Unravelling the Affective Appearance of Products
An Interactive Instrument for Application in the Packaging Industry

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Abstract
A growing body of empirical research is available to aid design decision-making. Much of it comes from other disciplines, making it difficult to assemble and codify in an accessible form. One such area concerns people’s emotional-aesthetic reactions to product appearance, where disciplines allied to Psychology and Neuroscience have made considerable headway. Various models now exist that describe the processes underlying product evaluation and identify key facets of these processes. The project to be described incorporates this information into a software instrument for use within the packaging design industry. It is interactive, multi-layered, and incorporates ‘real life’ scenarios to illustrate its application to different consumer markets and for different packaging products. Scenarios are used to illustrate its application in different consumer markets and for different packaging products. A feature of the instrument is its layered construction whereby the designer can dig deeper into each facet and draw upon the actual empirical research that underpins it. It can therefore be used at different levels of sophistication; its underlying goal being to unpack the complexity of this area and to make it accessible to the design team.

Keywords: multi-disciplinary knowledge, user research, instrument for design practice, packaging design

Background
In theory, design decision-making is now facilitated by a growing body of empirical research. In practice, however, much of this research comes from other disciplines and can be extremely difficult for designers to use in real world practice. The reason is simply that these disciplines rely upon different research methods, often quantitative, and express their results in a language that is unfamiliar within the design community. This creates a barrier to accessibility. Added to this is their adoption of diverse discipline-specific theoretical models which militate against comprehension. Key disciplines are sub-fields of Psychology, Sociology, Marketing, and Human Computer Interaction (HCI), each with its own methods, models, and terminology. Inevitably, much of the research does not focus directly upon designed products, but rather contributes to our understanding of human perception, cognition, and affect. Its relevance therefore lies in its application to design. Clearly, human perception, cognition, and affect applied to designed products are an extremely broad area. This paper and the instruments it describes focuses on perhaps the most difficult to conceptualize, namely, people’s emotional-aesthetic
reactions to product appearance. Within this domain, disciplines allied to Psychology and Neuroscience have made considerable headway.

*Emotion-aesthetics as a growing research area*

Over the past two decades findings in Neuroscience have shown that emotion plays a much larger part in human information processing than previously thought (LeDoux, 1996). The cognitive science perspective of “the brain as a computer” saw cognitive processing as more important than emotion: research has now shown that emotion plays a vital role in human decision-making (Damasio, 1994). In fact, without emotion, decision-making cannot operate. While the cognitive and affective (or emotional) aspects of brain function were in the past treated as entirely separate, it is now established that we need both to function in the world. The cognitive and affective aspects of brain processing are often discussed as separate. In reality, the two are inseparable, though for conceptual convenience they have been partitioned. In dealing with designed products and their packaging, we acknowledge this partition, though we seek to integrate where possible.

The study of emotion in relation to designed products has become a growing research area. Notions of *Product Pleasure* (Jordan, 2000), *Emotional Design* (Norman, 2004), *Product Emotions* (Desmet, 2002), and *Kansei Engineering* (Nagamachi, 1996) epitomize this new direction. Closely related to emotion is the research area of aesthetics. While traditionally the domain of philosophy, it has been subject to empirical investigation for over a century within the field of experimental psychology. The term aesthetics derives from the ancient Greeks and is defined as ‘knowledge that came from the senses’. However, by the 18th century, Baumgarten notably used the term to mean taste or beauty (Rée, 1999). This notion of aesthetics as beauty was first taken up by philosophy and art. Empirical research later investigated why certain paintings, films and, recently, products were considered beautiful or appealing to the viewer (Berlyne, 1974; Crozier, 1994; Fechner, 1876). The focus of this research has even extended to the aesthetic appeal of digital artefacts, such as websites (Lindgaard & Whitfield, 2004; Tractinsky, 1997). Central to these investigations was the question “Does a universal aesthetic exist?” as professed by the Modernists and typified by the Bauhaus (Itten, 1997) or is “beauty in the eye of the beholder?” Crozier (1994) states that aesthetic appeal is not inherent in the object, but rather is a property of the object-individual interaction, and one subject to context and change. Hekkert (2007) argues that the term aesthetic is often confused with the notion of beauty. Concurring with the original Greek meaning of the term, Hekkert posits that aesthetic encompasses all sensorial experience one would have with a design artefact including not only sight, but also the other senses as well. Rather than sensorial, the general public may think of aesthetics as the “styling” of an artefact (Smith & Whitfield, 2005). Within this paper the notion of aesthetics is confined to sensorial experience.
Designing a knowledge instrument for packaging design

The successful application of consumer research is vital to the design development process. This is evident in packaging design where consumer research increasingly quantifies how design contributes to the bottom line (Young, 2002). Package appearance has been shown to significantly impact upon consumer choice (Garber, 1995). However, how consumer research is designed, conducted and interpreted can be problematic for designers. A better understanding of the research relevant to understanding consumer response should assist in creating better design outcomes. The project presented here applies this knowledge to the needs of the packaging design industry.

