The New Relationship between Emotion and the Design Process for Designers

Amic G. Ho[1]

[1] Community College of City University | City University of Hong Kong

Abstract   Design is a professional activity practiced by designers in various design fields, such as industrial design, graphic design, and interior design. Because the focus ofthe design discipline is changingfrom technological breakthroughs to satisfying users' needs, many design processes have beenintroduced and adopted to achieve various design objectives. These design processes involve numeroussubprocesses and components that interact to form a comprehensive system. Severalfactors affect the process, causing design outcomes to vary. Design processes no longer conform to the conventional prototype, but conform to a divergent and interactive model thatincorporates new ideas and types of creativity to elicitbreakthroughs and innovations. This study was conducted to understand the relationship between designers' emotions and every step of the decision-making process, and how these relationships affect the overall design process. Designers can understand the relationships between emotions and design processes.Hence,they would able to develop methods and techniques, for example, they would understand and manag their emotions,in order tomanipulatetheir design processesto be tailored to the required outcomes.

Keywords   Emotion, Designer, Design process, Decision making

Corresponding author: Dr. Amic G. Ho (amicgh@gmail.com)

1. Introduction

Design is a professional activity currentlypracticed by designers in various design fields, such as industrial design, graphic design, and interior design. Therefore, designers are expected to be creative professionals who create artifacts to respond to various design requirements in an integrative and holistic way. The design process is the working flow that designers practice everyday. It hasdeveloped and become a crucial topic in design research. Previous studies have developed and shapednumerous frameworks of the design process.These frameworks provide designers with new insight into methods for manipulating the design process to satisfy the required outcomes, thus enabling designers tomanage their design process effectively as well as to improve the quality of their creative ideas and innovative design outcomes. However, as research developed, it became clear that designers todayseek to developa personal design process suited to their working habits or toachieving required results (Best, 2006). Developing a design processes based on the designer's perspecitves, such as their own design knowledges, working habit, emotions, may directly contribute design outcomes; design and emotion studies would be one of the aspects.

Most of the research on design and emotion has extensively investigated the emotional responses of users in their interaction with design outcomes. These studies were conducted to improvedesigners' ability to design better. Other aspects such as "emotional functions" and "design of experience" have been researched. However, few studies have investigated the relationship between designer's emotion and the design process. According to recentstudies on design and emotion, emotion is considered to be a pattern of reactions that occur in response to external and internal stimuli, in conjunctionwith the process of engendering cognitive activities and subjective feelings. How doesemotion affect the design process, and at what level does emotionaffectthe design process? From whom,in which context, and through what medium is emotion initiated?

This paper describes the functions of emotion in the design process and how emotion can elicit affection indecision-making process as well as in the final design outcome. A new conceptual model is proposed to illustrate the close relationships between all of theessential elements involved in the design process.

2. Studies on the roles ofDesigners in Design Processesand Design Outcomes

On the basis of previous research on user- and consumer-driven design, design and emotion scholars have focused on designer-driven design (i.e., the relationship between designers and design outcomes). Vosburg (1998) assertedthat the emotional changes experienced by designers candrive them to think in new directions and, therefore, enhance the quality of their ideas. Emotional changes can also help designers to differentiate between diverse types of information,thereby enhancingdesigners' capacity to choose the most effective strategies forsolving problems (i.e., the decision-making process). Scholars have suggested that the role of designers should be emphasised in design and emotion studies. Tan (1999) stated that the role of the designer involvesstorytelling (communicating ideas through design) rather than simply pleasing users. From this perspective, the goal of design is to createproducts thatelicit consumers' emotional responses and, thus, satisfy consumers' needs. Sanders (1999) studiedthe influence of the emotional responses and experiences of usersand consumers on the design process, stating that the feelings and aspirations of users or consumers can inspire successful designs. Throughfeedback, users oftencontribute useful information forthe generation of ideas and advanced testing indesign development. Chhibber, Porter, Porter, and Healey (2004) adopted the Jordan's "four-pleasure" framework (i.e., physiopleasure, sociopleasure, psychopleasure and ideopleasure) (Jordan, 2000) and investigated whether designers apply their own knowledge in the design process rather than focus only on the user's point of view.They suggested that designers adopt intuitive methods in the design process. Forlizzi, Disalvo, and Hannington (2003) identifiedemotion as one of the key elements that influence designers. They argued that changes in the external environment, such as social changes and new interactions between people and objects, influence designers' goal setting and reflective emotional responses to design (i.e., emotional experience). Similarly to Forlizzi, Disalvo, and Hannington (2003), Ben-Peshat (2004) assertedthat designers' emotional changes can increase their sensitivity towards social and cultural change(i.e., the external environment). This, in turn, encourages designers to use their professional skills as well astoadopt more emotional and intuitive methods in the design process. In this case, designers focus on their personalknowledge rather thanthe needs andfeedback of users. Hence, in addition to enriching users' experiences, adesign process that focuses on designers' personalinterests and perspectives (mostly involvingdesigners' emotions) enables close relationships between designers and the public (i.e., users and audiences) to be established. This process focused on designers' personal interests and perspectives, is as effective as a design process focused on users' feedback. It also can influence the relationship between designers and their design outcomes.

