A Longitudinal Study of Product Attachment and Its Determinants

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ABSTRACT
This paper investigates how the emotional bond a consumer experiences with ordinary durables varies over time. We found that product attachment is affected by the degree of self-expression, memories, and perceived pleasure. Over time, the determinants of product attachment can be added or lost, or their impact on product attachment can change. Our research shows that product usage is essential to maintain the impact of memories on product attachment. For users, the impact of the determinants was stable over time. For non-users, however, the impact of memories on product attachment decreased to non-significance, whereas the impact of the low pleasure ratings increased.

INTRODUCTION
Consumer behavior research has focused primarily on purchase behavior. However, to understand consumers’ replacement behavior, more knowledge is needed of the relationship that consumers experience with products during ownership. Specifically, how does the consumer-product relationship evolve over time? Product attachment is defined as the emotional bond a consumer experiences with his/her product (Schifferstein and Pelgrim 2004). This definition implies that an emotional tie exists between the owner and the object and that the specific product has a deep and important meaning to the owner. People experience more protective behaviors toward these objects (Belk 1991) and often develop long-lasting relationships with them. Product attachment is concerned with specific objects. This makes it conceptually different from two other constructs: product involvement and consumer-brand relationships (Kleine and Baker 2004). These constructs are generally conceived as the importance of a product category to a person (e.g., Costley 1988) and the relationship to a brand (e.g., Fournier 1998), respectively.

Several qualitative and survey studies on product attachment have investigated the degree of product attachment at one specific moment in time (e.g., Ball and Tasaki 1992; Kleine, Kleine, and Allen 1995; Wallendorf and Arnould 1988). Although these studies are clearly valuable for understanding the concept of product attachment, they have some apparent shortcomings. 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). These interactions encourage the development of meaning in reference to the object. Accordingly, several scholars have 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). This research provides a first attempt to investigate the concept of product attachment using a longitudinal approach.

DETERMINANTS OF PRODUCT ATTACHMENT
The experience of attachment to a product is related to the degree to which this product is used to define and maintain a person’s self (Ball and Tasaki 1992; Csikszentmihalyi and Rochberg-Halton 1981; Kleine et al. 1995). Based on the different facets of the self (Greenwald 1988), we distinguish four possible determinants of product attachment: self-expression, group affiliation, memories, and pleasure.

Self-Expression
The first determinant stems from people’s need to express their personal identity. People are motivated to establish and communicate a personal identity, distinct from that of others. The use of products is one way by which an individual can symbolically display one’s individuality to oneself and to others (Solomon 1983). For example, a person’s clothing expresses who (s)he is as an individual. People tend to develop stronger attachments to products that are used to express and maintain a personal and unique identity (Kleine et al. 1995; Wallendorf and Arnould 1988).

Group Affiliation
The second determinant stems from people’s need for affiliation. People experience a need to be connected, joined, associated, and involved with others. The products that support group affiliation define what groups of people can belong to. They symbolize a person’s desirable connections to family members, friends, or social groups. 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 (Kleine et al. 1995; Schultz, Kleine, and Kernan 1989).

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, a souvenir can remind someone of a favorite past travel experience. Several studies concluded that people become more attached to products that serve as a reminder of the past (Belk 1988, 1990; Kleine et al. 1995; Wallendorf and Arnould 1988).

Pleasure
According to Greenwald’s (1988) conceptualization of the self, the self contains a component that strives for hedonic satisfaction: the diffuse self. This component has its roots in the body’s innate pleasure and pain responses. It includes pleasure experienced during usage as a result of superior functionality, aesthetic pleasure derived from the product’s appearance, or pleasure resulting from its benefits, like entertainment or relaxation. An example is a person who enjoys his high-quality stereo, because it provides a great sound. Schifferstein, Mugge, and Hekkert (2004) found empirical evidence for the effect of pleasure on product attachment. Moreover, past studies distinguished pleasure (or enjoyment) as a reason to consider a product as special, cherished, or treasured, which indicates the presence of an emotional bond (e.g., Dittmar 1991; Kamptner 1995; Richins 1994).

DYNAMIC CHARACTER OF PRODUCT ATTACHMENT
In some cases, the experience of an emotional bond to 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 from one generation to the next (McCracken 1986; Price, Arnould, and Curasi 2000). How-
ever, for most possessions that are used daily, the experience of product attachment is dynamic. This article contributes to the literature on product attachment by investigating how the emotional bond to ordinary products may change over time.

The dynamic character of attachment can come about in two ways: 1) the degree to which a product is used to define the different facets of the self can change (i.e., the four determinants can be added or lost) or 2) the importance of each determinant for the development of product attachment can change over time (i.e., the determinants’ impact can vary).

First, the degree to which a product brings about the four determinants of product attachment can vary over time. 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 car does not fit him anymore (a loss in the product’s self-expressiveness) and, therefore, he may decide to replace it for a more expensive one that conveys more status.

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. 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 experienced with the currently owned product.

Second, the importance of the determinants for the development of product attachment can change over time. 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 dies. 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 determinants memories on the degree of product attachment.

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

\[
ATTACH_{it} = b_0 + b_1SELF_{it} + b_2GROUP_{it} + b_3MEMORIES_{it} + b_4PLEASURE_{it} + e_{it}
\]

- 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 of product-related memories for subject i at time t
- PLEASURE\(_{it}\) = the degree to which a product elicits pleasure for subject i at time t
- \(b_0\) to \(b_4\) = regression weights
- \(e_{it}\) = error terms
- i = subject
- t = time period

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, GROUP, MEMORIES, and PLEASURE. Variations in the impact of the determinants over time are revealed by changes in the regression weights \(b_1\) to \(b_4\).

