IASDR07
INTERNATIONAL ASSOCIATION OF SOCIETIES OF DESIGN RESEARCH THE HONG KONG POLYTECHNIC UNIVERSITY 12TH TO 15TH NOVEMBER 2007

NINE SOURCES OF PRODUCT EMOTION

P.M.A. Desmet

Delft University of Technology, Department of Industrial Design,

Landbergstraat 15, 2628 CE Delft, The Netherlands.

p.m.a.desmet@tudelft.nl

ABSTRACT

This paper introduces a framework of nine sources of product-evoked emotions, which each can be considered to be the outcome of a unique pattern of eliciting conditions. Three main theories of product affect served as the fundament for this framework that combines the two key variables 'stimulus' (related to the product) and 'concern' (related to the person). The framework of nine sources of product emotion can be used as a basis for understanding and exploring the complex and layered emotional responses often elicited by products and services. Because the framework is based on empirical evidence of how people experience emotions, and of how products elicit emotions, it can support designers in their efforts to design for emotions. In addition, the framework can be used to structure research efforts reported in the research literature and to identify opportunities for new research efforts.

Keywords: Emotion, Design Psychology, Design Theory.

1. INTRODUCTION

In spite (or maybe because) of their elusive nature, emotions experienced in response to consumer products have managed to achieve a firm position on the design research agenda. Design and emotion has become an established research area, outliving the idea that the interest in emotion is a mere 'trend of the day.' In response to this interest, this paper introduces a framework of product emotion that may help to structure ideas about the different ways in which products evoke emotions. In this paper, the term 'product emotion' is used to refer to all emotions experienced in response to, or elicited by, seeing, using, owning, or thinking about consumer products. An explanation of product emotion should meet three basic requirements (Desmet, in print). First, it should reflect both the individual and temporal variability in emotional responses elicited by products. Whereas one person may be attracted by a glass dinner table, another may feel contempt towards the same table, and whereas one person may be disappointed by the performance of a mobile phone, another may be pleasantly surprised by its innovative design. In addition, an individual's emotional response to a given product may change over time. One may be, for example, initially satisfied with a new couch, but experience dissatisfaction after using it for some time. Second, the explanation should reflect the differentiated nature of product emotion. Products do not elicit mere like (attraction or pleasure) and dislike (aversion or pain) responses, but distinct emotions, such as astonishment, inspiration, fascination, boredom, sadness, jealousy, and many others. Moreover, we often do not feel a particular single emotion towards a product but a combination of 'mixed' (and sometimes paradoxical) emotions. One person can be proud of a new pair of shoes and happy with the reaction of his or her partner, and at the same time irritated by the lack of comfort and afraid of damaging the delicate leather. Third, the explanation should clarify the role of the product as a stimulus in the mechanisms that bring about product emotion.

Although in the last decade the design research community has shown an increased awareness of the phenomenon product emotion, the main literature sources indicate a surprisingly small interest in proposing general explanations of product emotion that meet the above stated basic requirements. Three basic approaches have been introduced, discussed, and applied: a pleasure approach (introduced by Jordan, 2000), an appraisal approach (introduced by Desmet, 2002), and a process-level approach (introduced by Norman, 2004). Jordan uses a psychological pleasure-framework to explain various types of product pleasure, Desmet uses cognitive appraisal theory to explain the process of product emotion, and Norman explains product emotion with a neurobiological emotion-framework that distinguishes several levels of information processing. The framework introduced in this paper was based on these three approaches to product emotion.

Although the focus will be on tangible products, the model also applies to intangible services. The model represents a psychological view on product emotion because it represents the cognitive mechanisms that intervene between seeing, using, owning, or thinking about a product, and the emotional outcome. Before introducing the framework, each of the three approaches will be reviewed briefly. Readers will find that although they show some essential differences, these approaches are not mutually exclusive and share some basic assumptions and theoretical considerations.

2. PLEASURE BASED APPROACH TO PRODUCT EMOTION

Patrick Jordan (1999) proposed a pleasure-based approach to human factors, in which pleasure with products is defined as the emotional, hedonic, and practical benefits associated with products. The approach draws on a pleasure framework introduced by Tiger (1992) that distinguishes four conceptually distinct types of pleasure that people may seek: physical, social, psychological, and ideological pleasure (Fig. 1).