Departing from previous studies, Aken (2005) focused on the management of the design process. He indicated that designers who have more experience and a strong emotional investment in their practice are moreable to

manage the design process. This enables them to avoid engaging in unmanaged processdesign, which can lead to problems incoordination and time management. Desmet (2008) focused on the effect of emotional changes on design practice and observedthat pleasant emotions can facilitate the design process. He interviewed numerous designers about their experiences in design to explore how the variousemotions experienced by designers influence their design processes. By conductingthe interviews, Desmetdeterminedthat different design processes generate variousdesign outcomes, which, in turn, elicit variousemotional responses from users. In addition, Desmetobserved that positive emotions contribute to designers' creativity. Most designers tend to maintain pleasant emotions during the design process as becausethis helps to generate positiveoutcomes. Based on a study of the "three levels of design" concept suggested by Norman (2005), Lacey (2009) explored how feedback from users or consumers influences the practical design process. Lacey proposed the "favourite mug" approach and observed that users' feedback is mainly associated with their physical and emotional responses, which can be attributedto the personal taste of designers and users or consumers. Lacey demonstrated that information on both designers' and users' individual favourites and their emotional attachment (i.e., emotional changes) to products inspire ideas in the design process. Lacey proposed that the reflective level in Norman's three levels of design involves a level of engagement that can encourage meaningful interaction between users and designers.

3. Studies on Designers' Decision Making in the Design Process

Early design and emotion studies did not clearly identify the effects of designers' emotions.Recent studies have focused on the role of designers' decision making in the design process. Levin (1984) introduced the concept of design as a decision making process. According to Levin, after understanding aproblem, designers set goals that they consider during the design process. Designers may develop a range of plans and then exercise discretion in choosing from sets of parameters. When making these decisions, designers process certain information thatcan be grouped into three main categories: practical considerations; related knowledge, such as personal experience withusers' requirements and previous designs; and conjecture. Designers process information by deriving solutions and engaging in consistency testing, comparison, and selection. Herrmann and Schmitt (1999) observed that, to produce satisfactory design outcomes, designers must manage the process of transforming customers' information into the design concept under time and budget constraints. Designers acquirethe information, make a decision, and transform the decision into new information used in subsequent development. Therefore, the ability to process information is a key factor in determining the effectiveness of adesign process. In addition, manage-

