

Expressing Emotional Concept in Visual Communication Design: An Anthropological Case Study on Emotional Design in China

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ABSTRACT By adopting visual communication design as the medium for introducing emotional designs, this paper investigates the relationship between emotional concepts and visual communication design. Application methods for expressing warm emotions and related fishbone charts were explored through observations, interviews, and a questionnaire survey involving different people, statistical analyses of related data, and analyses of the expression of emotions in visual communication design. It provides a form of design with warm emotions in visual communication design to enable the audience feel pleasure that not only originates from life but also transcends life when they receive the information of the design work. It is shown that visual communication design contains useful anthropological information. It helps to understand anthropology using emotional design as a tool.

INTRODUCTION

The rapid scientific and economic development in modern society has resulted in the emergence of several issues, such as lack of interpersonal affection, alienated relationships, and apathy. These issues have attracted the attention of specialists and scholars in China and worldwide (Maria et al. 2015; Steffi et al. 2015; Wang et al. 2015). The modern industrial design should be in the face of tradition, facing the future, pay attention to human emotion, will shorten the distance between people and products. Pay attention to the emotion of industrial design is necessary for the industry designer's ability and the goal, is the source of the subject of industrial design development (Huo 2015). Human emotions are characterized by the reflection of cultural backgrounds, cultural accumulations, and cultural atmospheres, which are traits not possessed by animals (Ljubica and Julio 2016; Cliff and Joyce 2015). Susanne once said that the creation of artworks is essentially a form of expressing emotions, that is, artworks display the essence of human feelings (Susanne 1957). For designers, expressing their emotions is a new means to bring human-oriented designs into being.

The continuous development and prosperity of human civilization are attributed to the fact that the increasing needs of human beings have

been satisfied. These situations are the same as those in design works, which should be human-oriented and designed according to human needs. To embody this concept, the expression of emotions, that is, the intention of the designers and the core of art creation are the most important. Emotional concepts are studied and expressed based on visual communication design, which is a form of creation that is most closely related to daily life.

Subsequently, visual languages, graphic creativity, color matching, and the layout of characters are widely applied to express emotions through the connections and infiltrations of various disciplines. Under this environment, designers have begun to realize and comprehend the importance of expressing emotions in design. They then start to exert effort in finding and expressing emotions. Emotional design involves capturing the characteristics of human emotions and satisfying the needs of audiences with an appropriate design technique. The expression of emotions in design enables people to sense respect and care, which is the forefront of this trend. As a perfect and harmonious combination of human and design, emotional design embodies the human spirit. It is also inevitably induced by social development, human progress, and a highly developed civilization.

Objectives

In this paper, a series of theoretical analyses on emotional design and discussions on some typical cases was performed according to the

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perspectives of visual communication design theory and design psychology. The results of a market survey on the psychological and emotional needs of audiences were also considered to explore the method for expressing emotion in visual communication design. Through this means, the indifference and tediousness of present works in visual communication design can be improved. Furthermore, this study can provide designers and consumers with useful references and guidance.

Literature Review

Studies on emotional concepts in the field of design are currently classified into two categories: perceptual engineering and emotional design. Emotional design was first proposed by American cognitive psychologist Donald A. Norman. It is currently a mature designing concept in the field of design. From the perspective of cognitive psychology, Norman introduced the classification of emotions into the experience design of products. Then, three types and characterizations of emotional experiences in the experience design of products and the properties of each type of emotional experience as well as their emphases on different attributes of products were analyzed and elaborated (Norman 2005). Desmet constructed the export model of product sentiments based on the cognitive structure and cognitive process of emotions. This model provided a basic tool to assess product sentiments and guide emotional designs (Desmet 2002).

Jonathan Ive, the chief designer of Apple Inc., emphasized that designers should pay particular attention to sentiments, emotional experiences, and joviality. Apple won the favor of consumers with a series of products with emotional and interactive experiences, such as the iPad, iPhone, and iPod (Teng and Nie 2006). The work of Maria highlighted the challenge of developing methodological approaches customized for the field of emotional design in interactive products (Maria et al. 2006). Desmet introduced a general framework for product experience applied to all affective responses that could be experienced in human-product interaction. Three distinct components or levels of product experiences were discussed: aesthetic experience, experience of meaning, and emotional experience (Desmet and Hekkert 2007). Desmet discussed an ap-

proach to 'design for wow', which focused on the emotions that constituted a 'wow' experience (Desmet et al. 2007).

Miguel analyzed how slight changes might affect user perception and influence their intention to purchase a product (Miguel et al. 2010). Miller examined the influence of aesthetic design on learner experience in an e-assessment environment, particularly on cognitive load and task performance (Miller 2011). Michael determined that their approach was an initial step toward empirically parameterized emotion models that would attempt to reflect user expectations (Michael et al. 2011). Helfenstein drew a conclusion that the degree to which users fully share the increasingly socioemotional stances of designers must be studied (Helfenstein 2012). Supavich used self-reported and behavioral screen-captured data to investigate the influence of Norman's emotional design levels and metacognitive awareness on website trustworthiness during an information search learning task (Supavich and Pavlo 2013).

