

Design and Emotion

Addressing emotional response with a structured approach

Adrian Finnanger

Department of Product Design

Norwegian University of Science and Technology

ABSTRACT

Emotional aspects have gained increased interest in design research over the last decades, and several researchers have contributed with theories on affective phenomenon in relation to products. This paper presents three of the most acclaimed frameworks, and discusses ways in which these can be utilized in efforts of product design. Main findings indicate that there is much to be gained from considering emotion-eliciting factors in the design of physical things. Notably, structured approaches can help designers ensure that important benefits are not over-looked. However, designers must take measures to ensure that insight attained from emotional design is successfully transferred to user value. Failure to do so might reduce its methods to function merely as marketing tools.

KEYWORDS: Emotional design, product design, product stimulus, affect, emotion, pleasure, appraisal, visceral design, behavioural design, reflective design

1. INTRODUCTION

Emotion is probably the single most important thing affecting how we experience the world around us, and while we can easily relate to our feelings towards nature, people or animals, the notion that interaction with inanimate things transpire in a similar manner should not be a far stretch either. When encountering a product for example, our response is determined not only by how well it functions, but also by what it looks, feels or sounds like. And when something is aesthetically pleasing, and cater to our feelings of self and place in society, we experience it positively. This is why you might spend your pocket on a nice watch or jacket, though cheaper alternatives will keep time and maintain your body heat just as well. In other words, emotions play a crucial role in how we assign value to objects and why we choose to acquire them.

But the consumer perspective is only part of the story, however. Emotions also play a vital role in our ability to understand and learn about the world. For instance we know that positive feelings kindle our curiosity, while negative ones protect us from dangers and keep us from repeating old mistakes. Hence we understand that distinctions like the one introducing this paper are faulty at best.

In fact, most designers know all too well that considering emotion-eliciting features separate from what is more commonly considered 'function', is simply not a recipe for success. And as for our most favourable objects, they are usually the ones that capture us with some kind of emotional attachment. Thus we can only surmise that emotion should be regarded from the earliest stages of design, even when we are aiming for something functional. Ability to do so

is commonly thought to be one of the most important abilities separating designers from professionals of adjoining disciplines, but why is this so important or even unique to design?

The goal of this review is twofold. First I will identify the main theoretical models commonly associated with the concept of design and emotion. Second I aim to examine how these can be utilized in the process of products design. In the latter, inherent possibilities and restrictions will be assessed through discussion.

2. THEORETICAL MODELS

2.1 Pleasure approach

Several efforts have been made to adapt emotion into the field of human factors. Most influential in this regard is probably the works of Patrick Jordan, advocating use of a pleasure-based approach to human product interaction [1].

Jordan's framework builds heavily on a study outlined by anthropologist Lionel Tiger, but the content has since been modified to fit the context of design. In this perspective, pleasure is understood as 'the emotional, hedonic and practical benefits that accrue from the relationship between a product and a person' [2]. Pleasure should thus not be regarded as a property of the product itself, but rather of the human interaction with it.

Moreover, Jordan gathers that usability-based approaches to design are very limited, and that they tend to focus merely on a person's 'cognitive and physical characteristics'. A pleasure based approach, however, encourages a holistic view of the user, judging the quality of a design based on an 'all-catching' emotional classification [2]. This is done through the four pleasures distinction — *physical*, *social*, *psychological* and *ideological*. The respective categories can be defined by the following characteristics:

Physio-pleasure refers to pleasure derived from sensorial perception, and is primarily associated with touch, taste, smell or feelings of sensual character [2]. In the context of products, physio-pleasures would typically be associated with the tactile qualities of a surface material or olfactory properties. Typical examples of such might be the softness of a teddy bear or the smell of a new car. Experiences of food and drink are also relevant for the category.

Socio-pleasure is the enjoyment derived from relationships with others. This will typically include interaction with friends, colleagues or loved ones. However, relationships could also be understood as a person's sense of belonging with society as a whole [2]. Here products facilitate interaction in a number of ways. For instance they will commonly act as focal points in social gatherings, or nourish interaction by being talking points themselves. Another relevant role is the one as indicators of social belonging. In this perspective a person's relationship with a certain product may contribute to form their social identity or status.