ment skills have been addressedin studies on the decision-making process (Longueville, Le Cardinal, Bocquet,&Daneau, 2003). Variousmanagement skills, including time and risk management, are widely used to prescribe and optimise the decision-making process and the quality of the results. Designers choose the most suitable management skills to develop systematic decision-making processes. Almendra and Christiaans (2009) emphasised that, to enhance information processing and management skills, decision making in the design process must be recognised as a customer-centric strategy that is sustained by the accurate and updated understanding of the target users or consumers. Hence, designers should choose the most effective method foraccessing and managing knowledge, and use a strategy or plan to solve problems. Scaletsky and Marques (2009) proposed a concept similar to that of Almendra and Christiaans on the importance of strengthening designers' management skills. They suggestedthat designers learn the skills of allocating and choosing materials, becausethese skills are decisive factors in the design process. In addition, the use and aesthetics of products are topics that require extensive consideration. Aken (2005) stated that, in addition to acquiringinformation from objects, designers gain knowledge, experience, and skills from people. Because a considerable amount of human interaction (e.g., interactions between the client and the designer and between the designer and his or her design teammates)is involved in design activities, the pattern of communication adopted by adesigner affects decision making. According to Enayati (2002), designers who have stronger communication skills tend to make more effective decisions. In summary, designers can control various factors that affect their decision making. This section reviews various studies that have explored the factors that drive designers to make detailed decisions during the design process, such as information processing, the use of strategies, and the allocation of materials.

4. Studies on the Relationship between Designers' Emotions and Their Decision Making in the Design Process

Numerous studies have explored the relationship between designers' emotions and the design process. Some studies have investigated whether designers draw on their own emotional responses when developing designs rather than focusing only on the user's point of view. Drawing on the existing theories on emotion and experience, Forlizzi, Disalvo, and Hannington (2003) described how emotion is a key element that influences designers and argued that changes in the external environment, such as social changes and new interactions between people and objects, influence designers' goal setting and reflective emotional responses to design (i.e., emotional experience). Designers' reflective emotional responses are likely to influence their decision making during the design process. However, few studies have investigated the

relationship between emotion and designers' decision making within design processes.

Based on the foregoing research, the criteria and conditions related to the relationship between designers and design outcomes can be generalised as follows:

- Changes to the external environment influence designers' emotions;
- Designers' emotional changes influence the design process and the structures and functions of design outcomes;
- Introducing more personal experience and emotion into the design process can improve the management of the design process;
- Incorporating emotions into design outcomes (including material and visual expressions) can strengthen the relationships between designers and users; and
- Designers currently tend to use more emotional and intuitive methods in the design process than they did in the past.

5. A New Model (the E−wheel Model) forExplaining the Functions of Emotion in the Design Process

5.1. The functions of emotion in relation to external and internal factors

According to the foregoing review of the "design and emotion" theories, early studies failed to provide substantialevidence on the ways in which emotion affects the design process. Therefore, the function of emotion in the design process must be explored in greater detail. The design process comprises various stages, and internal factors (Cupchik, 2004), such as information processing and the allocation of materials, involve different types of decision making. Designers make decisions (influenced by their emotions) that affect internal factors in the design process (Vosburg, 1998; Aken, 2005). According to the theoretical studies of Ho and Siu (2009) on the concepts of "design" and "emotion," the phrase "internal factors in the design process" refers to factors that the designer controls. These factorsmotivate designers to make detailed considerations in the design process, such as considerations related to information processing, the use of strategies, and the allocation of materials.

In addition, a designer's emotions canaffect these internal factors and, thereby,elicitvarious design outcomes (Sanders, 1999; Chhibber, Porter, Porter,&Healey, 2004). Moreover, numerous external factors can directly affect designers' decision making without involving designers'emotions (Almendra&Christiaans, 2009; Aken, 2005). Ho and Siu (2009) classifiedexternal factors in the design process, such as social, cultural, and

technological developments, that designers do not directly control. These factors can affect designers' emotions and decisions, which affect the internal factors in the design process and, thus, affect the design outcome.

This is consistentwith the view of Forlizzi, Disalvo, and Hannington (2003) that changes in the external environment can affect designers' reflective emotional responses (i.e., emotional experience). The effect that external factors exerton designers' emotions depends mainly on a designer's awareness of and reflections on the external environment (i.e., the external factors of the design process). The decision-making ability of designers may be enhanced when they incorporatetheir emotions into the design process. In addition, the emotional changes, which is the result of designersincorporate their emotions into the design process, motivate designers to think in different directions and, therefore enhance the quality of their ideas (Vosburg, 1998).These emotional changes would enhanceddesigner's decision-making ability.After enhancing the quality of their ideas, designers may consider their design problems from various perspectives. When designers incorporatetheir emotions into the design processes, their decision-making abilities are improved. Because emotional changes can help designers differentiate amongdiverse types of information, incorporating emotions into the design processes can enable designersto choose themost effective problem-solving strategies (i.e., decision-making processes).