Huang presented a product configuration analysis method based on personal construct theory to address product attributes with emotional effects in new product development (Huang et al. 2014). Mayer determined that the emotional design of multimedia instruction involved making the essential elements in the graphics of lesson appealing, such as by rendering them with humanlike features and distinct, appealing colors (Mayer and Estrella 2014). Jan examined the design factors that might evoke positive emotions in learners and investigated the effects of these positive emotions on learning (Jan et al. 2014). Steffi differentiated the current findings by systematically deducing emotionally relevant design features and considering negative emotional states (Steffi et al. 2015). Maria studied the features of creating objects that formed a positive emotional response (Maria et al. 2015).

In recent years, many Chinese specialists and scholars have conducted related studies. A History of Modern Graphic Design, edited by Wang, is a book published in China, which systematically deals with the history of modern graphic design development. In this book, Wang briefly discussed that the modernization of the theories and practices of graphic design was the embodiment of the changes in techniques, cultural heritages, and the spirit of times in design. However, the book lacks specialized and systemic expo-

sitions on the expression and significance of the concept of emotional design in modern visual communication design (Wang 2002).

Liu concluded the core of all designs into 'usage' and 'emotion' based on design purpose through the psychological processes of designers and with design objects as research subjects (Liu 2006). Li stressed the importance of emotion in design through studies on the power of emotions, the six steps of emotional design, and real cases (Li 2007). Meng described the generation, functions, and goals of emotion-oriented design by introducing an 'emotion-oriented' concept into designs. The idea of emotion-oriented deduction was proposed to reveal real interactive relationships among designers, their works, and the audience (Meng 2012).

To date, emotional design has been primarily reflected in the fields of product design, television, business anthropology, media animation, and industrial design, whereas the concept of emotion has not been obviously embodied in the field of visual communication design (Grafam 2010; Tian and David 2014; Ilhan and Ender 2014; Tian and Shao 2014; Tian and Zhu 2014; Apurva and Ravi 2014; Xu 2016). In visual communication design, the expression of emotions still faces the following problems. Firstly, the consciousness of expressing emotions remains deficient or even completely unseen in visual communication design. Moreover, rough, indifferent, and tedious designs prevail. Secondly, the expression of functions is blindly sought after in visual communication design.

However, the orientation and expression of the value of emotions are neglected. In addition, excessive emphasis is placed on visual influence, which may significantly affect the clear delivery of information and lead to the loss of emotions. Moreover, the eminence of artistic expression and the pursuit of personality are the primary foci, whereas regional and cultural characteristics as well as attitudes and understandings toward the emotions of people with different backgrounds are neglected.

RESEARCH METHODOLOGY

The art of design, design psychology, psychology, chromatics, visual design aesthetics, marketing, sociology, and communication were adopted as bases of a cognitive theory to express emotions in visual communication design.

The results of a market survey on the psychological and emotional needs of audiences, the research achievements of emotional concept in related disciplines, and the data of emotional design in China and worldwide were comprehensively analyzed. Studies on the expression of emotions in visual communication design were conducted according to the principles for selection in the fields of industrial design, product design, and graphic design.

In this paper, a series of studies was conducted based on both firsthand data gained through investigations and the analyses of secondhand information. The current researchers consulted related literature and gained accurate understanding on the research subject and on the involved concepts to obtain sufficient theoretical bases for the current study by retrieving and sorting literature and data. The current researchers asked the interviewees some questions regarding emotional design in public, and related information was collected through observation. Design works that contained warm emotions were collected and arranged for analysis through a case study.

The understandings of people from various fields on designs with warm emotions were analyzed through interviews with specialists, scholars, the general audience, and designers. A questionnaire with queries that the current researchers found interesting was prepared, and respondents were invited to provide their answers by writing them on the form or sending them through the Internet. Then, the results were investigated to form conclusions. Existing data were collected and processed for analyses through a statistical method. The adopted technique route is presented in Figure 1.

RESULTS AND DISCUSSION

Relationship between Emotional Concept and Visual Communication Design

Alessi determined that a superior design should be touching. Moreover, it should convey certain emotions, evoke memories, and bring surprises (Alessi 1998). A good design is similar to a piece of poetry about life, which guides people into deep thinking. Emotions and the design itself, similar to two steadily flowing tides, have promoted the continuous development of human creation throughout the history of art de-

