concern. Als Susan een kamer binnenkomt, zal ze niet onopgemerkt blijven door haar enorme enthousiasme en levendigheid. Ze moet er dan ook niet aan denken om als een grijze muis door het leven te gaan. Haar collega's vindt ze aardig, en iets met ze drinken op vrijdag, zoals de gewoonte is, zal ze dan ook nooit afslaan. Volgens Stephan gaat het zonnetje schijnen als zij binnenkomt, maar sommige mensen kunnen zich ergeren aan haar overdreven aanwezigheid. Susan besteedt veel tijd aan haar sociale leven: Ze heeft veel vrienden en vindt het fijn om in gezelschap te zijn. "Hoe meer zielen, hoe meer vreugd" is één van haar motto's. In haar hobby komt haar behoefte om in de belangstelling te staan haar van pas: Ze is zangeres in een band. Haar vrienden zouden haar omschrijven als iemand, die altijd overal voor in is en die geen blad voor haar mond neemt. Haar ideale vakantie is een actieve doe-vakantie, maar wel in een druk gebied. Het is niets voor haar om in een afgelegen hut in het bos te zitten.

Introvert Person

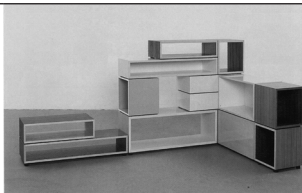
Susan is 27 jaar en getrouwd met Stephan. Ze heeft een baan als scheikundig laborante. Als Susan een kamer binnenkomt, vindt ze dat onprettig, ze zou het liefst hebben dat niemand haar opmerkt. Ze moet er dan ook niet aan denken om in het middelpunt van de belangstelling te staan. Haar collega's vindt ze aardig, maar iets met ze gaan drinken op vrijdag, zoals de gewoonte is, zal ze niet snel doen, omdat ze zich snel ongemakkelijk voelt in een grote groep. Volgens Stephan hebben stille wateren diepe gronden, maar sommige mensen zullen haar als afstandelijk typeren. Susan heeft een paar heel goede vrienden, die ze al heel lang kent. Ze houdt niet erg van feestjes, vooral niet wanneer ze er weinig mensen kent. Ze vindt het moeilijk om contact te leggen en om een gesprek op gang te houden. Liever zit ze thuis op de bank met een goed boek of tijdschrift. Haar vrienden zouden haar omschrijven als iemand, die pas het achterste van haar tong laat zien als je haar goed kent. Haar ideale vakantie is een wandelvakantie met haar man naar een afgelegen hut om lekker te genieten van de rust. Het is niets voor haar om in een druk vakantiegebied te zitten.

Appendix F: Stimuli used in Study 7


Description of the personalization option

1. 
- This couch consists of a seat with pins. The consumer can put the seat in the desired position by sticking the pins in the 'back'. The pillows can be hung over the back or the seat with a strap.


Deze bank heeft een zitvlak met pinnen. De consument kan het zitvlak in de gewenste stand zetten, door deze pinnen in de 'rugleuning' te steken. De kussens kunnen met een band over de rand van de rugleuning of het zitvlak worden gehangen.

2. 
- This cabinet consists of a number of separate components. The consumer can position these components in several ways, which makes it possible to create different cabinets out of the same components.


Deze kast bestaat uit een aantal losse onderdelen. De consument kan deze onderdelen op verschillende manieren ten opzichte van elkaar positioneren. Zo kunnen met dezelfde onderdelen verschillende kasten worden gemaakt.

3. 
- This screen consists of elastics and slots. The consumer can use these elastics and slots to place little things, such as cards, photographs, and pencils.

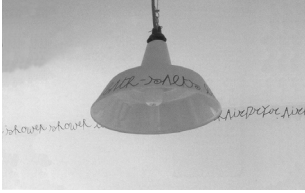
Dit kamerscherm heeft elastieken en gleuven. De consument kan deze elastieken en gleuven gebruiken om kleine spullen zoals kaarten, foto's en pennen achter te plaatsen.

