A methodological approach to visceral hedonic rhetoric

Cara Wrigley, Vesna Popovic, Marianella Chamorro-Koc

School of Design, Faculty of Built Environment and Engineering,
Queensland University of Technology, Brisbane, Australia.
(cara.wrigley; v.popovic; m.chamorro)@qut.edu.au

Abstract: One of the most important tasks as an industrial designer is to evoke specific affective responses via the creation of their designed products. This paper describes an investigation of visceral hedonic rhetoric through the study of interactive products. This research lays the foundation for this work by discussing the scope, significance and limitations of currently available research in the areas of visceral design, consumer hedonics and product rhetoric. Understanding why consumers respond to certain visceral hedonic rhetoric stimulus and what those stimuli are will provide further understanding into the field of emotional design. The study examines visceral hedonic responses given by consumers to three interactive products including mobile telephones, USB memory sticks and MP3 players. The methods used in this study will be discussed in further detail in this paper.

Key words: Interactive products, emotional design, visceral design, hedonics, product rhetoric.

1. Introduction

The emotional attachment between user and product is one of complex behavior and multifaceted reasoning, powerful enough to provoke and motivate consumers to select and purchase one product over the choice of another. This results in designers conceiving products that target consumer's emotions specifically aimed at inducing that user-product attachment [26,9,11]. According to Norman the field of emotion and design encompasses a multifarious of human behaviors involving emotional processing, submerged in this is the level of visceral unconscious cognition [26]. An emotive connection between product and user is imperative to the success or failure of a product [28]. As current as this filed is, a lack of theoretical clarity exists in the issue of emotional design [26,9,11].

The emerging research of visceral hedonic rhetoric is of vital importance to the design discipline due to its immediate nature as well as enabling designers to instantly create powerful emotional connections between consumers and products [27,30]. This requires investigating visceral hedonics by examining a variance of products and their hedonic visceral responses. This will assist in developing new design approaches to allow product designers to gain a better understanding about a product's attributes. Therefore, three key areas of research were identified: (i) Visceral Design; (ii) Consumer Hedonics; and (iii) Product Rhetoric. These are illustrated in Figure 1:
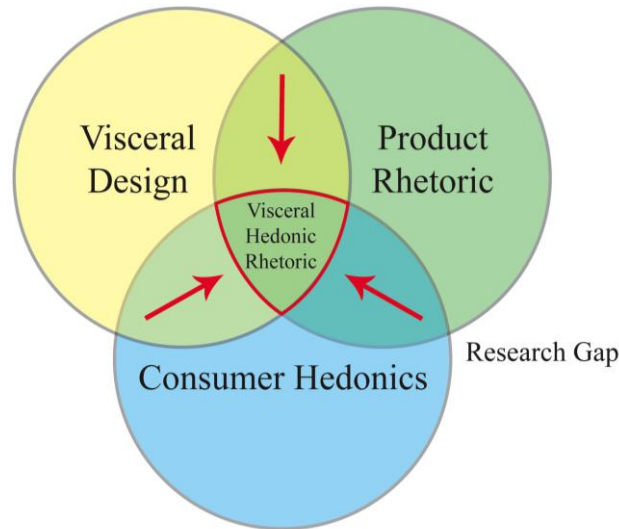
Figure 1: Area of research

2. Visceral hedonic rhetoric

The primary motivation for this study is the desire to fill the knowledge gap about visceral hedonic rhetoric and its role within the design of interactive products. There is evidence that research has been conducted on each of the topics encompassing the scope of the research but never concurrently together. It is the proposition of this study that a combination of the visceral design, consumer hedonics, and product rhetoric categories, can assist in identifying the visceral hedonic rhetoric in product design.

