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A theory-based framework of branded product emotions

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Abstract: Design of a branded product requires an effective understanding of how the consumers perceive and make sense of products and the brand. Kansei Engineering is an approach that takes the consumers perception and emotions into account through the Kansei words and provides information about the relation between perceptual concepts and physical properties of the product. However, the consumer perception related to non-physical aspect of the products (such as brand association) is not considered in the KE approach. This paper introduces the "branded product emotion framework" to help an understanding of the relation between brand image and Kansei concepts. According to this framework the consumer emotional responses to a new branded product can be evoked by consumers' perception of the physical properties of that specific product (Kansei), by the associations to the brand and by the association to the product class. The objective of the framework is helping to achieve a better analysis of the factors that are contributing to generate or affect the emotions and evaluations that consumers make of a branded product and reduce the risk of overlooking those emotions that brand elicits without the intermediation of the product. The frameworks is helpful in the design process of branded product in which the members of the design team, especially product designers and engineering designers, should collaborate and communicate around the brand value and the Kansei concepts to justify the design decisions and implement these concepts into a new product.

Keywords: Branded products, Kansei Engineering

INTRODUCTION

In today's market, product success is determined by consumer satisfaction that is achieved by satisfying the consumer needs (Smith & Smith, 2012) and taste. Beyond technical performances the visual attributes of products attract consumers and entice them to inspect a product more closely and consider a purchase (Seva & Helander, 2009). Companies, that are able to provoke certain emotional responses through the product appearance and to create a bond between consumers and the product, gain competitive advantages on the market and increase their product success.

Brand is an identifier of the products of a company amongst others. It is a factor that influences strongly the choices for consumers. Brand simplifies purchasing decisions, offers quality assurance and reduces perceived risks involved in the purchase (Karjalainen, 2003) and therefore contributes to elicit emotional responses from the consumer. Companies use design to create brand

recognition (Karjalainen & Snelders, 2010) and also to make consumers feel more attached to products (Aaker, 1996).

It is challenging to make sure that the consumer perceptions of the physical properties of a branded product (e.g. color, shape, material, surface texture) do not conflict with the emotional responses that the brand company initially intended. The difficulty for companies is first to understand the factors contributing to the generation of emotional responses by consumers when they face a new branded product and second to establish links between product properties and the consumer perceptions.

To address these difficulties many studies have been carried out on how consumers perceive and make sense of products (Blijlevens, 2009; Crilly, et al., 2004; Crilly, 2011; Petiot & Yannou, 2004) and on how the consumer emotions are affected by a product. The objective of these studies was to provide designers with useful information about the "side-effect" of their product design decisions on the way consumers will emotionally respond to the product. This information can help designers both in anticipating (and avoiding) the unwanted emotional responses and in stimulating the intended emotional response to make better products (Desmet & Hekkert, 2009).

Kansei Engineering (KE) takes consumer feelings and emotions into account through the Kansei (Japanese for emotional or affective) words and helps the product designers to find out what the design concept should or should not include to respond to the consumer feelings. For example the relationship between the different coloured areas and the aesthetic degree of the product (influenced by the coloured components and display angles) can be studied by KE approach (Hsiao et al., 2008). KE has been widely applied from measuring the product experience in food industry (Kang & Satterfield, 2009) and packaging (Barnes et al., 2008) to the design of E-commerce website for visualizing the information (Lokman & Noor, 2006).

Kansei concepts refer to perceptual concepts and the semiotics that are used to express consumer perceptions of products. For the branded products both Kansei concepts and brand values generate emotional responses, but the relation between brand values and Kansei concepts needs to be clarified.

This paper develops the "branded product emotion framework" to help an understanding of the relation between brand image and Kansei concepts. After a literature review on the models that address the product emotion and consumers perception, we present our model and explain it using some examples.

Literature review

In literature two different approaches take consumer emotions into account: theory-based and pragmatic-based approaches. The theory-based approaches aim to provide insights to facilitate the study of emotional responses by characterizing the emotion elicitation process (Desmet & Hekkert, 2007) and modeling how consumers perceive and experience a product (Crilly et al., 2008; Crilly et al., 2004; Warell, 2008). For example Desmet's **model of product emotion** (Desmet, 2003; Desmet and Hekkert, 2007) presents four main parameters that contribute to the eliciting process of emotions: appraisal, concern, product and emotion. The main assumption of this model is that the emotional responses are the result of an appraisal process in which people appraise (i.e. evaluate) a product based on their concerns (i.e. the points of reference in the appraised process that can match or mismatch a product). For example the reason of attractiveness of an umbrella for a person can be due to his/her concern for staying dry.