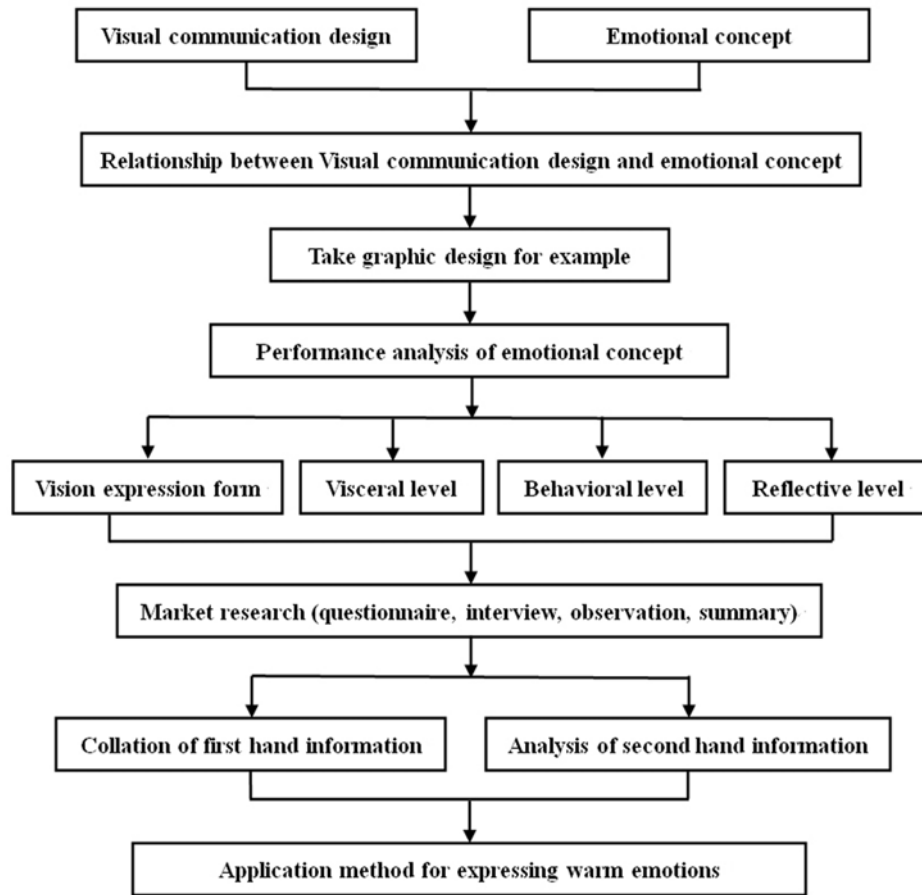


Fig. 1. Visual communication design and warm emotions

Source: Author

sign (Chuang and Ma 2015; Guo 2015). Given that the applications of morphology and function are common in design, designers have become increasingly inclined to the pursuit of emotional appeal of people. Admittedly, the connection of design and emotions arouses the potential desire of consumers to purchase, that is, consumption is induced by a sense of mental resonance and respect. For a design work, the emotional experience underneath the visual perception is the soul of the design.

An excellent design work communicates with people through emotional experiences. All these statements suggest that emotions have decisive influences on visual communication design (Zheng 2015; Sun 2015). First, the relationship between visual communication design and emo-

tions is not only dependent on the results of usage but also closely connected with the feelings in the process. Second, the expression of emotions in visual communication design exhibits multiple levels, such as perceptual and rational emotions. In particular, emotions that cause physiological changes among people via perceptions and high-level emotions that can be related to a profound social significance both exist. Finally, emotions are characterized by diversity in visual communication design. Design works may inspire emotional experiences of different types and at various levels because of complex objectives. The relationship between visual communication design and emotions can be analyzed with the aid of a graph that reflects the chain reaction of product emotions, as shown in Figure 2.

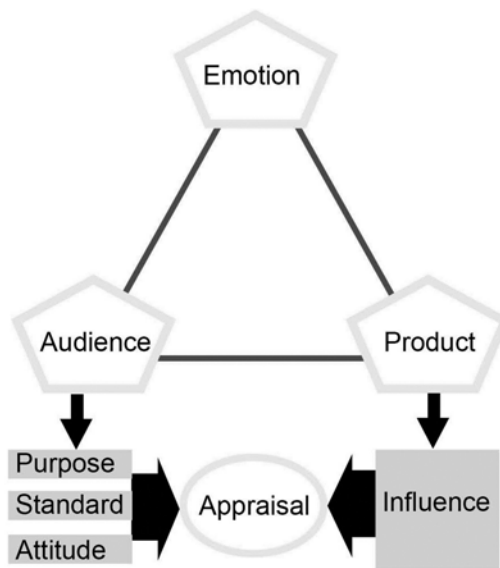


Fig. 2. Schematic of product emotion chain reaction
Source: Author

Analyzing the Expression of Emotional Concepts in Visual Communication Design

Emotions that Directly Involve the Audience at the Instinct Level

Does visual communication design stay only at the level of visual communication? In the book entitled *The Design in Design*, Kenya, a Japanese graphic designer wrote, said that although he was a visual communication designer, his work was not limited to the field of vision. He started from the sense of touch, and designed various media related with the sense of touch for information transmission (Kenya 2011). Accordingly, communication in visual communication design currently extends from vision to sense of touch.

Similarly, communication in visual communication design can overcome the range of vision and expand to the senses of touch and hearing, as well as to olfactory and gustatory senses until the objective of moving people is realized, as shown in Figure 3. The basic principle of design at the instinct level originates from human instincts. Within this range, physical characteris-

tics, including visual, tactile, auditory, and gustatory senses, are all in dominant positions. In designs based on instinct, shape and form are the most significant factors. Instinct-based designs focus on shapes, and the combinations of these design elements can impose direct effects upon human senses and arouse certain emotions, that is, instinct-based designs can have emotional effects to people intuitively. Yang emphasized that designers should pay attention to the details of the design process of the creative and emotional induction, which generates inspiration, so that emotional experience and physical play to reach the highest level (Yang 2015).