2.1 Visceral Design

Norman [26] states that there are three levels of cognition involved in emotional processing comprising of the visceral, behavioral and reflective and should be addressed by designers in that order. More specifically visceral design engages instantaneous reactions by which the user responds to the visual and other sensory aspects of a product [24]. Norman [26] describes visceral design as the cognitive examination of immediate responses enabling users to react to visual and other sensory aspects of an artifact before considerable contact transpires [26]. Visceral design involves the original impact that a product has on a consumer, occurring instantaneously; allowing consumers to make direct decisions about what is good, bad, safe or dangerous. This is an experience that consumers are powerless to dictate as they become victim to the visceral features of a product, which are not only crucial to a productive design, but are embossed in the unconscious psyche of the user. Many authorities have tried to define the visceral as it is used in many different contexts and across a broad scale and spectrum [26,21,19,12]. From the literature reviewed the bulk of the information regarding visceral design is fairly broad and no definite case studies focus entirely on visceral design or visceral hedonics. Add to this the apparent lack of research linking visceral hedonic responses to products and their consequent design properties, and the need for understanding in this subject becomes quite considerable.

2.2 Consumer Hedonics

Hedonics can be defined as the branch of psychology that studies the mind's pleasant and unpleasant sensations and has been identified as anything relating to the pursuit of pleasure [29,16]. Hedonics is also influentially

significant to consumers as the choices and decisions made by the consumer to purchase a product for its enjoyment, pleasure and excitement is a positive step for the design [2]. While consumers have often reported wanting functional or tangible attributes when purchasing products, there is also a demand for a hedonic or satisfying emotional response and experience when using a product. Hedonic behavior in consumers relate to aspects of the product purchase and handling experience, and to the multi sensory, fantasy and emotive aspects of product usage [16]. Inevitably hedonics is important to a product's success and is considered in the design industry in the pursuit of pleasurable design [29]. From the literature examined there remains a need to separate and compare responses and to determine their causes as this still presents a significant gap in the field of hedonics. It is an issue that must be thoroughly addressed if any significant contribution to design is to be made [17].

2.3 Product Rhetoric

Throughout history rhetoric has been defined as the art of speaking well or the art of persuasive verbal communication. Over the years it has developed interdisciplinary associations with the common goal of strategically effective communication [10]. Buchanan [5] affirms that the "designer, instead of simply making an object is actually creating a persuasive argument that comes to life whenever a user considers or uses that product as a means to some form of end" [5:8] compared to Barthes [1] who believes that a single rhetorical form exists in the realm of design. Bathres [1] indicates that the rhetoric of an artifact is specific to the extent to which it is subject to the physical constraints of vision [1].

Today, rhetoric is undergoing a new era of research and development, with designers helping to shape it to meet modern contemporary demands [18]. If designers can benefit from rhetorical insights, then design can continue to influence and form society through its persuasive assertions. Uncovering what designers need to discover is an entirely new aspect of demonstrative rhetoric which will significantly affect the understanding of product influence in the future. Product rhetoric provides the research with persuasive product design properties and focuses on the features that enable products to communicate convincingly. In relation to visceral hedonics, it grounds the study in the field of product design.

2.4 Literature Summary

From the extensive literature review carried out on such related categories of visceral design, consumer hedonics and product rhetoric it is made apparent how vast the gap is, both individually in each category and as a conglomerate of visceral hedonic rhetoric.

From the literature reviewed the main points that emerged were the discovery of consumers' experiences being shaped by the three levels of design, visceral, behavioural and reflective [26]. From Norman's research it revealed the lack of investigation into the first level of unconscious cognition, visceral design. Authorities tended to agree that visceral elements are a product's characteristics that appeal directly to the visceral cognition level in the consumers' mind [12] but what these elements were however was unknown. The area of hedonics is fairly well established field but there still remains a gap prevalent involving the causes of consumer hedonic behaviour and its triggers. Hedonics however in conjunction with the two other areas of study positions hedonics in entirely new light. Historically product rhetoric is not new; nor is it a widely investigated field of research. However,

reconciling product rhetoric with the visceral hedonic responses, positions rhetoric in an entirely novel area of research.

Table 1 summarises the relevant research and demonstrates significant research gaps. It shows that the knowledge of this topic is very general and no actual, specific case studies have been undertaken. This is the main research gap that needs to be addressed.

Two major gaps identified from the literature review are that:

1   there are no specific studies of visceral hedonics and its relationship to product design;

2   there is no available information linking the study of visceral hedonic behaviour to product use, consumption, physical design features or purchase decisions.