4. 
- This mobile phone consists of an interchangeable front and rear side. The consumer can replace the phone's front and rear side for another pair, by which (s)he can choose from several designs and colors.

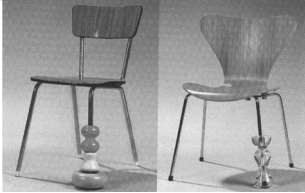
4. *Deze mobiele telefoon heeft een verwisselbare voor- en achterkant. De consument kan de voor- en achterkant van deze telefoon vervangen door een ander paar, waarbij hij/zij keuze heeft uit verschillende designs en kleuren.*

5.  This van is painted. The consumer has created a design in which the colors, patterns, and text are noted. Subsequently, (s)he has executed this design.

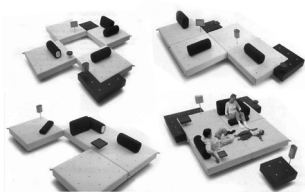
Dit busje is beschilderd. De consument heeft een ontwerp gemaakt waarin de kleuren, patronen en tekst zijn vastgelegd. Daarna heeft hij/zij dit uitgevoerd.

6.  This lamp's shade is written on. The consumer has chosen a text and color and has written it on the lamp's shade.

Deze lamp heeft een beschreven kap. De consument heeft een tekst en kleur gekozen en op de kap van de lamp geschreven.

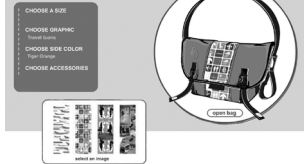
7.  This chair's leg is equipped with an ornament. The consumer can choose the preferred ornament from several types.

De poot van deze stoel is voorzien van een stoelsieraad. De consument kan het gewenste sieraad voor de stoel kiezen uit verschillende soorten.

8.  This couch consists of pillows and extra components, such as backs and tables. The consumer can position the pillows in several ways. In addition, the extra components can be placed in the holes of the pillows.

Dit wooneiland bestaat uit kussens en extra onderdelen, zoals rugleuningen en tafeltjes. De consument kan de kussens op verschillende manieren ten opzichte van elkaar positioneren. Daarnaast kunnen de extra onderdelen in de gaten van de kussens geplaatst worden.

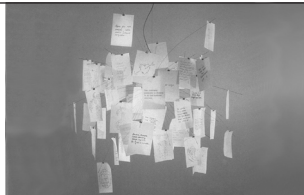
9. GRAPHIC MESSENGER BAG



This bag can be ordered over the Internet. The consumer can choose the color of the sides and the strap of the bag from a color pallet. The design in the center can be selected from a number of options.

Deze tas kan via het Internet worden besteld. De consument kan kiezen uit een kleurenpallet voor de zijpanelen en de draagband van de tas. Het design in het midden kan uit een aantal opties worden geselecteerd.

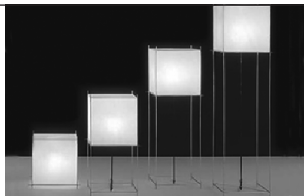
10.



This lamp consists of a number of clips. The consumer can hang all sorts of pictures, cards, photographs, and notes on these clips.

Deze lamp bestaat uit een aantal knijpertjes. De consument kan aan de knijpertjes allerlei plaatjes, kaarten, foto's en briefjes hangen.

11.



This lamp consists of a shade and detachable legs. These legs are available in several heights. The consumer can choose which leg height (s)he desires at purchase. Legs of different heights can be purchased afterwards.

Deze lamp bestaat uit een kap met losse poten. De poten zijn in verschillende hoogtes leverbaar. De consument kan bij aankoop kiezen welke hoogte poot hij/zij wil. Poten van andere hoogten kunnen worden bijgekocht.

12.



This chair has four legs, of which one leg is too short. Therefore, it is initially impossible to sit down. The consumer should place something underneath this leg, before (s)he can sit down on it.

