

Stakeholders' perceptions of product messages

Emma Linder¹, Elin Olander^{2,3}

¹Department of Product Design, The Norwegian University of Science and Technology,
Norway.

²Department of Design Sciences, Industrial Design, Lund University, Sweden.

³The Vårdal Institute, Lund University, Sweden.

Abstract

Designers create messages that are encoded in the products' design and consumers perceive the products in an environment. Hence the product can be seen as a communication media between the designer and different product stakeholders. The stakeholder's response to the designer's intent embodied in the product design falls into three categories: cognitive, affective and behavioural. In some cases, it is important to have an understanding of stakeholder response to product design. This paper presents theories, approaches and methods for the understanding of stakeholder response to designer intent embodied in product design and discusses them in relation to the extent to which they are usable in a design project. The possible use and appropriateness of the theories and methods are exemplified by the authors' ongoing research projects. Since the perception of a product form is subjective, there can be differences between designers' and stakeholders' responses to product design. Therefore, in some cases, it is important to make designer intent and stakeholder response explicit and to analyse the discrepancies. Using different approaches and methods to understand stakeholder response can be used to improve a product design and for guiding the stakeholders' choices of products to purchase.

Keywords: designer intent, stakeholders' cognitive response, semantic interpretation, aesthetic impression, symbolic association

Introduction

The word design comes originally from the Latin 'designare' which means 'mark out', designate. He who designates something communicates. The designer communicates with users by means of the product sign (Monö, 1997).

The purpose of this paper is to underscore the importance of successful communication between designers and stakeholders when perceiving products by means of the product design. First, the main concepts of communicative aspects of design and product meaning are reviewed. Next, examples are presented of approaches to how stakeholder response to product design can be understood, together with arguments as to when and why this is important. Finally, the appropriateness of the approaches for the application to the authors' ongoing research projects is discussed and exemplified.

Product design, meaning and communication

Most objects have a main function that is the original reason for its existence. This can be pure aesthetic as in the case of some art objects created to give observers a sensorial experience, or technical, as in the case of a knife that exists because there is a need to cut something into smaller pieces. An immediate way to make a user understand the aim of a product, how it should be used, by whom, where it comes from, etc., is through the product form. From this perspective, products can be considered to have a communicative function, see Figure 1 (Crilly, 2005; Gros, 1983; Monö, 1997; Muller, 2001).

Vihma (1995) applied the Piercian semiotic approach to analyse the meaning of design products, which means considering the possibility to interpret products in many ways as signs. This view was later adopted by several other authors (Monö, 1997; Muller, 2001; Opperud, 2001; Wikström, 2002, 2006). Product semantics, which is a branch of product semiotic theory, deals with the meaning of product signs.

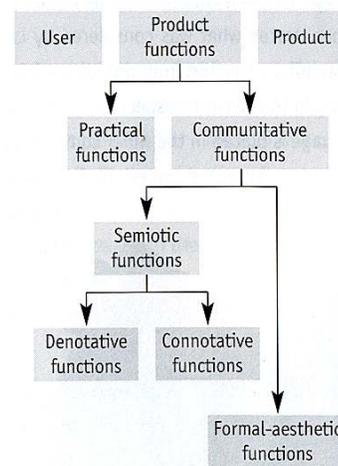


Figure 1. Product functions from Muller (2001), based on Gros(1983).

As a way to analyse product meaning, Rune Monö (1997) applied the communication theory of Shannon and Weaver (1949) to the field of design. According to Monö (1997), products send out messages formulated in a 'language' that we perceive with our senses. The language consists of signs, carried by design elements such as forms, colours, and sounds. These elements are associated with aesthetics and contribute to what is perceived as a product's meaningfulness.

Designer intent, stakeholder response

Crilly (2005) expands Monö's product communication theory adding to it theories regarding the designer intent with the product design and the consumer response to it, see Figure 2. In this model the designer creates a message that is encoded in a product, which is perceived by the consumer within an environment. From a communication theory perspective the designer is regarded as the source, the product as the transmitter, and the environment as the channel where the message is transferred to and received by a person's senses. The final destination for the information perceived by the senses is the result of human responses (Crilly, 2005).

