

AicE-Bs2013London  
Asia Pacific International Conference on Environment-Behaviour Studies  
University of Westminster, London, UK, 4-6 September 2013  
*"From Research to Practice"*

# Unconscious Human Behavior at Visceral Level of Emotional Design

Muhammad Jameel Mohamed Kamil, Shahrman Zainal Abidin\*

*Department of Industrial Design, Universiti Teknologi MARA (UiTM), Shah Alam, 40450, Malaysia*

---

## Abstract

In the near future, the emphasis on product design innovation will be on finding a fit between technology and human values. However, there is still a limited discussion available on the unconscious human behaviour as well as inadequate literature related to the visceral level of emotional design. The purpose of this study is to manipulate the value of view of multidisciplinary experts. The paper's goal is to provide a new perimeter of design thinking with respect to the emotional design, as well as the direction for the development of innovative product design.

© 2013 The Authors. Published by Elsevier Ltd. Open access under [CC BY-NC-ND license](#).

Selection and peer-review under responsibility of Centre for Environment-Behaviour Studies (cE-Bs), Faculty of Architecture, Planning & Surveying, Universiti Teknologi MARA, Malaysia.

*Keywords:* Unconscious human behavior; visceral level; emotional design; behavioral science

---

## 1. Introduction

Product design is a creative discipline which requires designers to challenge themselves to create an aesthetic, functional and marketable product. The evolution of innovation and a critical study regarding design thinking has brought the platform of product design to another level. The past several years have endorsed a rising interest and eagerness for designing the user experience (Forlizzi & Ford, 2000). Designers themselves are responsible to create a new paradigm in the product making process by exploring every possible factor in high value innovative design concept. To achieve the vision, conscious human behavior has been widely studied, and the research output has been implemented in all innovative interaction products. The product's designed features and properties help the user to get acquainted through, interaction and emotional involvement at the same time. In comparison to the conscious human

---

\* Corresponding author. Tel.: +6-035-544-405-8; fax: +6-035-544-401-1.  
E-mail address: [shahrman.z.a@salam.uitm.edu.my](mailto:shahrman.z.a@salam.uitm.edu.my)

behavior, unconscious human behavior has always been hard to identify. The limited discussion on the latter leads designers to neglect its potential value.

Imagine the situation where one is writing using a pen and suddenly feels being out of ideas. The blank paper is just in front of one's eyes, but he/she does not find any clue to write ahead. In this situation, an individual is stressed out and start scratching his/her head. Unconsciously, people shake their pen likewise what they usually do when face boredom. In this condition, if suddenly the pen would start to glow with wonderful colors, thus the glowing light may entertain people while reducing their stress throughout the period of writing. The above-mentioned example explains the value of existence of human unconscious behavior, which contributes a great potential towards emotional design at a visceral level.

This study attempts to explain the value of unconscious human behavior and aims to justify its contribution in the design of an emotional product. The paper consists of an explanation of implicit user's problems and needs from the designer's perspective. Finally, the discussion is presented about how designers should start to enlarge their design thinking parameters to an interactive design and to explore alternative design concepts.

## **2. Aims of study**

This study aims to provide a new perimeter of design thinking and direction for the development of innovative product design. It is hoped to stimulate the product designer's interest in digging all the possible values in unconscious human behaviour. In the future, it is also hoped that they could interpret it and contribute to design an innovative products.

## **3. Objective of study**

This study's objective is to examine how designers generate an idea based on the value of unconscious human behaviour. Furthermore, the study will identify pattern of gesture existed in unconscious human behaviour towards a certain products. While ongoing a few controlled experiment, author will examine the relationship between the values of unconscious human behaviour with designer's ideation through sketching activities. At the end of this study, it is hoped to find out whether author could establish a guideline of skills, techniques and strategies help to support designer's visualization and presentation.

## **4. Research background**

### *4.1 Unconscious mind from the psychologist's perspective*

Freud (1955) defined unconscious mind as a pool of thoughts, memories, urges and feelings that are beyond human consciousness. The unconsciousness continues to affect the experience and behavior, although we are ignorant of these fundamental impacts. Freud (1955), in his Topographical theory, described three areas of mental functioning or systems of mind that exist and also defined their association with conscious thoughts. He stressed that unconscious level of mind denotes a set of mental processes and content that is operated outside conscious awareness. In addition, he considered the mind structurally identical to an iceberg in which a major portion exists underneath the surface, affecting the conscious mind dynamically and decided.