Arousing the Emotions of the Audience at the Behavior Level

Behavior-based designs place emphasis on the operations of designed works, namely, utility, and aim to offer customers the joy and efficiency of utilization. A good behavior-based design should consider four aspects, namely, function, understandability, feasibility, and physical senses. The principal function in visual communication design is information transmission. Norman emphasized that in addition to determining the most basic function of using a product, minimal attention was paid by designers to the manner in which customers used it (Norman 2005). Do consumers encounter some problems while using the product? That is, the fact that 'the product is usable' does not necessarily mean that it is easy to use. This situation is also reflected in visual communication design. A design work can surely convey information. However, this fact does not necessarily mean the information can be readily accepted or bring joy to the audience. Cheng pointed out that human nature of the design is not only to meet the needs of people for the basic functions of the product, but also to meet the user's personalized emotional needs (Cheng et al. 2015). Ye emphasized that emotional design is a kind of new design thought and introduced an emotional creative design method based on the Norman's theory in the emotional level of three kinds of design (Ye and Pan 2015). As presented in Figure 4, the goal of visual communication designers is to achieve a resonance of emotions between the audience and the designers when the audience obtains the information and idea conveyed by the product.

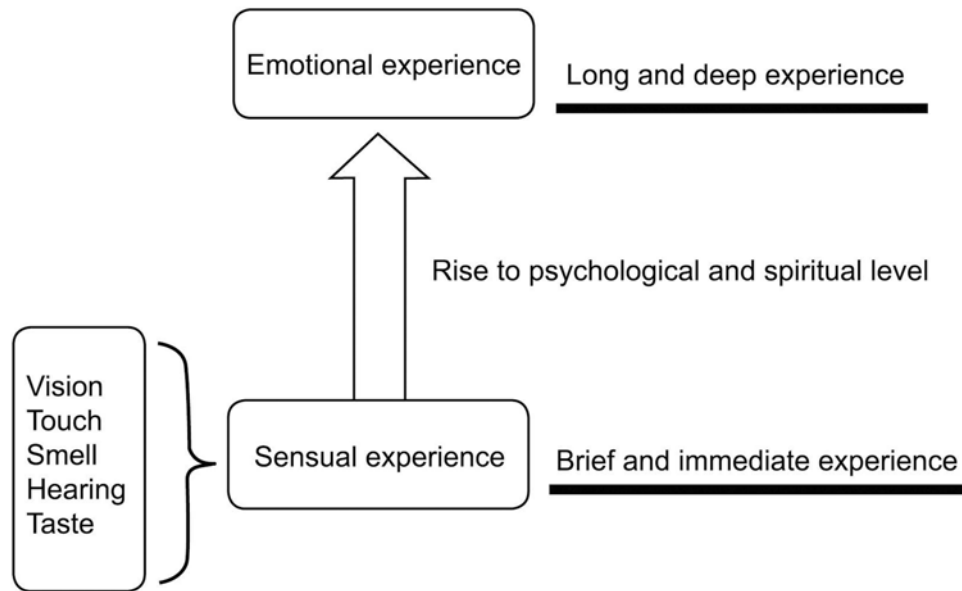


Fig. 3. The emotion of the audience at the visceral level
Source: Author

Extension of Audience Emotions at the Reflection Level

Reflection is the highest level of experiencing emotional cognition after a long period of interaction with products, which is achieved through the reflection of self-image, personal insights, and understandings on living and life through comprehension and introspection. In essence, reflection is a deep emotional experience generated in the hearts of users based on the effects induced by the former two levels. That is, it is a psychological effect that originates from the interaction of the consciousness, understanding, personal experiences, and cultural backgrounds of users. Reflection-based designs are the ones that really impress customers because they are significantly affected by the knowledge and experiences of customers and they involve culture and ideology. Emotional experiences at this level involve materializing ideological values, such as culture, information, idea, experiences, and desires, and adding abstract consciousness into the basic functions of design works to satisfy the specific needs and desires of people.

Emotional experiences at the sentiment and reflection levels are high-level emotional pursuits, namely, the peak experiences defined by Maslow

(Maslow 1964). They place emphasis on the significance of information, culture, products, or the utility of products, and inspire people to feel through reflections on these products. In general, activities at the reflection level determine the overall impression of people on a product. Therefore, people make associations on a design product based on vision. Then, they recall and reassess these associations. The design of continuing emotions at the reflection level is an important part of visual communication design and emotional design, which represents the future development trend of visual communication design. In general, reflection-based emotions can be inspired through the following manners, as illustrated in Figure 5.

The three levels of emotional designs intercross and interact with one another. In particular, the affections of consumers on products can be induced instinctively through the design of colors, and the joy of use can be increased by improving usability. Moreover, deep emotional responses of consumers can be evoked through associations, memories, and assessments at the reflection level. That is, the core of emotional design lies in arousing emotions from two aspects. The first aspect involves stimulating the emotions of the audience with the form of de-

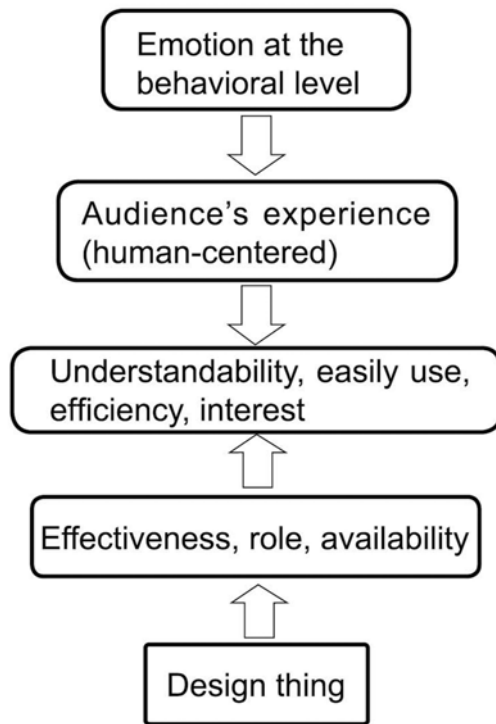


Fig. 4. The emotion of the audience at the behavioral level
Source: Author

sign or symbolic languages. Thus, desire for a product is aroused when demands actually exist. The other aspect involves inspiring the positive emotions of users under the situation of using the product. For example, the improvement of efficiency, usability, and joy of using and accepting, as well as room for thinking during use, enables the audience to feel the pleasure of self-fulfillment and conquest.

