

EXPLORING LASTING USER-PRODUCT RELATIONSHIPS, MEANING AND MATERIALITY

Clare GREEN

ISD (Institut Supérieur de Design) Rubika, Valenciennes, France
Ecole des Hautes Etudes en Sciences Sociales, Paris, France

ABSTRACT

Investigating lasting user-product relationships means looking essentially at post-purchase user behaviour. This subject highlights meaning and symbolism in objects and questions the role of materiality. This is a study area with particular relevance to design for sustainability, going far beyond strategies for longer product ownership resulting in less product production. Studying lasting user-product relationships can generate understanding about our relations to physical artefacts and what might constitute sustainably appropriate physical product related behaviour.

This paper reviews recent research literature informing lasting user-product relationships and discusses the theoretical frameworks currently proposed for the subject. We detail a selection of key themes that emerge, and may constitute a possible structure for addressing this subject in design education and practice. These frameworks and themes were part of a number of teaching modules of different lengths addressing the subject of lasting user-product relationships. We finish with a brief presentation and discussion of these teaching case studies, highlighting some of the opportunities this subject affords.

Keywords: Lasting user-product relationships, sustainable behaviour, attachment, materiality.

1 INTRODUCTION

User-object interactions are at the centre of design education and practice, with the objects treated by designers becoming progressively more intangible. In order to determine which physical experiences can be replaced by virtual experiences, we need better understanding of the role of physical artefacts for the people who interact with them. Research into lasting user-product relationships can be an effective way of addressing this question.

Existing research proposes that designers can contribute to the environment through making long-lasting products [1]. We can try to conceive emotionally durable designs [2] embedding less transient, enduring values within products that may be sustained through the passing of time. Schifferstein et al [3] suggest that when a person becomes attached to an object he or she is more likely to handle it with care, repair it when it breaks down and postpone its replacement as long as possible.

Design for product longevity [2] can be based on the stages of product ownership [4]; pre-acquisition, early ownership, mature ownership, pre-disposal and post disposal. A potential difficulty for stimulating product attachment through product design is that consumers do not actively search for it at purchase [5]. Rather than solely focusing on the early stages of ownership, and pre-acquisition, designers need to enhance their understanding of user behaviour in relation to physical products in daily life contexts. Attachment theory shows that after purchase there is a process of progressive meaning-making in product relationships, but it is interesting to also address the role of physical products in daily-life meaning making.

For future designers, not only conceiving, creating and making but understanding is key. Looking at existing product relationships may give useable insights for application in contexts such as up-cycling, service design scenarios and shared-use products. This subject can help designers develop and refine research tools relevant to longer-term enquiry and encourage a focus on longer time frames.

2 USER-PRODUCT RELATIONSHIP FRAMEWORKS

The question of lasting relationships with material products is covered in two inter-related research areas; attachment and emotional durability. Attachment theory is closely linked to consumer research,

whereas the question of lasting or durable product relations, perhaps first addressed in anthropology, is now part of experience design and design for empathy.

The focus of this paper is on lasting product relationships but certain frameworks that do not directly address the question of longevity may still be useful for structuring the subject.

2.1 Attachment

Product attachment is defined as the strength of the emotional bond a consumer experiences with a specific product [5]. Attachment possessions are ordinary objects that have special meaning formed through experiences involving the object [6]. Kleine and Baker's definition of an attachment relationship defines nine constitutive characteristics; a specific material object, one that is psychologically appropriated, singularised, is a self-extension, contains some personal history, some strength, is emotionally complex, is dynamic and is multi-faceted. Key characteristics mentioned are self-definition and self-continuity/change. Empirical product-attachment research [5,3] shows support for the importance of the private and public self, represented by memories, but also for the diffuse self [3] represented by product-related enjoyment and pleasure. The self is divided into four facets; diffuse self, private self, public self and collective self.

The importance of self-related meanings is central to product attachment theory. This in turn is based on the premise that we regard certain possessions as parts of our selves [7] and that possessions are an important component of sense of self. Russell Belk's key work on the role of the extended self [7] looks at frameworks such as Sartre's Having, Doing and Being. People seek, express, confirm and ascertain a sense of *being* through what they *have*, and *doing* is the transitional phase between the two. Belk mentions that Marx considers doing and working the most central to self-worth, and like Fromm, rejects the having mode as being unrewarding.

Another possible framework is that of Arendt [8]; the two different ways of cultivating a sense of self being through action or contemplation. User-product research findings [8] identify noticeable gender and generational differences in preferences for action and contemplation objects.