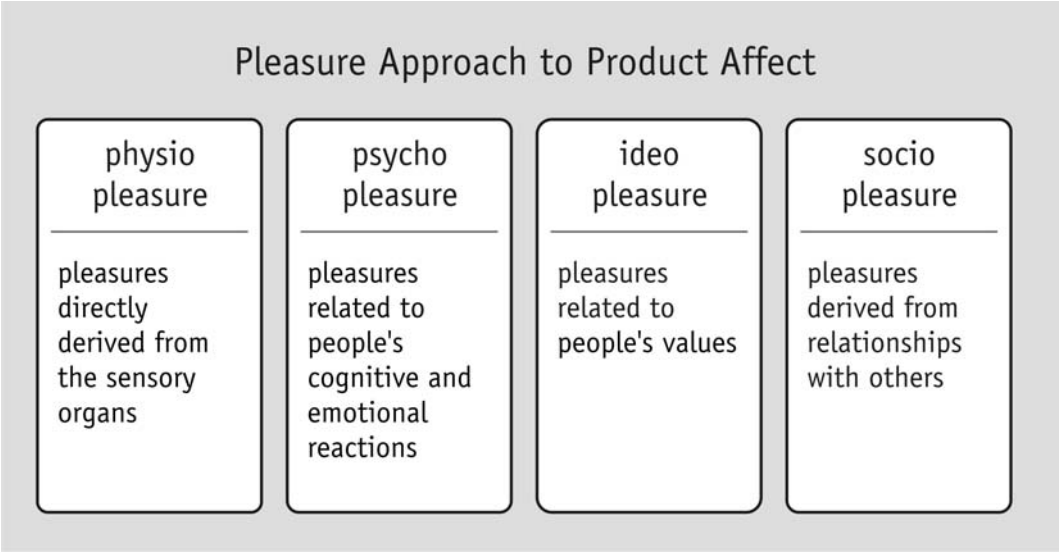

Figure 1. Framework of product pleasure as proposed by Jordan (1990)

Physio-pleasure has to do with the body and with pleasures directly derived from the sensory organs (such as touch, taste, and smell). Products are perceived with the sensory organs and therefore a direct source of physio-pleasure or displeasure. For example, a mobile phone can generate physio-pleasure because of its soft touch and elegant appearance. Socio-pleasure is the

enjoyment derived from relationships with others. This type of pleasure is relevant for those products that facilitate social interactions. Some of Jordan's examples are products that attract comments (like a piece of jewellery), or act as a focal point for social gatherings (like a coffee machine). Psycho-pleasure is related to people's cognitive and emotional reactions, and has to do with the cognitive demands of using products. A text processor that is easy to operate provides a higher level of psycho-pleasure than one that is cumbersome and illogical because it enables the user to complete the task more easily. Ideo-pleasure is related to people's values (i.e. pleasures from 'theoretical' entities such as books). Ideo-pleasure experienced in response to products is related with the values that the products embody. A product made from bio-degradable materials, for example, might be seen as embodying the value of environmental responsibility. This, then, would be a potential source of ideo-pleasure to those who are particularly concerned about environmental issues.

An important contribution of this work is that it clearly illustrates the layered nature of product affect, and some of the important variables that are involved in the underlying process, such as the sensory quality of the product (physio-pleasure), the social context in which the product is used (socio-pleasure), task-related concerns of the user (psycho-pleasures), and values of the user (ideo-pleasures).

3. PROCESS-LEVEL APPROACH TO PRODUCT EMOTION

Donald Norman (2004) proposed a framework of product affect that distinguishes between three types of affect and three corresponding design focuses. He used the multi-level analysis of information processing discussed by Ortony, Norman, and Revelle (2005) as the theoretical fundament for his framework. In this analysis, affect is considered at each of three levels of information processing: the reactive, the routine, and the reflective level. The most elementary, reactive, level involves fixed action pattern responses, such as reflexes or simple fleeing behaviour. These are biologically determined responses, and an example is the impulse to immediately reject bitter substances by spitting them out. The second level is called routine because it is concerned with the execution of well-learned routine behaviours and skills. Routine level processes are able to quickly engage in or inhibit actions to correct for simple deviations from expectations. An example is riding a bicycle, an activity that involves routine actions to control for balance and speed. The third level, the reflective level, is the most sophisticated because it involves all higher-level cognitive processes. In general, this level comprises consciousness together with all advanced cognitive skills, such as the ability to form generalisations, to make plans, and to solve problems. Norman (2004) discusses how each of the

three levels of processing are involved in affective product experience. His main claim is that each level involves a distinct type of product affect and a corresponding design focus (Fig. 2).