Deze stoel heeft vier poten, waarvan er één te kort is. Daardoor kan er in eerste instantie niet op gezeten worden. De consument moet iets onder deze poot zetten, voordat hij/zij er op kan gaan zitten.

13.



This lamp is delivered as a do-it-yourself kit consisting of a lamp with a cord and a metal sheet, from which little leaf and flower shapes can be pushed. The consumer should push the shapes from the metal sheet and should hang them on the lamp.

Deze lamp wordt geleverd als een bouw pakket bestaande uit een lamp met snoer en een metalen plaat, waar blaadjes- en bloemetjesvormen uit kunnen worden gedrukt. De consument dient de vormen uit de metalen plaat te drukken en om de lamp heen te hangen.

14.



This leather jacket is worn out. The consumer has worn the jacket a lot, due to which the jacket has shaped to one's body and bare spots are created.

Deze leren jas is versleten. De consument heeft de jas veel gedragen, waardoor de jas naar zijn lichaam is gevormd en er slijtage plekken zijn ontstaan.

15.



This chair is delivered in the shape of a block of steel. The consumer should hit this block of steel using a sledgehammer to transform it into the desired shape of a chair.

Deze stoel wordt geleverd in de vorm van een blok staal. De consument moet met een grote hamer op dit stalen blok slaan om de gewenste stoelvorm te krijgen.

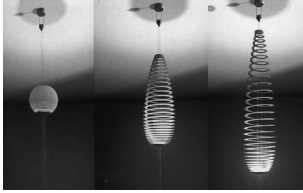
16.



This flowerpot is constructed out of flexible material. The consumer can change the flowerpot's form by transforming the material.

Deze bloempot is gebouwd uit flexibel materiaal. De consument kan de vorm van de bloempot veranderen door het materiaal te vervormen.

17.



This lamp consists of a metal spiral. The consumer can elongate and shorten the spiral. By stretching the lamp, it transforms its shape and more light is spread.

Deze lamp bestaat uit een stalen spiraal. De consument kan de spiraal uitrekken en induwen. Door de lamp uit te rekken krijgt deze een andere vorm en komt er meer licht doorheen.

18.



These shoes can be made to order for the consumer. To create a pair of shoes with the correct fit, the foot size is determined by means of a 3D scan. The consumer can also choose the color of the shoes from several color combinations.

Deze schoenen kunnen voor de consument op maat worden gemaakt. Om een paar schoenen met de juiste pasvorm te maken, worden de maten van de voet door middel van een 3D-scan vastgelegd. Daarnaast kan de consument de kleur van de schoenen kiezen uit verschillende kleurencombinaties.

19.



This lamp is totally covered in black paint, due to which it cannot spread light. The consumer should scratch a pattern, drawing, or text in the paint using a sharp object. Light will shine through the scratched parts.

Deze lamp is geheel bedekt met zwarte verf, zodat er geen licht doorheen komt. De consument moet met een scherp voorwerp een patroon, tekening of tekst in de verf krassen. Licht schijnt door de weggekraste delen.

20.



This bicycle is painted. The consumer has chosen several colors and has painted the bicycle at one's own discretion.

Deze fiets is beschilderd. De consument heeft verschillende kleuren gekozen en heeft naar eigen inzicht de fiets beschilderd.



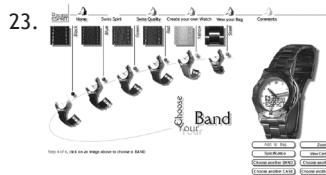
This flower vase is closed at top and bottom at purchase. The consumer should cut the vase breadthways at a personally chosen spot, to be able to use the vase. That way, a vase is created at both sides of the edge.

Deze bloemenvaas is bij aankoop aan de boven- en de onderkant dicht. De consument moet, om de vaas te kunnen gebruiken, de vaas op een zelf gekozen plek in de breedte doorsnijden. Zo ontstaat er aan beide kanten van de snede een vaas.