Forming the Application Method for Expressing Emotions

Questionnaire

The subject of this survey is warm feelings. The categories, ages, and cultural backgrounds of the respondents were selected to acquire effective data. The professions of the respondents in the survey included specialists in the field of design, employees in the design industry, sales workers, the general audience, and undergraduates engaged in artistic design. The number of respondents in the survey was 128. The ques-

tionnaire mainly involved the following contents: gender, age, region, educational background, cognitions of people from different industries toward warm feelings, the relationship between design works and warm feelings, the elements and characteristics of design works that produce warm or not warm feelings, the effects of design works on warm or not warm feelings during appreciation and use, and suggestions on designing works with warm feelings.

Data Analysis

The relationships among design psychology, psychological assessments of the effects of design, emotional design, and visual communication design are investigated by collecting data regarding visual communication design and emotional design. During the design process, designers should start from the original concepts, and the relationship between emotions and humans and between emotions and design must be understood. Meanwhile, analyses regarding forms to express design, such as shape, color, texture, and structures, should be conducted and conclusions should be drawn. In addition, the overall and objective understanding of human senses and feelings should be gained. A number of definitions and limitations for human sensory perceptions are presented in Table 1. Designers should master these limitations and ranges to assist their designs and to implement them by developing a series of methods for expression.

Table 1: Perceptions of limitations of people

Sensory channel	Type	Threshold value
Vision	Luminance range	$(10^{-5}-10^4) \times 3.1831 \text{ cd/m}^2$
	Light difference threshold	1/70
	Spectral wavelength range	400-700 mm
	Flash frequency limit	<50Hz
Hearing	Sound wave frequency range	20-20000 Hz
	Auditory distance	$\leq 7\text{m}^*$ $\geq 35\text{m}^{**}$
Touch	Fingertip	3 g/mm^{2***}
Smell	The sensation distance of odour	$\leq 1\text{m}$
Memory	The short-period memory capacity	$7 \pm 2 \text{ chunk}$

Note: *The current researchers are able to have a conversation at ranges less than 7 meters,

** The current researchers are unable to have an actual communication at ranges more than 35 meters,

*** The absolute threshold for touch is 3 g/mm^2

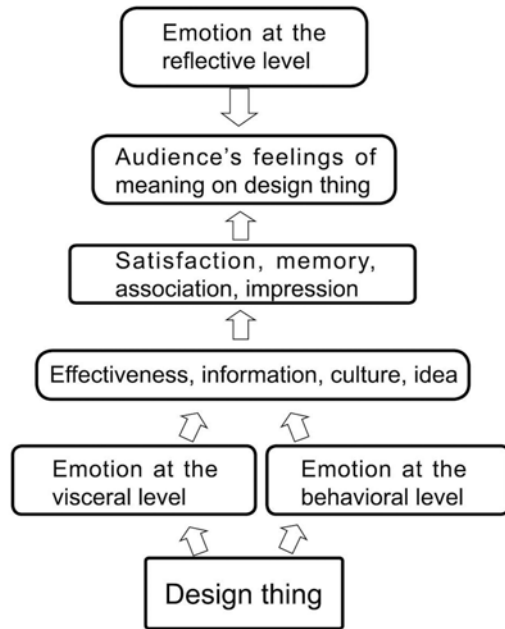


Fig. 5. The emotion of the audience at the reflection level

Source: Author

Statistics of the audience of visual communication design works in the questionnaire (the total number of participants is 128). In this survey, the youngest participant is 19, and the oldest is 62. Among the participants, 58 are male and 70 are female, as shown in Table 2.

Table 2: Statistical analysis table of the investigated objects

Number of people	Age Range				
	18-29	30-39	40-49	50-59	≥60
Male	30	8	10	6	4
Female	42	6	14	6	2

Statistics of audience attention to the contents of works of visual communication design in the questionnaire. Table 3 presents the survey results of audience attention to the contents of works of visual communication design. As shown in the Table 3, most of the participants place the greatest concerns to aesthetic property, followed by emotions infused in the works. According to the results of the survey, an overall flow path of attention is deduced, namely, aesthetics, emotions, functions, practicality, and

other properties. These results indicate that in designing products and works, designers should start from visual aesthetics to draw the attention of people. Then, emotions should be infused into the design so that emotional interactions can be achieved effectively when the audience continues to appreciate and accept visually attractive design works. Finally, designers should refine their practicality and add emotional values and warmth to the design work after ensuring preferable qualities in aesthetics, emotions, and functions.