The **Visual product experience (VPE)** of Warell (2008) is inspired by the basic product emotion model of Desmet and provides a model for perceptual and visual product experience. In VPE model the product experience is composed of sensorial, cognitive and affective modes.

Crilly et al., (2004) propose **a framework for the consumer response** to the visual form of product, using the basic element of Shannon theory of communication (Shannon, 1948). In the model of Crilly et al. (2004), the design process is seen as a process of communication in which the intention of the designer or the design team is embedded in the product. The product is perceived by the consumers within an environment. This perception leads to cognitive, affective and behavioral responses, where cognitive response is composed of aesthetic, semantic and symbolic aspects. Response to the design message takes place within the consumer's culture context.

The pragmatic-based approaches aim to identify and capture the direct link between the consumers emotional responses and the product properties (Desmet & Hekker, 2002; Nagamachi, 1995). Many of pragmatic-based approaches rely on verbal and non-verbal questionnaires such as the classic Kansei Engineering approach (Nagamachi, 1995). Alternative techniques such as facial expression coding and infrared thermography (Jenkins et al., 2009) are also helpful to capture emotional responses. Desmet (2002) use a non-verbal self-reporting approach that is implemented in a software called product motion measure (PrEmo).

Although these approaches are very useful to understand the factors contributing to the emotional responses (theory-based approaches) and help to build links between the consumer perception and physical properties (pragmatic-based approaches), they do not provide a clear insight into the relation between emotional responses to the brand and to the consumer perception of the physical product.

There are a few studies that have addressed brand as a distinct element that affects the interpretation and sense making of the physical product properties by consumers. For example the relation between brand strategy and product design has been addressed in "semantic transformation" proposed by (Karjalainen 2004). This model describes how qualitative brand descriptions, that are transformed into value-based design features, generate the intended meaning of products (Figure 1). This allows for an in-depth analysis of how a design can communicate the brand message. The model suggests a triadic relationship among a perceptible object, for example a design feature, shape, color, referred to by Karjalainen as *Representament*, an *Object* (of reference, brand value), and an *Interpretant* (for example the user).

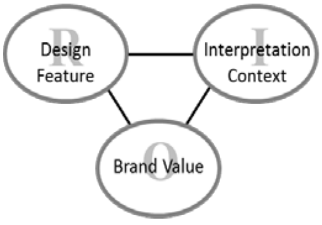

Figure 1**: The R-O-I framework for the analysis of Brand references in Design**

According to this model, the product can have elements (or features) that create association and link the product to brand values. Likewise, the brand values (and their representations in different products) affect the interpretation of the product elements (Karjalainen 2010). But from the model the relation between brand values and Kansei concepts are not clear.

Some other researches have looked at the brand values and Kansei concepts (in generation of emotional responses) using the Kansei Engineering (KE) approach. As the original KE approach did not explicitly consider the brand values, the researchers have adopted a method to link the brand values to Kansei words. For example Barnes et al. (2008), Dong, Xie, & Ding (2010) and Kongprasert (2010) use a hierarchy of words so that each 'high level' Kansei word is described by some other 'low level' words until they are related to a physical property (see Figure 2). The brand values are taken into account for the Kansei word selection and the highest level is held by the brand values.

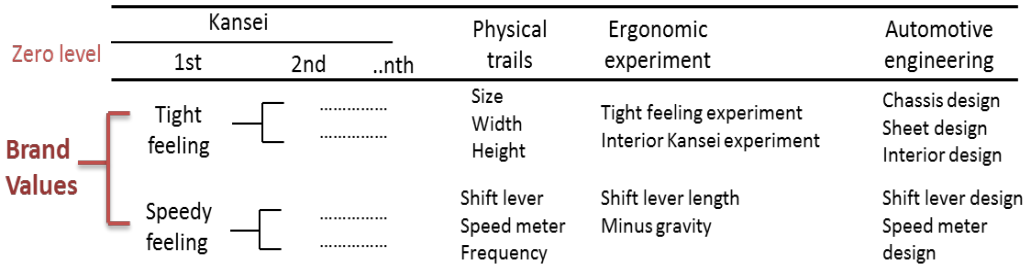

Figure 2: **Kansei Engineering flow, Nagamachi 2002**

In such a hierarchical structure of words (as shown in Figure 2) the high level concepts (brand values) can be assured if the lower level concepts (Kansei words) are met by the physical properties. For example consider a car company that wants to communicate its brand value and creates the brand image in the minds of consumers as "dynamic". Dynamic image can be achieved by creating a "tight feeling" and "speedy feeling" for consumers of the car. The tight feeling can be generated through specific physical properties such as size and height in the design of the car. This affects the design of internal product components to achieve that specific size to generate a tight feeling and create a dynamic image for the brand.