Psycho-pleasure pertains to people's cognitive and emotional reactions, and is typically associated with the performing of tasks. In this perspective, psycho-pleasures are mainly induced through the experience of cognitive demands or rewarding functions [2]. The understanding of products as tools is a central concept in this category, and psycho-pleasures are accordingly closely related to performance and the field of usability.

Ideo-pleasure, lastly, has to do with people's values. In relation to products, this would include the aesthetics of a product or the values that a product embodies [2]. A product that expresses environmental responsibility would, for example, typically associate *ideo-pleasure* for someone concerned with the environment. Similarly the category can be used to apprehend products as pieces of art. When a product is perceived as

such, the inherent level of function would typically be highly dependant on how it affects its surroundings aesthetically.

In addition to the main categories, Jordan also relates the concept of 'need-pleasures' and 'pleasures of appreciation' [2]. The thing to note of these, is that pleasure can be thought of both as 'the eliminating of pain' as well as 'the provision of positive feelings'. Designers might also want to consider these as issues to be addressed in the product creation process. Having said that, designing a product to provide a particular benefit does not necessarily depend on knowing which category of pleasure it falls under. What is important is rather that the benefit is identified in the first place. To this end, a structured approach can help designers ensure that possible benefits are not over-looked.

2.2 Appraisal theory

Desmet and Hekkert (2002) and Desmet (2003) introduces another theoretical basis for the process of emotional response to consumer products [3]. By revealing the cognitive basis of emotions, Desmet maintains that this model can be used to 'explain the broad, personal, and compound character of product interaction'.

The fundamental mechanisms of this framework stems from pioneering psychologist Magda B. Arnold, who defined emotion as 'the felt tendency toward anything intuitively appraised as beneficial, or away from anything intuitively appraised as harmful'. This definition illustrates a view of emotions as instrumental, serving an adaptive function with pulling us towards certain people, ideas and objects, and pushing us away from others [11]. The view also implies that although people differ with respect to emotional responses, the preceding processes are universal.

In order to make this perspective relevant for consumer products, Desmet has adapted the view into a 'basic model of product emotions' (Figure 1). In this he relates four key parameters:

product, concern, appraisal and *emotion* [3]. A central understanding of the framework is that emotional response does not result from a product per se, but rather from the process of appraisal [5]. Furthermore the model emphasizes the role of *concerns*, that is, 'more or less stable preferences for certain states of the world' [11]. In other words, concerns are our personal motives in life. During interaction with products, appraisal will serve as a mediator between our concerns and a given product stimulus [5]. Ultimately this process has three possible outcomes: pleasant emotion, unpleasant emotion or absence of emotion, respectively

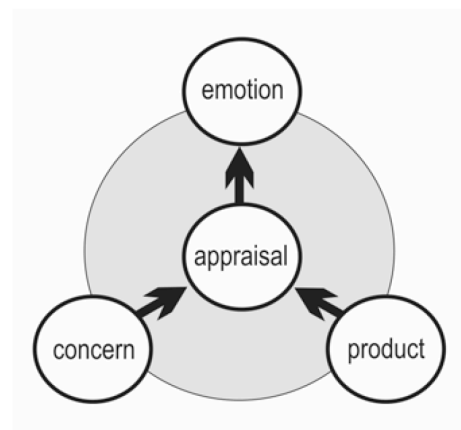


Figure 1: Basic model of product emotions

Furthermore Desmet holds that particular types of emotions are associated with particular appraisals, and that these can be predicted from the nature of the underlying issue (e.g. Lazarus, 2001; Roseman and Smith, 2001). Accordingly, each appraisal and related concern addresses a distinct evaluative issue through 'appraising questions'. In the case of products, these questions can relate issues such as: 'Does this product help me attain some goal? Can I afford it? Will my neighbours approve?' and so on [5]. The causal relationship between issues and respective classes of emotions is shown in the figure below (Figure 2).