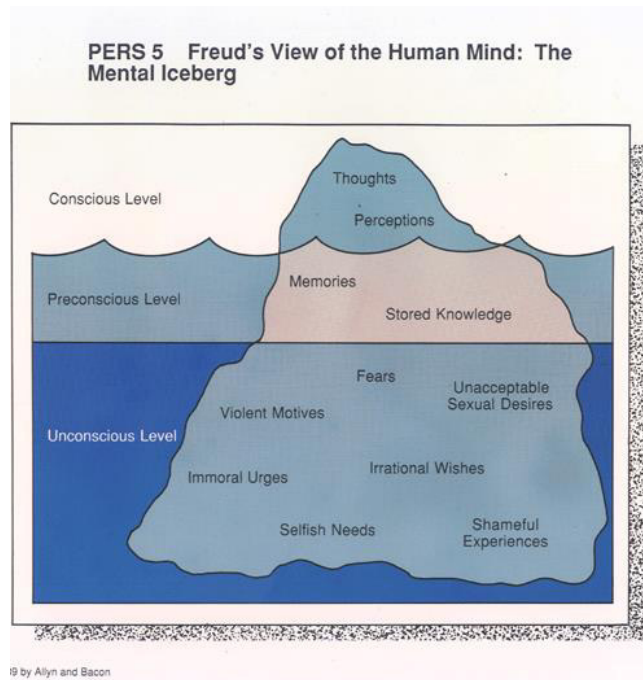


Fig. 1. Freud's iceberg model of unconscious, pre-conscious and conscious levels

Recently, it has been stated by numerous researchers that the entire behavior of a person is extensively determined by the unconscious mechanism rather than the conscious control (Vollmer, 2001). Additionally, Vollmer also presented the evidence to support the above-mentioned claims. He also concluded that though several psychological phenomena (perceptions, memory, feeling, mood, mannerism and automatism) have unconscious factors, the data do not demonstrate that the routine behaviors; like talking, writing, working and moving, are independent of one's conscious control.

However, Bargh and Morsella (2009) explained the human unconscious mental and behavioral processing by presenting the model of unconscious behavioral guidance system. Bargh and Morsella stressed that there must have two main stages of human version of unconscious behavioral guidance systems rather than only one (i.e., S-R). These two stages include the preliminary automatic activation of the mediating system using external stimuli (Step 1) and the effect on the behavior by the formerly defined system in step 1 (Step 2).

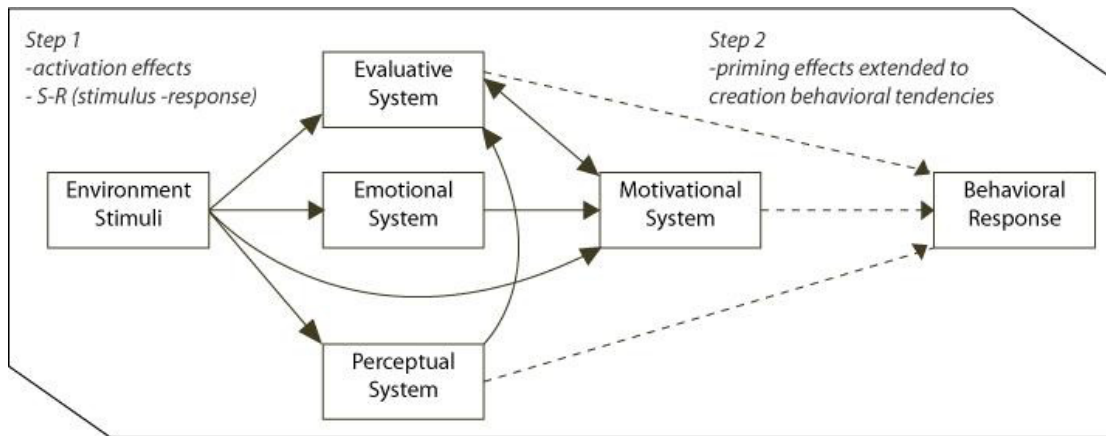


Fig. 2. Bargh and Morsella's Unconscious behavioral guidance systems: "Step 1" (solid lines) refers to automatic activation of distinct internal information processing systems; "Step 2" (dotted lines) refers to automatic influences of these activated systems on behavior

The model indicates that the behavioral response was first stimulated by the environment and the process continued to affect the emotional, perceptual, evaluative and motivational system before finally creating the behavioral response. These unintentional processes happen in one's routine life and determine each behavioral response that humans make. Designers view this model as a key factor, which is valuable in understanding the user's behavioral process, before identifying other gaps.