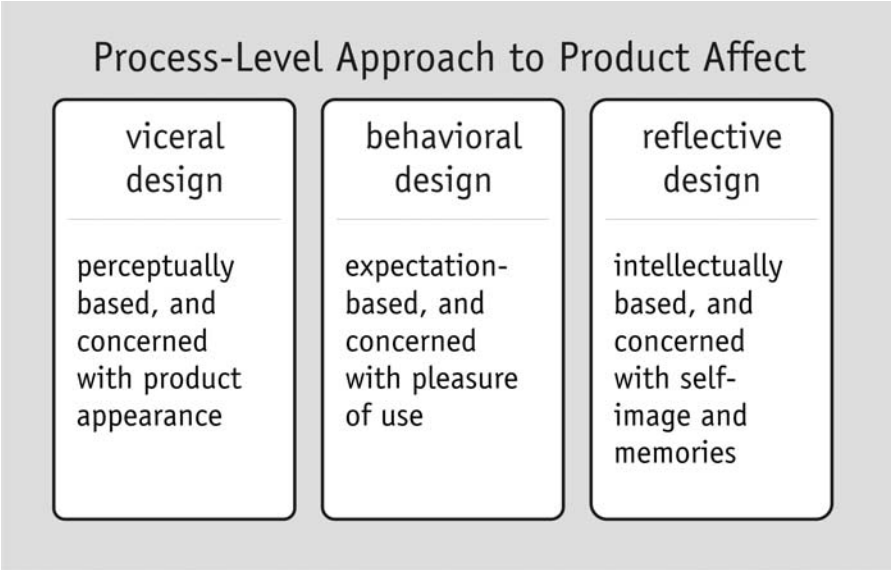

Figure 2. Process-level based framework of product affect as proposed by Norman (2004)

The first type, i.e. visceral affect, is perceptually based and corresponds with 'visceral design' that is concerned with product appearance. The second type, i.e. behavioural emotion, is expectation-based and corresponds with 'behavioural design' that is concerned with the pleasure and effectiveness of use. The third type, i.e. reflective emotion, is intellectually based and corresponds with 'reflective design' that is concerned with self-image, personal satisfaction, and memories. The distinction between three levels of processing with each associated affective phenomena (simple affect, primitive, and complex emotions) is an important contribution to the design and emotion discourse, because it clarifies and illustrates the role of cognition in the process of product emotion, and provides us with a basis for explaining why and how products elicit emotional responses.

4. APPRAISAL APPROACH TO PRODUCT EMOTION

Desmet (2002) introduced an model of product emotions (Fig. 3), that he considered to be 'basic' because it applies to all possible emotional responses elicited by (buying, using, or owning) products, and because it identifies three key variables in the emotion process: (1) concern, (2) stimulus, and (3) appraisal. The model was based on appraisal theories of, for example, Lazarus (1991a), and Ortony, Clore, and Collins (1988).

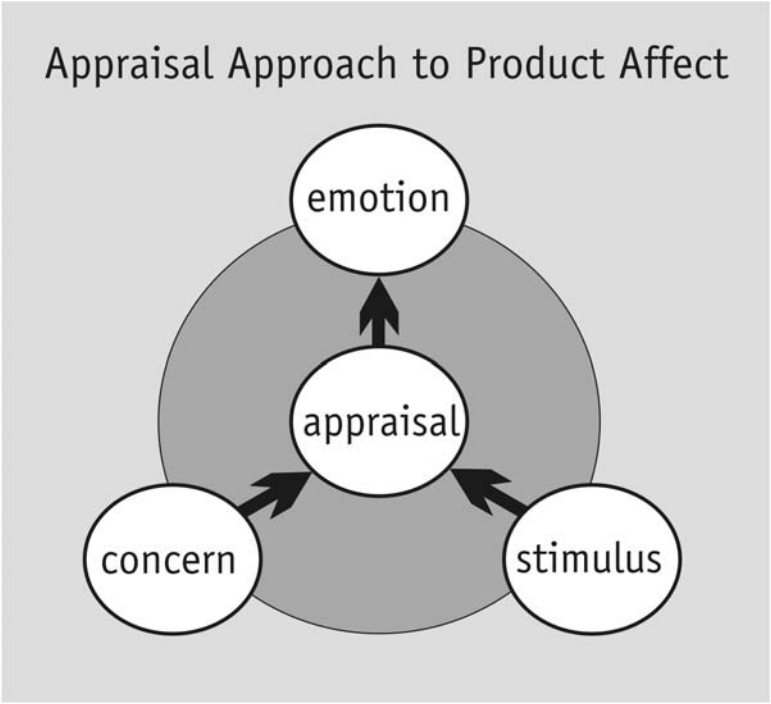

Figure 3. Appraisal model of product affect as proposed by Desmet (2002)