2.2 Needs and Pleasure

The diffuse self, or pleasure area mentioned above is hard to define. Linked to innate body related reactions, the diffuse self is seen [3] as striving for hedonic satisfaction. In product relations this includes sensory pleasures experienced during usage and aesthetic pleasures derived from appearance and familiarity.

In order to give structure to the notions of enjoyment and pleasure the four pleasures framework [9] can be useful. Starting from Maslow's hierarchy of needs, Jordan [9] creates a consumer needs hierarchy (functionality, usability, pleasure) where functionality is the minimum and pleasure is the emotional benefit people will seek beyond (but often including) enjoyment in usability. This framework aims to help categorize the different types of pleasure people may seek or experience [9]. The four distinct types of pleasure are physical, social, psychological and ideological. Physio-pleasure relates to bodily experiences and sensory organs, touch, taste and smell. Socio-pleasure is linked to relationships with others. Psycho-pleasure relates to cognitive and emotional reactions experiencing a product, ease and enjoyment in use. Ideo-pleasure relates to values, tastes and personal aspirations.

Pleasures are to be understood as being either need pleasures; those that relieve discontentment, and appreciation pleasures; positive or additional to a state that may already be contentment. Jordan suggests that a pleasure-based approach to design must be based on understanding individuals. The four part framework facilitates clustering and organising human factor characteristics which in the pleasure area are expected to be diverse and personal.

2.3 Emotions and Processing

The four pleasures framework is presented as a classifying tool for designing pleasurable products, without a particular emphasis on hierarchy. The approach taken by Donald Norman [10] refers to emotions rather than pleasures and establishes a model describing three different levels of brain processing controlling everyday behaviour. The three levels are a) the visceral level, also known as the sensory/aesthetic or form-related response in other literature [11], b) the behavioural level, also sometimes referred to as response to function and the c) reflective level or meaning related or personal/symbolic response. In Norman's model the three levels interact with one another and modulate each other and have the capacity to generate positive or negative affect and emotions. The

three levels are placed vertically, so as to explain "top-down" behaviour, coming from the highest reflective level, and "bottom-up" activation, driven by perception and feeling. Although Norman's model is very close to models of cognitive response to product visual appearance [11], it does aim to describe what happens in everyday product interactions and not only visual interactions.

Norman links the reflective level to long-term product relations, but not the visceral and behavioural levels, focused on feelings and experiences using products in the immediate time-frame and mainly sub-conscious. For lasting user-product relationships a different model may be needed to understand how habit and automatisms could modify the importance of reflective level processing. In neurological research close to Norman's model, more emphasis is placed on sensory and body related processes. [12] This framework is nevertheless useful for expressing the role of emotions and the continuing mutual influencing and updating of information processing [12] from both high level cognitive activity and body/sensory related activity.

2.4 Durable Relations

In research more directly linked to lasting relations, Stuart Walker [13] looks at enduring artefacts. Rather than individual user-product experiences, the start point is artefact categories existing in one form or another in human societies for millenia. The three broad categories into which product characteristics are classified are 1) functional, 2) social/positional and 3) inspirational/spiritual. The categories are discussed with regard to sustainability and category combinations are presented as being more or less problematic. The functional and social qualities combination is seen as the most short-lived value, with the social category in Walker's model closely linked to social status. Complex object types combining all three categories are seen as containing fundamental lessons for design of sustainable products. Exploring the example of prayer beads as a complex, enduring object, Walker concludes that an artefact relationship involving physical object qualities, physical activity, tactility, visual understanding, aesthetic experience, meaning and inner growth has the potential to become a precious personal possession. Walker puts emphasis on products having profound meaning potential, but also emphasizes the need for combined physical, tactile and meaning-making qualities.

Support for a multi-faceted experience can also be found in empirical research into lasting user-product relations by Odom, Pierce, Stolterman & Blevis [14]. Their work uses a framework of three perspectives that affect durability; function, symbolism and material qualities, from Peter Paul Verbeek. Analysing data from detailed personal inventories, Odom et al suggest that mutually reinforcing interrelations among function, symbolism and material qualities contribute to a high strength of attachment to an object. In line with theories proposed by Verbeek, material qualities are seen as particularly important and are present in the four relationship clusters proposed by the authors. These clusters are; 1) engagement; objects that promote physical engagement during use, materially engaging interactions; 2) histories; the extent to which materials of an object preserve personal histories and memories, both through signs of use or through their sheer persistence over time; 3) augmentation; objects that gain symbolic, creative and personal value through modifications, reuse and alterations, 4) perceived durability; the extent to which an objects' owner regards an object as long-lasting in function and/or longevity.