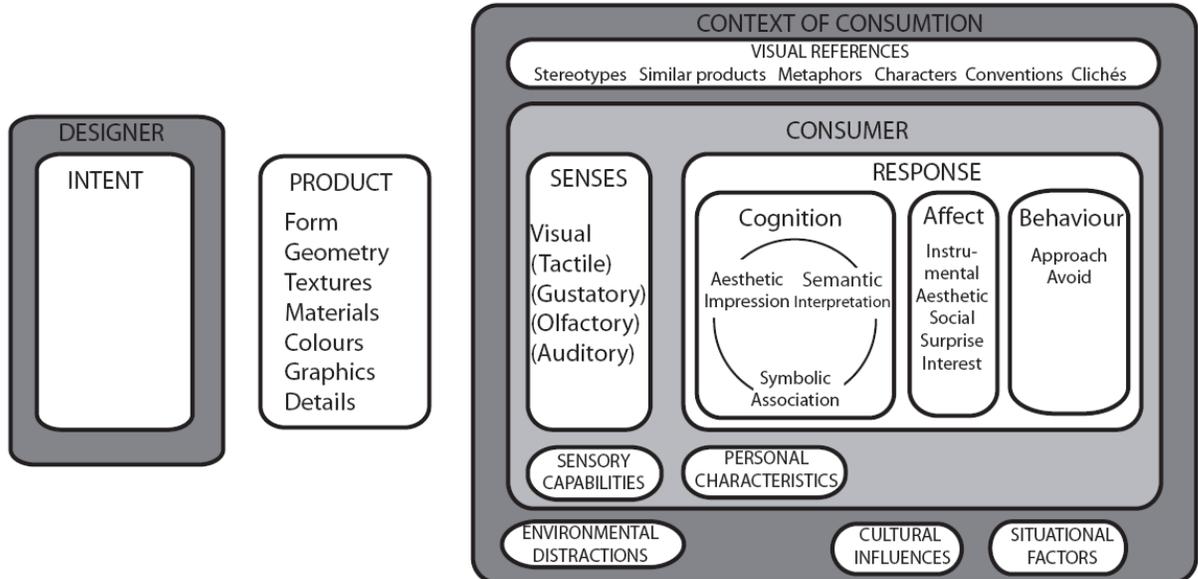


Figure 2. Framework for consumer response to product aesthetics adapted from Crilly (2005) showing the moderating influences that affect response.

When designers use their skills to develop a product concept for a client, predetermined restraints and goals are described by the client in the design brief. Within this framework the designer shall come up with a new product concept by making interpretations of the brief and creating product concepts through creative processes. The outcome of such processes is a creation embodying both conscious intentions and non-conscious acts. Examples of conscious intentions can be to design an aesthetically pleasing product, a product communicating product origin, properties, qualities or characteristics or even a product telling the world something about its owner.

The product evokes a response inside the person who comes in contact with it (Crilly, 2005). This response is usually a combination of a cognitive, affective and behavioural nature, see Figure 2. A cognitive response can be categorised into semantic interpretation, symbolic association and aesthetic impression. The semantic interpretation is what a product is seen to convey about its function, mode-of-use and qualities. The symbolic association is what a product says about its owner or user which is a result of the personal and social significance attached to the design. The aesthetic impression is the sensation that results from the perception of attractiveness or unattractiveness of the product. The second kind of response is the affective one, which involves the emotions, moods and feelings awakened by the product. The third and last kind of response to a product is the behavioural one, which deals with the approach or avoidance of the product.

Not only is the primary user's response to product design of importance, but also the response of other stakeholders. In this paper we regard any group or individual who can affect, or be affected by the achievement of a design client's purpose with a design project as stakeholders (cf. Freeman, 1984). Such a broad description has been criticised by Phillips (2003) who narrowed down the definition of stakeholder to those groups from whom an organisation (i.e. a design client) has voluntarily accepted benefits such as financial backers, employees, customers and suppliers. Other groups which might either benefit or be harmed are seen as derivative stakeholders such as media, competitors or activist groups. In many cases it is not the end user who purchases the product, but an organisation or a committee, which is why the responses of members of such a group need to be considered as well. The main focus of this paper is on how stakeholders' *cognitive* responses to product design can be accessed and understood and why this is important.