This glasses' frame can be made to order for the consumer. To obtain a frame that matches the consumer's face, a digital photograph is made. Subsequently, the computer gives advice about the shape of the frame that fits the face best. The consumer can then implement changes regarding the frame's shape and color together with the optician.

Het montuur van deze bril kan voor de consument op maat worden gemaakt. Om een montuur te krijgen dat goed past bij het gezicht van de consument wordt er een digitale foto gemaakt. Daarna geeft de computer advies over de vorm montuur dat het beste bij het gezicht past. De consument kan vervolgens samen met de opticien veranderingen doorvoeren wat betreft de vorm en kleur van het montuur.



This watch can be ordered over the Internet. The consumer can determine the watch's appearance by choosing from several models, straps, and dials.

Dit horloge kan via Internet worden besteld. De consument kan het uiterlijk van dit horloge bepalen, door uit verschillende modellen, horlogebandjes en wijzerplaten te kiezen.

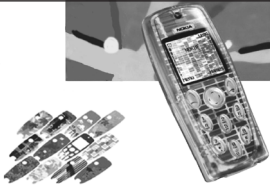
24.



This wedding ring can be composed of standard pieces. The consumer can choose the sizes and color of these separate pieces from a number of options to select the desired wedding ring. The selected ring can be ordered at the jeweler or over the Internet.

Deze trouwring is samen te stellen uit standaard delen. De consument kan van deze afzonderlijke delen de afmetingen en kleur kiezen uit een aantal opties om zo de gewenste trouwring te selecteren. De gekozen ring kan bij de juwelier of via Internet worden besteld.

25.



This mobile phone consists of a transparent front and rear side, between which a picture can be placed. The consumer can create a design for the phone. From this design, (s)he can make a cut-out in the phone shop that fits exactly between the transparent front and rear side.


Deze mobiele telefoon heeft een doorzichtige voor- en achterkant, waartussen een afbeelding kan worden geplaatst. De consument kan voor de telefoon een motief ontwerpen. Van dit motief kan hij/zij bij de telefoonwinkel een uitsnede laten maken, die precies achter de doorzichtige voor- en achterkant past.

26.




This tool has several accessories. The consumer can change the accessories of the tool. As a result, the tool can be used for several activities, such as drilling, sanding, and polishing.


Dit gereedschap heeft verschillende opzetstukken. De consument kan deze opzetstukken van het gereedschap verwisselen. Daardoor is het gereedschap te gebruiken voor verschillende bewerkingen zoals boren, schuren en polijsten.

27.  On this mouse pad a picture is printed. The consumer can choose which picture or photograph is portrayed on the mouse pad.

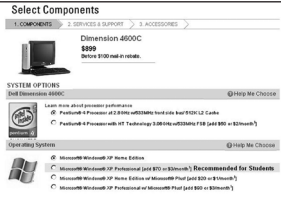
Op deze muismat is een foto afgedrukt. De consument kan kiezen welke afbeelding of foto er op de muismat wordt afgebeeld.

28. **Cups Unlimited**
 This cup can be ordered over the Internet. The consumer can choose the image on the cup from a number of options at purchase.

Deze beker kan via Internet worden besteld. De consument kan de afbeelding op deze beker bij aankoop kiezen uit een aantal opties.

29.  The mobile phone has programmable ringtones. The consumer can order different ringtones over the Internet or compose one's own. It is also possible to assign a personal ringtone to a caller, so that you can identify who is calling from the melody.

De mobiele telefoon heeft programmeerbare ringtones. De consument kan via Internet verschillende ringtones bestellen of een eigen tone componeren. Het is ook mogelijk om een beller zijn eigen ringtone te geven, zodat je aan de melodie hoort wie je belt.

30. **Select Components**
 This computer can be ordered over the Internet. The consumer can choose the components of which the computer is composed from a number of available options at purchase. For instance, the type of processor, the internal memory, and the type of monitor have to be selected.

