Chinese typeface with italic function

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1. Introduction

Italic type (in western typography) is a cursive typeface based on calligraphic handwriting. In early 16th century, when italic type was invented, italic type was a text type. Nowadays, the use of italics as text types waned, yet their new role is to emphasize gently, quote, and mark special text. Italic type are no longer a stand-alone type now. They turned into a sub-style of a font family. A text type is required to include at least roman style and italic style.

However, there is no true italic type in Chinese typography. When doing translation, the format of italic type is usually changed to: bold, underline, emphasis mark, other typeface, fake italic type, or sometimes even plain text. All these format have their own shortcomings when used as a replacement of italic style, and the a point in common is that they are considered to have different effect from italic type as typographic cuing, changing the original meaning of the text unconsciously and lead to different understanding. In the tide of globalization, international communication will only be on the increase, so is the demand of typographically precise transition.

Unfortunately, no research of Chinese italic type has been done yet, but some designers from different countries made their efforts in the field of CJK. It seems that the discussion of CJK italic type is becoming hot, yet research and try on text italic type have not been done.

If there are Chinese types with italic style, the problem of vacancy of italic type can be solved directly. Chinese italic type can be a help to two-way translation and bring more possibility to Chinese typography.

In this paper, finding clues of Chinese equivalences for italic type is the main objective: is there any existing Chinese type has similar impression with western italic type? What is readers' preference to typeface and typeface combination? Is geometrically transformed typeface proper when used as italic type?

In addition to that, a trial Chinese italic type is introduced.

With these goals this paper carried out two experiments. At the first stage, impressions of existing Chinese typefaces and English typefaces were researched. In the second stage, overall effects were researched through application questionnaire. Apart from typefaces used in the previous stage, some geometrically transformed typefaces and the trial typeface were also tested. As a result, some candidate choices of Chinese italic type is given.

2. Experiment of Existing Types' Impression

In this stage, different typefaces' impression were collected through questionnaire. SD (Semantic differential) method and factor analysis was employed.

On the basis of former researches and preliminary test, 14 pairs of bipolar adjective terms about impression were chosen to describe both Chinese typefaces and western typefaces[1]:

Heavy / Light	*Vulgar / Refined*
Simple / Gorgeous	*Hard / Soft*
Antique / Modern	*Weak / Powerful*
Fierce / Calm	*Worrisome / Sober*
Boring / Interesting	*Cold / Warm*
Dull / Sharp	*Dim / Bright*
Illegible / Legible	*Unstable / Stable*

Each subject was asked to evaluate typefaces according to these 14 adjective pairs on a scale from 1 to 5. For instance, in the

case of "*heavy/light*", 1 point meant "very heavy" and 5 points meant "very light".

In the aspect of Chicness typeface, 16 typefaces in all from 4 script styles (calligraphy styles) and 4 type styles (styles for movable type and computer fonts) that modern readers could not recognize were chosen:

- Clerical script (隶书/隸書)
- Regular script (楷书/楷書)
- Semi-cursive script (行书/行書)
- Cursive script (草书/草書)
- *Heiti* (黑体/黑體/ゴシック体)
- Imitation *Song* (仿宋体/仿宋體/宋朝体)
- *Ming* (明体/明體/宋体/宋體/明朝体)
- *Yaoti* (姚体, a display type)

The unified sample text for Chinese typefaces is: 中国智造，慧及全球。微风迎客，软语伴茶

In the aspect of Latin typeface, in order to gain the average impression of both roman type and italic type, 3 font families from different countries were chosen:

- Caslon from England
- *Didot* from France
- *Palatino* from Germany

The sample text for English type is a famous pangram[2]: *The quick brown fox jumps over the lazy dog.*

31 men and 17 women volunteered for participation in the study during January 10th, 2013 and January 20th, 2013. Most subjects were 20~30 years old. The result is shown in Figure 1.

Following main points about italic type were found:

- Compared with roman types, western italic types scored 1.19 point higher in "*gorgeous*", 0.99 point higher in "*light*", 0.77 point higher in "*soft*", 0.73

point higher in "*interesting*", but 0.79 point lower in "*stable*", 0.68 point lower in "*legible*" and 0.63 point lower in "*sober*".