Understanding stakeholders' cognitive responses to product design

Advances in technology offer a myriad of capabilities to products and their users, but at the same time an increased challenge for designers and stakeholders in terms of communication through product form. It is often the buyer's or user's ability to understand and appreciate the product that is a constraint for the success of a product design in the marketplace (Veryzer & Borja de Mozota, 2005). In general, consumers have no access to the designers of the products they engage with. Thus the consumers' interpretation of the design is based predominantly on their interaction with the product (Norman, 1998).

According to Hsu, Chuang and Chang (2000), there are significant differences between designers' and users' perceptions of product form. The same product form gives designers and users different impressions, and the same words describing a form might have different meanings for designers and users. As a result there is a risk that stakeholders do not perceive the message intended by the designer, or perceive a message different from the one intended by the designer. This fact underlines the importance of the analysis of design concepts in terms of human perception and response to messages embodied in the product form. The level of importance of a cognitive response to product design in line with the designer's intent varies and depends on the type of product and context.

There are a variety of approaches to how designers or researchers can gain a deeper understanding of stakeholders' cognitive responses to product design. In the consumer behaviour field there is a long tradition of research on consumer response to products. In addition, approaches to the understanding of the importance of the possessions in the social and private lives of people have been developed in marketing, psychology and anthropology (Creusen & Schoormans, 2005; Csikszentmihalyi, 1991; Dittmar, 1992; Richins, 1994b; Schultz Kleine & Menzel Baker, 2004). Considerable research has been conducted in the field of empirical aesthetics in order to better understand the nature of aesthetic appreciation, resulting in a number of methods available for the assessment of human aesthetic response to form (P H Bloch, Brunel, & Arnold, 2003; Creusen & Schoormans, 2005; Holbrook, 1986; Veryzer, 1993). Lately some design researchers have developed methods by which stakeholder response to product design can be understood (Adank & Warell, 2006; Oppered, 2001; Vihma, 1995; Wikström, 2002, 2006).

The semantic interpretation

A correct semantic interpretation of the designer intent is important in cases when the design should lead to a desired reaction or action. If a stakeholder response occurs as intended by the designer, there has been a successful communication between the designer and the stakeholder experiencing the product. This can be essential when the product design describes a certain mode of operation. In other cases the designer might have tried to express product performance and characteristics that are key issues for the differentiation from competitors in the marketplace in order to strengthen the products competitiveness. A successful stakeholder semantic interpretation to such product form is the stakeholder idea of the product as possessing these particular qualities in opposition to competing products. An additional effect of differentiation is attained by companies that develop design strategies where a range of design elements that are repeated in the product portfolio increase brand recognition (Karjalainen, 2004). Stakeholder semantic interpretation of such elements can help reinforce their ideas of brand values.

There are several methods by which stakeholder semantic interpretation of product form can be accessed and understood (Opprud, 2001; Osgood, Suci, & Tannenbaum, 1967; Vihma, 1995; Wikström, 2002). Osgood et al. (1967) presented the semantic differential method for the analysis of the meaning of objects. This method places it within a three dimensional semantic space. The position of the meaning of an object within the semantic space is determined through surveys where subjects evaluate the design by means of adjectives describing desirable or undesirable characteristics. When the product is placed in the semantic space, the product meaning can be compared with competing products' meanings, or with a concept of a product with the perfect meaning.

Wickstöm's (2002) product semantic analysis (PSA) suggests a range of tools by which users' semantic interpretation of products' can be accessed. PSA is structured upon three of Monö's (1997) four semantic product functions: *identify*, *describe* and *express*. The method permits designers or researchers to identify users' emotional and cognitive requirements of a product, and to assess whether these requirements have been met in products or product concepts. The quality of a product's semantic functions *to identify purpose and use* and *to describe function*, are measured by four parameters: intelligibility, response time / handling time, correctness and insecurity. The use of

semantic word scales is suggested for the analysis and evaluation of the quality of a product's semantic function *to express* (c.f. Osgood, 1967).