The risk involved in such a method is that it may lead to overlook those emotions that brand elicits which are not intermediate in the product.

Kansei is concerned with the perceptions coming from the product itself. We argue that the emotion related to the brand should be differentiated from the emotion related to the product perception.

It has been well established that products generate emotive responses. These emotional responses are influenced by the product class as well as the association that users make with the brand, based on personal beliefs, values and emotions toward the brand.

For example see Figure 3 for "feminine PUMA sport shoe". The product is "feminine" not "masculine". The culture and the user's background are very important in this interpretation. The perception of "feminine" of the shoe varies with cultures and through the ages. The "PUMA" brand can be recognized from the logo or the red line on the shoe. A direct association to the brand such as previous experiences with other PUMA products can generate emotive responses (i.e. it is a "PUMA" shoe not any shoe). Furthermore the class of the product generates feeling about the expected function (i.e. a "sport" shoe).

Figure 3: **Example the emotional responses to a branded product**

Framework for branded product emotions

In order to better understand the relation between brand and Kansei we presents a framework (Figure 4) inspired from the "Visual Product Experience (VPE)" model of (Warell 2008) and Desmet's model of product emotion (Desmet 2003, Desmet and Hekkert 2007) as well as the "Semantic Transformation" model of (Karjaleinan 2004) described before.

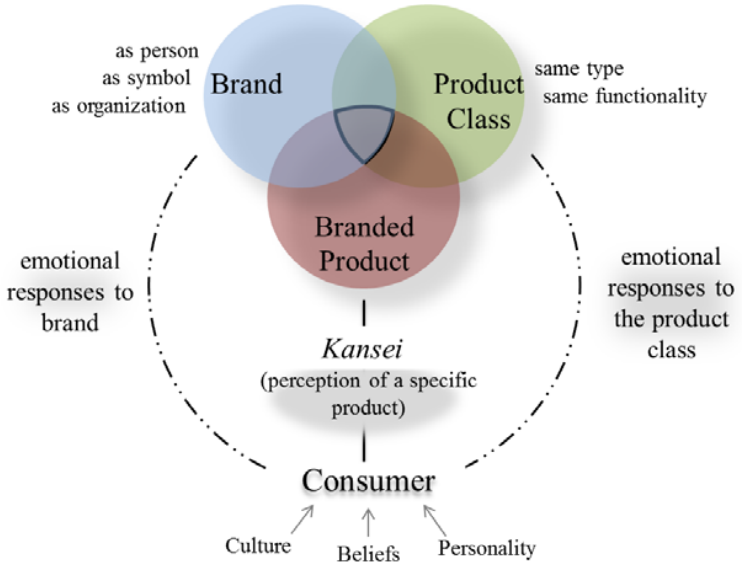

Figure 4: **Framework of new branded product emotions**

According to this model the consumers emotional responses to a new branded product can be evoked by the consumers perception of the physical properties of that specific product, by the associations to the brand and by the association to the product class. In addition, according to (Crilly et al., 2008) factors such as the consumers' cultural background, beliefs, values and personalities are also important to be taken into account, because these affect their emotional

responses.

In this model Kansei concepts are semantic words to describe the consumers perception of product's physical properties such as shape, weight, specific features or its packaging.

Product class is the label for all the products with the same core functionality (e.g. all the sport shoes, all the mobile phones). Products that are grouped in the same class share typical basic elements and similar functions. They may have variations of color, shape or brand name. The product class elicits emotional responses through the expectation it creates in the mind of consumers and through the evaluation of the new product compared to other products that perform the same or comparable functionality or have similar elements. The range of products grouped in the same class is dependent on how broad the definition is. For example for foot wear products, a product class may include sport shoes whereas a broader classification may include all type of sport and party shoes as well as slippers.

The consumers emotional responses can be generated through the attachments users have to brand and their experience of previous products of the same brand. It can be related to the image that consumers have of the brand personality, the organization and what the brand symbolizes for consumers (for example the feeling of buying and using the best).

