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EMOTIONS & FONTS
CONSTRUCTING EMOTIONAL MAP OF CHINESE FONTS

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ABSTRACT

Words are tool that convey not only information but also emotions. A beautiful story can always catch our feeling: we cry, we laugh; we are nervous, and sometimes angry. However, it always happens: we feel different when reading in different fonts. Using the right fonts at the right time is also important nevertheless may easily ignored. This study focused on the relationships and mechanism between Chinese fonts and emotional adjectives. For purpose, night subjects were asked to give points to 74 font samples in 9-level Likert scale with eight adjectives. The eight adjectives—joy, sadness, trust, disgust, fear, anger, surprise, and anticipation—were chosen for its polarity of emotions, from the Theory of Emotions, proposed by Plutchik. With the collecting data, factor analysis was applied to extract important elements. Consequently, two extracted components were "Mental Congruity" and "Mental Pressure". The results show that (1) Archaic fonts bring more fear and sadness due to higher mental pressure; however modern fonts with more joy and surprise, because of lower pressures; (2) common fonts are more acceptable and anticipated for higher mentally congruous, contrarily, uncommon ones get easy to be disgusted and surprised with its mentally incongruity. On the other hand, fonts were scored in both elements, hence a map of emotions and fonts were constructed. The result is significant and can be applied for publishers to manipulate the emotions in story books, novels, or even comic books by degree.

Keywords: *Chinese fonts, Emotions, Emotional map*

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1. INTRODUCTION

The appearance of words is a symbolism of civilization. It used to record histories and tales for centuries. It's a medium to convey information more easily to others from time to time. More than that, words can be used to record humans' feelings—recorded between lines, or recorded on the way you write, under different fonts.

Literature contains thousands of emotions to be expressed in thousands of forms, sometimes sensitive and sometimes wild. By writing, authors leave messages of what feeling they want to express and to share. By reading, readers can join literary feasts from time to time, to feel like what authors feel. It is the characteristic of literature—the emotional impact it can have on the reader (Brewer and Ohtsuka, 1988; Tan, 1994; Dijkstra et al., 1994).

Moreover, styles of lettering are not themselves neutral. They convey different messages of their own (Bartram, 1982; Brumberger, 2003; Rowe, 1982) through what Childers and Jass (2002) termed "typeface semantics." For instance, consumers might associate ornate fonts with elegance and style. Ad copy and packaging may all convey covert messages through the choice of typeface they adopt. (Doyle and Bottomely, 2006)

Relative studies about Chinese fonts have examined this typeface semantics in several Kansei phrases, however, focused on the phrases that describe its exterior most. Few are discussed interior, the emotional phrases. This study hence mainly stressed on how people feel of different Chinese fonts, and tried to find the emotions that would be aroused when watching different fonts and what emotions will be best fit into different fonts. Furthermore, the study was interested in the relative strength of emotions between fonts. By collecting data and constructing graphical analysis would be great help to understand it.

2. FONTS & EMOTIONS

2.1. Fonts expression in Chinese

Chinese word system has been developed for thousands years. It is also one of the oldest systems which still in use in contemporary. Even though the words have lot of changes from the very beginning, the spirit still exist. Feng (2007) has made a research about typeface semantics with Chinese fonts. He constructed a system, adapted from the Latin font classification system, PANOSE SYSTEM 2.0 to archive Chinese fonts characteristics. The characteristics of Chinese fonts can be defined as genre, serif, weight, topology, contrast, angle, tool kind, and aspect ratio. On the other hand, the corresponding Kansei phrases—classical, elegant, gorgeous, strong, vivid, soft, romantic, active, eye-catching, mature, compact, modern, and dislike, were selected by a standard of common product design evaluation phrases (Chen, 1993). Then, using Quantification method I, the relations between the characteristics and the Kansei phrases can be analyzed. The results show the relations between Kansei phrases and the characteristics of Chinese fonts.

2.2. Plutchik's nature of emotion

20th century is a booming era for human psychology. Some Scholars turned their interests from outer world back to humans' behaviors, including how they feel. Hence, the essence of human emotion has been widely discussed. Several theories were constructed to explain the mechanism of human emotions. Robert Plutchik (2001) presented a review of the nature of

human emotions. He pointed out that:(1) What we call "cognition"—the activity of knowing, learning, and thinking, of which emotion is a part—evolved over millions of years. The process of evolution by natural selection applied not only to anatomic structures but also to the "mind" of an animal and to expressive behavior; (2) an emotion is not simply a feeling state: emotion is a complex chain of loosely connected events, the chain beginning with a stimulus and including feelings, psychological changes, impulses to action, and specific goal-directed behavior. In other words, feelings do not happen in isolation. They are responses to significant situations in the life of an individual, and often they motivate actions; (3) in general emotions are activated in an individual when issues of survival are raised in fact or by implication. Such situations include threats, attacks, poisonous substances, or the sighting of a potential mate. The effect of the emotional state is to create an interaction between the individual and the event or stimulus that precipitated the emotion. The interaction usually takes the form of an attempt to reduce the disequilibrium and reestablish a state of comparative rest.