The symbolic association

Richins (1994a) examined people's expression of personal values through possessions. She distinguished between the private and public meanings of possessions. The public meaning of an object is based on social stereotypes about the relationship between possessions and their owners. The private meaning of a possession is a mix of public meanings and meaning cultivated over time through repeated interactions with the product. The personality or even identity ascribed to the user or owner of a product by society can be of great importance to the user or owner of the product. Because possessions are part of the social communication system, and are sometimes actively used to communicate aspects of the self, people are likely to care most deeply about those possessions whose public meanings are congruent with the self (Richins, 1994b). If the designer fails to communicate what potential users or owners wish to express about themselves through owning or using the product, it can cause potential users or owners choosing competing products, or experiencing discomfort. On the other hand, if a product gives its user or owner an identity close to his or her real identity, the social interaction between the user or owner and others is facilitated. Socio-pleasure which is the enjoyment derived from relationships with others (Tiger, 1992) is one of the four pleasures Jordan (2000) has applied to understand what is pleasurable about products. The other three pleasures regard *ideo* (a person's taste and values), *physio* (the human body) and *psycho* (cognitive demands such as emotional response).

Many empirical studies regarding the symbolic meaning of products have been conducted, mainly in the field of consumer behaviour research (Csikszentmihalyi, 1991; Richins, 1994a, 1994b; Schultz Kleine & Menzel Baker, 2004). Richins (1994a) used surveys to find out which possessions were more or less important in the life of people and why, and to what degree the private and public meanings of the objects differed. In a first mail survey, subjects were asked to mention a few possessions that were very important to them and describe why. The possessions were then categorised by object type according to Richins (1994b). Examples of object types are: sentimental objects showing associations with important others, transportation, practical objects, personal appearance objects, and extensions of self (trophies and souvenirs). The private meanings of the

valued possessions were assessed by content analysis according to Richins (1994b). Examples of meaning categories are: utilitarian, enjoyment, identity, appearance, and interpersonal ties.

LaTour, Henthorne and Braun-LaTour (2003) used a combination of qualitative methods to expand the understanding of the symbolic meaning of cigar consumption. First the researchers themselves explored the context of a social cigar smoking event. This event brought together users and provided an opportunity to observe behaviour in context and develop a basis for further qualitative research. One-on-one interviews were held with the users, who were first asked to volunteer to be photographed while smoking. The three dimensional stereographic photos were then used during the interviews in order to dredge the consciousness and sub-consciousness of the user. Such an assessment provides an in-depth projective view of the subject and enables an elevated objectivity, enhanced insight and diminished interview wear-out (Heisley & Levy, 1991). According to Collier and Collier (1986), the richer, the more provocative and the more vividly intense the photograph of the user, the greater is the potential projective response or insight to be gained from the interview. The data was then coded and analysed.

Ahuvia (2005) accessed the private meaning of objects in a different mode, based on the view that humans' sense of identity is structured in terms of a life narrative within which objects and people play active roles in key episodes stored in the memory. The key episodes are strung together and form a story. This story allows people to make sense of who they are and provides a connected identity from past, to present, and into possible imagined futures. A survey consisting of 10 in-depth interviews was followed up by 70 phone interviews asking informants what, if anything, they loved and discussing these loved items. Questions covered the informants' life history, things other than people they loved, their history with these loved items, people that they loved, and objects that they felt neutral about. The interviews made it possible for the researcher to trace many of the loved objects' meanings to identity conflicts in the life of the informants. The study revealed that loved items were connected to the self both by expressing the self and by transforming the self into some new desired form.

The aesthetic impression

The aesthetic impression of a product is the result of the product being perceived as beautiful or not. Aesthetic responses are typically associated with positive affect and pleasurable experiences.

However, there is always a risk of negative reactions to product form perceptions. A product must therefore elicit more positive than negative responses among consumers (P. H. Bloch, 1995).

According to Veryzer (1993) this can be done respecting gestalt laws of proportion and unity. This is in line with what Papanek (1984) argues about people's inherent preference for objects with symmetry, unity, and harmony among elements. Other theories maintain that aesthetic appreciation is connected to the simplicity or complexity of a form, the grade of novelty versus familiarity in form or even the correspondence of the product's form to stabilised mathematical formulas (Muller, 2001).