When the consumer perception of physical properties of product aligns with the emotional responses to the brand value, the brand values and the brand's image is reinforced in consumer's mind. For example if honesty is a brand value (Figure 5), a large clear window on a plastic bag that shows the actual product, is a visual indicator that the product and the brand are trustworthy and honest (Kang & Satterfield, 2009).

Figure 5: **Intersection, reinforcement of brand image and Kansei concepts**

However consumers perception of a product (Kansei concepts) is not always necessarily aligned with what the brand intends to communicate (see Figure 6). For example "modernity" might not be the intended brand image that a DVD-player manufacturing company wants to create. But a DVD-player that is angular, metallic-looking and is made of a smooth material is perceived as modern (Blijlevens 2009).

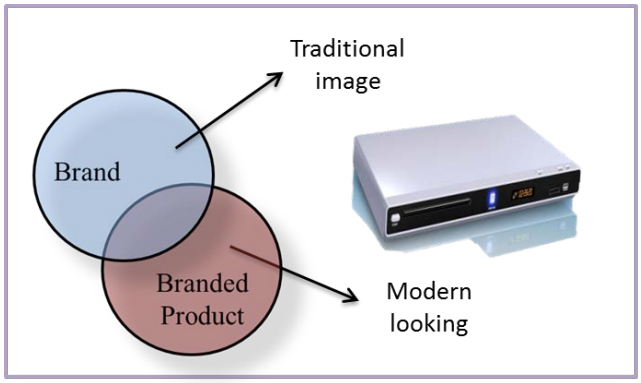

Figure 6: **Example where Kansei and brand values are not aligned**

When Kansei (consumer perception of the product) and the intended emotional responses that the brand company wants to create do not align, the product perception and the brand image can either complement or contradict each other. For example a brand that conveys the value of “prestige” and lacks the “modernity”, can gain “modernity” by introducing products that have modern design.

It is especially challenging when consumer perception of the product properties and the brand image coming from other aspects of brand value are incompatible and contradict each other. This will cause difficulties for consumers to form an image of product and brand and will negatively affect their attitude towards the brand (Rompay, Pruyn, & Tieke, 2009).

The case of complementing or contradicting emotional responses may also happen when some properties of the product do not share the functionalities expected from the product class. For example as it is shown in Figure 7, high heels are not expected for a product in sport shoe class (or shoes grouped in party shoe class are not expected to carry sport looking). This kind of products sends a mixed message that leads to ambiguity for assigning the product to a product class. In psychology literature the term “cognitive dissonance” is used to describe the feeling of discomfort resulting from two conflicting beliefs (or perceptions).

Figure 7: **Example where the perception of product class and the Kansei are not aligned**

Sometimes the emotional response arising from the product class might be in conflict with the emotional response coming from the brand value. For example “rigidity” is the intended image that the Tecnifibre brand tries to communicate to consumers (Figure 8). Rigidity is embedded in the

“inflexible” structure of Tecnifibre tennis rackets. However, the design of a tennis bag implies “flexibility” coming from the product class of sport bags. This requires a design solution that incorporates both “flexibility” and “rigidity” in the product.

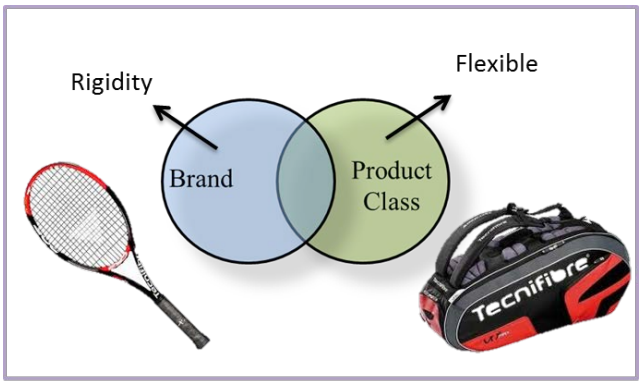

Figure 8: **Example of when brand value and the product class are not aligned**

Discussion

Like other theory-based approaches, our ‘branded products emotion model’ provides insights and understanding to analyze the factors that are contributing to generate or affect the emotions and evaluations that consumers make of a branded product.

Once the relation between brand image and Kansei concepts are clarified, the important point to consider is that for the design of a branded product, the members of the design team, especially the product designers and the engineering designers, should collaborate and communicate together to implement the brand value and the Kansei concepts into the new product throughout the design process.