Table 3: The attention of the audience from visual communication design

Feature	Number of people	The percentage of participants*
Aesthetics	52	40.6
Emotionality	48	37.5
Functionality	16	12.5
Practicability	8	6.3
Others	4	3.1

Note: * The total number of participants is 128

Statistics of the colors that are considered to convey the warmest emotions in visual communication design works in the questionnaire. Most people consider yellow, red, gold, and orange when selecting warm colors. Men and women hold different opinions on which colors are warm. Despite the common inclination to select yellow, orange, gold, and red, men tend to choose deep and sedate colors, such as brown, white, gray, and blue, whereas women are more inclined to select bright and vivid colors. Moreover, participants of different ages have varying definitions and selections for warm colors. In particular, the respondents belonging to the age range of 40-60 tend to choose gray, yellow, gold, or even black. For respondents belonging to the age range of 20-30, neutral or bright colors, such as white, yellow, gold, and orange, are common choices. After sorting through the 128 questionnaires, 13 colors were selected as the most preferable warm colors of the audience, as presented in Table 4. These 13 warm colors were then classified and screened. Figure 6 displays the preliminary screening and classification results of warm colors. As shown in the figure, colors that stimulate warm emotions are on the left, including purple and green in the middle. Meanwhile, cold colors are on the right. This method can be a reference in selecting colors for emotional designs.

Table 4: Preliminary statistical table of warm color

Object	Warm color	Number of people
128 Effective Questionnaires	Yellow	58
	Red	45
	Gold	37
	Gray	26
	White	29
	Silvery	32
	Orange	41
	Brown	18
	Pink	33
	Purple	13
	Green	12
	Black	8
	Blue	4

Application Methods for Expressing Warm Emotions

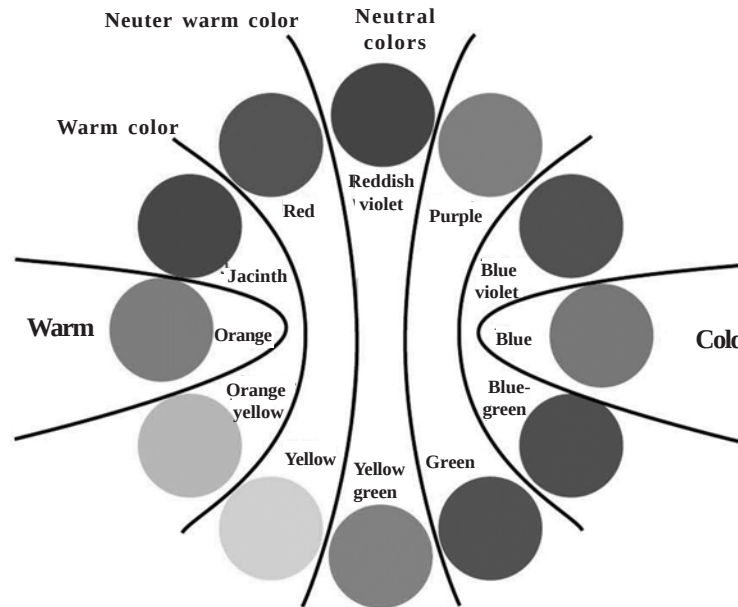
After sorting and analyzing the data presented earlier, a set of complete and logical application methods for expressing warm emotions can be acquired. The specific procedures are described as follows.

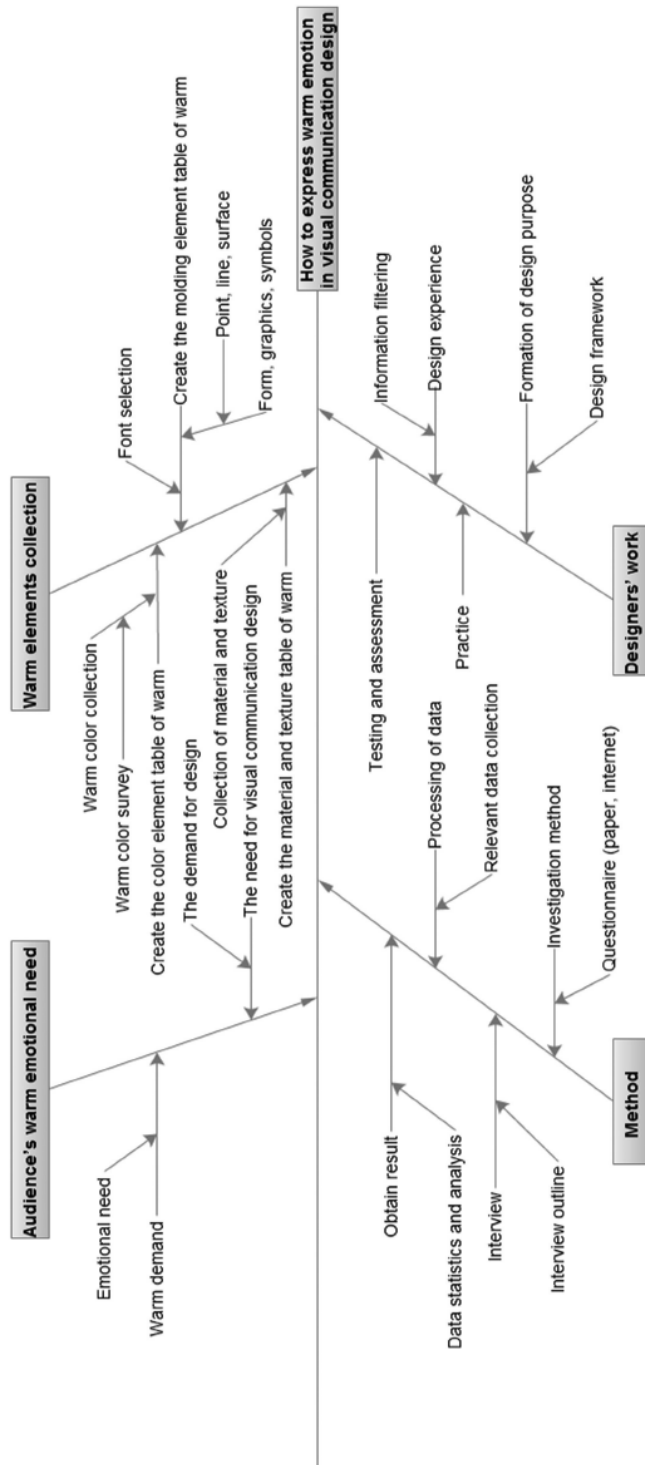
(1) Overall method of design. The first step in emotion-oriented studies is to complete the questionnaires, investigations, interviews, data collection, and analyses.