(P. H. Bloch, 1995) mentions four reasons why it is important to pay attention to product aesthetics: the aesthetics of a product have a significant role for consumers in the choice between two products that are equal in function and price; the product aesthetics can help to convey desiderate messages about product characteristics; in a larger sense, product aesthetics are important since they affect the quality of our lives; aesthetic characteristics of more durable products can have an impact for years and become part of the sensory environment. The 'five senses testing' approach, developed by Adank and Warell (2006) is a method by which stakeholders' evoked sensory experiences of a product or concept can be accessed and traced to product attributes, features and characteristics. The sensory experience results from the sensory perception which in turn leads to aesthetic, emotional and pleasurable responses. These responses can be fitted into Crilly's (2005) framework within affective and cognitive responses to product aesthetics. Whilst the main focus of the method is on aesthetic response, any type of response or affect based on sensory perception is valid.

The five senses testing approach (Adank and Warell, 2006) consists of three techniques that can be performed early in a conceptual product phase or later for evaluation of the finalised product: the sensory experience assessment, the sensory snapshot and the experience continuum sampling.

The sensory experience assessment is carried out through a product examination prior to use and one during use. In the former, subjects are to verbalise their five senses experience of images of the product/concept. In the latter, subjects are to discuss possible improvements of the product based on use in context.

In the sensory snapshot technique, the quality of the elicited sensory experience of a product is assessed and represented in a snapshot (graphic representation/star diagram), Figure 3. Descriptions of the sensory experiences in relation to the snapshot give the designer a good basis for concept improvement.

Through the last of the three techniques – the experience continuum sampling – a more in-depth understanding of the sensory experience of product features and interactions can be gained. Analysis is carried out on specific product interactions involving important user groups rating their sensory experience of the product interaction, Figure 4.

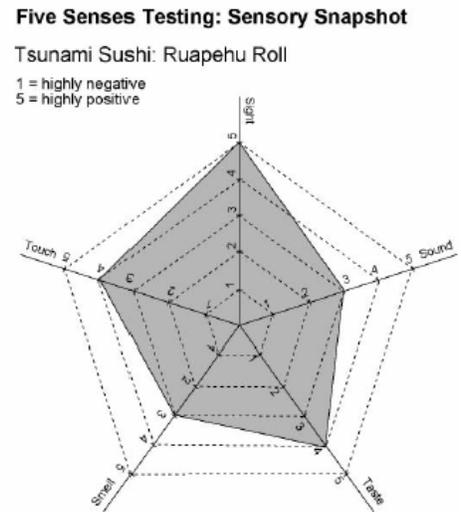


Figure 3. A sensory snapshot from a five senses test of a Ruapöehu sushi roll (Adank & Warell, 2006).