Appling the brand knowledge in the design of a new product is an intuitive process. The communication of such tacit and implicit knowledge is difficult. Likewise the knowledge related to consumer perception and Kansei is also tacit. Although Kansei Engineering can provide input information and to some extent make this knowledge explicit by linking emotions and perceptions to physical properties of product, the implication of such knowledge in the design of a new product is not entirely evident. For example, Kansei concepts are context dependent. The meaning of “soft” changes from one product to other and it is difficult to say that there is an absolute link between for example the “rounded shape” and the “soft impression” in different products. The communication of Kansei concepts among the members of the design team is difficult because Kansei concepts are subjective. The subjective nature of Kansei concepts means that different people have different interpretations, which gives room for ambiguity.

In addition to the challenges related to the communication of brand values and Kansei concepts, general factors contributing to a potential communication breakdown among the design team should be considered. This includes different sets of principles, goals and training (Pei et al. 2010), thus different viewpoints on the design of the product (Bucciarelli, 1994). The use of different design representations expressing different types of information (Eckert & Clrakson, 2004) and different technical languages (jargons) (Eckert & Stacey, 2001) are also challenging. The impact of a company’s organization and configuration (e.g. locations of design department and engineering department, task definition of each department, chronologic order of activities etc.), could also act as barriers.

Conclusion

This paper presents a model of the emotional responses of consumers to a new branded product. In summary, the purpose of using particular shapes, curves, colours or elements in the design of a new product can be related to the intention of communicating the brand value and foster the brand image in the minds of consumers or to create recognition. The design decisions can be also related to the intention of generating emotions and perception related to a specific product (Kansei concepts). It is important that physical properties of the product do not generate contradicting Kansei and brand-related emotions. Furthermore, consumers emotional responses to a branded product might not be generated only due to its physical properties, but also due to the consumers' understanding of the brand in general and due to the evaluations of the product class. The consumers' cultural background, personality and beliefs are also contributing to how they perceive and emotionally respond to products.

The model provides the basis for future studies by raising interesting questions about how to identify and manage the compatibility and potential contradiction of brand image and product perception. It is important to understand the brand evolution and its future objectives defined by brand developers, and consider these objectives in the design of new products. For example if the objective of the brand company is to communicate a new value to the consumers, the design of all the new series of its products need to embody the new value.

References

Aaker, D. A. (1996). *Building Strong Brands* (p. 380). New York, USA: The Free Press.

Barnes, C., Childs, T., Henson, B., & Lillford, S. (2008). <IT>Kansei</IT> engineering toolkit for the packaging industry. *The TQM Journal*, *20*(4), 372–388. doi:10.1108/17542730810881357

Blijlevens, J. (2009). How Consumers Perceive Product Appearance : The Identification of Three Product Attributes. *International Journal of Design*, *3*(3), 27–35. Retrieved from http://www.ijdesign.org/ojs/index.php/ijdesign/article/view/535

Crilly, N. (2011). Do users know what designers are up to? Product experience and the inference of persuasive intentions. *International Journal of Design*, *5*(3), 1–15. Retrieved from http://140.118.10.110/ojs/index.php/IJDesign/article/view/716

Crilly, N., Maier, A., & Clarkson, P. J. (2008). Representing Artefacts as Media : Modelling the Relationship Between Designer Intent and Consumer Experience, *2*(3), 15–27.

Crilly, N., Moultrie, J., & Clarkson, P. J. (2004). Seeing things: consumer response to the visual domain in product design. *Design Studies*, *25*(6), 547–577. doi:10.1016/j.destud.2004.03.001

Crilly, N., Moultrie, J., & Clarkson, P. J. (2009). Shaping things: intended consumer response and the other determinants of product form. *Design Studies*, *30*(3), 224–254. doi:10.1016/j.destud.2008.08.001

Cupchik, G. (1999). Emotion and industrial design: Reconciling meanings and feelings. In *Proceedings of the 1st International Conference on Design and Emotion* (pp. 75 – 82). Delft.

Desmet, P, & Hekker, P. (2002). The basis of product emotions. *Pleasure with products, beyond usability*, (1988), 60–68. Retrieved from http://books.google.com/books?hl=en&lr=&id=xyCBQfIKKk0C&oi=fnd&pg=PA58&dq=The+Basis+of+Product+Emotions&ots=IElvtPcpef&sig=BrZbObG2rxkUe0PHqxJ42mXLMBg

Desmet, Pieter. (2002). *Designing Emotions* (p. 231). Delft University of Technology.

