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# Emotions of Simplified and Traditional Chinese Typeface

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**Abstract:** Chinese typeface is widely used in design works that have numbers of users. The majority of Chinese words today consist of two or more characters. Basically, the simplified forms of Chinese characters are used in mainland China, Singapore, and Malaysia. The corresponding traditional characters are used in Taiwan, Hong Kong, and Macau. This study quantifies the relationships between emotions and Chinese typefaces by the process of kansei engineering. 20 simplified types and 20 traditional types were extracted and the kansei evaluation experiment was conducted for the people in mainland China and Taiwan where are the main regions using Chinese. The results of cluster analysis, factor analysis, and dual scaling analysis are used for comparison of affective differences between mainland China and Taiwan. Particularly, it is found that for the widely used types Heiti, Songti, and Kaiti, the people in mainland China and Taiwan have opposite feelings of classic and contemporary.

**Keywords:** *Font emotion, Affective design, Chinese Characters*

## 1. INTRODUCTION

Typeface is fundamental to document designs. As a visual element of the document, type affects the reader's initial impression and reading experience [1]. It is proved that typefaces have significant impacts on human emotions in the research of document design [2]. Nowadays, the needs of multilingual design are growing for multilingual signage, website, etc. There are some researches about affective design of Latin type, Japanese type, Chinese type, etc. [3, 4, 5, 6]. The affective knowledge of typeface is helpful to font selection in design works, even for document designers and graphic artists.

Chinese characters are among the most widely adopted writing systems in the world by numbers of users. It is used not only in mainland China, Taiwan, and Hong Kong, but Japan, North Korea, South Korea, and Vietnam, although Mongolia and parts of Central Asia. The standard of Chinese characters in these areas are settled independently. The so-called Chinese typeface contains simplified Chinese (SC) used in mainland China and traditional Chinese (TC) used in Taiwan. As we know, there are differences in the perception of typeface personalities between varying cultures, gender, and expertise-level. To our knowledge, there are less research

about the affective differences between SC and TC types. In other words, there are less knowledge about the typographic affective differences between the people in mainland China and Taiwan.

This research aims to evaluate the affective performance of typical Chinese typefaces by quantitative methods and compare the different impressions for typefaces between the people living in mainland China and Taiwan. We extract some typical typefaces of SC and TC fonts, and conduct the kansei evaluation experiment to gain the affective evaluation data for these fonts. In this work, the evaluation results are shown as a guideline for affective font selection. Moreover, cluster analysis, factor analysis and dual scaling analysis are executed for comparison.

## 2. AFFECTIVE EVALUATION FOR TYPEFACES

### 2.1 Font selection

For SC and TC types, the Chinese characters share the same glyphs and some have subtle differences. Even some punctuations have some differences in design, while it is not strict in daily use. Although there are thousands of Chinese fonts, they can be basically classified into several groups, as Heiti, Yuanti, Songti, Fangsong, Kaiti, other calligraphy types and Decorative types in digital age. In

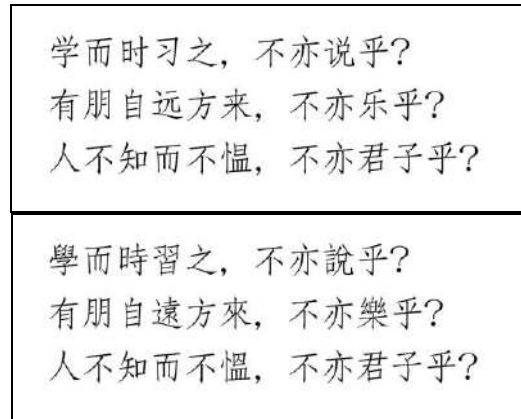
**Table 1:** Font list of SC and TC (some fonts have SC and TC in a file, some have different font file for SC and TC)