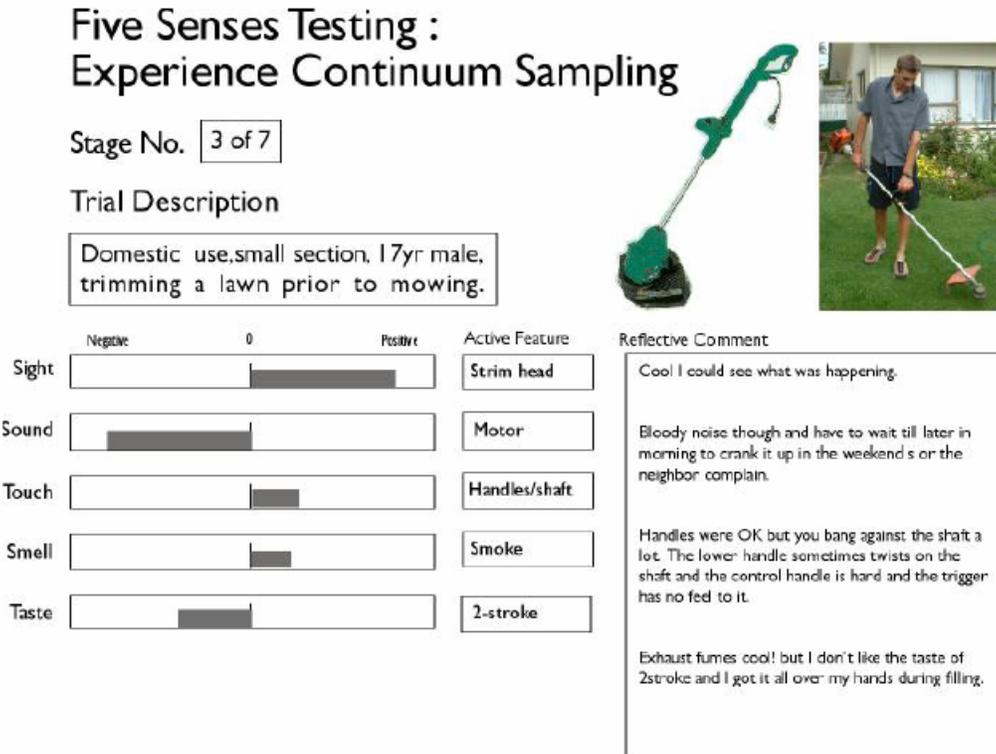


Figure 4. The outcome of an experience continuum sampling on a trimming machine (Adank & Warell, 2006).

Discussion

Designers are not always aware of their own acts when designing concepts and why different stakeholders interpret a product concept in a certain way. It is possible for both designers and researchers to use the methods outlined in this paper in order to look into their proper design work, make explicit and analyse performed acts, and map their own intentions and the corresponding stakeholder response. In addition, evaluation methods may be used to identify the concept of an ideal product from different stakeholders' points of view, and compare it to the idea of the designer. In this section, the applicability of the methods presented in this paper will be exemplified and discussed based on the authors' research projects.

Assistive products often contribute to stigmatising and segregating their user. Designers' awareness regarding users' symbolic associations of these products can reinforce the users' desired self-expression or expectations from society. If symbolic association is of importance in a context of utility product competences on the market, it is even more important if the user is unable to choose

among products, being forced to take what is offered as often occurs in the case of assistive products. The challenge is to make the product match the user's desired identity.

In a study (Olander, 2007) which focused on emotional relationships between users and products within the concept of universal design by exploring how users express their responses to products regarding identity, attitudes and feelings, (Jordan, 2000) applications of the four pleasures impacted the analysis of empirical interviews with young adults with disabilities. Richins (1994a, 1994b) findings of types of objects that are important, and different categories of meaning in general, are also valid for the specific user group of young users with disabilities. Both studies (Olander, 2007; Richins, 1994a) take their initial point from objects of importance for their users. Richins' (1994a; 1994b) methods could be used when the designer knows what type of object is in demand to explore the different categories of meaning to be expressed.

La Tour et al. (2003) combine interviews with context photographs. This approach to intense consciousness regarding the users' projective responses is really interesting since it is often difficult for users to express their perceptions of products. For some users it can be more difficult than for others. This is the case for users of assistive products and the reason might be few alternative products to choose from compared with utility goods. A product needs a perfect function before other qualities are noticeable. However, if the designer uses tools that might facilitate the user's expression of their responses, it could contribute to predominant benefits for how the product area can be developed. The method described by La Tour et al. (2003) can facilitate the user's explicit symbolic responses to product design. The same is valid for Ahuvia (2005) using life narrative stories; especially the use of time dimensions such as stories connected to past, present and imagined futures. In the Olander (2007) studies, the interviews focused only on the present. Human senses are essential for perceiving a product. Many of our aesthetic values are based on interpretations from what our senses perceive. Users with disabilities sometimes lack one or two senses such as vision or hearing. This fact challenges the five senses testing method developed by Adank and Warell (2006). How would a product change if you deliberately tried to explore a variety of approaches where users with different access to their senses evaluated products?

Another product area where methods presented in this paper can be useful is for products in business-to-business¹ markets. The unconventional relationship between designer, owner and user results in a high degree of complexity when it comes to understanding stakeholder response to product design. The product needs to appeal in many different ways to the buyer, owner and user. The different stakeholders' responses to product design depends on their preferences regarding functionality, performance, characteristics and aesthetics, and how these features are embodied in the product design. In a research project, the semiotic design quality of the offshore ships, which is an example of business-to-business products, is analysed. The aim is to find ways of improving the semiotic design quality of the exterior of offshore ships.