Desmet, Pieter. (2003). A Multilayered Model of Product Emotions. *The Design Journal*, *6*(2), 4–13. doi:10.2752/146069203789355480

Desmet, Pieter, & Hekkert, P. (2007). Framework of Product Experience. *International Journal of Design*, *1*(1), 57–66. Retrieved from http://www.ijdesign.org/ojs/index.php/ijdesign/article/view/66/15

Desmet, Pieter, & Hekkert, P. (2009). Special Issue Editorial : Design & Emotion What Inspired the Interest in User, *3*(2), 1–6.

Dong, X. F., Xie, Q. Sen, & Ding, L. (2010). Research on Brand Products Based on Kansei Engineering. *Advanced Materials Research*, *171-172*, 389–393. doi:10.4028/www.scientific.net/AMR.171-172.389

Ho, A., & Siu, K. W. M. (2009). Emotionalise Design, Emotional Design, Emotion Design: A new perspective to understand their relationships. In *Proceedings of the International Association of Societies of Design Research*. Seoul.

Hsiao, S.-W., Chiu, F.-Y., & Chen, C. S. (2008). Applying aesthetics measurement to product design. *International Journal of Industrial Ergonomics*, *38*(11-12), 910–920. doi:10.1016/j.ergon.2008.02.009

Jenkins, S., Brown, R., & Rutterford, N. (2009). Comparing Thermographic, EEG, and Subjective Measures of Affective Experience During Simulated Product Interactions. *International Journal of Design*, *3*(2). Retrieved from http://www.ijdesign.org/ojs/index.php/IJDesign/article/view/564/260

Kang, S., & Satterfield, D. (2009). Connectivity Model: Evaluating and Designing Social and Emotional Experiences. In *Proceedings of International Association of Societies of Design Research* (pp. 2247–2256). Retrieved from http://gsct3237.kaist.ac.kr/e-lib/Conferences/IASDR/2009/Papers/Orally Presented Papers/Behavior/Connectivity Model - Evaluating And Designing Social And Emotional Experiences.pdf

Karjalainen, T. M. (2003). Strategic design language–transforming brand identity into product design elements. In *10th Intarnational Product Development Management Conference, June 10-11*. Brussels. Retrieved from http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.198.406&rep=rep1&type=pdf

Karjalainen, T. M., & Snelders, D. (2010). Designing Visual Recognition for the Brand*. *Journal of Product Innovation Management*, *27*(1), 6–22. doi:10.1111/j.1540-5885.2009.00696.x

Kongprasert, N. (2010). *A Methodology for the Integrated Design of Customer Goods*. *Production*. Institut polytehcnique de Grenoble. Retrieved from http://hal.archives-ouvertes.fr/tel-00580864/

Lokman, A., & Noor, N. (2006). Kansei Engineering Concept in E-commerce Website. *Proceedings of the International Conference on Kansei Engineering and Intelligent Systems*, 117–124. Retrieved from http://anitawati.uitm.edu.my/mypapers/06_KEIS06_KEConceptinECommerce.pdf

Nagamachi, M. (1995). Kansei Engineering: A new ergonomic consumer-oriented technology for product development. *International Journal of Industrial Ergonomics*, *15*(1), 3–11. doi:10.1016/0169-8141(94)00052-5

Petiot, J.-F., & Yannou, B. (2004). Measuring consumer perceptions for a better comprehension, specification and assessment of product semantics. *International Journal of Industrial Ergonomics*, *33*(6), 507–525. doi:10.1016/j.ergon.2003.12.004

Rompay, T., Pruyn, A., & Tieke, P. (2009). Symbolic meaning integration in design and its influence on product and brand evaluation. *International journal of design*, *3*(2), 19–26. Retrieved from http://doc.utwente.nl/69990/

Seva, R. R., & Helander, M. G. (2009). The influence of cellular phone attributes on users' affective experiences: A cultural comparison. *International Journal of Industrial Ergonomics*, *39*(2), 341–346. doi:10.1016/j.ergon.2008.12.001

Shannon, C. (1948). A mathematical theory of communication. *Bell System Technical Journal*, *27*(379 - 423).

Smith, G. C., & Smith, S. (2012). Latent Semantic Engineering – A new conceptual user-centered design approach. *Advanced Engineering Informatics*, *26*(2), 456–473. doi:10.1016/j.aei.2012.02.012

Warell, A. (2008). Multi-modal visual experience of brand-specific automobile design. *The TQM Journal*, *20*(4), 356–371. doi:10.1108/17542730810881348