#### 4.2 The study on human behavior and interaction factor of commercialized product design

The emergence of innovation in product design has challenged the designers to become more aggressive in producing an aesthetic, functional and marketable product. The product design discipline has evolved in parallel with the huge development in engineering and manufacturing fields. Product design could be involved with many other disciplines, which could enhance the product value such as psychology, biology, and geology. The product design field has moved forward towards integration of interaction design in its process. The concept of people-oriented design has been a new phenomenon widely.

In early 80's, Bill Moggridge explained the interaction design as a combination of software and user interface design. However, Kuang (2009) argued that there is often an incorrect thought that only interaction design pays attention to the software interface and its related issues. Kuang also stressed on the differentiation between the interaction design and traditional design, which is mainly concerned about products' forms or features, content and connotation. Interaction design emphasized to give priority to the planning and description of the behavioral things, and also aimed to describe the most effective form that conveys such an act. The main context of interaction design is reasonably plan to expect how the users utilize the products, adapt the experiences, as well as the products itself. The arguments simply explained that the idea of interaction design is more than computer interaction. In simpler terms, it is an interaction between users and the object itself.

Human beings are gifted with a different set of behavior. Ying et al. (2010) indicated that the world-ocean interprets the behavior as creatures interact with their surroundings through their external and internal activities. The different ways of interaction usually depend upon many factors such as anthropology, geology, and ethnography. The interaction somehow could be intuitive and loopy from time to time. Nowadays, the study of human behavior and interaction in product design has been embraced as a good design business. Successful American company, Apple Inc. has come out with many products, which based on their critical research in human behavior. The interactive experience, existed while using the applications, make Apple's products such as the iPhone being the world's obsessed device. Swapping the phone screen becomes the new paradigm in the communication device industry. The products are likely to offer more than just usability and convey an emotional interaction, lifestyles etc. The ideas of adapting artificial intelligence make the product more 'human' than a 'machine'. The success factor of these products is based on the critical study on the interaction and incorporating the human behavioral factors into account.

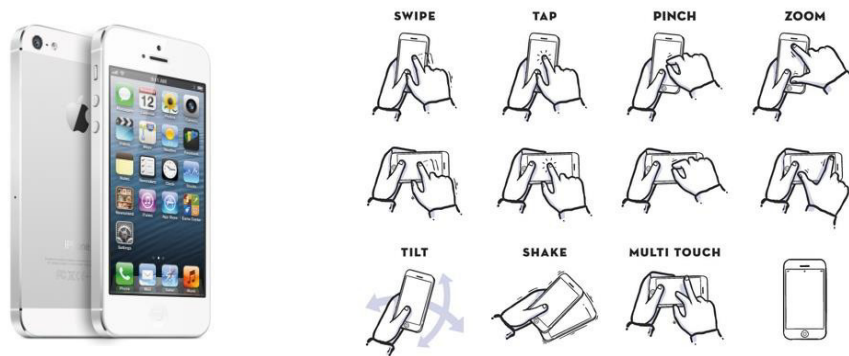


Fig. 3. (a) iPhone; (b) Hand gesture using iPhone

Another example would be the Tip Ton chair by Vitra, which is designed by understanding the user's behavior while sitting on the chair. Some people love the forward-tilt sitting position, and Tip Ton is designed to fulfill their needs with a simple alternation without causing any damage to the chair itself. The uniqueness behind this chair lies in the skids, which rise at a nine-degree angle. The pelvis and the spine are straitened by the forward-tilt sitting position thus improving the blood circulation within the abdominal and back muscles. In this era of post-modernism, designers are trained to understand the user's needs by digging all the possible facts. They are capable to identify the design opportunities with the help of the critical study of user's behavior.