Table 1. Research gap identification

Author	Year	Summary
Buchanan	2001	- rhetoric in design plays a vital role - suggestions of designers producing an object that comes pre-programmed with a persuasive agenda - comments that products are vehicles for argument and persuasion
Crusen and Snelders	2002	- pleasure is derived aesthetically from products - appearance and shape influence consumer choices - consumer response to answering machines- establish the importance of the categories within the product's appearance
Desmet	2002	- establishment of emotions and their role in designed products - emergence of interest in emotionally designed products - clarification of the relationship between product appearance and the emotional response elicited by a consumer
Forlizzi, Disalvo and Hanington	2000	- philosophical and cognitive science understanding of emotion and experience - attempt to produce a generative framework to aid designers in harnessing emotional experiences
Jordan	2000	- identification of pleasure based approaches to human factors - design of pleasurable products in relation to the hedonic factors - linking of product benefits to product properties
Loewenstein	1996	- description of the „visceral' as a sensation of being out of control - discussion of visceral factors such as hunger, thirst, sexual desire, emotion and pain - admission that visceral factors have a direct hedonic impact on people's actions - establishment of link between hedonic and visceral reactions
Norman	2004	- establishment of three levels of emotional cognition in unconscious processing: visceral, behavioural and reflective - allowing products to produce controlled user responses
Hekkert	2002	- investigation of the relationships between aesthetic experience, hedonics and the sensory perception - allowing four aesthetic principles to be derived
Crilly, Moultrie and Clarkson	2008	- investigated product form from a designers perspective - designed a framework showing how designers think product form affects consumers with different intentions

Table 1 reveals the requirement needed in a stronger research emphasis in the culmination of visceral design, consumer hedonics and product rhetoric properties and responses, ascertaining the base for this emerging research.

2.5 Interactive Products

Interactive products are used in the project as the research proposition states. Everyday, popular and „trendy' consumer products — such as digital electronic devices—are targeted as the optimal section for the study due to their broad range of usage within the targeted participant pool. Many authorities [7,14] have conducted research on interactive products within the design realm yet no defining description has been commonly agreed on. Some descriptions include "an interactive product constitutes as defining the behavior of products and systems that a user can interact with" [4:49], as well as "products with interactive features for immediate gratification" [25:152]. There seemed to be no general consensus on what defines an interactive product, yet studies were still conducted using and classifying them.

Interactive products are typically products that centre on and around complex technology systems such as software, mobile devices, and other electronic gadgets. However, it can also apply to other types of behaviour and services involved with interaction design which defines itself as the behavior (interaction) of an artifact or system in response to its users [20]. Various authorities have used interactive products in industrial design studies. A outline of this can be seen in the relevant interactive products literature summary.

Table 2. Interactive product literature summary

Author	Year	Aim	Methodology Summary
Lim, Donaldson, Jung, Kunz, Royer, Ramalingingam, Thirmaran, Stolterman	2008	• Tested visceral , reflective and behavioural levels of emotions in correspondence to design properties of interactive products	• participants took photographs of products that they had a strong emotional connection to • interviewed the participant after about their overall impressions of the selected products in terms of why they liked or valued the product as well as the semantic questionnaire where they matched each product they had photographed to a series of descriptive words belonging to the 3 levels of cognition (visceral, behavioural and reflective)
Crilly, Moultrie, Clarkson	2008	• To design a framework showing how designers design product form for consumers with different intentions	• semi structured interviews with 23 professional industrial designer holding a senior position in UK design companies • main question asked "from a design perspective why do products look the way they do?"
Mahlke, Lemke, Thuring	2007	• Measure non-instrumental qualities that define aesthetic and symbolic aspects in interactive products	• 3 mobile telephones we were used as stimuli , all had the same sort of functional capabilities, differences in symbolic qualities and aesthetics • measurements of aesthetes and symbolic aspects with a questionnaire using scale factors
Hassenzahl	2004	• Investigated the interplay between user perceived usability , hedonic attributes, goodness and beauty of interactive products	• 4 mp3 skins were used as stimuli (a skin is a digital graphic file used to change the appearance of on the mp3 application software) • participants were exposed to the skins then participants had to rate them on a scale of ugly to beautiful

From the literature reviewed on interactive products it was found that generally one example or case study of an interactive product was investigated and the corresponding results were generalized into results for the entire category of interactive products. Additionally the methodology for this study was furthermore reviewed and verified in the fact that few studies used actual products to represent what they were simulating.