(2) Emotional needs of audiences. To design a work with warm emotions, the audience should be first decided. Then, designers should understand their own emotional appeal and investigate among the audience with regard to the selection of emotions that encompass warm meanings and warm emotions desired by the audience.

(3) Collection and arrangement of 'warm' elements. In this step, a large number of investigations and studies are required, and all the elements that conform to the definitions of warm emotions should be collected and arranged. Designers should collect as much data as possible and screen these data appropriately according to the range of design. For example, given that visual communication design is the focus of the current study, the effective visualization of warm elements is necessary to enable people to feel the expression of warm emotions directly.

(4) Work of designers. In the last step, the pieces of information obtained from the former three steps are integrated and applied. Therefore, this step is critical in deciding whether the design work is endowed with warm emotions and whether the idea can be practically implemented. These procedures can be expressed in a fish-bone chart regarding the emotion-oriented research, as shown in Figure 7.

**Fig. 6. Preliminary screening classification results of warm color**



The development of application methods for expressing warm emotions provides a method for emotional design that concerns warm emotions. The expression of other emotions can also be deduced from this method. Moreover, it is also an intuitive approach for expressing emotions in visual communication designs. In the design process, designers can use this method to complete the required expressions and solve the related problem. During the early stage of design, the fishbone chart in emotion-oriented research can be adopted as a guiding method. After the work is finished, this method can be used to assess whether the design work expresses warm emotions. Even for existing design works, this method can be applied to evaluate whether these works satisfy the requirements. Accordingly, designs that do not express warm emotions can be improved.

CONCLUSION

Emotion-oriented design is a tendency of modern design development. Current designs should transcend the objective of merely satisfying the functional needs and visual feelings of people. Instead, modern designs should also deliver certain emotional experiences to consumers and the audience, in general, through visual languages. In this study, visual communication design, a design discipline closely related to the daily lives of people, was adopted as the medium introduces emotional design. The elements affecting the emotional experiences of people were studied.

The current situation and disadvantages of visual communication designs were investigated and reviewed with the interdisciplinary knowledge of chromatics, psychology, design psychology, visual design aesthetics, and sociology. Moreover, assessment criteria and a research framework to improve visual communication designs were proposed. The application methods for expressing emotions in visual communication designs and the fishbone chart for emotion-oriented research were explored through theoretical analyses of emotional design to assist designers in producing human-oriented design works with emotional functions and contribute to emotional design development in the entire design industry.

RECOMMENDATIONS

It may be asserted that visual communication design and anthropology are not as far re-

moved from each other as suggested by the available academic literature. Although they seem to be different, there are definite overlaps waiting to be harnessed for research and for better understanding of visual communication design using anthropology. Vice versa may also be true implying that it might be possible to understand anthropology using emotional design as a tool, since visual communication design contains useful anthropological information.

Previous research into visual communication learning has mainly focused on cognitive factors to investigate different instructional conditions and design principles. Emotional factors have so far been widely neglected. However, recent studies showed that the emotional design of visual communication learning material can evoke positive emotions in learners that in turn facilitate the learning process. Following this lead, this study aims to further explore the potential of an emotional design. The emotional concept and visual communication design at the future of technology and research have broad space for development. In view of the researchers' primitive accumulation on research is comparatively difficult since resource of research is limited. The research of this paper is not enough depth and perfect. In the follow-up process, in-depth study will be improved and perfected.

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REFERENCES

- Alessi A 1998. *The Dream Factory: Alessi Since 1921*. London: Konemann.
- Apurva B, Ravi K 2014. Copyright violations, 'inspirations' and adaptation in Indian films: A case for cinema as visual anthropology? *Anthropologist*, 18(1): 211-216.
- Cheng AP, Qiao LH, Fan XD 2015. Research on the application of humanized design concept in product design. *Design*, 13: 56-57.
- Chuang MH, Ma JP 2015. Analysis of emotional design and cultural product narrative communication model. *Springer International Publishing*, 9181: 187-196.