The project will include acts of design performed by the researcher. In order to validate the quality of the research, it is important to analyse what is done, why and how and evaluate the effects of the actions. Such evaluations can illustrate the positive effects of a conscious use of product semiotics within the industrial design process for offshore ships. In addition, different preferences, interpretations and responses to the product design of different groups of stakeholders with a variety of relations to the product can be mapped.

Methods presented in this paper, and especially the part of the PSA method (Wikström, 2002) that examines the expressive semantic function of products can be used for the analysis of the offshore ship exterior. The quality of the semantic function *to express* in an offshore ship design can affect the degree to which desiderate associations regarding the products performance and characteristics occur as a result of visual perception. In addition, it can be a great benefit for offshore ship designers to be aware of what their products identify (as a result of the semantic function *to identify*). An offshore ship design that strongly identifies its origin is likely to reinforce the offshore ship company's brand. This is relevant in such a competitive market as the offshore ship design market. A user semantic interpretation of the semantic function *to describe*, for example, control panels and handles in offshore ships is essential since a response resulting in handling failure puts hundreds of lives and the marine environment in danger.

Yamamoto and Lambert (1994) provided evidence that aesthetically pleasing properties of industrial products have a positive influence upon product preferences among industrial buyers.

¹ Products in Business-to-business (B2B) markets are often industrial products, designed and produced to be sold by one business to another business, in contrast to consumer products within business-to-consumer markets (B2C) that are destined to consumers.

Accordingly, offshore ship designers can gain competitive advantage by considering product aesthetics during the design process. Offshore ships are usually presented to potential buyers through visual representations of the physical product. The sensory experience assessment and the sensory snapshot from the Adank & Warell (2005) five senses tests can be useful to gain an understanding of stakeholder aesthetic response to offshore ships since both of them can be performed using visual material as a representation of the physical product.

It is important to keep in mind when trying to understand stakeholder aesthetic responses to product design, that much of the aesthetic impression is formed on a nonconscious level (Veryzer, 1999). Veryzer (1999), argued that even though subjects often prefer an object designed with respect to gestalt laws, it is rare that he or she is able to understand and verbalise why that particular object is preferred over objects where gestalt laws are not respected. The five senses test (Adank & Warell, 2006) skirts this problem by tracing sensations to specific elements. Anyone is able to describe their sensation of something without being pushed to explain why in theoretical terms.

Stakeholder response to product design is subjective. There is not one response valid to all stakeholders perceiving a product. Therefore, it is important that analysis of stakeholder response is performed with the different groups of stakeholders whose responses can be of importance. We do not argue that it is impossible to satisfy more than one user group with the same product design. In fact, in many cases the designer needs to have a wide perspective when designing a product that is purchased by one stakeholder and used by another. The product then needs to both pass the critical lenses of the purchasing stakeholder and at the same time be appreciated by the end user. It is not always a matter of course for a purchasing stakeholder to completely and exclusively consider the requirements of the user, but inevitably parts of his or her own interpretation of and response to the product design will guide the choice of which product to purchase. This situation is valid in the research cases exemplified above.

References

- Adank, R., & Warell, A. (2006). *Assessing the sensory experience of product design: Towards a method for 'Five Senses Testing'*. Paper presented at the Design & Emotion.
- Ahuvia, A. C. (2005). Beyond the extended self: Loved objects and consumers' identity narratives. *Journal of Consumer Research*, 32(1), 13.
- Bloch, P. H. (1995). Seeking the Ideal Form - Product Design and Consumer Response. *Journal of Marketing*, 59(3), 16-29.