3. Methodology

From the identification of the research gap the methodology was derived with the aim to explore visceral hedonic rhetoric evident in the design of interactive products by using qualitative methods. The interactive products chosen for the study were mobile telephones, USB memory sticks and Mp3 players. The reasoning behind this selection was due to the suitability from within the interactive product category and the participant demographic pool. Also the selection of real product stimuli was derived for this methodology.

3.1 Research approach

The primary objectives of this research are to identify: (a) visceral hedonic rhetoric evident in designed interactive products; (b) specific properties that cause visceral rhetoric in designed interactive products and (c) differences in visceral hedonic responses between novice and expert users. To achieve such objectives two experiments were designed to identify visceral product properties and test them in conjunction with product rhetoric. From this it was possible to identify what visceral hedonic rhetoric is evident in interactive products. Then by analyzing the results against how accustomed they are to the product this will provide findings on the differences between novice and expert users.

The experiment is designed to investigate visceral hedonic rhetoric evident in the design of interactive products. This research has been divided into two Experiments in correlation to the following objectives:

Objective A (Experiment 1): To identify visceral product properties evident in interactive products

Objective B (Experiment 2): To explore the hedonic responses of product rhetoric

3.2 Participants

Participants in this study range from 18 to 24 years in age. This is due to many reasons; first is the high usage rate of interactive products in this age bracket. Involving all three interactive products used in this study, the demographics of the participants will remain constant through the duration of the study. Second, amongst consumers of all age groups, the age bracket of 18-24 year olds represents the age bracket of young consumers who have the buying power to choose the products they purchase, as opposed to those younger children where the purchase decision resides with the parents [23]. Thirty people were recruited for the experiment. As this is partly an observation methodology in part designed to investigate the effect of visceral hedonics, thirty people was felt to be a suitable number based on the review of other product observations [3].

3.3 Procedure

Figure 2 illustrates the research procedure where the main two objectives of the study are investigated through the two different experiments, by using all three various interactive products.
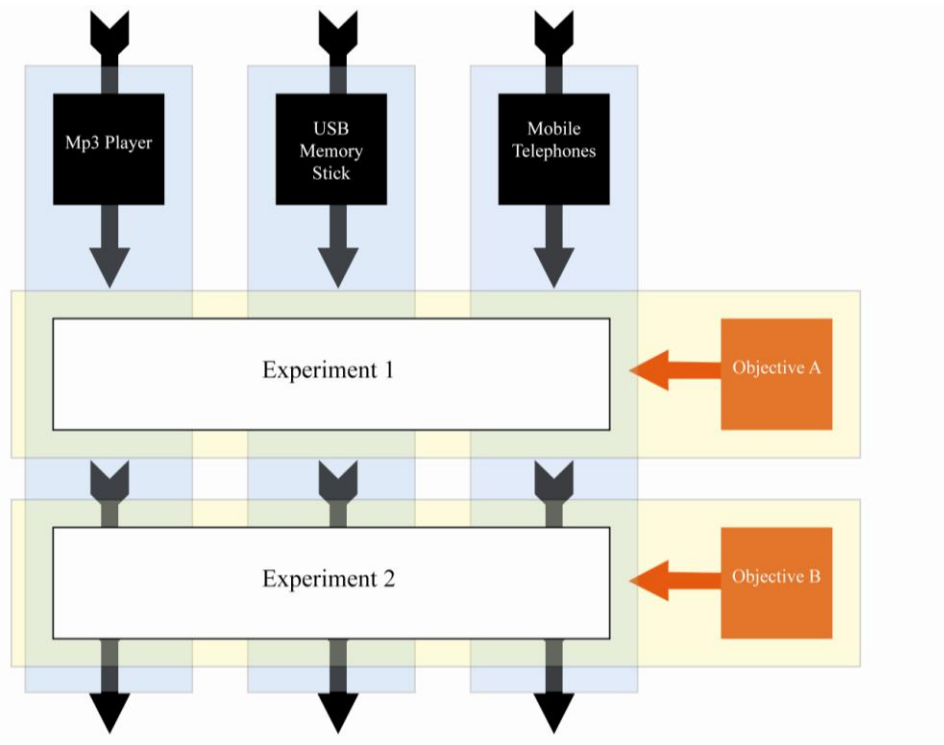
Figure 2: Research Procedure