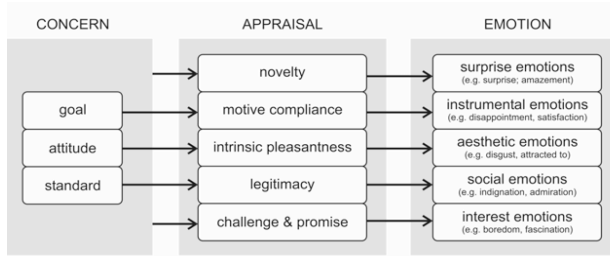


Figure 2: Classification of product emotion

The classification of emotions has fluctuating depictions in Desmets work, and the model can be somewhat difficult to follow. This has also received some criticism [12]. However, the essence of the interplay is worth noticing. First, the model illustrates how products can in fact function as stimuli for emotional responses. Secondly, understanding the conditions that causes emotional response (issues) can help designers address emotion through their own structured approaches. In the latter perspective, user concerns in relation to the given products will be of particular importance.

The classifications introduced in appraisal theory have several important implications for our understanding of product emotions. First, they argue that relating emotional response only to aesthetics is incorrect. Aesthetic emotion merely represents one concern, and ‘the other four are just as relevant’ [5]. Accordingly, emotional design should not be considered a matter of styling. Instead it must incorporate ‘a greater understanding of the numerous emotional meanings construable by the intended users’. Secondly, Desmet argues that the generalised pleasures of Green and Jordan are too narrow. Although the effort to expand human factors is admirable, ‘the obvious focus on pleasure of use still ignores the wealth of pleasant and unpleasant emotions that may be experienced during product interaction’ [5]. Designers might thus want to look elsewhere for an all-catching categorization of product stimulus.

2.3 Process-level approach

Although succeeding several influential works within the field, Donald Norman is considered to have popularized the term of *emotional design* with his book bearing the same title. In this and related publications [8], Norman proposes a framework of product affect that distinguishes between affective states with corresponding design focuses. The three states are respectively noted as *visceral*, *behavioural* and *reflective*, similar to the levels of information processing commonly used in cognitive science [10].

The overall structure of Norman’s process-level approach is more or less identical to the ABC model of attitudes, but some of the concepts have been changed to suit application in design. This includes labels as well as some content, but the frameworks are still very similar in how they consider the presence of *affect* and *emotion* at each level of conscience. Whereas the affective system passes immediate value judgements, the cognitive system is interpretive. However, they complement each other and while ‘affective states are driven by cognition, cognition is likewise impacted by affect’ [7]. In practical terms this means that all the levels interweave and affect each other. Even so, the central claim of the framework is that each level of cognition requires a unique approach by the designer [10].

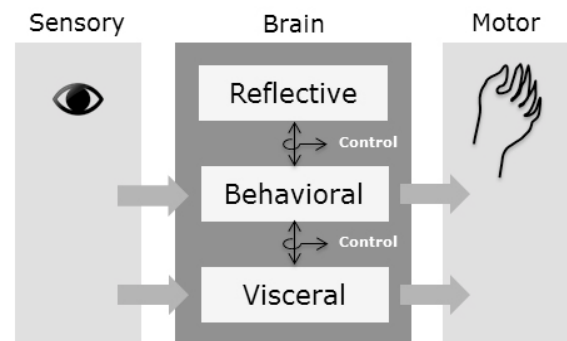


Figure 3: Three levels of processing

The *visceral level* involves so-called fixed action pattern responses [10], which are both pre-consciousness and pre-thought. At this level the brain is incapable of reasoning and only work instinctual through biologically determined responses. As a consequence the visceral level is characterised by only eliciting simple positive or negative affect, and no complex emotions [6]. Biological dispositions are typically manifested in attraction towards characteristics that historically has offered nutrition, warmth or protection against harm. Examples of such might include bright colours, symmetry, high contrast or perceivable patterns. In opposite, conditions like darkness, bitter taste or sharp objects will typically elicit negative affect. Returning to a design perspective we can somewhat simplified relate that perceptions of “pretty” or “ugly” reside within the visceral affective level, and therefore correspond to what we should understand as visceral design [10].