According to appraisal researchers, all emotions are preceded and elicited by an appraisal (Roseman, 1991). Appraisal is an evaluative process that serves to 'diagnose' whether a situation confronting an individual has adaptational relevance and, if it does, to identify the nature of that relevance and produce an appropriate emotional response to it (Lazarus, 1991b). One who is confronted with a fire alarm will most likely experience fear with a corresponding tendency to flee because the fire alarm signals a potentially harmful situation with particular behavioural consequences. This example illustrates that appraisals are inherently relational (e.g. Scherer, 1984). Rather than exclusively reflecting either the properties of the stimulus (e.g. a fire), the situation (e.g. the office), or the person (e.g. asthmatic condition), appraisal represents an evaluation of the properties of the stimulus and the situation as it relates to the properties of the individual (Smith and Lazarus, 1990). In short, appraisal is an evaluation of the significance of a stimulus for one's personal well-being. It is this personal significance of a product, rather than the product itself, which causes the emotion. Because appraisal mediates between products and emotions, different individuals who appraise the same product in different ways will experience different emotions. One who is stressed may respond with irritation to the ring tone of his or her mobile phone because he or she appraises it as undesirable, whereas another person may appraise the same event as desirable.

Desmet (2002) proposed that a product appraisal has three basic possible outcomes: the product is (potentially) beneficial, harmful, or not relevant for personal well-being. These three general outcomes result in a pleasant emotion, an unpleasant emotion, or the absence of an emotion, respectively. The point of reference in the appraisal process is a concern, that is, a more or less stable preference for certain states of the world (Frijda, 1986). Desmet indicated that the third variable, i.e. the stimulus, is not necessarily the product itself. The emotion can also be elicited by an event related to the product, such as a consequence of the product, the behaviour of the product in interaction, or an associated object or person, like the manufacturer or the user. The basic model indicates that an emotion is not elicited by the product as such, but by an appraised concern match or mismatch, and that the study of product emotions requires an understanding of the concerns that underlie them.

5. NINE SOURCES OF PRODUCT EMOTION

The main value of the three above discussed approaches is that they can be used as tools that can make it easier for those involved in the design process to consider the full spectrum of the sorts of emotions that products can bring. Note that there is substantial overlap in the three approaches. Both the pleasure and the process-level approach involve several distinct, theoretically independent, sources of product affect. In the pleasure approach, responses are distinguished on the basis of differentiated needs, and in the process-level approach, responses are distinguished on the basis of levels of processing. Although in that sense different, the types of affect seem to correspond at least to some extent: visceral affect corresponds with physio-pleasure, behavioural emotion with psycho-pleasure, and reflective emotion with socio- and ideo-pleasure. As the appraisal approach focuses on the general process rather than on specific sources of affect, this approach can be used as an underlying structure for both other frameworks.

The key factor of an appraisal perspective on the elicitation and differentiation of emotion is the assumption that people constantly evaluate (actual or imagined) stimulus events for their personal significance. In the appraisal, the concerns of the user are matched with the properties of the stimulus. The framework of Jordan focuses on different types of concerns, and the framework of Norman focuses on different types of stimuli. The current framework is based on the idea that different types of concerns can be combined with the different types of stimuli to represent nine distinct and conceptually different product appraisal checks, or ‘sources of product emotion (Fig. 4).