He also created a wheel of emotions in 1980 which consist of eight basic emotions and eight advanced emotions each composed two basic ones.

Table 1: Basic emotion and basic opposite

Basic emotion	**Basic opposite**
Joy	Sadness
Trust	Disgust
Fear	Anger
Surprise	Anticipation
Sadness	Joy
Disgust	Trust
Anger	Fear
Anticipation	Surprise

Table 2: Advanced emotion composition and advanced opposite

Advanced emotion	**Composed of...**	**Advanced opposite**
Optimism	Anticipation + Joy	Disappointment
Love	Joy + Acceptance	Remorse
Submission	Acceptance + Fear	Contempt
Awe	Fear + Surprise	Aggressiveness
Disappointment	Surprise + Sadness	Optimism
Remorse	Sadness + Disgust	Love
Contempt	Disgust + Anger	Submission
Aggressiveness	Anger + Anticipation	Awe

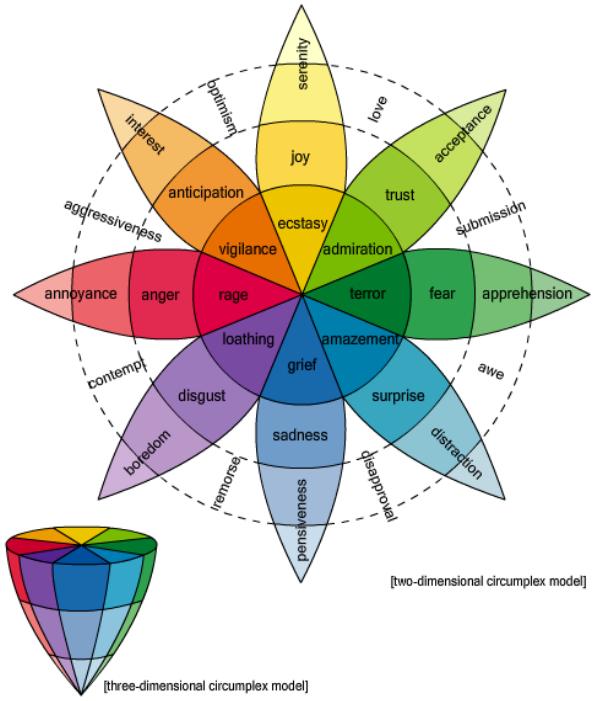


Figure 1: Plutchik's wheel of emotions

The system was adopted in the research because of its basic concept that emotions were stimulated by surrounding events, which may be appropriate when reader join into the story they are reading.

3. EXPERIMENT DESIGN

3.1. Experimental font cards

In this experiment, subjects were asked to give scores to 74 font cards under 8 adjectives. 9 Chinese words, chosen from top 500 common words, were arranged in 3 times 3 arrays in each card. Words with emotional meanings were also excluded. Font selections were referred to Feng's work (2007).

Figure 2: Experiment card sample

3.2. Participants & Experimental design

Participants were nine master students of National Cheng Kung University, with average 25 years old, visual design background for 4.56 years (standard errors: 2.01 years). They were asked to indicate on eight adjectives in random order. The eight adjectives are: joy, trust, fear, surprise, sadness, disgust, anger, and anticipation, guided from the basic emotions of Plutchik's theory. Under each adjective session, 74 experimental cards were scored by nine-scale Likert scoring method—subjects would be asked to arrange these cards for how strong the feeling of that adjective in three piles. After that, they would be asked to separate each pile in another three piles, sorted by the feeling intensity, too. The data of each adjective will contain 74 numbers with 1-9 points given.

3.3. Factor Analysis

After data gathered, to find out the relationships between fonts under the adjectives, factor analysis was applied to extract the important factors (Darlington et al., 1973; Cattell, 1978; Gorsuch, 1983).

Before applying factor analysis, it is necessary to make sure the existence of covariance between adjectives. This study took Barlett's test of sphericity for the reason. Then, Kaiser-Meyer-Olkin measurement was taken for sampling adequacy. The result is shown in the table below. From the result of table, the approximate Chi-Square value of Barlett's test is 649.142, p value is < 0.001, representing that there was covariance between adjectives. On the other hand, KMO value of the research was 0.753, representing the adequacy of sampling. Usually KMO value was acceptable over 0.7.