Deze computer kan via Internet worden besteld. De consument kan de componenten, waaruit deze computer is opgebouwd, bij aankoop kiezen uit een aantal beschikbare opties. Zo moet bijvoorbeeld het type processor, het interne geheugen en het type monitor worden geselecteerd.

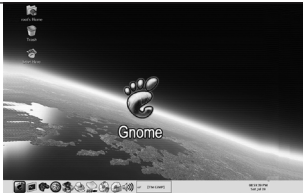
31.



This digital video recorder records programmes on a hard disk. The consumer can set preferences for genres and programmes. The recorder will store these in its memory. Based on these data, the recorder will also record similar programmes.

Deze digitale videorecorder neemt programma's op op een harde schijf. De consument kan voorkeuren voor genres en programma's instellen. De recorder slaat dit in zijn geheugen op. Op basis van deze gegevens neemt de recorder ook vergelijkbare programma's op.

32.



The consumer can change the appearance of his/her pc's desktop by choosing a different picture from a number of options that are standardly available in Windows. In addition, the consumer can scan a photograph or picture to use as desktop.

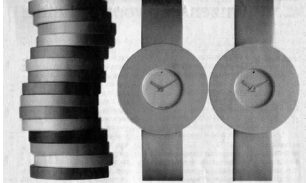
De consument kan het uiterlijk van de desktop van zijn/haar PC veranderen door een andere afbeelding te kiezen uit een aantal opties, dat standaard beschikbaar is in Windows. Daarnaast kan de consument ook een foto of afbeelding inscannen om als desktop te gebruiken.

33.




This thermostat measures how quickly a room heats up. The consumer can set the desired temperature for each point in time. Then, the thermostat will make sure the room reaches the desired temperature as efficiently as possible.


Deze thermostaat meet hoe snel een ruimte opwarmt. De consument kan voor elk tijdstip de gewenste temperatuur instellen. De thermostaat zorgt er dan voor dat de ruimte op een zo efficiënt mogelijke manier de gewenste temperatuur bereikt.

34.  This watch consists of an interchangeable frame. The consumer can choose which frame color (s)he prefers for the watch.

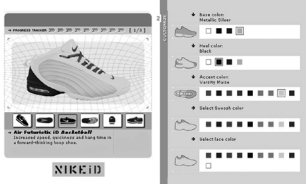
Dit horloge heeft een verwisselbare rand. De consument kan kiezen welke kleur rand hij/zij om het horloge wil.

35.  This ring is created according to one's own design. The consumer has created a design and, subsequently, has the ring made by a jeweler.

Deze ring is gemaakt naar een eigen ontwerp. De consument heeft een ontwerp gemaakt en heeft vervolgens de ring door een juwelier laten maken.

36.  This organizer's front can be ordered over the Internet. The consumer can choose from a number of types of wood and can place one's own text on it.

De voorkant van deze organizer kan via Internet worden besteld. De consument kan uit een aantal soorten hout kiezen en kan hier een eigen tekst op laten zetten.

37.  These shoes can be ordered over the Internet. The consumer can determine the appearance of these shoes by choosing the colors for the various shoe parts from a number of options. It is possible to place a personal text at the backside of the shoe.

Deze schoenen kunnen via Internet worden besteld. De consument kan het uiterlijk van deze schoenen bepalen, door de kleuren voor verschillende delen van de schoen uit een aantal opties te kiezen. Het is mogelijk om een eigen tekst op de achterkant van de schoen te laten zetten.

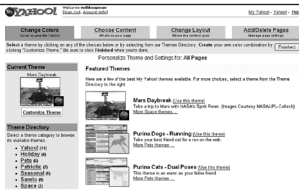
38.



These lamps are self-made. The consumer has created a design, has chosen materials, has cut the materials down to size, and has assembled the lamps.