Odom et al highlight the complex nature of people's relationships to objects, and place emphasis on the capacity of material qualities for forming more meaningful and useful relationships over time. Time itself, as a contribution to the relationship, is also present in three of the four clusters proposed.

3 KEY THEMES

This brief overview of existing research can provide a simplified framework with different levels of processing/reception from a cognitive/ideological level through to a visceral/instinctive level. We also have support for the idea that lasting user-product relationships are likely to be multi-faceted, and that all levels of the framework should be activated for lasting relationships. We probably need to consider the importance of different time scales, and also the fact that lasting user-product relationships are highly individual experiences.

In addition to this simplified framework, there are four themes or families emerging from existing research that deserve particular attention when considering lasting material product relations. These four broad families also constitute a way of conceptualizing what may exist in lasting user-product relationships, and can be a form of check-list for a multi-faceted design approach. The four themes developed below are self/meaning, function, material qualities/materiality and time.

3.1 Self and Meaning

Meaning is influenced by a consumer's previous experiences [2], is context specific and personal. Possessions are an objective manifestation of the self [7] and may help us to reinforce positive aspects of our identity to ourselves, illustrating our values, beliefs and choices as an individual.[2] Attachment research has shown that products can embody memories, and by maintaining a sense of past, help to define and maintain self-identity[15]. Whereas attachment research emphasizes self-expression through product personality [6], for lasting user-product relationships, personal narratives/stories may be important qualities. Narratives, like memories, are exclusive to each individual user [2] and can generate profound sensations of attachment and empathy over time. These qualities are relatively easy to express, which may explain their visibility in empirical research.

The closer our relationships are with objects, the closer our relationships are with people [16] is one surprising conclusion suggested by Daniel Miller. The possession and use of objects is not just a question of inwardly and outwardly focused self-expression, but may be part of our construction as social beings, helping us to represent others and our relationships with them. Objects may also be effective ways of communicating aspects of the self that might not be easy to express. Importantly, the "self" in the title of this theme may also be a collective self, an "us".

It could be argued that all meaning contained in products effectively relates back to the self, but the self in terms of self-definition in the widest sense, and self-continuity [5]. Twitchell comments that the happy consumer makes objects come alive while the unhappy one lets the producer generate meaning [17]. For meaning making to be positive it should be self-generated.

This broad family is interesting as an individual and differentiated experience, as an expressible quality and as a robust contributor to product attachment and probably to emotionally durable design,

3.2 Function

The broad theme of function includes use, doing and making. Many aspects of function overlap with the self area, but are perhaps less narratives than daily rituals. Functions here are seen as active behaviour that may contribute to a sense of self and include some notions of doing and/or engagement. The engagement cluster proposed by Odom et al [14] falls into this theme, describing objects that promote physical engagement with the user during use. Engagement qualities may be found in tools that require mastery or skill. Meaningful tools, defined by Battarbee and Mattelmaki, [18] may pose challenges, involving learning over time and involve personal effort, which may also be linked to the idea of psychic energy investment [8].

In the function area there is also a notion of independence, a certain self-sufficiency and satisfaction in doing. The augmentation cluster presented by Odom et al includes intentional modification, customization, decoration and annotation. All of these being physical actions with, and marks left on, material objects. Continued physical interaction with products seems essential to prolong the impact of a product's special meaning and thus for sustaining the consumer-product relationship [15], through use but also through actions such as care and cleaning behaviour.

Function and doing might also be more indirect, as in the example of prayer beads [13] where manipulating beads aids concentration or meditation. The message carrying capacity of objects, acting as communication short cuts, where objects may speak more easily and eloquently [16], might also be considered a function.

This family may be a meaningful way of reconsidering and enlarging the notion of function.

3.3 Materiality

The term materiality is used as opposed to intangibility and concerns material, tactile qualities of products. Current consumers may be more interested in meaning than material [17]. The increasing awareness of the roles of the different sensory modalities and interactions between them may lead to a shift of focus for many designers away from the physical product to the specific experience that a product evokes [19]. But multi-sensory experience approaches probably should encourage more, and not less, attention to the physical aspects of a product, particularly in the sustainability context.

Product material aspects can easily go un-noticed and often should, as Verbeek and Kockelkoren [20] explain using Heidegger's present-at-hand/ready-to-hand distinction. A product while ready-to-hand is invisible; focus is on the action being accomplished, not the object in hand enabling it. But the product becomes present-at-hand when we return our attention to it, for repair or storage. Products must allow for a return from presence-at-hand to readiness-at-hand if a durable relationship with their users is

desired [20]. This dual status makes understanding the role of materiality difficult, our relationships with objects may be strongest when we are not focusing attention on them.