Fig. 4. (a) User with forward-tilt sitting position; (b) Tip Ton Chair by Vitra

#### 4.3 The significance of unconscious human behavior in design

The relationship between human and environment determines the human behavior (Hua & Fei, 2009). Behavior can be defined as the outer activity controlled by psychology. Hua and Fei also indicated that unconscious behavior is a human's unconscious behavior trend and the natural objective behavior based on the long-term life experiences, human psychology and human nature; as well as on psychological and emotional implications. It is also closely related to the user's latent needs. Hua and Fei also emphasized that traditionally it was a practice simply, to treat, the interactive behavior as the procedure to accomplish the user's goal, which is one of the conscious behavior, termed as *Goal-Oriented Behavior*. Although in daily use as well as in various contexts of daily life most of the human behaviors are unconscious. As an example, there are various unconscious behaviors that occur in one's daily lives such as shaking an umbrella after rain, shaking a pen while scratching head for ideas, swinging a key-chain while waiting and so on. With regards to the *Goal-Oriented Behavior*, which is related to the objective, unconscious behavior is an instinct that creates people's interaction with the product unconsciously (Hua & Fei, 2009).

The most intelligent creatures in the world, i.e. humans, usually try to solve their problems by themselves before expressing it to anyone else and do not turn to anything unless they need it (Hua & Fei, 2009). In this situation, human usually uses their immediate sense of creativity to solve the instantaneous problem as creativity is achieved by inspiration instead of instruction (Chen & Ling, 2010).



Fig. 5. (a) Shaking the umbrella; (b) Swing the pen; (c) Shaking a leg





Fig. 6. Immediate creative solution in instantaneous situations

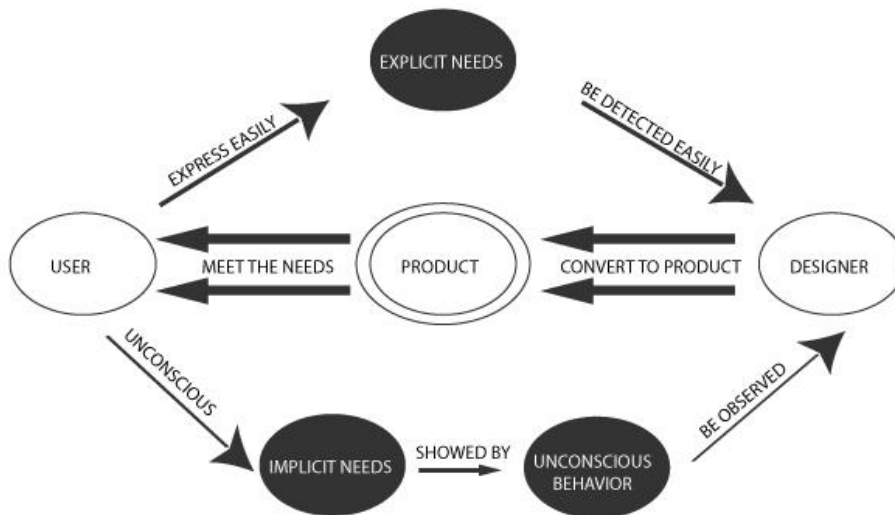


Fig. 7. Obvious and latent needs of everyday life (Hua & Fei, 2009)

Certain needs are extremely obvious which can be called as explicit needs. Those needs can be easily detected by users and can easily be converted into products, by the designers. For example, an umbrella was invented to keep the people dry without restraining their movement in the rain. Hua and Fei (2009) also claimed that some needs could not be detected easily because these needs can only be met and balanced by one's own selves without any strong desire to achieve something, which was termed as

implicit needs. In this process, the way in which people solve or balance their own implicit needs is called as unconscious behavior. As an example, when an individual returns home with a wet umbrella, then he/she tends to shake the umbrella unconsciously in order to remove the water. Apparently, this unconscious behavior may confuse the designers, and they could not easily detect the user's implicit needs. It explains about the absence of various products to solve the wet umbrella problem, from the day umbrella was invented until the modern times.