Deze lampjes zijn zelfgemaakt. De consument heeft een ontwerp gemaakt, uit materialen gekozen, de materialen op maat gemaakt en de lampjes in elkaar gezet.

39.



This website is an Internet site to send email. The consumer can determine the site's layout by choosing the background picture and the color combinations from a number of options.

Deze website is een Internet site, waar e-mail verstuurd kan worden. De consument kan de lay-out van de site bepalen door de achtergrondafbeelding en de kleurencombinaties uit een aantal opties te kiezen.

40.



This website is an Internet site to purchase books, CDs et cetera. The consumer can search, for instance, on the website for a book. Then, the site will give the consumer also advice about other similar products that resemble the book that is sought.

Deze website is een internetsite, waar men boeken, CD's enzovoort kan kopen. De consument kan zoeken op de website, naar bijvoorbeeld een boek. De site geeft de consument dan tevens advies over andere vergelijkbare producten, die op het gezochte boek lijken.

41.



This box is self-made. The consumer has bought tiles and has broken them in pieces. Subsequently, (s)he has stuck the pieces of tile on the box at one's own discretion.

Dit kistje is zelfgemaakt. De consument heeft tegels gekocht en in stukjes gebroken. Daarna heeft hij/zij de stukken tegel naar eigen inzicht op het kistje geplakt.

42.



This Barbie can be ordered over the Internet. The consumer can choose the colors of the doll's skin, lips, and eyes from a number of options. In addition, the hair color and style can be chosen.

Deze Barbie kan via Internet worden besteld. De consument kan de kleuren van de pop's huid, lippen en ogen kiezen uit een aantal opties. Daarnaast kan de haarkleur en het model van het haar worden gekozen.

Appendix G: Co-Occurrence Matrix Study 7

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1	2	3	4	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	27	28	29	30	32	34	35	36	37	38	39	41	42		
1	15																																							
2	10	15																																						
3	1	1	15																																					
4	2	1	1	15																																				
5	0	0	5	1	15																																			
6	0	0	3	0	9	15																																		
7	2	1	1	12	1	0	15																																	
8	13	13	1	2	0	0	1	15																																
9	0	0	0	3	0	2	4	0	15																															
10	0	0	11	1	3	2	1	0	0	15																														
11	4	4	1	8	1	0	7	4	3	1	15																													
12	0	0	4	1	1	0	1	0	0	4	2	15																												
13	5	5	0	0	2	1	1	5	0	2	3	4	15																											
14	0	0	0	0	2	2	0	0	0	0	0	1	1	15																										
15	0	0	1	0	3	2	0	0	0	4	1	3	6	1	15																									
16	10	9	1	1	1	0	1	9	0	1	2	0	4	0	1	15																								
17	10	9	1	1	1	0	1	9	0	0	3	0	4	0	0	14	15																							
18	0	1	0	0	1	1	0	1	4	0	1	0	1	1	1	0	0	15																						
19	0	0	1	0	4	3	0	0	0	2	1	5	7	1	11	0	0	1	15																					