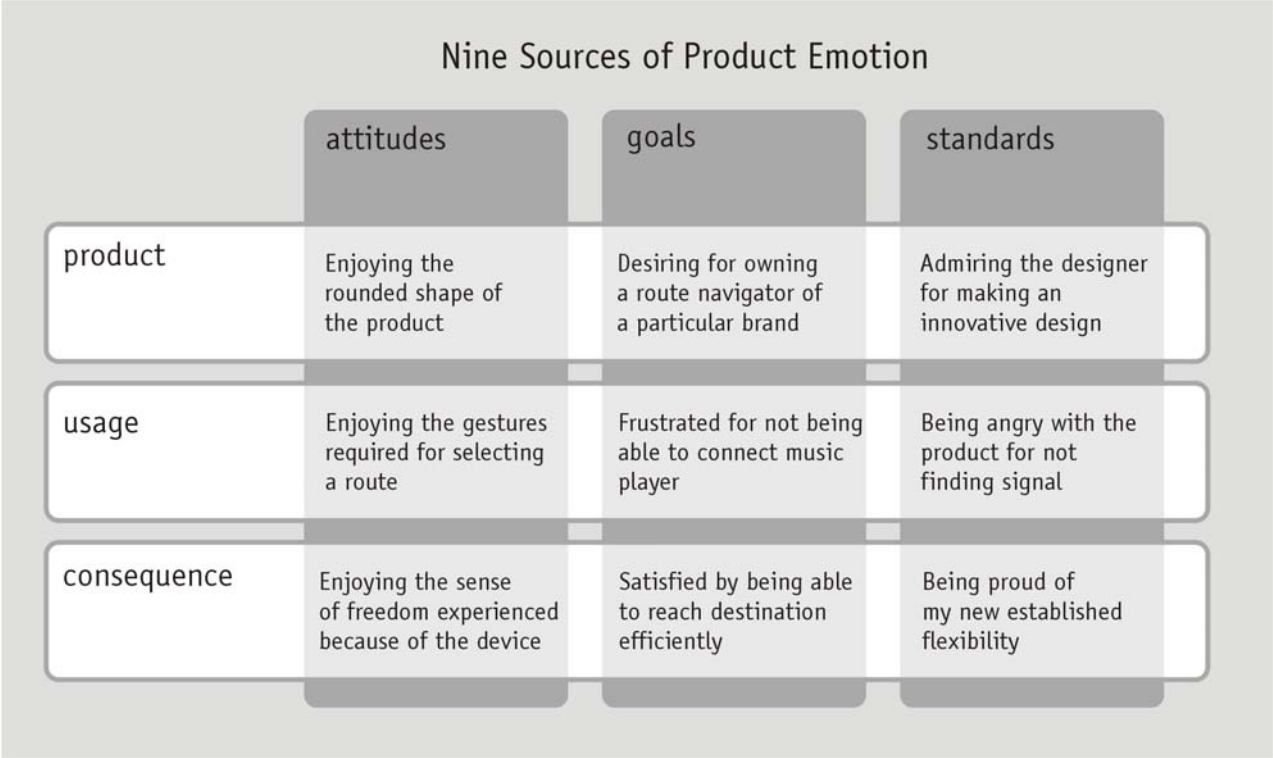

Figure 4. Framework of nine sources of product emotion

The nine sources of product emotion shown in Figure 4 represent combinations of the variables in the basic model in Figure 3. The columns represent three types of concerns, and the rows represent three types of stimuli that can evoke product emotions. The examples shown in Figure 4 are emotional responses I experienced in response to a newly bought car navigation system. These examples will be discussed in Section 5.3. First, Sections 5.1 and 5.2 discuss the three types of stimuli and the three types of concerns.

5.1. THREE TYPES OF STIMULI

According to Frijda (1986) any perceived change, or event, has the potential to elicit an emotion. In the case of products, the stimulus 'event' can be: perceiving the product, manipulating the product, and the consequences of (manipulating) the product (see, Desmet, 2002; Norman, 2004). Perceiving the product is the most straightforward stimulus event. Seeing, touching, hearing, and smelling an object can be a strong emotional stimulus. The second stimulus event type is product manipulation (which includes using, but also things like exploring, and playing with the product). Manipulating a product is an event in itself, which can be separated in many sub-events of action and reaction of both user and product. Each of these events can be an emotional stimulus. For

example, the TV doesn't respond to the remote control, the oven starts to produce a scent of freshly baked cookies, the alarm clock sets of, a drawer runs unexpectedly smooth, and so on. The third stimulus event type is the consequences of (manipulating the) product. The consequence of wearing a fashionable new suit can be positive remarks of colleagues; the consequence of using a laptop can be that the work is done more efficiently; the consequence of eating too much ice-cream can be a tummy ache. Each of these consequences can act as emotional stimuli. Note that the absence of an expected consequence can also elicit an emotional response. Those who expect a friend for dinner will be disappointed when the friend does not show up, and those who buy an auto-bronzing lotion, will be dissatisfied when the product does not tan their skin.