Screening questionnaire

Participants were screened through the information gathered in the screening questionnaire. This is done to establish suitability of participants. The purpose was to gather information about the participants' demographics and background, as well as helping to ascertain how familiar they were with the selected interactive products used in this study. This added in segregating participants into categories needed to analyze the correlating results in correspondence to objective (c) differences in visceral hedonic responses between novice and expert users.

Experiment 1

*Objective A: t*o identify visceral product properties evident in interactive products, are explored in Experiment 1 and consists of an observation with the purpose of extracting from the participant types of visceral responses (e.g. colour, texture, shape and sound). They are sensory aspects of appearance [24]. These responses identify the emerging categories needed for further study. The categories of responses become the foundations for Experiment 2.

Table 3: Experiment 1 Summary - Objective A

	Experiment 1
Objective	• To identify visceral product properties evident in interactive products
Setting	• People and Systems Laboratory (PAS Lab), D Block, Queensland University of Technology, Gardens Point Campus.
Time	• 20 minutes
Methods	• Observation
Data collection	• Using the digital video cameras and recorders in the research laboratory

Experiment	• six interactive products were placed one at a time in front of individual participants for the exposure time of 2 seconds
	• each participant was asked a series of questions pertaining to what their first instinct of the product was.
	-What is your first reaction towards the product?
	-What is the first thing that comes to mind?
	-Do you like it?
	-Why?
	• each participant was asked to respond very quickly and the responses recorded
Data analysis tools	• Atlas.ti was used to analyse the text data and Noldus Observer was used to analyse the observational data
Participants	• 30 participants aged between 18 and 24 spanning all categories of age, gender, culture and novice to expert demographics
Materials	• 6 mobile telephones stimuli
	• 6 USB memory stick stimuli
	• 6 Mp3 player stimuli
	• 6 white box covers to hide the stimuli

Experiment 2

Objective B: to explore the hedonic responses of product rhetoric, will be investigated using Experiment 2. Findings of Experiment 1 will specifically determine how the interactive products are presented within the founded visceral product property categories (eg colour, shape, brand and texture) to the participants. The aim is to individually isolate and analyse their visceral responses. This experiment will need to be repeated with different probes in order to mask and highlight various visceral attributes. The probes will be formulated from the results of experiment 1 and are unable to be determined until experiment 1 has been conducted and the findings analysed.

Table 4: Experiment 2 Summary - Objective B

	Experiment 2
Objective	• To explore the hedonic responses of product rhetoric
Setting	• People and Systems Laboratory (PAS Lab), D Block, Queensland University of Technology, Gardens Point Campus.
Time	• 15 minutes
Methods	• Observation and questionnaire
Data collection	• Using the digital video cameras and recorders in the research laboratory
Experiment	• six interactive products will be simultaneously exposed to the participant
	• interaction time will be controlled
	• researcher will instruct the participant to rank the products in order of preference
	• the final choice will be recorded
Data analysis tools	• Atlas.ti will be used to analyse the text data and Noldus Observer will be used to analyse the observational data
Participants	• 30 participants aged between 18 and 24 spanning all categories of age, gender, culture and novice to expert demographics
Materials	• 6 mobile telephones stimuli
	• 6 USB memory stick stimuli
	• 6 Mp3 player stimuli

Table 3 and 4 represent the two experiments used in achieving the two main objectives of the study. The methods described in the table were conceived using real product stimuli as opposed to flash cards or drawings used to represent the product which was found to be a common occurrence in many studies throughout the literature review.

