# Research of Styles and Visualisation Characteristics on Chinese Engraved Ancient Book Typeface Culture – Sample Study on Point Size for Ancient Books of the Wangli Reign of Ming Dynasty

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***Abstract***

**This research mainly conducted a study on the point size for Ming Dynasty Wangli Reign engraved books of China. This is a research focused on the subject of typeface point size. A study on editing elements among different typefaces in Chinese ancient engraved books was conducted in order to clarify if there was a specific rule on point sizes used. We also tried to understand if there was any absolute connection between point size and the size of version. This research investigated 217 Ming Dynasty Wangli Reign engraved books collected by the National Central Library of Taiwan. We have derived point size rules applied to various editing items and the popular forms in the time of specific engraved versions from these engraved books. We than analyzed and integrated overall factors that had constituted point sizes on engraved books. The result indicated that there were no limits on point size when it comes to application of typeface. However, there were certain connections existed between the width of columns and point size on these ancient books. The following characteristics were observed when we explored Ming Dynasty Wangli Reign typeface size: 1. For point sizes on the Ming Dynasty Wangli Reign version, most of them are distributed in the segment from size 38 to size 50. The number for size 44 ranks as the highest. 2. The largest size is 56 while the smallest is 20. Size 56 accounts for the biggest number of sizes. 3. For point sizes on volume names, most of them are in the segment from size 38 to size 50. With this, we came to the conclusion that point sizes for Ming Dynasty Wangli Reign version engraved ancient book poses special characteristics on Cultural Heritage Knowledge Visualisation.**

***Keywords- Typeface, Printing , Han Tze.***

## I. RESEARCH BACKGROUND

Engraved printing dated back roughly to Sui and Tang dynasties and it reached the peak during Sung and Yuan dynasties. Although typography began to show up in Sung dynasty, printing business at that time still focused on engraved printing. The printing influence on Chinese editing visual styles from the ways of using engraved plates is still faintly visible as of today such as the column width and numbers on ten-line paper. Later, the so-called number one printing exclusive typeface for Ming Typeface emerged during the Ming dynasty. Ming dynasty is actually the peak of our country's engraved book business. From central to local government and from public offices to private schools, there were numerous engravers in these institutions. Engraving had become a trend at that time. This was especially true during the years after Jia Jin and Wagnli Reigns. Fields of politics, economy and culture all enjoyed relatively prosperity. As a result, culture businesses, which included publishing business of engraved books and printed books, had all obtained distinctive developments. First of all, the number of types for engraved books increased. This had enabled Ming dynasty engraved printing business to obtain newer and more mature developments under the base of achievements from previous generations.

If we observe forms and contents of Chinese ancient books from the perspective of Cultural Heritage Knowledge Visualisation, we'll find that numerous different forms of books had been created from the combination of practical values and artistic appreciation values. Such combination enriched the long lasting Chinese history of culture. From the unique chapter structures of these books, we also observe perfect presentation on layout editing and binding. All these elements constituted an important chapter on the history of Chinese traditional editing. That is also the motive for this research. Consequently, this research utilizes Ming Dynasty Wangli Reign version as its subject for study in an attempt to understand visual characteristics and phenomenon presented by Chinese ancient books.

## II. SUBJECT AND STEPS OF THE STUDY

Ming Dynasty Wangli Reign rare books, a total of 217 volumes which include 21 volumes for Jing Section, 68 volumes for Shih Section, 71 volumes for Zi Section, 54 volumes for Ji Section and 3 volumes for Cong Shu, collected by the National Central Library of Taiwan were selected as subjects for this research. These books were looked into one by one and actual observation, photo taking, measuring and calculation were conducted. This research actually focused on engraved printing versions. Therefore, manually-written versions were not included in the scope of this research.

Here, we need to explain a little bit on why this research's sampling of time mainly focused on Wangli Reign of Ming dynasty. Development of Chinese books

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DOI 10.1109/IV.2012.94

experienced a huge leap in Ming dynasty. At that time, not only did engraved books enjoy rich contents with astonishing large quantity, but technologies in typography, registering and woodblock also achieved distinctive advances. This was because economy was booming in Ming dynasty and average people were eager for books. Additionally, technologies in paper making and printing improved dramatically. All these contributed to the extremely favorable environment for the development of book culture business. Specifically, stereotyped writing system was drafted to serve as the standard for recruiting public service officials. This had sped up the need for books. In the meantime, public sectors also began to collect books from all times. As a result, both private and public sectors of Ming dynasty treasured their collection of books and were proud of their engraved books. During the period from Wangli Reign to the end of Ming dynasty, typefaces for engraved books had become even squarer. This trend had eventually evolved into the Ming Typeface with the characteristics of "thin horizontal strokes and thick vertical strokes." Method of binding also had changed from back-wrapping to thread-binding. All these are signs that indicated the astronomical number and richness in styles for engraved books in Ming dynasty. Through the guidance of philology, this research has come to the conclusion that most Ming dynasty printed materials, with originally such a large quantity and later being tested by times and screened by book collectors, survived as of today are master pieces and representation of times.