Because changes inthe external factors of the design process affect designers' emotions, designers' emotional responses affect how they make decisions. The degree to which external factors affect designers' emotions depends mainly on designers' awareness and reflections on the external environment. Moreover, a changed decision affects the internal factors (i.e., the factors that the designers control) during the design process, thereby changing the decisions made in the following stages of the design process. According to Kaufmann (2003), some designers believe that positive emotions are helpful in processing information because they increasedesigners'ability to analyse received information, thereby enhancing designers'decision-making abilities. Because information processing is an internal factor in the design process, incorporating emotions into stages ofthe process enhances the overall design process. Hence, an ideal design processoptimises design outcomes. Best (2006) stated that a design process that involves emotion ensures the quality of design outcomes.

5.2.Framework ofthe new model (the E−wheel model)

Drawing on design process research, Ho and Siu (2009) discussed the function of emotions and proposed the E-wheel model ("E" refers to "emotion") (Figure 1) to explain the relationships amongst designers, emotions, internal factors (e.g., information processing, material allocation), and external factors (e.g., technological, social, cultural, and economic factors) in the design

processes. According to Scherer (1984), an emotion expresses a pattern of reactions in response to external stimuli and engenders evaluations of the stimuli and of a person'ssituation. Therefore, incorporating emotions into the decision-making process affects the decision-making abilities of designers. Ho and Siu (2009) explored howinternal and external factors affect the overall design process, which involves numerous decision-making processes. External factors can affect the emotions of designers,causingthem to make variousdecisions that affect the internal factors and, hence, change the overall design process. This process provides insight into how designers can use their emotions to deveop appropriate responses that optimise their designs.
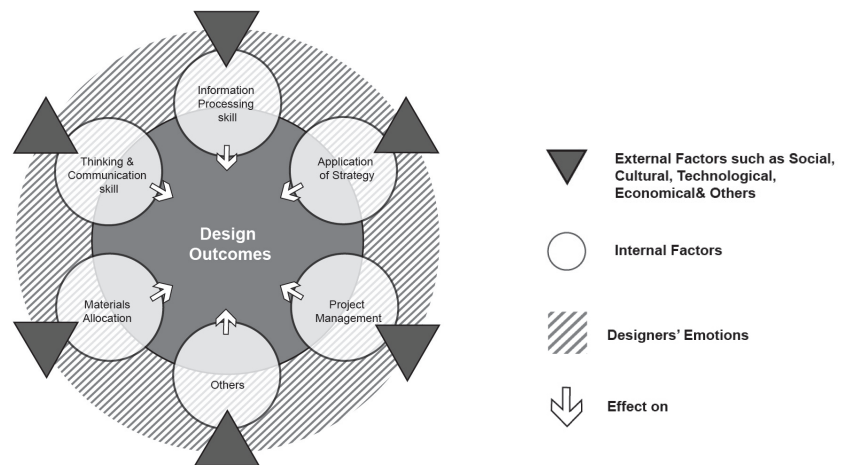

Figure 1 E−Wheel model demonstrating the functions of emotions and their relationships to the internal and external factors that affect the design process.

As illustrated in the E-wheel model, external factors affect designers' emotions and decision making. Forlizzi, Disalvo, and Hannington (2003) suggested a similar concept, proposing that external factors can function as stimuli (i.e., external stimuli) that affect the emotions of designers and cause designersto make different decisions, such as material allocation, project management. The emotional responses to external stimuli involve a process of evaluating stimuli and situations. These responsesare closely related to cognitive behaviours such as decision making (Scherer, 1984; Arnold &Gasson, 1954). Emotional changes enabledesigners to differentiate among diverse information and, thereby, choose the most effective problem-solving strategies (i.e., decision-making processes). However, different decision-making processes involveddifferent internal factors. When designers make decisions based on emotional concerns, the internal factors (e.g., information processing and material allocation) in the design process are affected. Kaufmann (2003) stated that some designers use their emotions effectively to make decisions based on internal factors, thus motivating designers to make detailed considerationsrelated to information processing, strategies,

and material allocation in their design processes. This change to the internal factors altersthe decisions made in the subsequent stages of the design process. Hence, the ideal design process optimises the design outcomes. Best (2006) stated that a design process that involves emotion ensures the quality of design outcomes. In other words, it is possible for designers can develop appropriate emotional responses to optimise their designs.