Fig. 8. Obvious and latent needs of everyday life

Hua and Fei (2009) also scrutinized the outcomes of the behaviors and found that it is not very tough to find about unconscious behavior as it is just the outer representation of people's unconscious needs. The clarification of the aforementioned statement is that the user's implicit needs can be dug through the observation of unconscious behavior. It is necessary in order to deliver original ideas for an innovative design. Therefore, unconscious behavior could be an important resource in determining needs.

#### *4.4 Emotional design and it's visceral level of interaction*

Products can evoke many different kinds of emotions. Human can admire the latest ultra-slim computer tablet, be irritated by an annoying vacuum cleaner, and feel at ease in a comfortable couch. Although the thrill of driving a motorcycle seems incomparable to the touch of melancholy felt when coming across a long forgotten childhood teddy bear, both these responses belong to the wide spectrum of human emotions (Desmet, Porcelijn, & Dijk, 2007).

The products and artificial environment constituted different items are the external world of customers' lives. Designing, examination and the use of the product create the interaction between customers and products (Yang & Chen, 2008). Yang and Chen also reported that the user experiences three psychological processes in the progression of interaction such as the perception of the outside world, the cognition of the product utilization process and understanding of the product reflection. In the process of utilization of the product, the perception changes the corresponding psychology i.e. emotional changes or emotional experience. Internal consciousness may stimulate related emotional experience similar to the external perceptions that cause emotional transformations. Therefore, in the whole process of the interaction between users and products, emotions penetrate into all of them.



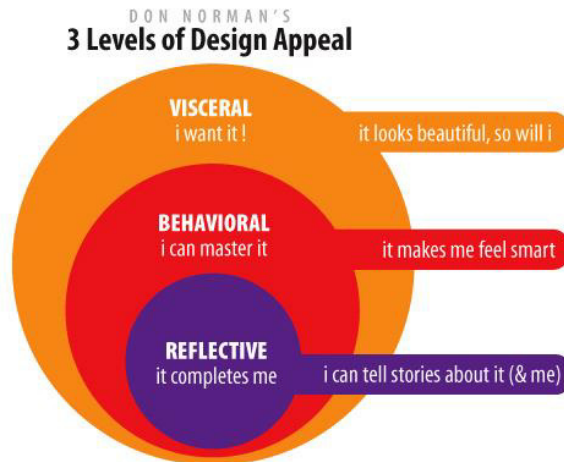


Fig. 9. Don Norman's 3-levels of emotional design

Norman (2004) defined emotional design and its targets into three levels: Visceral, behavioral and reflective, in his book of *Emotional Design* based on the psychology research in emotion process. The fundamental principle of visceral level originates from human instinct, which is harmonious between diverse people and cultures. Norman mentioned that the interaction at the visceral level of emotional design is instinctive and it is captivated by the sense stimulations including hearing, seeing, touching, tasting, smelling etc. Once the user receives a sense of stimulations and responds to them directly, it obtains diverse emotional interactions. Visceral is an initial level, but it is the most direct and irresistible one. Norman described the design of visceral level as the design, which can please user's sensory experience. He signified the role of the premier appearance in improving the user's experience of visceral level. Hua and Fei (2009) argued that there would be a gap in the study of needs of visceral level because the inherent expression forms are too hard to be caught or dug out.

Light Chimes by Philips is an example of an emotional product with a visceral level of interaction. The lamp's concept is outdoor lighting, which can detect changes of breeze and temperature. It correspondingly shifts between lightening styles. The light increases in brightness when the wind blows and passes through the hole within the circular LED. Meanwhile, it reacts to the temperature by changing color accordingly which provides an indication of weather conditions outside.



Fig. 10. Light Chimes by Philips

## 5. The problem statement derived from research background

The research background has shown the value of unconscious human behavior as a huge potential at the aspect of interactive experience. Hua and Fei (2009) justify that the unconscious human behavior is always neglected by many designers. Furthermore, Hua and Fei also indicated that the study and application of interaction design in behavioural level has been known to researchers. They also argued that there would be a gap in the study of needs of visceral level because the inherent expression forms are too hard to be caught or dug out. The lack discussion on this matter would be a gap which should be explored.

## 6. Understanding significance factors derived from research background

Author reached a few main significance factors on the basis of the above discussion that stated about the value of unconscious human behavior, needs, together with its potential contribution in designing emotional product design.