When practicing actual investigation, extreme caution must be exerted during measuring and sampling. This is because papers for ancient books are fragile and their historical values are beyond measurement. Therefore, historical relics must not be damaged. During the study of typefaces on samples, measurements were conducted using a vernier scale. Numbers obtained from measurements were verified, one by one, against "National Central Library Rare Book Catalogue Initial Edition" published by the National Central Library before serving as a statistical foundation for the study. As for typeface sizes on ancient engraved books, photo typing scales were used to replace average rulers to avoid over wearing on the layouts of ancient books and reduce damages caused when flipping pages of these ancient books. As a result, sizes of points are expressed in grades. However, most engraved typefaces from Ming Dynasty Wangli Reign of China are influenced by Sung Dynasty engraved books. Therefore, as far as typeface sizes are concerned, sometimes these typefaces will come with characteristics of long, short, tall and flat simply for the sake of presenting typeface individuality and sense of beauty from respective calligraphers. This research selected books that account for the majority of volumes as samples. The expectation of this research is, despite the awareness of something missing, to obtain some statistics from existing studies in order to compensate philologists' lack of explanation on China's Ming Dynasty Wangli Reign typeface size application. In order to study and analyze actual point size application on ancient books, this research tries to summarize and integrate point size rules applied to various editing items, or styles of prevailing social practices at the time of publication, from engraved books in order to have an understanding of overall phenomenon that constituted point sizes on these books.

Research steps were conducted in two ways. One was with assistance from the National Central Library of Taiwan and consultation with related philologists. Actual observation, photo taking, measuring and calculating were conducted on each sample in a hope of obtaining quantitative statistics on forms and styles and using these statistics as foundations for theory. On the other hand, this study also utilized actual research results on philology to serve as categorization references on research phenomenon. The purpose is to consolidate representative Chinese Han Tze form characteristics in order to provide references on editing and design education as well as design practices.

## III. Study on Engrave Book Typeface Size

For typeface on modern day layout editing and designing for books and publications, their applications include point size changes and rich and diversified typefaces. Visually, this leads to more possibilities. Typefaces can be regarded as pure typefaces while, in the meantime, they can also be treated as parts of graphs depending on the changes in point sizes. As for typeface application on Chinese Ming Dynasty Wangli Reign ancient books, there were several engraved books written in Xiao Tze such as "New Edition for Scholar Hsu, Xuan Fu's Compilation on Mao Poem Six Chapter Jiang Yi," "New Edition for Shih Gan Li Dai Jun Duan," "Xing Li Xuan Cui" and so on. In Sung dynasty, there were books with mini size pages and large size pages. For Jin Chang Ben in Ming dynasty, however, most of them have large size pages with relatively wider and larger calligraphy, about 20 to 30 centimeters of height and 15 to 28 centimeters of width. Most typefaces are Zhao typeface with the size of ancient coins. For application of large/small size typefaces on ancient books, the purpose of using "large size typeface" is, as compared with today's application of different sizes of typeface in printing, presumably for engravers' convenience in engraving and printing, or for readers' convenience in searching while reading. Whether it's engraved printing or typography printing, ancient people would impose careful calculation on layout to ensure low cost and exquisite layout while enhancing editing effectiveness. However, are these really the reasons for ancient people's application of different size typefaces on engraved books? Among various factors that influenced the application of typeface size in Chinese Ming Dynasty Wangli Reign ancient books, there were no specific materials in various related documents that can offer explanation on this issue. This research tries to explore if there are any specific rules of application or other factors remain to be discovered. Accordingly, this research is focused on the discussion and analysis on the presentation of visual phenomenon.

Typefaces used in Chinese ancient books evolved from large/small Zhuan in the early days to Li Shu which was then

followed by Shin Cao and Kuang Cao that move like clouds and water in a flat space and Jen Shu, also known as Kai Shu, which has a rigorous space structure. From the perspective of rich and changing flat space utilization for Chinese typeface, it will not be persuasive to claim that column width of ancient books is the only reason that limits point size. Furthermore, the size of typeface on books will influence the setting and planning on the lines of layout and becomes a long-practiced rule simply because of typeface structure relationship and visual needs. In fact, we can find from Chinese Ming Dynasty Wangli Reign ancient books that applications of typeface on each of these books were rich and diversified. In some cases, there were even applications of different typefaces on the same layout. Take "Chu Xue Ji" in illustration 1 for example. Notes written in Xiao Tze were listed side by side with contents in the same column. Typefaces for contents are flat while the ones for notes are relatively slender. Furthermore, most printed typefaces on Chinese Ming Dynasty Wangli Reign ancient books were written by calligraphers before being engraved by engravers later. Therefore, there should be no specific size limits on typeface utilization.