5.2. THREE TYPES OF CONCERS

Emotions arise from encounters with events that are appraised as having beneficial or harmful consequences for the individual's concerns, that is, his or her major goals, motives, well-being, or other sensitivities (Frijda, 1986; Lazarus, 1991a). Concerns are the dispositions that we bring into the emotion process, and stimuli are construed as emotionally relevant only in the context of one's concerns (Lazarus, 1991a). Emotion theorists often distinguish between three concern types: attitudes, goals, and standards (see, e.g. Ortony et al., 1988). This concern distinction has been found effective for understanding product emotion (see, Desmet, 2002).

Attitudes are relatively enduring, affectively coloured beliefs, preferences, and predispositions toward objects, persons, or events (Frijda, 1986; Ortony et al., 1988; Russell, 2003). Some of our affect dispositions (also referred to as attitudes or sentiments) are innate, and others are acquired. Examples of innate affect dispositions are the preference for sweet and aversion for bitter tastes (Rozin and Fallon, 1987), and preferences for particular odours and for particular facial features and expressions (Etcoff, 1999). We have attitudes towards product types ("I don't like microwave ovens") aspects or features of products ("I like red cars"), towards style ("I like Italian design"), towards usage ("I like cars that have a firm drive"), and towards consequences of products ("I like feeling relaxed after drinking a beer").

Goals are the things one wants to get done and the things one wants to see happen. Many goals are directly and indirectly activated in the human-product relationship. For example, we buy, own and use products because we believe they can help us to achieve things (a digital agenda to make us more organised), or they fulfil a need (a bicycle fulfils the need for transportation). In other cases, products can be obstructive for goal attainment, by putting goal satisfaction out of reach, delaying its attainment, or requiring additional effort (see Srull and Wyer, 1986).

Standards are our beliefs, social norms or conventions of how we think things should be. Whereas goals refer to the state of affairs we want to obtain, standards are the states of affairs we believe ought to be (Frijda, 1986; Ortony et al., 1988; Scherer, 1984). For example, many of us believe that we should respect our parents, or wear clean clothes at work. Most standards are socially learned and represent the beliefs in terms of which moral and other kinds of judgmental evaluations are made (Ortony et al., 1988). Whereas goals are relevant for our personal well-being, standards are relevant for the preservation of our social structures (and thus indirectly also for our personal well-being). Social organization depends on shared rules (norms) about what behaviour is acceptable and what is unacceptable. Such norms are sustained by appropriate emotional reactions of group members to behaviour that violates norms, as well as to conforming behaviour. We approve of things that comply with standards and disapprove of things that conflict with them.

5.3 SOURCES OF PRODUCT EMOTION EXAMPLES

The examples given in Figure 4 are emotional responses towards a recently purchased car navigation system (Fig. 5). The framework was used to structure these emotions, and below the examples are used to discuss each of the nine sources of product emotion.

Figure 5. Recently purchased car navigation device

Product - Attitude

The navigation device has a round shape that fits the hand. Because of the shape and weight, the feeling of holding the device pleases my sense of touch. In the case of the product level, the

stimulus is the (visual, tactile, olfactory, auditory, gustatory) manifestation of a product. Products are objects, and all objects (including their properties and features) are appraised as matching or colliding our attitudes. As a result, one is attracted to a sensuous shape of a perfume bottle, feels aversion towards the off-coloured leather suitcase, or enjoys the taste of sweet and cold ice-cream.

Product - Goal

Before purchasing the navigation device I had explored various alternative options. After reading some reviews, I started to desire for a device of one particular brand. Products can be appraised as matching a goal. In this case the goal at stake involves the product as such, which can be, for example, the goal to own a particular product. Other examples of goals that involve products are the goal to share, personalise, restore, discard, or repair a product. If a person has the goal to own a particular pair of shoes, this person will be disappointed to hear that the model is out of stock. One who is interested in owning an original T-Ford will be happily surprised when accidentally bumping into one in some old barn.

Product - Standard

I was marvelled by the precision of the device: on any place on this planet it can locate itself with a two meter precision. I admire the designers for generating this marvelling piece of technology. In the case of the first stimulus level, the legitimacy of the product itself is at stake. We have standards of how products should be and how they should be designed and produced. One can admire a chair for being more eco-friendly than a conventional chair. Or one can be irritated by a new car model because automotive companies should not introduce new versions too often. In those cases the products are appraised as the outcome of the action of some person or institute, and that particular action is appraised as either legitimate or as improper.