Appendix G: Co-Occurrence Matrix Study 7 (continued)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	27	28	29	30	32	34	35	36	37	38	39	41	42		
20	0	0	4	1	11	7	1	0	1	2	0	0	1	2	3	0	0	2	3	15																				
21	2	1	0	0	3	2	1	1	0	2	2	5	10	1	10	1	1	1	12	2	15																			
22	1	0	0	2	0	0	3	0	3	0	3	0	1	0	0	0	0	7	0	0	1	15																		
23	0	0	0	3	0	2	3	0	13	0	3	0	0	0	0	0	0	3	0	0	3	15																		
24	0	1	0	2	0	2	3	1	11	0	2	0	0	0	0	0	0	3	0	1	0	1	11	15																
25	1	1	6	4	5	4	4	1	0	5	2	1	0	1	0	1	1	0	2	5	0	0	0	15																
27	0	0	5	2	4	4	3	0	2	3	0	0	1	1	2	0	0	1	4	5	2	0	1	1	7	15														
28	0	0	0	0	0	3	1	0	6	0	0	0	0	0	1	0	0	3	2	1	1	2	4	5	1	4	15													
29	1	1	4	1	0	3	1	0	1	2	1	1	0	0	0	0	0	1	2	1	1	0	0	5	1	15														
30	0	0	0	1	0	1	2	0	10	0	2	0	0	0	0	0	0	4	0	1	0	2	10	9	0	0	3	0	15											
32	0	0	5	2	2	1	2	0	0	4	0	0	0	1	0	0	0	2	3	0	0	0	0	8	7	1	10	0	15											
34	4	3	0	11	0	0	8	4	2	0	7	0	2	0	0	3	0	0	0	0	0	1	2	1	2	1	0	3	1	15										
35	0	0	0	0	1	1	0	0	0	0	1	0	1	0	0	0	0	0	1	0	2	0	1	1	0	1	0	0	15											
36	0	0	0	1	0	3	2	0	6	0	1	0	0	0	1	0	0	3	2	0	1	3	5	3	1	5	13	2	3	2	2	0	15							
37	0	0	1	1	0	3	0	0	7	1	1	0	0	0	0	0	4	0	1	0	3	7	5	0	1	10	0	5	1	2	0	10	15							
38	0	0	0	0	1	1	0	0	0	1	0	1	1	1	1	0	0	1	0	2	0	1	0	1	0	0	1	0	0	10	0	15								
39	2	3	4	3	1	0	3	3	0	3	2	0	0	1	0	2	2	1	2	0	0	1	2	5	3	2	4	1	6	3	0	2	3	1	15					
41	0	0	2	0	9	7	0	0	0	1	0	0	2	2	4	0	0	1	4	8	3	0	0	1	3	2	0	0	0	1	0	4	1	0	6	0	15			
42	0	0	0	2	0	2	2	0	13	0	2	0	0	0	0	0	4	0	1	0	2	13	11	0	1	5	0	11	0	3	0	5	9	0	1	0	15			

Curriculum Vitae

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Ruth Mugge is an Assistant Professor at the Faculty of Industrial Design Engineering of Delft University of Technology, the Netherlands. After obtaining her Master Degree (cum laude) in Industrial Design Engineering in 2001, she started her PhD project on product attachment. The research objective of this project is to explain and stimulate the emotional bond a person experiences with his/her product. She presented her research at several international conferences on product design, psychology, marketing, and consumer behavior, and published in the Design Journal, the Advances in Consumer Research, as well as in several peer-reviewed books. In 2005, she won the Research Proposal Competition organized by the Product Development & Management Association (PDMA).

List of Publications

- Mugge, Ruth, Jan P. L. Schoormans, and Addie de Lange (2007), "Consumers' Appreciation of Product Personalization," in *Advances in Consumer Research*, Vol. 34, Eds. Gavan Fitzsimons and Vicky Morwitz, Orlando, FL: Association for Consumer Research, forthcoming.
- Mugge, Ruth, Jan P. L. Schoormans, and Hendrik N. J. Schifferstein (2007), "Product Attachment: Design strategies to Stimulate the Emotional Bonding with Products," in *Product Experience*, Eds. Paul Hekkert and Hendrik N. J. Schifferstein, forthcoming.
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- Schifferstein, Hendrik N. J., Ruth Mugge, and Paul Hekkert (2004), "Designing Consumer-Product Attachment," in *Design and Emotion: The Experience of Everyday Things*, Eds. Deana McDonagh, Paul Hekkert, Jeroen van Erp, and Diane Gyi, London: Taylor & Francis, 327-331.

Awards

- Mugge, Ruth, Jan P. L. Schoormans, and Hendrik N. J. Schifferstein (2005), "Consumers as Co-Designers: Consumers' Appreciation of Product Personalization," Winner of the 2005 Product Development & Management Association (PDMA) Research Proposal Competition, Total award: \$2500.