With extraction method—Principal component analysis, two factors are extracted, with totally 77.424% of variance explained.

Table 3: (a) Initial Eigenvalues and (b) Total Loadings

(a)

Component	Total	% of Variance	Cumulative %
1	4.775	59.688	59.688
2	1.419	17.736	77.424
3	0.865	10.812	88.235
4	0.619	7.736	95.972
5	0.125	1.564	97.535
6	0.103	1.284	98.819
7	0.066	0.823	99.642
8	0.029	0.358	100.000

(b)

Component	Total	% of Variance	Cumulative %
1	3.541	44.259	44.259
2	2.653	33.165	77.424
3			

4			
5			
6			
7			
8			

Eight components were reduced into two factors. To find out what the extracted factors would be, eight phrases were plotted into the new plane constructed by the extracted factors by matrix transformation.

Table 4: Rotated component matrix

Phrase	Component 1	Component 2
joy	-0.616	-0.688
sadness	0.241	0.897
trust	0.925	0.263
disgust	-0.782	-0.160
fear	0.046	0.969
anger	0.539	0.096
surprise	-0.661	-0.554
anticipation	0.952	0.154

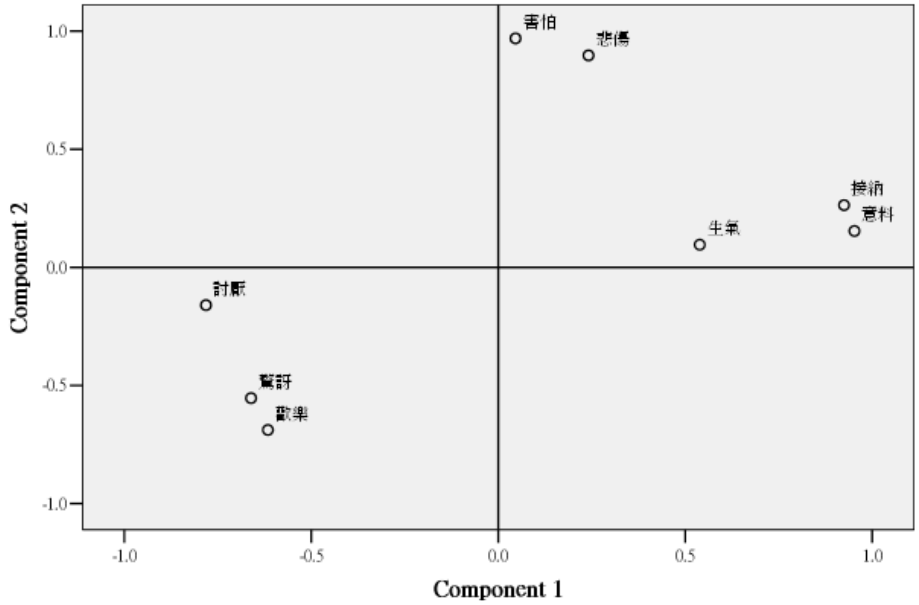


Figure 3: Component plot in rotated space

4. RESULT

The result shows that two factors are extracted from eight emotions. Here are the descriptions of the component:

(1) Component 1 can be seen as "Mental Congruity", which stresses on the degree of how match with your mental schema. Common things always have higher degree matches people's mental model, so it get higher positive congruity. Rare things usually don't match people's impression, which lead to a negative congruity. However, it may cause two types of reaction: very disgust or very enjoy.

(2) Component 2 can be read as "Mental Pressure", which implies a vector force pressing people or dragging people. Higher positive level represents a pressure is pressing toward people, which brings more fear and sadness. On the other hand, higher negative level means the force of pressure is dragging people, hence brings more easy and relief toward them.

Finally, it is interesting to put *74* fonts onto the chart based on the new axes.