Usage - Attitude

The device is operated with a touch screen, and the gestures required to operate when driving are actually enjoyable. Manipulating the product can also involve sensations that are appraised as pleasant or unpleasant. The gestures that are required to operate an espresso machine, the expressive movements of playing the violin, and the forces that are felt when driving a motor cycle are appraised as intrinsically pleasant or unpleasant. In those cases the act of using the product rather than the product as such generates sensations that are pleasing or displeasing.

Usage - Goal

One of the goals I had when installing this device was to attach my music player in order to integrate the two functions. I found however that I still need to use the interface of the music player even though it is connected to the navigation device. It is frustrating to do so when driving the car. When using products, people are involved in goal directed behaviour sequences. If this sequence is blocked in the interaction, people will typically experience frustration. One can be frustrated by product packages that are impossible to open (e.g. pre-packed slices of cheese), satisfied with products that are easy to operate (e.g. the self-explaining Apple i-Pod interface), and pleasantly surprised by the accurate response of a stereo set's volume to the remote control.

Usage – Standard

Sometimes the device does not work because it cannot find the satellite signal. In some cases it took the device almost ten minutes to find a suitable signal. This made me angry because the device should help me to make the journey more efficient – instead of having me wait for ten minutes. The second stimulus level involves standards of performance, that is, standards of how products should behave when they are used. For instance, one shouldn't hear a rattling sound when driving a brand new car, a computer should not crash without a warning, and the brakes of a bicycle should be reliable. One can experience emotions such as anger or disappointment when a product does not meet the standards of performance.

Consequence – Attitude

Since I own the device I experienced a new sense of freedom and lightness because I now no longer have to worry about the direction when driving the car. The consequences of (using or owning) the product can also be intrinsically pleasant or unpleasant. For example, the consequence of eating too much cake is an unpleasant feeling in the stomach, the consequence of looking at art is a pleasant feeling of inspiration, and the consequence of using a massage device is the pleasant feeling of relaxation.

Consequence – Goal

The main goal that motivated the purchase of the navigation device was to be more time-efficient. The device proved to satisfy this goal by helping me find the best route to my destinations. The consequence of (using or owning) the product, can be appraised as facilitating goal achievement (e.g. being satisfied by an alarm clock because one is not late for work), or frustrating goal achievement (e.g. being dissatisfied with the new mattress because it increases instead of decreases the backache).

Consequence – Standard

When my friends complimented me with my flexibility when we planned a city trip to Paris, I experienced a sense of pride. The third level is related to the consequence of owning or using the product. Discrepancy with standards of ownership can lead to emotions such as contempt, and exceeding the standards may produce admiration. One can admire one's perfectly mown lawn, a consequence of using a high quality lawn mower, or one can feel contempt towards some person's run down car. One can also appraise the legitimacy of one's own behaviour with reference to internal standards, one's internalised moral code or self-concept. These standards represent the self-ideal and are central for the experience of the so called self-reflexive emotions, such as pride, guilt and shame. One can be ashamed of owning sex toys or proud of owning a signed baseball

5.4 MIXED EMOTIONS

The distinction between various sources of product emotion enables us to explain why products sometimes elicit mixed emotions. First, mixed emotions may be elicited within a particular source. One can experience mixed emotions in response to events that are consistent with one goal and obstructing another (Weigert, 1991). Buying a digital agenda may correspond with the goal to be more time efficient, but at the same time conflict with the goal to be independent of digital devices. The same applies to all other sources of emotion. One may appraise the colour of a product as pleasant, and, at the same time, the tactile quality as unpleasant. One may appraise the innovativeness of a product as legitimate, and, at the same time, the high price as illegitimate. Second, mixed emotions may be generated by emotional responses elicited by different types of sources. For example, the intrinsic pleasantness check is independent of the motivational state of the person, whereas motivational state is the decisive element in the goal conduciveness check. We all know from experience that an inherently pleasant product can block goal achievement, since something pleasant (like chocolate cake) can obstruct us in reaching a goal (trying to lose weight). One can experience shame from using a rollator (standard of being independent), and at the same time, be satisfied with the increased mobility it provides (goal of being mobile). Note that our emotional responses are not mutually independent because our attitudes, goals, and standards are related to each other. One can have a favourable attitude towards the colour red (appraise a red product as intrinsically pleasant), can have the goal to own a red car (appraise a red car as motive consistent), and may have the standard that cars of a particular brand should be available in the colour red (appraise a brand that does not offer red cars as illegitimate).