3.4 Analysis

The study was conducted with experiment 1 and the audio recordings were transcribed. These transcripts were inserted into the qualitative analysis program Atlas.ti where they were coded. The textual data was coded to allow for comparison and analysis. The codes emerged from the analysis were developed into two categories: products and visceral responses. The product code identifies which real product the participants are responding to and the visceral response code identifies what visceral responses are linked to such products.

3.5 Indicative Findings

After the completion of experiment 1 the significant visceral product responses that emerged were: size, shape, colour, perceived usability, features, material, analogy, portability, novelty and function. These categories were noted from the instantaneous verbal and visual responses given by the participants (Figure 3).
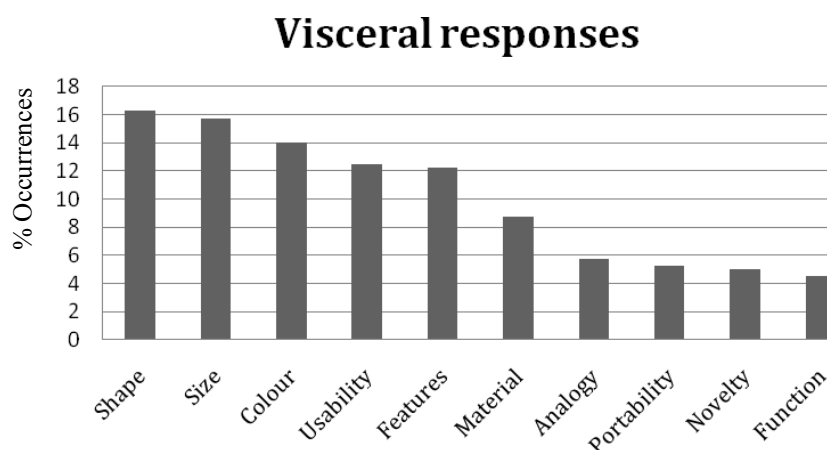

Figure 3: Indicative findings

The indicative findings illustrated in Figure 3 show the distribution of visceral responses in regards to their occurrences. From the results shown is the most dominant response (16.25%) followed by size (15.75%) and colour (14.00%). Some of the verbal comments referring to the visceral category „shape were: *'it looks slim and chic', 'it looks old lady-ish because it is a standard shape', 'the shape looks old and outdated', 'it is different because of its shape'* and *„mostly curvy I like it'*. Responses that were categorised by the common theme of colour were: *'it looks futuristic because of the colour silver', 'the colour pinks make it look like a little girls mobile telephone', 'the colour red doesn't appeal to me'* and *'I don't like the colour'*. These responses were verbal comments in reference to the initial perception of the stimuli (Experiment 1). These preliminary results illustrate that „shape' had a highest visceral occurrence of 16.25%, while „function' had a lowest occurrence rate of 4.5%. It seems that „shape' was much more dominant than „function' with both category positions resulting on opposite ends of the graph. It may be inferred from this that function is much less viscerally reactive to

participants than „shape'. It was also noted that „usability' and „features' had similar frequency of occurrence. This might be associated with these two categories communalities. These results will be investigated further in the second experiment where each visceral response will be isolated and individually measured hedonically against each other.

4. Conclusion

It is expected that this research and the resulting conclusions from the finished project will provide a deeper understanding and consideration of visceral hedonic rhetoric when designing future products. The culmination of all categories in this research allocates this study in an extremely novel position. The contribution to new knowledge in the broader research community is its strong perceived outcome. Findings from the study can be used to design products for various visceral hedonic responses. This will not only assist the immediate industry of industrial design but the wider design domain. It is anticipated to offer a greater perspective in the use of visceral hedonic rhetoric as well as avenues for further investigations.

5. References

[1] Barthes, R. (1977). *Rhetoric of the Image*. *In Image Music Text*, New York: Hill and Wang.

[2] Barrett, L., Mesquita, B., Ochsner, K., & Gross, J. (2007). The Experience of Emotion. *Annual Review of Psychology*, 58, 373-403.

[3] Blackler, A. (2008) *Intuitive interaction with complex artefacts : empirically-based research.* VDM Verlag, Saarbrücken, Germany.

[4] Brian, D., & H. Lou. (1993). Flash memory goes mainstream. *IEEE Press*. 48-52.