But while pretty designs certainly have their relevance, designers and consumers alike have a tendency to consider them lacking of substance. In contrast the second focus is all about performance. On the *behavioural level*, processes are still sub-conscious, but because associated skills are acquired through learning they also involve experience and expectations of the near future. This give rise to affective states such as *fear* or *hope*, which we may consider primitive forms of emotion [10]. An example of behavioural mechanisms at play is when people get angry at objects that fail to deliver performance as expected. Accordingly these responses are commonly described as “expectation-induced.” Behavioural design corresponds to the general concept of usability, but also goes beyond this to include product responsiveness or ‘feel’, as well as the subjective ‘feeling of control’. Hence the corresponding design focus should not only consider task efficiency, but also the inherent pleasure of use [10].

Finally, the *reflective level* is home of our conscious thoughts. At this level efforts should be directed towards cultural meaning and emotional content such as memories or stories. According to Norman, the reflective level is the only state in which ‘full-fledged emotions’ can arise [10]. By this he means responses that ‘incorporate a sense of feeling derived from the visceral and behavioural levels, alongside conscious interpretation of that feeling’ [10]. Accordingly reflective level responses typically read as ‘intellectually-induced’.

Culturally driven endeavours are highly relevant for reflective design, because they cater for experiences that are both conscious and self-aware. Hence designers can navigate more complex mechanisms, like perception of quality or the users pride of ownership. The reflective level is also the highest level of cognition, which means that it can override the other ones. This helps explain phenomena such as acquired taste, where we learn to overcome our natural inclinations and eventually develop responses that differ from those of our peers, or even our own at a different time or place [10].

In addition to what is mentioned, Norman also make distinctions that are of relevance for time perspective and the ethnographic context. For example the visceral and behavioural levels are all about ‘now’, while the reflective level extends much longer. Accordingly, reflective design deals with relations through owning, displaying and using a product over time [10].

In a similar manner the levels differ in universal validity. At the visceral level we mostly respond in the same way all over the world, but in behavioural and reflective states people are very sensitive to experience, training and education. In these perspectives, designers therefore need to consider personal and cultural differences to a much greater extent.

3. PRACTICAL APPLICATION

3.1 Framework comparison

Whether based on *pleasure, appraisal or process-levels*, the approaches discussed in this paper all have central aspects in common. If nothing else, they all illustrate that the field of product emotion have a complex and multifaceted nature. As emphasized by Jordan and Norman both, emotional responses stem from the way we interact with products, and we cannot regard them properties of the products themselves. Instead we must consider that biological, social and cultural dispositions, as well as the context in which interaction occurs, will constitute major contributing factors.

Having said so, there are a couple of central differences. These are primarily related to the explanatory models that authors have chosen to adapt, and ultimately they amount to variance in how the role of emotions is considered in cognitive processes. While Norman states that full-fledged emotions only exist on the reflective level, Desmet consider them results of appraisal processes not limited to elaborate thought. And where Norman and Desmet respectively focus on explaining *why* products evoke emotional response, Jordan merely attempts to structure them into categories.

Despite these differences, the concluding models can mostly be regarded as both similar and overlapping. This is especially the case in that all three frameworks attempt to structure responses through a form of 'all-catching' categorization. Moreover there are similarities in how the facets of *product stimulus* are described. For instance there are many similarities between the visceral affective states, Jordans physio-pleasures and Desmets aesthetic emotions. Furthermore there is resemblance in how behavioural responses and psycho-pleasures reward the accomplishing of tasks, and how reflective responses and ideo-pleasures relate phenomenon such as social status or personal taste.

3.2 Putting models to use

While the models correlate on central claims, greater differences are noticeable in the way explanatory models have been put to use. In this regards, Desmet provides a unique perspective with his PrEmo tool. Though only briefly discussed here, the main idea of this method is that it enables designers to *test* for consumer emotion [5]. This stands out from the other frameworks, which are considered to only have *evaluative* properties. There are of course other generative tools within design that also incorporate emotion, but PrEmo is unique in that it is the only one derived directly from studies of emotional design [5].