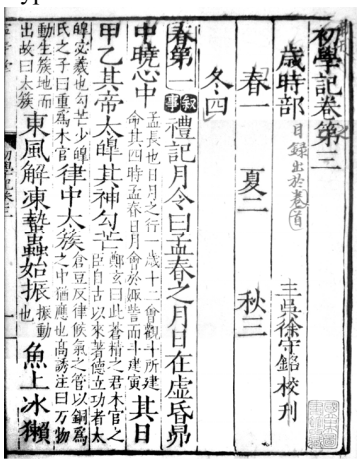

Figure 1. Ming Dynasty Wangli Reign "Chu Xue Ji"

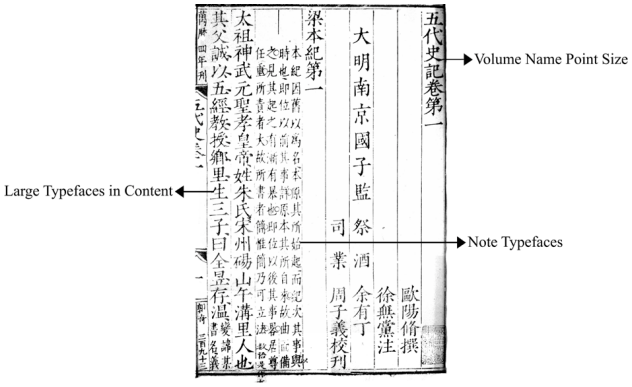


Figure 2. Ming Dynasty Wangli Reign "Chu Sao Chi Yu "- Illustration on the Study of Point Size

## IV. Analysis and Discussion on Wangli Engraved Point Size

Most words in the lines of each edition of Chinese ancient books have fixed patterns. However, there are some cases that don't have fixed patterns. For instance, if we examine the size of words in ancient books from the perspective of modern day printing editing concept, generally the size of words for volume name on the first line of each page is the largest. Size of words for contents comes in the 2nd place while the one for notes is the smallest. Nevertheless, this way of categorization seems to be slightly sloppy and simple and there is no reference from a more accurate comparison. Accordingly, this research tries to further explore and understand this issue. This research investigated 217 Ming Dynasty Wangli Reign engraved books collected by the National Central Library of Taiwan. An investigation was conducted by taking measurements on first volumes and contents of first pages. Basic contents for measurement in this phase include the followings in the first pages of the first volumes for each of Ming Dynasty Wagnli engraved books: 1. point size for volume name; 2. point size for large typefaces in content; 3. point size for notes. Explanation on basic forms is presented in illustration 2.

Based on measurements from the survey over Chinese Ming Dynasty Wangli version ancient books, we have come to the conclusion that "point size for volume name is bigger than the one for content," "point size for content is bigger than the one for notes" and "point size for volume name is bigger than content point size which is bigger than notes point size." On the other hand, we have also found that "point size for volume name is smaller than the one for content," "point size for content is smaller than the one for notes" and "point size for volume name is smaller than content point size which is smaller than notes point size."We have also learned if point sizes for various different elements are the same. Through cross observation and analysis on these statistics, we are then able to discover numbers, among numerous statistics, that can serve as our references. Our findings are presented in table 1 below.

TABLE 1 Presentation of Comparisons among Point Sizes for Editing Elements of Ming Dynasty WangliVersion

| | Point Size Comparison on Various Editing Elements | Number of Books |
|---|---|---|
| 1 | Volume Name Point Size > Content Point Size | **56** |
| 2 | Volume Name Point Size = Content Point Size | **117** |
| 3 | Content Point Size > Notes Point Size | **180** |
| 4 | Content Point Size = Notes Point Size | **12** |
| 5 | Volume Name Point Size > Content Point Size > Notes Point Size | **48** |
| 6 | Volume Name Point Size = Content Point Size = Notes Point Size | **3** |
| 7 | Volume Name Point Size < Content Point Size | **36** |
| 8 | Content Point Size < Notes Point Size | **0** |
| 9 | Volume Name Point Size < Content Point Size < Notes Point Size | **0** |
| 10 | No Notes | **25** |

(statistics compiled from this research)

We learn from the survey and analysis above that, for the first volumes of Chinese Ming Dynasty Wangli Version ancient books, books with volume name point size bigger than content point size outnumbered those with content point size bigger than volume name point size. Take illustration 3 “Liu Jin Tu”for example. Its volume name point size is bigger than content point size and its editing presentation also comes with the function of decoration and reminding. As for illustration 4 “Da Ming Hui Dian,”its content point size is bigger than volume name point size. However, there are not many differences if observed in naked eyes. Their differences will only appear under the measurements with a gauge.