5.3.Examplesto illustrate the E-wheel model

The E-wheel describes the relationships between the external factors that affect the emotions of designers and the emotional changes that directly affect designers'decision making in the overall design process. The book RMX Extended Mix, which was designed in 2001 by Rinzen, a group of Australian artists,is used as anexample to explain and illustrate the E-wheel concept. Adrian Clifford, a memberof the group, stated that every designerin the group produced an initial piece on one of eight themes. The files were then passed between the designers, who progressively modified, augmented, and erased content in each step of the process. The files of the group members who previously contributed to a piece functionedas external stimuli (i.e., external factors) that caused emotional changes in the designer. The designers sought to express their emotional responses to the work of the othergroup members. In this case, the designers were able to express their own perspectives on the subjectsthat interested them while applying their professional skills. The designersdetermined which design elements (i.e., internal factors such as the material allocation, project management)to apply and, thus, were able to incorporatetheir own emotions, interests, and intuitive evaluations into the design process.

Another example of emotionalised design is the characters designed by Sticky Monster Lab. According toa design magazine International Design Network(2013) that interviewed different characters designers for exploring the design process of characters design,one of the interviewees, Sticky Monster Lab, stated that"a good character design should express and deliver the designer's emotions." The team acknowledgedthat expressing designers' thoughts and intentions (includingemotion) is sometimes challenging. Their statement indicatesthat changesin external factors cause emotional changes in designers. Designers in Sticky Monster Lab often incorporateaspects of their emotions into their projects when striving to achieve design objectives, and determine which design elements to use(i.e., internal factors). These designers canincorporate their emotions, interests, and intuitive evaluations into the design process, producing a design outcome that elicits emotional responses in users or consumers.

These examples fully support the proposed E-wheel model, which illustrates how external factors affect designers' emotions and how their emotions then affect their decision making in relation to the internal factors

of the design process. Accordingly, changes in the design process lead to variousdesign outcomes. Therefore, the E-wheel model supports the proposition that designers' emotions are the key element in the overall design process.

6. Conclusion

This paper describes the functions of emotions and how internal and external factors affect the design process, whichconsists ofvariousinterrelated decision-making processes. External factors affect designers' emotions when decision making, thus affecting internal factors and causing the design process to change. This concept provides insight into how designers can realise their emotionsand develop a corresponding response thatoptimises their design process, enabling them to achieve the required design outcome.

Reference

1 Aken, J.E.V. (2005). Valid knowledge for the professional design of large and complex design processes, *Design Studies, 26*(4), 379–404.

2 Alexander, R. (2001). *Rinzen presents RMX extended play.* Berlin: Gestalten Verlag.

3 Almendra, R. & C, hristiaans, H. (2009). Improving design processes through better decision–making: An experiment with a decision–making support tool. *Proceedings of International Association of Societies of Design Research.* Available at http://www.iasdr2009.org/ap/Papers/Orally%20Presented%20Papers/Design%20Method/Improving%20Design%20Processes%20through%20better%20DecisionMaking%20%20an%20experiment%20with%20a%20decision%20making%20support%20tool.pdf. [Accessed 8 March, 2010]

4 Arnold, B., & Gasson, J. A., (1954). *The human person: An approach to an integral theory of personality.* New York: Ronald Press.

5 Ben–Peshat, M. (2004). Popular design and cultural identities – Emotional exchange: Study cases in Israel. *Proceedings of the 4th International Conference On Design And Emotion.* Available at http://www.designandemotion.org/ [Accessed 30 February, 2010]

6 Best, K. (2006). *Design management: Managing design strategy, pocess and implementation.* AVA Publishing.

7 Character Design Issue. (2013, January). Designers with a lot of character.*IDN*, *19(6)*, 24–25.

8 Chhibber, S., Porter, C. S., Porter, J. M. & Healey, L. (2004). Designing pleasure; designers' needs. *Proceedings of the 5th International Conference on Design and Emotion*. Retrieved January 26, 2011, from http://www.designandemotion.org.