- Cliff S, Joyce T 2015. Exploring the emotional experience of the user and designer, both in the design process and classroom. *Procedia Manufacturing*, 3: 2267-2274.
- Desmet P 2002. *Designing Emotions*. Delft: Industrial Design.
- Desmet P, Hekkert P 2007. Framework of product experience. *International Journal of Design*, 1(1): 57-66.
- Desmet PMA, Porcelijn R, Dijk MBV 2007. Emotional design: Application of a research-based design approach. *Knowledge, Technology & Policy*, 20: 141-155.
- Graffam G 2010. Design anthropology meets marketing. *Journal of Anthropologica*, 52(1): 155-164.
- Guo YX 2015. Prospective research on emotional concept in visual communication design. *Architectural Engineering Technology and Design*, 31: 1815.
- Helfenstein S 2012. Increasingly emotional design for growingly pragmatic users? A report from Finland. *Behaviour & Information Technology*, 31(2): 185-204.
- Huang YX, Chen CH, Wang IC, Li PK 2014. A product configuration analysis method for emotional design using a personal construct theory. *International Journal of Industrial Ergonomics*, 44: 120-130.
- Huo SB 2015. Superficial analysis of the emotional concept in product design. *Science and Technology & Innovation*, 10: 24-27.
- Ilhan A, Ender S 2014. Examination of the relationship between general self-efficacy beliefs, emotional intelligence levels and emotional self-efficacy levels of students in school of physical education and sport. *Anthropologist*, 18(3): 893-902.
- Jan LP, Steffi H, Elizabeth OH, Bruce DH, Enjoon U 2014. Emotional design in multimedia learning: Effects of shape and color on affect and learning. *Learning and Instruction*, 29: 128-140.
- Kenya H 2011. *Designing Design*. Zurich: Lars Muller Publishers.
- Liu S 2006. *Design Art Psychology*. Beijing: Tsinghua University Press.
- Li J 2007. *Emotional Branding Design*. Beijing: Chinese Marketing Publishing House.
- Ljubica D, Julio S 2016. Contrasting vertical and horizontal representations of affect in emotional visual search. *Psychonomic Bulletin and Review*, 23: 62-73.
- MaslowAH 1964. *Religions, Values, and Peak Experiences*. London: Penguin Books Limited.
- Maria JS, Ricard B, Rake P, Belda-Lois JM, Amelia G, Amparo L, Jose MC, Miguel S 2006. The use of emotional design techniques in user oriented design of interfaces within a smart house environment: Case study. *Technology and Disability*, 18: 201-206.
- Miguel AA, Alfredo B, Enrique A 2010. Analysis of the impact of slight changes in product formal attributes on user's emotions and configuration of an emotional space for successful design. *Journal of Engineering Design*, 21(6): 693-705.
- Miller C 2011. Aesthetics and e-assessment: The interplay of emotional design and learner performance. *Distance Education*, 32(3): 307-337.
- Michael K, Thomas D, Patrick G 2011. Designing emotions. *Kunstliche Intelligenz*, 25(3): 205-211.
- Meng M 2012. Deduction and development of 'emotion in action' - study on affective communication in visual communication design. *Art Panorama*, 7: 116-117.
- Mayer RE, Estrella G 2014. Benefits of emotional design in multimedia instruction. *Learning and Instruction*, 33: 12-18.
- Maria K, Yevgeniy P 2015. The specifics of creating emotional comfort by means of modern design. *Procedia - Social and Behavioral Sciences*, 166: 199-203.
- Norman DA 2005. *Emotional Design: Why We Love (or Hate) Everyday Things*. New York: Basic Books.
- Sun YJ 2015. Application of emotional concept in modern graphic design. *Beauty and Times*, 3: 126-127.
- Susanne KL 1957. *Problems of Art*. London: Macmillan Coll Div.
- Supavich P, Pavlo A 2013. A multimethod evaluation of online trust and its interaction with meta cognitive awareness: An emotional design perspective. *International Journal of Human-Computer Interaction*, 29: 582-593.
- Steffi H, Julia M, Maria R 2015. Emotional design in multimedia learning: Differentiation on relevant design features and their effects on emotions and learning. *Computers in Human Behavior*, 44: 81-95.
- Teng SY, Nie ZB 2006. *Aesthetics and Design in the Age of Knowledge Economy*. Nanjing: Nanjing Publishing House.
- Tian G, David K 2014. Why is business anthropology important? *Anthropologist*, 18(1): 1-5.
- Tian G, Shao H 2014. Product design and enterprise anthropology. *Journal of Hangzhou Teachers College (Social Sciences Edition)*, 4: 83-89.
- Tian G, Zhu TT 2014. Industry and commerce anthropology approach of product design. *Nationalities Research in Qinghai*, 25(1): 7-11.
- Wang D, Kang J, Qin SF, Birringer J 2015. Cultural-based visual expression: Emotional analysis(of human face via Peking Opera Painted Faces (POPF). *Multimedia Tools and Applications*, Published online 21 May, 1-27.
- Wang SZ 2002. *A History of Graphic Design*. Beijing: China Youth Publishing House.
- Wang JM 2011. *Art Design Introduction*. Beijing: Chinese Light Industry Press.
- Xu Y 2016. Study on color psychology in art design. *Appreciation*, 2: 23.
- Yang CR 2015. Superficial talk about the design and analysis of visual communication design concept. *Science and Technology & Innovation*, 20: 26.
- Ye DH, Pan JZ 2015. Based on the emotional design of mobile phone interface icon creative research. *Design*, 7: 59-61.
- Zheng L 2015. Application of emotional concept in visual communication design. *Panorama of Chinese Nationalities*, 18: 179-180.