- Bloch, P. H., Brunel, F. F., & Arnold, T. J. (2003). Individual differences in the centrality of visual product aesthetics: Concept and measurement. *Journal of Consumer Research*, 29, 15.
- Collier, J. J., & Collier, M. (1986). *Visual Anthropology: Photography as a research method*. Albuquerque, NM: University of New Mexico Press.
- Creusen, M. E. H., & Schoormans, J. P. L. (2005). The different roles of product appearance in consumer choice. *Journal of Product Innovation Management*, 22(1), 63-81.
- Crilly, N. (2005). Product aesthetics. Representing designer intent and consumer response. Unpublished Doctoral Dissertation. University of Cambridge.
- Csikszentmihalyi, M. (1991). Design and order in everyday life. *Design Issues*, 8(1), 8.
- Dittmar, H. (1992). *The social psychology of material possessions : to have is to be*. Hemel Hempstead: Harvester Wheatsheaf.
- Gros, J. (1983). *Grundlagen einer Theorie der Produktsprache. Einführung. Heft 1: Hochschule für Gestaltung Offenbach am Main*.
- Heisley, D. D., & Levy, S. J. (1991). Autodriving: A photoelicitation technique. *Journal of Consumer Research*, 18(December), 15.
- Holbrook, M. B. (1986). Aims, Concepts, and Methods for the Representation of Individual Differences in Esthetic Responses to Design Features. *Journal of Consumer Research*, 13, 10.
- Hsu, S. H., Chuang, M. C., & Chang, C. C. (2000). A semantic differential study of designers' and users' product form perception. *International Journal of Industrial Ergonomics*, 25, 17.
- Jordan, P. W. (2000). *Designing pleasurable products : an introduction to the new human factors*. London: Taylor & Francis.
- Karjalainen, T.-M. (2004). *Semantic Transformation in Design: Communicating strategic brand identity through product design references*. Helsinki: The University of Art and Design Helsinki.
- LaTour, M. S., Henthorne, T. L., & Braun-LaTour, K. A. (2003). Is a cigar just a cigar? A glimpse at the new-age cigar consumer. *Academy of Marketing Science Review*, 2003(12), 15.
- Monö, R. (1997). *Design for product understanding : the aesthetics of design from a semiotic approach*. Stockholm: Liber.
- Muller, W. (2001). *Order and meaning in design*. Utrecht: Lemma.
- Norman, D. A. (1998). *The design of everyday things*. London: MIT Press.
- Opperud, A. (2001). *Semiotic product analysis*. Paper presented at the Design and Emotion.
- Osgood, C. E., Suci, G. J., & Tannenbaum, P. H. (1967). *The measurement of meaning*. Urbana, Ill.: University of Illinois Press.
- Papanek, V. (1984). *Design for the Real World*. New York: Van Nostrand.
- Richins, M. L. (1994a). Special Possessions and the Expression of Material Values. *Journal of Consumer Research*, 21(3), 11.
- Richins, M. L. (1994b). Valuing Things - the Public and Private Meanings of Possessions. *Journal of Consumer Research*, 21(3), 17.
- Schultz Kleine, S., & Menzel Baker, S. (2004). An Integrative Review of Material Possession Attachment. *Academy of Marketing Science Review*, 2004(1), 39.
- Shannon, C. E., & Weaver, W. (1949). *The Mathematical Theory of Communication*. Urbana, IL: University of Illinois Press.
- Veryzer, R. W. (1993). Aesthetic response and the influence of design principles on product preferences. *Advances in Consumer Research*, 20, 5.
- Veryzer, R. W. (1999). A nonconscious processing explanation of consumer response to product design. *Psychology & Marketing*, 16(6), 25.

- Veryzer, R. W., & Borja de Mozota, B. (2005). The Impact of User-Oriented Design on New Product Development: An Examination of Fundamental Relationships. *The Journal of Product Innovation Management*, 22(2), 15.
- Vihma, S. (1995). *Products as representations : a semiotic and aesthetic study of design products*. Helsinki: University of Art and Design Helsinki UIAH.
- Wikström, L. (2002). *Produktens budskap : metoder för värdering av produkters semantiska funktioner ur ett användarperspektiv*. Göteborg: Institutionen för produkt- och produktionsutveckling, Chalmers tekniska högskola.
- Wikström, L. (2006). *Product semantics in theory and practice*. Paper presented at the Design & Emotion Conference.
- Yamamoto, M., & Lambert, D.R. (1994). The impact of product aesthetics on the evaluation of industrial products. *Journal of Product Innovation Management*, 11(4), 15.