classification	SC fonts	Sample	TC fonts	Sample
Heiti	Heiti	论语	Heiti	論語
	SimHei	论语	SimHei	論語
	Hiragino Sans GB	论语	Hiragino Sans GB	論語
	MS Yahei	论语	MS Yahei	論語
	LantingHei	论语	LantingHei	論語
	Source Han Sans	论语	Source Han Sans	論語
Yuanti	Yuanti	论语	Yuanti	論語
	DFYuanti	论语	DFPGYuanti	論語
Songti	Songti	论语	Songti	論語
	SimSun	论语	SimSun	論語
Fangsong	STFangsong	论语	STFangsong	論語
	Adobe Fangsong	论语	Adobe Fangsong	論語
Kaiti	Kaiti	论语	Kaiti	論語
Seal script	DFPJinWne	𠄎𠄎	DFPGJinWen	論語
Semi-cursive script	-	-	DFPGXingshu	論語
Weikai	DFPTanLi	论语	-	-
Clerical script	Weibei	论语	Weibei	論語
	DFPPOP	论语	DFPGPOP	論語
	DFPShaoNv	论语	DFPGGirl	論語
	Wawati	论语	Wawati	論語
	HanziPen	论语	HanziPen	論語

this work, 20 SC fonts and 20 TC fonts are selected shown as Table 1. Among them, 19 fonts are belonging with the same types, and 1 font is different. These fonts are from some famous Chinese font company, as Sino Type (ST), Dyna Font (DF), etc. Among them, 6 fonts of Heiti, 2 fonts for Yuanti, Songti, and Fangsong which are commonly used in digital devices are selected.

## 2.2 Kansei evaluation experiment

For the evaluation targets, one chapter of the Analects of Confucius is selected as the content of samples which is widely known in China. Leading is set to 1.6em. 20 SC samples and 20 TC samples were made for each SC and TC fonts shown as Figure 1. 30 kansei words were extracted to express design tastes of typography, as pretty (漂亮), casual (随性), dynamic (动感), romantic (浪漫), mild (温和), feminine (女人味), natural (自然), elegant (优雅), gorgeous (华丽), wild (豪放), classic (古典), formal (正式), dandy (花俏), chic (别致), fresh (清新), clear (清晰), modern (时髦), pop (流行), retro (怀旧), noble (高贵), friendly (亲切), contemporary (现代), standard (标准), stylish (时尚), expressive (生动), readable (易读), like (喜欢), reliable (可靠), attractive (醒目), beautiful (美丽). All these kansei words are used for evaluation experiment of SC and TC typefaces. The experiments for SC and TC were conducted separately.



**Figure 1:** Evaluation samples of SC and TC in Adobe Fangsong

The investigation was executed by 5-point scales of SD method and entrusted to the investigation company, Macromill. It was conducted for 82 people in mainland China to evaluate SC samples and 82 people in Taiwan to evaluate TC samples. The age of these participants had a distribution in twenties, thirties, forties, and fifties. The evaluation results were collected in January, 2017.

## 3. ANALYSIS AND RESULTS

### 3.1 Cluster analysis

Ward method is used for hierarchical cluster analysis. As the results, 20 SC fonts can be divided into 3 groups which are close to serif, san-serif, and design type in Latin types. Here, it is intuitive to use serif and san-serif for naming font classifications and the design type class includes Calligraphy and decorative types. The details are as follows, where ‘[]’ denotes sub-classifications that have close images.

- Serif: [Adobe Fangsong, SimSun, STFangsong, Kaiti], [DF Yuanti, Songti]
- San-serif: [Heiti, LantingHei, SimHei, Source Han Sans, Yuanti], [Hiragino Sans, MS YaHei]
- Design type: [DFPPOP], [Weibei, DFPTanLi], [DFPJinWen], [HanziPen, DFPShaoNv], [Wawati]

20 TC fonts have different classifications from SC fonts that Fangsong and Kaiti are evaluated with closer tastes of calligraphy, and Heiti, Songti, Yuanti have close tastes which are widely used in modern digital world. They are divided into 3 groups denoted as calligraphy type, design type, and practical modern type. The details are as follows, where ‘[]’ denotes sub-classifications that have close images.

- Calligraphy type: [Adobe Fangsong, Kaiti, Weibei], [DFPGXingshu]

- Design type: [DFPGJinWen], [DFPGPOP], [HanziPen], [WAwati, DFPGGirl]
- Practical modern type: [DFPGYuanti, Yuanti], [Heiti, MS YaHei, SimHei, Hiragino Sans, Source Han Sans, LantingHei], [SimSun, Songti, STFangsong]

**3.2 Factor analysis**

In this evaluation experiment, 19 fonts for SC and TC types are same among 20 evaluated fonts. To get the main kansei factors of Chinese typeface, the affective evaluation data of these 19 fonts from the subjects of mainland China and Taiwan is integrated. The results of factor analysis by promax rotation method are shown in Table 2. Factor 1 is interpreted as Informality with opposing meaning of casual and formal. Factor 2 is interpreted as Practicality denoting the word is readable or not. Factor 3 is interpreted as Times that classic, retro, and contemporary imply epochal meanings.