From the research background, author discovered that:

- The concept of people-oriented design has been a wide phenomenon and the design focus has emphasized on fulfilling human needs by understanding their environment, behavior, emotional and interaction.
- The concept of people-oriented design also expands the idea of interaction design as more than human-computer interaction.
- To achieve a successful vision in the concept of people-oriented design, the value of unconscious behavior shall not be neglected.
- Designers are main potential group since they are responsible to aimed at planning and describing the behavior things before designing a good product experience. To understand how designers generate an idea by integrating the value in unconscious human behavior to design an innovative emotional product, a critical study on designer's sketching activities shall be done.

## 7. What's next?

This study will construct a qualitative studies based on a descriptive and empirical research. The research design is descriptive in nature. It seeks answers to questions, which were formulated on literature

reviews and on what is often practiced by product designers in industry and academia by focusing on designer's interpretation towards the value of unconscious human behaviour in ideas generation.

The first approach in this research methodology is by pursuing semi structured interview with verbal protocol analysis. In this first approach, five experts Malaysian's product designer will be interviewed. This main purpose of this interview is to answer the first research question – how Malaysian designers defined the value of unconscious human behaviour in product design? This interview would achieve the first research objective.

The second approach in this research methodology is by pursuing naturalistic video observation. Naturalistic research approaches are used by researchers in a variety of disciplines, and the data that form the basis of naturalistic research methods can be gathered from many different sources in many different ways (Stangor, 2011). In this process, the empirical studies will be based on psychological activities. Random candidate will be involved in this process to identify their unconscious behavior toward specific product based on a specific environment which will be identified as the research is ongoing. The main purpose of this approach is to answer the second research question – what are patterns of gesture existed in unconscious human behavior towards a specific product? This observation would achieve the second research objective.

The third approach in this research methodology is conducts a video observation and verbal protocol analysis. In this experiment, the empirical studies will be based on sketching activities, where video observations similar to the “verbal protocol analysis” and refection of techniques will be carried-out on the designers. During this experiment, designers themselves need to understand why and how the product could be experienced. Five expert designers (respondent from interview) will be participating in this experiment. The main purpose of this approach is to answer the third research question – to what extent does product designers communicates by using visual language through sketching experience in design based on the value of unconscious human behavior? This observation would achieve the third research objective.

Many researchers believe that such experiences are nowadays more decisive to figure out people's buying behavior as compared to the primary or utilitarian functions (Hekkert, 2006). The validating data would be done based on Abidin, Warell, and Liem, (2011) in their framework of perceptual product experience (PPE). The PPE framework consists of two dimensions, which are presentation and representation. The first dimension, presentation, is concerned with the direct sensual stimuli associated to the experience. This may be seen as the ‘pleasurable’ side of the experience, linked to the direct and non-interpretative experience; and also includes the impression, appreciation and emotion sub modes. In this paper, the authors are interested in the significance of interactive elements, impression at a visceral level and emotion engagement as interpreted by designers, which is related to the presentation (dimension).

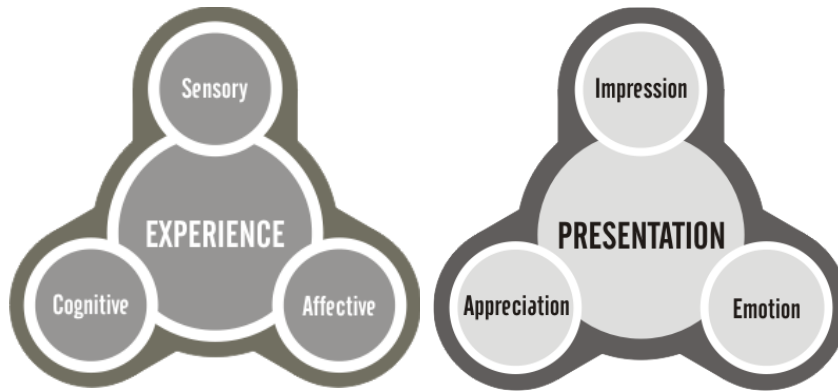


Fig. 11. (a) Perceptual Product Experience (PPE) framework; (b) PPE dimension: Presentation

## 8. Conclusion

In the whole design process, designers supposed to expand their parameters in design thinking by analyzing all opportunities that exist significantly within the unconscious human behavior. By keeping in view the former statement, further action on this issue would deliver more positive outcomes for the product design while including other field of expertise. Advance research on the aforementioned matter would encourage designers to stimulate an interest in interaction design and design an innovative concept. In addition, a critical, descriptive research should be done to discover the possible potential in the designer's design process.