- Both italic type and roman type had their own impression pattern. (Figure 2)
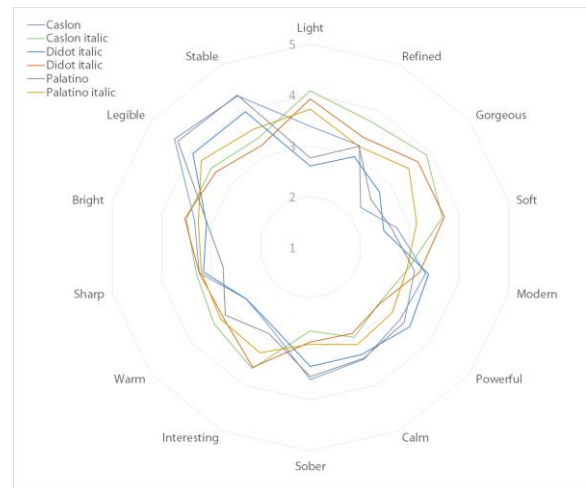

Figure 2: Schematic of typefaces' impression ratings

- 4 modern Chinese text typefaces (Regular script, modern Imitation *song*, *Ming* and *Heiti*) had similar impressions. This impression pattern was also similar to the pattern of roman text type. Therefore this paper suspects that the universal impression pattern of text types may exist.

- Among tested Chinese types, Semi-cursive script resembled western italic type most, followed by Slender Gold and *Wei* Regular

Then, factor analysis was conducted. 86% cumulative contribution ratio was reached with 3 factors. (Table 1) This paper interprets the 3 factors as "simplicity and legibility" (32% contribution ratio), "tender movement" (27%) and "sharp thin stroke" (26%).
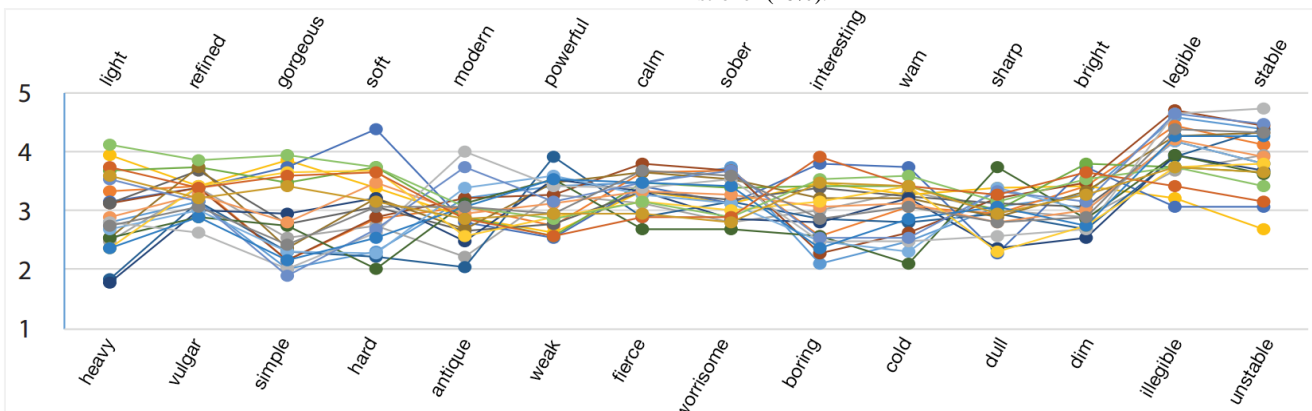

Figure 1: Schematic of typefaces' impression ratings

Table 1: Impression in the process of factor analyses

	Factor 1	Factor 2	Factor 3
Calm	.881	-270	-.160
Legible	.837	-.455	.086
Gorgeous	-.794	.439	.346
Interesting	-.602	.653	.189
Warm	-.219	.963	.089
Soft	-.239	.125	.942
Bright	.084	.084	.975
Modern	.316	-.551	-.685
Refined	.118	.499	.551

With this results typefaces could be located in 3D coordinate graphs (Figure 3), and these graphs can be used to choose typefaces as different as possible in the 2nd experiment.
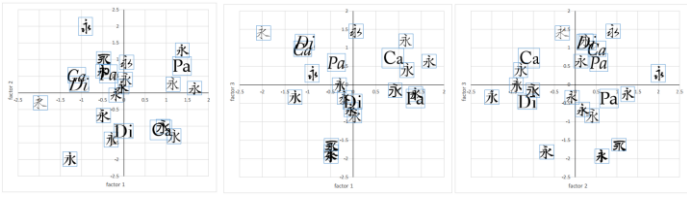
Figure 3: Type distribution map in 3 factors (dimensions)

2 main tendencies are found:

- The distribution area of western italic type is narrower than its corresponding roman type. The roman style of *Palatino*, *Didot* and Caslon are relatively separated from each on every map, while their italic styles are much closer to each on every map.