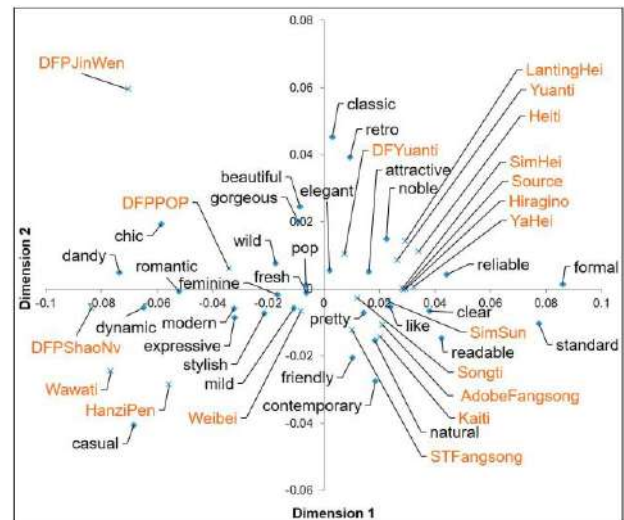
**Table 2:** Factor loadings by promax rotation

Kansei words	Factor1	Factor2	Factor3	
Informality	casual	1.0707	-0.1672	-0.2233
	dynamic	1.0547	-0.2776	-0.0280
	dandy	1.0182	-0.4133	-0.0665
	modern	0.9836	0.0225	-0.0189
	expressive	0.9760	-0.0895	0.0355
	pop	0.8727	0.2954	-0.1090
	romantic	0.8398	-0.0071	0.2140
	stylish	0.8148	0.2577	0.0622
	wild	0.7629	0.1832	0.1205
	chic	0.7532	-0.1487	0.3511
	feminine	0.7527	0.2374	0.1441
beautiful	0.4800	0.2711	0.4552	
Practicality	readable	-0.1929	1.1010	-0.1524
	standard	-0.4485	1.0469	0.0315
	contemporary	0.3434	0.9763	-0.3378
	clear	-0.0219	0.9585	0.0265
	formal	-0.4324	0.9267	0.2034
	reliable	-0.1193	0.8676	0.2449
	attractive	0.1648	0.7403	0.0792
	natural	0.4431	0.6546	0.0757
	friendly	0.5945	0.6407	-0.1227
	like	0.3901	0.6390	0.1676
	mild	0.5345	0.5818	-0.0141
	fresh	0.4685	0.5078	0.2123
Times	pretty	0.3568	0.4163	0.4011
	classic	-0.1566	-0.1587	1.1043
	retro	-0.0186	-0.0235	0.9800
	noble	0.1041	0.2690	0.7511
	elegant	0.2740	0.2580	0.6079
gorgeous	0.5228	0.0895	0.5634	

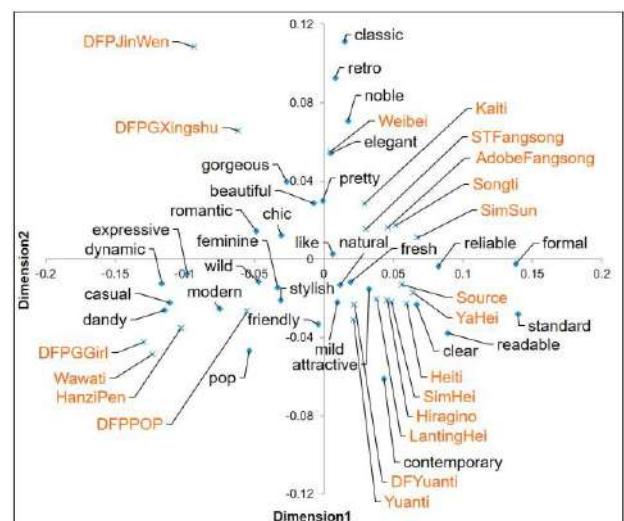
In addition, from the correlation coefficients among these kansei words we found that the people in mainland China and Taiwan have relatively close impressions of standard, formal, reliable, readable, clear, dandy, casual, contemporary, attractive, dynamic, elegant, romantic, and mild. Most of these words are objective feelings to fonts. On the other hand, some more subjective feelings which are effected by culture, life environment and experience as classic, pretty, natural, chic, fresh, like, noble, retro, friendly, gorgeous, beautiful, expressive, modern, stylish, feminine, wild, and pop, are not significant correlated between the people in mainland China and Taiwan.