9 Cupchik, G. C. (2004). The design of emotion. In D. McDonagh, P. Hekkert., & J. van Erp (Eds.), *Design and emotion: The experience of everyday things*, 3–6.

London: Taylor & Francis.

10 Desmet, P. M. A. (2008a). Inspire and desire. In P. M. A. Desmet, J. vanErp., & M. A. Karlsson (Eds.), *Design and emotion moves*, 108–127. Newcastle upon Tyne, UK: Cambridge Scholars Publishing.

11 Enayati, J. (2002). The Research: Effective Communication and decision–making in diverse groups. In M Hemmati, F. Dodds, J. Enayati (Eds.), *Multi–stakeholder processes for governance and sustainability: Beyond deadlock and conflict*, 73–95. London, Sterling, Va.: EarthscanPublications .

12 Forlizzi, J., Disalvo C., & Hannington B. (2003). On the relationship between emotion, experience and the design of new products. *The Design Journal, 6* (2), 29–38.

13 Herrmann , J. W., & Schmidt, L. C., (2002). Viewing product development as a decision production system. *Proceedings of DETC 2002, ASME 2002 Design Engineering Technical Conferences and Computers and Information in Engineering Conference*, 29. Canada, Montreal.

14 Ho, A. G., & Siu, K. W. M. (2009). Emotionalised design, emotional design, emotion design. *Proceedings of International Association of Societies of Design Research*. Retrieved January 25, 2011, from http://www.iasdr2009.org/ap/Papers/Orally%20Presented%20Papers/Behavior/Emotionalised%20Design,%20Emotional%20Design,%20Emotion%20Design%20–%20A%20new%20perspective%20to%20understand%20their%20relationships.pdf/

15 Jordan, P. (2000). *Designing pleasurable products: An introduction to the new human factors*. London: Taylor & Francis.

16 Kaufmann, G. (2003). The effect of mood on creativity in the innovative process. In L. V. Shavinina (Ed.), *The international handbook on innovation*, 191–203. Oxford: Elsevier.

17 Lacey, E. (2009). Contemporary ceramic design for meaningful interaction and emotional durability: A case study. *International Journal of Design, 3*(2), 87–92.

18 Levin, P. H. (1984). Decision–making in urban design. In N Cross (Ed.), *Developments in design methodology*, 107–122. Chicheser UK: Wiley .

19 Longueville, B., Le Cardinal, J., Bocquet, J., & Daneau, P. (2003). *Towards a project memory for innovative product design: A decision–making process model. International Conference on Engineering Design (ICED03)*, Stockholm.

20 Norman, D. A. (2005). *Emotional design: Why we love (or hate) everyday things*. New York, NY: Basic Books.

21 Sanders, E. B. N., &Dandavate, U. (1999). Design for experiencing: New tools, In CJ Overbeeke, P Hekkert (Eds.), *Proceedings of the 1st International Conference on Design and Emotion*,87–92. Delft: Delft University of Technology .

22 Scaletsky, C. C., & Marques, A.C. (2009). Materials database organization for the design pro Cess. *Proceeding of the 8th European academy of design conference*,421–425. Scotland, Aberdeen: the Robert Gordon University.

23 Scherer, K. R. (1984). *On the nature and function of emotion: A component process approach*. In K. R. Scherer & P. Ekman (Eds.), Approaches to emotion, 293–317. Hillsdale, NJ: Erlbaum.

24 Tan, E. (1999). Emotion and style as design. In C. J. Overbeeke& P. Hekkert (Eds.), *Proceedings of the 1st International Conference on Design and Emotion*, 55– 64). Delft,The Netherlands: Delft University of Technology.

25 Vosburg, S. K. (1998). The effects of positive and negative mood on divergent-thinking performance. *Creativity Research Journal, 11*(2), 165–170.