Although perceptions of designers and psychologist expert are varied due to the difficulties in identifying the unconscious behavioural response in human mental processing, the unconscious human behaviour is still considered a useful value for establishing ideas and understanding human latent needs quality. The unconscious human behavior has indicated its own value, which is always neglected by the designers. Designers should be deeply observing the user's implicit needs through the observation of their unconscious behaviors in order to provide new ideas for the innovative designs. As the research trend in design is shifted from the focus of attention; which is designed, to that of experience, the contributions from a variety of fields, such as behavioural science, create a range of approaches surrounding the multi-faceted topic of product experience.

In designing emotional product experience, the visceral level of interaction in emotional design is the most direct and irresistible. A few previously invented products, with an interaction at the visceral level have proven its capability to please user's sensory experience. Since the discussion on the interaction at the visceral level in emotional design is still in short, it becomes a big and golden opportunity for a design researcher to fill in the gap and contribute towards future product invention.

In the near future, the author will expand this paper parameter by identifying the significance of interactive elements, impression at a visceral level and emotion engagement as interpreted by designers based on their perception towards the value of unconscious human behavior. The next agenda also will be a focus on evaluating designer's sketching process towards designing emotional product and its interaction at a visceral level. A detailing structure of research methodology for the next paper will be critically identified as the research is on-going.

It is also hoped to achieve a new knowledge and guideline for designing interaction, thus establishing an understanding of the value of unconscious human behavior and emotional design at the visceral level

for them. Furthermore, the future research could develop significant information on understanding the user implicit needs to fulfill the consumers' emotional and satisfaction with the products.

## Acknowledgements

This research was financially supported by the Ministry of Higher Education, Malaysia; and the Universiti Sains Malaysia. This support is gratefully acknowledged.

## References

- Abidin, S., Warell, A., & Liem, A. (2011). The significance of form elements: a study of representational content of design sketches
- Bargh, J., & Morsella, E. (2009). Unconscious behavioral guidance systems, 1–36.
- Chen, K., & Ling, T. (2010). Creativity-provoking design education based on Jungian Psychoanalysis Theory. *Procedia - Social and Behavioral Sciences*, 2(2), 4555–4560.
- Desmet, P. M. a., Porcelijn, R., & Dijk, M. B. (2007). Emotional Design; Application of a Research- Based Design Approach. *Knowledge, Technology & Policy*, 20(3), 141–155.
- Forlizzi, J., & Ford, S. (2000). The building blocks of experience: an early framework for interaction designers. *Proceedings of the 3rd conference on Designing Interaction*
- Freud, S. (1955). *The Unconscious XIV* (2nd ed.). Hogarth Press.
- Hekkert, P. (2006). Design aesthetics: Principles of pleasure in product design. *Psychology Science*, 48.
- Ho, A., & Siu, K. (2009). Emotionalise design, emotional design, emotion design: a new perspective to understand their relationships. *Proceeding of IASDR 2009*.
- Hua, M., & Fei, Q. (2009). The value of unconscious behavior on interaction design. *2009 IEEE 10th International Conference on Computer-Aided Industrial Design & Conceptual Design*, 336–339.
- Kuang, Y. A study on industrial product design system based on interaction design philosophy. , *2009 IEEE 10th International Conference on ComputerAided Industrial Design Conceptual Design* (2009).
- Norman, D. a. (2004). *Emotional Design : why we love (or hate) everyday things*.
- Vollmer, F. (2001). The Control of Everyday Behaviour. *Theory & Psychology*, 11(5), 637–654.
- Yang, X., & Chen, C. (2008). Emotional interaction in product design. *2008 9th International Conference on Computer-Aided Industrial Design and Conceptual Design*, 51–54.
- Ying, F., Li, X., Zhang, X., Tao, J., Li, B., Gao, S., & Li, Z. (2010). Creative Interaction Design based on human behavior and emotion. *2010 International Conference on System Science, Engineering Design and Manufacturing Informatization*, 175–177.