**3.3 Comparison of mainland China and Taiwan**

To map all fonts and emotions, dual scaling analysis are executed. Optimal weights were calculated using the cross table containing the evaluation value of each kansei word to each font. After weighting to reflect the relative



**Figure 2:** Emotional mapping of 20 SC fonts



**Figure 3:** Emotional mapping of 20 TC fonts

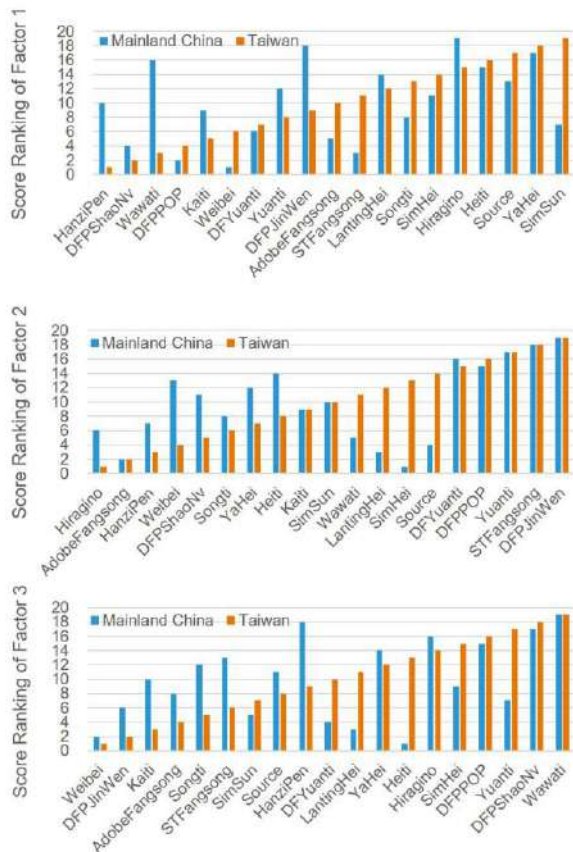


Figure 4: Factor score ranking of 19 SC and TC fonts

contribution of the dimensions, 2 dimensions are extracted and the mapping results for SC and TC fonts are shown in Figure 2 and 3. In these two figures, most emotions have similar distribution, while the distribution of serif types and san-serif types of SC and TC fonts have opposite distributions. The people in mainland China thought Heiti types are more classic, and Songti, Fangsong, Kaiti are more contemporary. While the people in Taiwan thought Heiti types are more contemporary, and Songti, Fangsong, Kaiti are more classic.

For details, the ranking of factor scores for 19 fonts for the three factors in previous section are shown in Figure 4. For factor informality, the people in mainland China and Taiwan have different impressions about HanziPen and Wawati that have cute handwriting style. The people in Taiwan have the impressions of casual and dynamic for these two fonts, while the people in mainland China do not. Moreover, the people in mainland China think that STFangsong and SimSun are a little casual and dynamic, while the people in Taiwan do not think so. For factor practicality, mostly the people in mainland China and Taiwan have similar feelings of readable and standard for fonts. However, some Heiti and Yuanti as Source Hans, SimHei, and DFYuanti are found with affective difference between the mainland China and Taiwan. For factor times,

the people in Taiwan have strong impressions of classic and retro for Kaiti, Fangsong, and Songti, while the people in mainland China think Heiti is more classic.

#### 4. CONCLUSION

This research is a beginning of exploring the affective differences of typeface across cultures. The key contribution of our work is to find out that there are significant differences of typographic feelings between the people in mainland China and Taiwan. For a same design objective, it is suggested to use different types to meet the affective needs of people from different culture and life environment. The affective knowledge of Chinese typefaces is used as a guideline for Chinese font selection, and it is also utilized in automatic design system.

Considering the internationalization and multilingual needs, we will compare the affective difference among other writing systems where Chinese characters are remained as a key component, such as Kanji in Japanese. Furthermore, we will explore and verify the historical reasons among different cultures for typographic feelings in our future work.

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