Schifferstein & Spence [19] highlight the emotional dimension of tactual product experiences, that lack of tactual perception can generate feelings of alienation. Affect-gating is a process in which an organism's affective state changes the kind of sensory input that is privileged to enter perception [21]. The research by King & Janiszewski [21] suggests we are more sensitive to tactile stimulation when in a negative affective state. Tactile stimuli can be sought for reassurance, and may be part of auto-telic experiences such as children picking up and carrying around stones. Autotelic material activity, described as non-instrumental, is an end in itself rather than a means to an end and may be unconscious and seemingly pointless [22]. The example of childrens' stones is also interesting as it also suggests tactile presence and pleasure.

This family may counter-balance notions of meaning, and may be under-explored due to the difficulties in quantifying and expressing material relations.

3.4 Time

The importance of time is presented in the perceived durability cluster proposed by Odom et al [14], objects that seem able to be long-lasting, denoting also notions of trust and persistence. Empirical research [3] showed that attachment to products owned for over 20 years was significantly higher than in shorter time scales. Products potentially accumulate valuable meaning over long time scales. Senses used for processing product information change over time, with visual processing used less.

Other related issues are growing old gracefully and visible marks of ageing on products [2], which can in some cases give value by adding character, a sense of age and stories. Products can and perhaps should evolve[2]. Time is likely to build up familiarity, and mere exposure [23] can give more positive affective reactions. Material products also function as effective markers and materialisations of time.

The time theme is complex and transversal, but also essential in lasting user-product relationships.

4 CASE STUDIES

A simplified version of the frameworks presented in section 2, as well as the four themes presented in section 3 were the basis for a number of different short teaching modules at various levels, for students studying product and services design. The modules have included different combinations of theory, user research and creative design exercises. The most effective modules are described below.

A short module, with 2nd year product and service design undergraduates, included a theoretical presentation, followed by a creativity exercise where key frameworks and themes were given as part of the brief. Students had one day to generate sketch concepts for tangible material products with the capacity to generate durable relationships. In this exercise, initial fears about being able to translate attachment determinants into tangible object attributes quickly proved unfounded. The slight lack of variety of concepts found showed that more time might be needed to identify which aspects are more or less easy to translate as product attributes. This quick creativity approach to introducing the subject is similar to, and matches results of the day-long "charette" proposed by Ramirez et al [24], received very well by students, and seen as having challenged their design thinking about longevity.

In another 2nd year module, each student was asked to interview 2 people in relation to a durable product relationship. Results were presented, discussed and emerging reasons for lasting relationships clustered. Despite being a very short module, the wide diversity of relationships, the variety of reasons for their strength, as well as the diversity of objects to which people were attached was effectively illustrated. Feedback from students was very positive, with the follow-up discussions illustrating students' surprise at seeing aspects of product relationships that they had not previously imagined. Students also were able to compare and refine their ideas on the best ways of conducting in-depth interviews, through a variety of communication media.

A longer module with 4th year service and product design students was in the form of a three-day workshop spread over three weeks. Working in small groups, students were encouraged to choose a variety of user-research methods appropriate for investigating lasting and emotional content in relationships with smart phones. Each student team chose 3 complimentary methods to use and adapt, from an initial selection of twenty. Following theoretical input on lasting user-product relationships, students presented their findings in the form of a user research toolbox and a summary of user-product relation observations. Student feedback suggests that the frameworks and themes presented during this workshop were seen as valuable for understanding a subject they considered both difficult and

important. Students confirmed re-using aspects from this workshop for “sense-making” in subsequent projects, including design projects addressing tangibility/intangibility issues.

5 CONCLUSIONS, FUTURE RESEARCH

Though frameworks and themes presented here are not yet structured into a definitive model, the processing-type framework combined with the identification of a number of key themes has proved effective for exploring lasting user-product relationships in teaching contexts.

General feedback from teaching this subject seems very positive, and a variety of approaches seem equally effective, both short and longer user-research exercises, quick creative exercises and as part of long design projects. These case studies need to be compared to other cases addressing this subject in design education, which was not possible in the scope of this article. Future design teaching and research could also aim to generate more testable artefacts with lasting relationship potential.

The questions and themes the over-all subject exposes; user-product material relations and longer time scales, seem potentially very valuable in design teaching and practice, both in product and service design contexts, and in design for sustainability.

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