[5] Buchanan, R. (1985). Declaration by Design: Rhetoric, argument and demonstration in design practice. *Design Issues*, 2(1), 4-22.

[6] Buchanan, R. (2001). *Design and the new rhetoric. Philosophy and Rhetoric*, 34(3), 183-206.

[7] Crilly, N., Moultrie, J., Clarkson, J. (2008) Shaping things: intended consumer response and other determinants of product form, *Design Studies*, 52 (12).

[8] Crusen, M., & Snelders, D. (2002). *Product Appearance and Consumer Pleasure*. In William S. Green and Patrick W. Jordan (Eds.), Pleasure with Products Beyond Usability, London: Taylor and Francis.

[9] Desmet, P. (2002). *Designing Emotions*. The Netherlands: TU Delft.

[10] Erlhoff, M., & Marshall, T. (2007). *Design Dictionary*, Berlin: Birkhauser.

[11] Forlizzi, J., Disalvo, C., & Hanington, B. (2000). On the relationship between emotion, experience and the design of new products. *The Design Journal*, 6(2), 29-38.

[12] Givechi, R., & Velazquez, V. (2001). Positive Space. *In Proceedings of 3rd IDEC 2001.*

[13] Han, S., Kim, K., Yun, M., Hong, S., & Kim, J. (2004). Identifying mobile phone design features critical to user satisfaction. *Human factors of ergonomics and manufacturing*, 14(1) 15-29.

[14] Hassenzahl, M. (2004). The interplay of beauty, goodness, and usability in interactive products. *Human computer interaction*, 2004(19).

[15] Hekkert, P. (2002). Design aesthetics: principles of pleasure in design. In William S. Green and Patrick W. Jordan (Eds.), *Psychology science*, 48(2) 157-172.

[16] Hirschman, E., & Holbrok, M. (1982). Hedonic Consumption: Emerging Concepts, Methods and Propositions. *Journal of Marketing* 46 (1982), 92-101.

[17] Jordan, P. (2000). *Designing Pleasurable Products*. New York: Taylor and Francis.

[18] Kaufer, D,. & Butler, B. (1996). *Rhetoric and the art of design*. New Jersey: Lawrence Erlbaum Associates Publishers.

[19] Langender, J., & Shimp, T. (2001). Consumer Vulnerability to scams, swindles and fraud: Influences on Persuasion. *Journal of Psychology and Marketing*, 18(7), 763-783.

[20] Lim, Y., Donaldson, J., Jung, H., Kunz, B., Royer, D., Ramalingingam, S., Thirmaran, S., Stolterman, E. (2008). Emotional experience and interaction design, Affect and emotion, *HCI 2008*.

[21] Loewenstein, G. (1996). Out of Control: Visceral Influences on Behaviour. *Organizational Behaviour and Human Decision Process*, 65(3), 272-292.

[22] Mahlke, S., Lemke, I., Thuring, M. (2007). The diversity of non-instrumental qualities in human technology interaction. *MMI-Interactive*, 13(August).

[23] McNeal, N. (1993). Development of consumer behavior patterns among Chinese children. *Journal of Consumer Marketing*.14(1) 45-59.

[24] Meikle, J. (2005). Ghosts in the Machine. *Technology and Culture*, 46(2), 385.

[25] Norman, D. (2002). *The design of everyday things*. USA: Basic Books.

[26] Norman, D. (2004). *Emotional Design.* New York: Basic Books.

[27] Norman, D., & Ortony, A. (2003). Designers and Users: Two Perspectives on emotion and design. *In Proceedings of FID 2003*.

[28] Overbeeke, K., & Hekkert, P. (1999). Editorial. In C.J. Overbeeke and P. Hekkert. *Paper presented at the Proceedings of the first International Conference on Design and Emotion.*

[29] Porter, S., Chibber, S., & Porter, J. (2001). Towards an understanding of pleasure in product design. *In Proceedings of 3rd IDEC 2001*.

[30] Wrigley, C., Popovic, V., & Chamorro-Koc, M. (2008). Hedonic Visceral Rhetoric: Designing for the Visceral. In Proceedings of *6th IDEC 2008*.