**The Present Study**

The aim of this study is to investigate how the experience of attachment to relatively ordinary consumer durables develops over time. 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). Accordingly, we present a longitudinal study which comprises of two questionnaire waves separated by a five months interval.

**METHOD**

**Stimulus Product**

The study investigates the development of attachment to a backpack that new 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.

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, 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. Third, the backpack was used in a natural setting for the study, which enhanced the study’s external validity. Fourth, 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.

**Questionnaires**

The questionnaires explored the respondent’s 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 control variables were included concerning the consequences of product attachment for consumer behavior (Ball and Tasaki 1992; Grayson and Shulman 2000; Schultz et al. 1989): disposability 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 irrereplaceability (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. Most of these items were obtained from past research in which the measures’ internal consistency (Cronbach’s alphas ranged from .78 to .86) was established (Mugge, Schifferstein, and Schoormans 2004a, 2004b; Schifferstein and Pelgrims 2004). The other items were self-generated. The items for product attachment and its four determinants are included in appendix A.
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 (64% males). Respondents were asked to supply their names and email addresses to be able to distribute the follow-up questionnaire by 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 promised 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 (69% males) for T2.

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). 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 1 presents a summary of the different groups of respondents distinguished in this study.

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).

RESULTS

Non-Response 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>0.05). However, t-tests revealed significant effects for the control variables disposal tendency (t(219)=2.78, p<0.01), product care (t(219)=-2.61, p<0.05), and expected life span (t(219)=-2.11, p<0.05). 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.

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 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 1. 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 1).

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), product attachment was used as the dependent variable and the determinants self-expression, group affiliation, memories, and pleasure as the independent variables (see table 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 checked for multicollinearity. No evidence for the presence of multicollinearity was found in our data \((VIF_{\text{max}}=2.25)\).

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 2). Several differences were found between the five regression analyses.

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 \((b_{\text{users T2}}=0.24, SE=.07 vs. b_{\text{non-users T2}}=.06, SE=.05)\), 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 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.

### DISCUSSION

This study contributes to the literature by investigating 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 is positively affected by the determinants self-expression, memories, and pleasure. These results support other work on product attachment in which a relationship between product attachment and defining the self was 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 for the determinants memories and enjoyment (= 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. Probably, this specific social identity has insufficient importance to university freshmen to enhance the experience of attachment to the backpack. In contrast, it is likely that other more important social identities (e.g., one’s belonging to a fraternity or sports club) do influence the experience of product attachment.

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 1 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 2), the attachment will also increase in time (see table 1). These results are in line with the arguments of Baldwin et al. (1996) who stated that attachment changes over time as a result of recurring interactions with a product.

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 2). This could suggest 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 time periods (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 using it. 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. 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, and, therefore, we believe that usage will only play 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.

In conclusion, as long as people keep using products, the impact of the product-related memories on the experience of attachment remains intact. However, if people stop using a product, the importance of these memories for the development of 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 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 and thus for sustaining the consumer-product relationship. 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).

Limitations and Future Research

A limitation of this study is that only two 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, 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 only investigate one specific product (i.e., a specially designed backpack) and sample (i.e., university freshmen). This limits the generalizability

### Table 2

Regression Analyses for the Determinants’ Effects on Product Attachment (b weights)

<table>
<thead>
<tr>
<th></th>
<th>Non-Resp (n=100)</th>
<th>Respondents (n=121)</th>
<th>Users (n=63)</th>
<th>Non-users (n=58)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Time period</strong></td>
<td>T1</td>
<td>T1</td>
<td>T2</td>
<td>T1</td>
</tr>
<tr>
<td>Self-expression</td>
<td>.26**</td>
<td>.29*</td>
<td>.48**</td>
<td>.35*</td>
</tr>
<tr>
<td>Group affiliation</td>
<td>-.07</td>
<td>.02</td>
<td>-.13</td>
<td>-.10</td>
</tr>
<tr>
<td>Memories</td>
<td>.32***</td>
<td>.30***</td>
<td>.24**</td>
<td>.41***</td>
</tr>
<tr>
<td>Pleasure</td>
<td>.31**</td>
<td>.32**</td>
<td>.22</td>
<td>.13</td>
</tr>
<tr>
<td><strong>Adjusted R²</strong></td>
<td>.61</td>
<td>.65</td>
<td>.51</td>
<td>.50</td>
</tr>
</tbody>
</table>

Note. *** p<.001, ** p<.01, * p<.05
### APPENDIX

#### MEASURES

| Product attachment       | I am very attached to my backpack  
|                         | My backpack has no special meaning to me*  
|                         | My backpack is very dear to me  
|                         | I have a bond with my backpack  
| Self-expression          | My backpack reflects who I am  
|                         | Other people can tell by my backpack what kind of person I am  
|                         | My backpack fits my identity  
|                         | My backpack suits me  
|                         | My backpack says nothing about me as an individual*  
| Group affiliation        | My backpack indicates that I am a DUT student  
|                         | Through my backpack I feel connected to other DUT students  
|                         | Through my backpack I belong to the group of DUT students  
| Memories                 | My backpack reminds me of people or events that are important to me  
|                         | My backpack makes me think back of someone or something that has happened  
|                         | I see my backpack as a reminder of certain people or events  
|                         | Through my backpack I think back to certain people or events  
| Pleasure                 | I enjoy my backpack  
|                         | It is a pleasure to use my backpack  
|                         | I feel good when I use my backpack  

* Indicates a reversed item

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.

### REFERENCES