In the case of Norman's process-level approach, this does not provide a tool for generative purposes. However, Norman does discuss the value of testing for user response. Here he argues that iterative, human-centred approaches work well for behavioural design, but not necessarily are appropriate for the visceral or the reflective levels [10]. In these, testing for user response is rather a symptom of 'design by committee', or the degrading of design to cater for marketing purposes. This illustrates the designer's role in assuring that insights transfers to actual user value. The question of whether emotional design is truly human-oriented, or actually purchase-oriented, thus ultimately depends on how designers put the frameworks to use [12].

This also brings us to the evaluative question of this review. How can emotional design be put to use? Are emotional responses predictable to a degree so that they can actually be designed? Researchers seem to agree that this is not the case. For one thing, human affective responses are situated. This means that they are highly dependent on context variables and the users latent concerns (Frijda, 1986; Ortony et al., 1988). In addition, designers must consider that in the end, products are adopted into the lives of users in diverse ways. This will add unforeseen usage, as well as response (Monö, 1997; Crilly et

al., 2004) [12]. In such an ever-changing context emotions will simply remain too ephemeral to be designed. However, this does not mean that we cannot design *for* emotion. To the contrary, it seems reasonable to assume that systematic endeavours of emotional design can contribute to maximize the chance of a desired response.

4. CONCLUSION

Emotional aspects have gained increased interest in design research over the last decades, and several researchers have contributed with theories on affective phenomena in relation to products. This paper presents three of the most acclaimed frameworks, and discusses how these can be utilized in efforts of product design. Jordan introduces the *pleasures framework*, in which he argues for a holistic view of the intended user. Findings indicate that structured approaches as such, can help designers ensure that possible benefits are not over-looked. Subsequently, Desmet puts forward a view of product emotion resulting from *appraisal*. Here, the causal relationship between human concern and distinct types of emotion is described. Lastly, Norman illustrates his cognitive ergonomics through *three levels of design*. These distinctions help designers understand when and how usability-approaches have limitations. Despite small differences the concluding models can be regarded as similar and overlapping. In particular models correlate in their depictions of emotion as a complex phenomenon, and in their emphasis on the value of an all-catching framework.

As discussions indicate, there is much to be gained from understanding the nature of product stimulus. Notably, emotional models can help with providing a broader understanding of users.

In addition, structured approaches can guide designers so that opportunities are not missed. What's more, it might be worth considering that the perspective is somewhat unique for the discipline of design. For a long time there has been a tendency in sophisticated society, to regard emotional responses as inferior to rational ones. Consequently main emphasis has been put on logic and rational thinking within the social sciences. But as our understanding of cognition has evolved, considering it dependent on emotion is now a much more common view. Humans are not logical – we are emotional. And this resonates particularly well within the design community of course, because designers already know emotion to be of chief concern. There is no denying that we need products that perform well, and in many cases appearance might be of secondary nature. Other times, however, we simply need products that make us feel good.

The interesting thing is merely that there seem to be interdependent mechanisms at play. In this regard pleasant emotions might not only have value as such, but could also render as an integral component of function respectively. And again, *value* is what is of importance to humans, which is why we probably need this balance for design to make sense. Either way the important thing to note is that considering *function* separate from *feel* is not a fruit-bearing perspective. Instead we might want to emphasize that brain processes are in fact both cognitive and emotional, and that the latter is more important in many respects. Without emotion our decision-making abilities would be fundamentally impaired, leaving us unable to evaluate function in the first place. This suggests that emotion should factor into all efforts of design, and simultaneously illustrates why it is important for designers to understand how emotions fit into the mix.

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FIGURES

Figure 1:
The Basic Model of Product Emotions
Desmet, P. (2003). A multilayered model of product emotions. *The Design Journal*, 6(2), pp. 4-13

Figure 2:
Classification of product emotions
Desmet, P. (2003). A multilayered model of product emotions. *The Design Journal*, 6(2), pp. 4-13

Figure 3:
The Three Levels of Processing
Norman, D. (2004). *Emotional Design: Why We Love (or Hate) Everyday Things*. Basic Books.