Our concerns are the dispositions that we bring into the emotion process. Although dispositional, these concerns do evolve over time, and differ in different contexts. Children have different goals, attitudes, and standards than teenagers and adults. Concerns are not independent of the context of usage. For example, people have other concerns with respect to computers in the context of work than in a family context. In addition, there are many factors that have a constant influence on our concerns, such as marketing, technological innovation, peer group behaviour, and fashion. The standard of performance for a laptop computer today differs from the one we had two years ago. Attitudes towards floral prints on clothes change with the season, the attitude towards smoking cigarettes is influenced by anti-smoke campaigns, etcetera. The product emotion system is not static but dynamic and interactive. Similar to the pleasure framework of Jordan (2000), the main value of the framework is that it can be used as a tool that helps in taking a structured approach to design for emotion. It represents some of the important variables in the process of product emotion, and can be used as a means of structuring thoughts and discussion as regard to emotion, or as a means of formulating relevant questions about the user or context of usage. One can explore the variables with the aim to generate positive outcomes on as much appraisal checks as possible. Alternatively, one can also explore these variables in order to deliberately design products that elicit mixed emotions by, for example, confronting its user with his or her sometimes contradicting concerns.

The palette of emotions that can be experienced in response to products displays many different varieties: some mild, some intense, some cursory, and some long lasting. It includes immediate emotions that relate directly to the interaction or context of interaction, like anger, confusion, contentment, enjoyment, and aversion, perceptible at the surface of our emotional experience, expression, and behaviour. And the palette also includes emotions that are more indirect; those that operate at a deeper level, invisible and less explosive, but no less oppressive and influential. These are emotions like trust, resignation, compassion, empathy, melancholy, hope and consolation. The framework of product emotion introduced in this chapter does not explain all these possible emotional responses, and future research may reveal additional types of concerns, types of stimuli, or dimensions that enable us to explain a wider variety of emotional responses. Even so, the basic framework of product emotion does illustrate that we can identify relationships between our highly personal and subjective emotional responses, and some objective and universal principles in the processes that elicit them.

REFERENCES

Desmet, P. M. A. (in print). Product Emotion. In: H. N. J. Schifferstein and P. Hekkert (Eds). Product experience.
Desmet, P. M. A. (2002). Designing emotions. Unpublished doctoral thesis, Delft University of Technology.
Etcoff, N. (1999). Survival of the prettiest: The science of beauty. New York: Doubleday.
Frijda, N. H. (1986). The emotions. Cambridge: Cambridge University Press.
Jordan, P. W. (1999). Pleasure with products: human factors for body, mind and soul. In W. S. Green & P. W. Jordan (Eds.), Human factors in product design: Current practice and future trends (pp. 206-217). London: Talyor & Francis.
Jordan, P. W. (2000). Designing pleasurable products. London: Talyor & Francis.
Lazarus, R. S. (1991a). Emotion and adaptation. Oxford: Oxford University Press.
Lazarus, R. S. (1991b). Progress on a cognitive motivational relational theory of emotion. American Psychologist, 46, 819-834.
Norman, D. A. (2004). Emotional design. New York: Basic Books.
Ortony, A., Clore, G. L. and Collins, A. (1988). The cognitive structure of emotions. Cambridge: Cambridge University Press.
Ortony, A., Norman, D. A. and Revelle, W. (2005). The role of affect and proto-affect in effective functioning. In J. M. Fellous & M. A. Arbib (Eds.), Who needs emotions: the brain meets the machine. Oxford: Oxford University Press.
Rozin, P. and Fallon, A. (1987). A perspective on disgust. Psychological Review, 94, 23-41.
Scherer, K. R. (1984). On the nature and function of emotion: a component process approach. In K. R. Scherer & P. Ekman (Eds.), Approaches to emotion (pp. 293-318). Hillsdale, NJ: Erlbaum.
Smith, C. A. and Lazarus, R. S. (1990). Emotion and adaptation. In L. A. Pervin (Ed.), Handbook of personality: Theory and research (pp. 609-637). New York: Guilford.
Srull, T. S. and Wyer, R. S., Jr. (1986). The role of chronic and temporary goals in social information processing. In R. M. Sorrentino & E. T. Higgins (Eds.), Handbook of motivation and cognition (pp. 503-549). New York: Wiley.
Tiger, L. (1992). The pursuit of pleasure. Boston: Little Brown.
Weigert, A. J. (1991). Mixed emotions: certain steps toward understanding ambivalence. Albany: State Universtiy of New York Press.