  This tendency implies that western italic style has a strong characteristic of its own. In other words, western italic type lacks large variation.

- Those Chinese typefaces which are close to western italic types on the maps tend to have slanted Horizontal strokes ("一"). The end of Horizontal stroke is higher than the start. The upwards slanting style may be considered as a Chinese way of slant character.

3. Making of trial Chinese italic typeface

Based on the results of the impression study, the influence of slanting stroke is investigated. By analyzing the directions and frequencies of different strokes, it was found that slanting upwards affects less in legibility than slanting rightwards in the case of Chinese, mainly because almost no stroke would be mistaken for slanted Horizontal.

In order to optimize the zigzag flow formed by slanted characters, a flow with wave-like top and flat bottom was aimed. To archive this, Horizontal and Vertical were mainly adjusted.

Figure 4: Samples of the experimental typeface (compare with *Ming*)

4. Experiment of Practical Application

In this last stage, another questionnaire was carried out to investigate the overall effect in practical application.

Some typefaces were used as italic type (hereinafter referred to as "assumed italic type") to display some special words. The normal text was *Ming*. Subjects were asked to evaluate: the beauty of the assumed italic type, the tradition of assumed italic type, the suitability of font combination, the salience at reading distance and glimpse distance (farther than reading distance). The rating scales were all 0~10 points.

Bold Ming, 11 transformed typefaces, 8 typical typefaces and the trial typeface were chosen in the formal survey (Table 2).

Table 2: Typefaces used in practical application

国	Ming	Heiti	Regular script	Clerical script	Wei Regular	Slender Gold	Semi-cursive script	Juzhen Imitation Song	modern Imitation Song	Trial typeface
No change	国	国	国	国	国	国	国	国	国	国
Upwards	国	国								
Condence		国	国							
Extend		国	国							
Rotate						国	国	国		
Rightwards		国	国							

71 Chinese subjects volunteered for participation in the study. Most subjects were 20~30 years old.

Following main points are found:

- Generally speaking, transformed typefaces scored lower than untransformed typeface in both scores and standard deviations. Extended and condensed typeface got particularly low score.

- Almost no significant difference with display medium and sex.

- Compared with youth, elders tended to give higher score in beauty, tradition and combination but lower score in salience. It may suggest that elders are more sensitive about typeface.

- *Wei* Regular scored as the most beautiful typeface, followed by bold *Ming* and Regular script. *Wei* Regular also scored as the most traditional typeface, followed by Semi-cursive and the trial typeface. It was also revealed to resemble western italic type in impression.

  Despite of *Wei* Regular's good results it is seldom used in China nowadays. Therefore designing another trial typeface based on *Wei* Regular is worth doing.

- Although it was found in the impression study that Semi-cursive and Slender Gold resemble western italic type most in impression, those 2 typefaces scored particularly low in the suitability of the font combination. This may imply that simple imitation of western italic type does not apply to Chinese.

- Generally, the trial typeface got good scores. Its synthesizer ranking (beauty + tradition + font combination) was the 2nd highest. The author considers it a modest success. Yet it is still distant from perfection.

- To conclude, this paper considers that *Wei* Regular is the best candidate for Chinese italic type, followed by the trial typeface, Regular script and modern Imitation *Song*. When modern impression is required, *Heiti* can also be a good choice

5. Conclusion

This paper proposed possible Chinese ways of italic types by comparing Chinese typefaces with western typefaces. A trial typeface was introduced. It aimed to be a Chinese italic type with humanity and tradition, and it archived this goal to some extent.

This paper considers *Wei* Regular the best candidate for Chinese italic type, followed by the trial typeface, Regular script and modern Imitation *Song*.

The name of "Chinese italic type" may be improper, since "italic type" was named for western historical reason and is no relation to Chinese history. A better name may be required in the future. Based on the current results, we plan to make more trial typefaces and optimized typefaces for further try. It is hoped that this exploratory study will stimulate further study in this field. This paper is just a starting research of Chinese italic type.

Following possible research topics in features can be given:

- Automatically evaluate salience by algorithm

- Italic style for *Heiti*

- The situation of vertical text direction

- The situation of traditional Chinese character

Notes:
1) Preliminary test was carried out to examine adjective pairs. As a result, "ambiguous/definite" was removed.
2) Pangram is a sentence using every letter of the alphabet at least once.

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