Packaging design development teams are often multidisciplinary being comprised of engineering, finance, and marketing, as well as design. The lack of a shared understanding of the area of how consumer research should be applied in the design is most obvious in practice where these various stakeholders’ perspectives, knowledge and agendas must be negotiated to ensure success in the design development process (Reinmoeller, 2002; Young, 2006). That said, the lack of a shared understanding and terminology can also benefit sectors of a company or an industry, as it can retain ownership via incoherence and the mystery of techniques that require, for example, statistical knowledge. In this way research knowledge becomes proprietary rather than shared. This competitive, proprietary climate makes the sharing of such knowledge extremely difficult, and underscores the need for an open source knowledge instrument that would be available to all design practitioners. The research described here was designed to address this by developing a knowledge instrument suitable for design practice.

In constructing such an instrument, various models pertaining to consumer responses to product appearance were examined (Bloch, 1995; Creusen & Schoormans, 2005; Crilly, Moultrie, & Clarkson, 2004; Desmet, 2002; Desmet & Hekkert, 2007; Garber, 1995). Bloch’s “Model of Consumer Responses to Product Form” covers the consumer’s psychological response to the product which in turn leads to a behavioural response. Desmet expands on this psychological approach by focusing on the affective or emotional side of a consumer’s response with his “Model of Product Emotions”. Crilly proposes a conceptual framework to bring together disparate areas in consumer response to product appearance, drawing on Bloch, Desmet and others. Desmet and Hekkert propose a framework for “Product Experience”, while Creusen and Schoormans propose key facets with their “Different Roles of Product Appearance in Consumer Choice”.

While these represent significant advances in this field, they nonetheless are disparate in their methods, theoretical orientations, and even in the terminology that they employ. Quite simply, there remains a lack of clarity, and no one common terminology or accepted overall framework exists. Furthermore, the focus has been on products generally, as distinct from packaging. The project described here, and its
resulting instrument, take packaging as the focus, and clarity as the guiding principle. The instrument seeks to assemble a wide range of knowledge and present it in a multi-layered and interactive form allowing the designer to access information about the various facets of this area.

The **Unpack Instrument**

The *unpack* knowledge instrument was developed to assist packaging designers to better understanding how consumers respond to their designs. It contains five sections covering The Project, The Knowledge, The Framework, The Scenarios, and The Feedback. *Figure 1* features the interface of the instrument.

![Figure 1](image)

As the instrument was intended for practical use in a design setting, the context of this application needed to be explored. The audience for the instrument was the experienced designer who would be familiar with the use of research within the design process. While many design companies may work with packaging design, the specific focus was upon companies that use research in their design process.
The Knowledge

This section details the literature from which the knowledge was derived and employed in the instrument as visualised in **Figure 2**. The two broader areas represented below by the two largest circles are design practice and design research. The smaller circles represent the more specific areas of the literature. From Design Research, the disciplines of Social Science, Business and Engineering were reviewed, while Design Practice literature draws upon packaging industry research, case studies and the use of market research within packaging design.

The Framework

The framework is separated into layers of information (**Figure 3**). This allows the user to explore various categories of knowledge at different levels of detail. At the most detailed level the user can access the key research material if they wish to delve further. The
The visualization of the framework is based on a tree map with the size of the circles indicating a hierarchy of information. The three largest circles represent the key facets of consumer response including Cognitive and Affective that result in a Behavioural response. The next largest circles display the next level of information and so on. For example, Cognitive is further broken down into Aesthetic, Semantic and Symbolic aspects (Crilly et al., 2004). While Affective encompasses a number of concepts from Kansei (Nagamachi, 1996), Emotional Design (Norman, 2004), Product Emotion (Desmet, 2002) and the notion of Product Pleasure (Jordan, 2000). Behaviour is more literal and results from the consumer reacting with an Avoid or Approach response. The third level of information, the smallest circle, adds to the complexity, further detailing various contributions from the literature.

Figure 4 demonstrates how the user can access by clicking on various facets of the framework within the instrument interface to further explore the theoretical concepts. The window in the lower left corner of the interface provides access to more detailed research. The instrument also seeks to make clear the often overlap between categories of knowledge, and differentiates the information and terminology derived from the academic and the commercial spheres.
Scenarios

Unpacking the framework was a challenge, and it was clear that the theoretical concepts behind the framework would be difficult to grasp without examples of a real world application. With this intention, scenarios were constructed that represented the knowledge in a way that would be familiar to designers. These scenarios feature a series of characters reacting to packaging designs and their giving their subsequent responses. See Figure 5 for an example of the characters and packages. The four characters were developed to represent various demographics within a consumer market, both male and female of different age and background. Each of the characters have chosen a packaged product, in this case bottled water, and they respond to the package. This response is then analysed or unpacked so the user of the instrument can view the framework applied to a real world packaging situation.

Figure 5

Feedback

Future work for this project includes testing in a number of environments. Investigating how designers respond to the instrument is the next phase of the research. This will involve its use in the packaging design industry to evaluate its impact on the design process.

Conclusion

This paper presents a knowledge instrument that can be used in the packaging design industry to better understand how consumers interact with package designs. The unpack instrument makes the complex knowledge in this area available to assist in design decisions. The structure of the instrument enables the user to delve deeper into a facet of the knowledge as required. To illustrate the application of the instrument, scenarios are presented that use real world design examples. The next stage of the project involves evaluating its use within the packaging design industry.
References