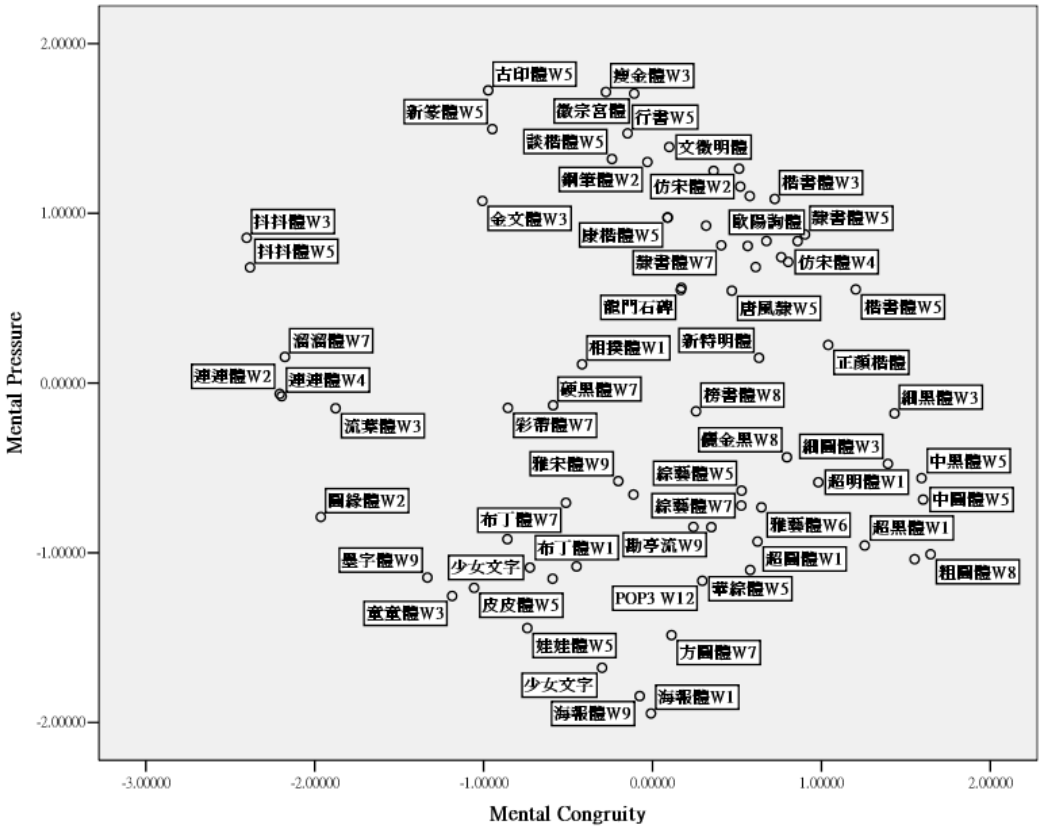
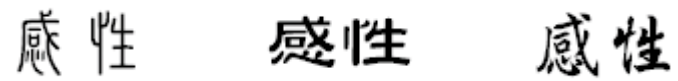


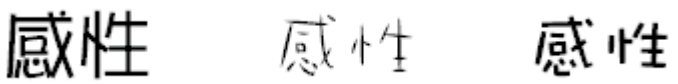
Figure 4: *74* fonts located on the plane of Mental Congruity-Pressure

There is something worthy to be noticed: (1) Archaic fonts like Chuan (篆體), Li (隸書), and Kai (楷體) were mostly located at the area with higher pressure. It referred that ancient typefaces are easy to bring awes and fears; on contrary, modern fonts like POP(POP體), Tong Tong(童童體), or Wa Wa (娃娃體), created lately so leave without the bag of history, are tending to make people relieving and joyful. (2) Fonts as Ming (明體) and Hei (黑體) are

more commonly used, hence get higher scores in positive mental congruity; on the other hand, Lian Lian(連連體) and Yuan Yuan(圓緣體) are rarely used, turned into lower score in mental congruity.



(a)



(b)

(c)

(d)

Figure 5: Four typical font groups—(a) Archaic fonts; (b) Modern fonts; (c) common fonts; (d) uncommon fonts, written "Kansei" in Chinese.

5. DISCUSSION

The research mainly discussed the relations between fonts and emotions. By examining the basic emotions from the theory of Robert Plutchik, factor analysis was next applied to reduce the number of component and extract the common factors. The result suggests that the two inherent components were "Mental Congruity" and "Mental Pressure", which affect people's mental mind working when watching the words.

However, there is still something to be discussed. The result of eight adjectives plotted on the chart doesn't show obvious polarity as Robert's theory. Eight emotions should be pair-wised showed up, joy to sadness, fear to anger, trust to disgust, and surprise to anticipation. It might be the inadequacy of applying the theory into reading behavior.

The theory of The Nature of Emotion primarily discussed the nature emotion of humans. The emotions are aroused by the events people faced directly, and the events can be very distinct. Unlike reading behavior, readers also react when reading different events, but eventually they are not in direct. All stimuli were accepted during reading, which may lower strength of the impact.

On the other hand, selection of fonts also controls the result of analysis. What fonts were picked would directly affect the result.

To conclude, different fonts can bring different emotional reactions when reading. Some mentally effects may primarily control readers' feelings. The emotional maps of Chinese fonts may be guidance when author tries to lead readers' emotions not only from the story but also the different fonts. In future, font's usage in a paragraph may be discussed; the strengths difference between fonts and article would also be studied.

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