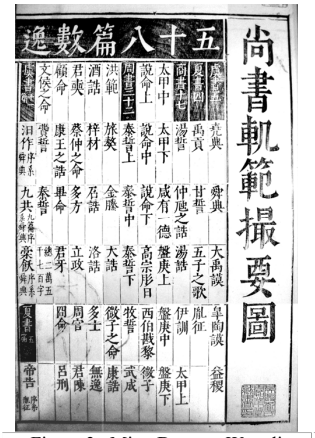


Figure 3. Ming Dynasty Wangli Version “Liu Jin Tu”

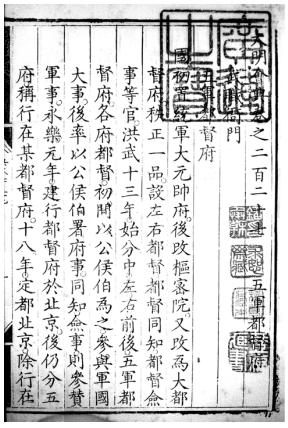

Figure 4. Ming Dynasty Wangli Version “Da Ming Hui

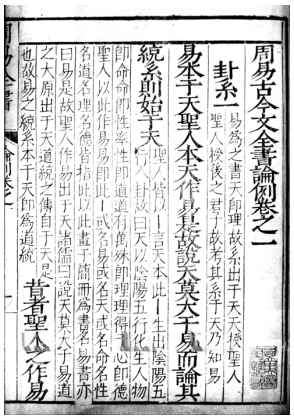

Figure 5. Ming Dynasty Wangli Version “Chou Yi Gu Jin Wen Quan Shu”

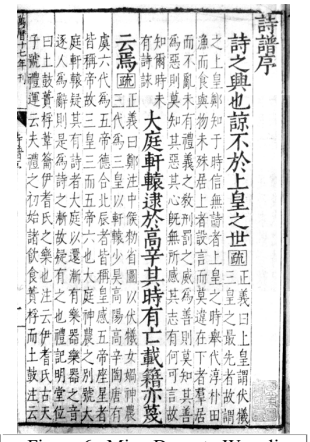


Figure 6. Ming Dynasty Wangli Version “Mao Shih Ju Shu”

During our comparison and analysis, the number of books with point sizes for volume names same as the ones for content accounts for the most part. There are a total of 117 of them. This explains why there is a certain connection among column width, parameter and typeface size. For all engraved typefaces on ancient books, almost all of their sizes followed the parameters of column width. Typeface sizes are almost the same as column width. Formations of such parameter editing on engraved books all originated from the imitation of Jan Ce books which were composed of strips of bamboo books. That was why these books were edited into using the same size typeface for both volume names and content in order to go with the form of one bamboo strip for one line of words. As for application of notes in content, most of them were edited in the form of two lines of notes listed side by side in one column and their sizes were smaller than the ones for content. No typefaces for notes are bigger than the ones for content. Furthermore, typefaces for notes were squeezed and lengthened when two lines of notes were crammed side by side into one column. This characteristic of slender typeface has become its most distinctive feature such as “Chou Yi Gu Jin Wen Quan Shu” in illustration 5 and “Mao Shih Ju Shu” in illustration 6.

### *A. Volume Name Point Size Distribution*

The total number of books for volume name point size measurement is 217 which are listed in table 2 below after being organized and calculated.

TABLE 2 Volume Name Point Size Distribution for Chinese Ming Dynasty Wangli Version

| Volume Name Point Size | 32 | 38 | 44 | 50 | 56 | 62 | 70 | 80 | 100 |
|---|---|---|---|---|---|---|---|---|---|
| Number of books | 7 | 28 | 83 | 65 | 14 | 7 | 6 | 1 | 2 |

(statistics compiled from this research)

Figure 7. Ming Dynasty Wangli Version “New Edition for Scholar Hsu, Xuan Fu’s Compilation on Mao Poem Six Chapter Jiang Yi”


Figure 8. Ming Dynasty Wangli Version“Xing Li Xuan Cui”

Measurement result indicates that, for point size utilized on volume name, the smallest is about size 32 with width and height of about 0.7-0.8 centimeters such as illustration 7 of “New Edition for Scholar Hsu, Xuan Fu’s Compilation on Mao Poem Six Chapter Jiang Yi” and illustration 8 of “Xing Li Xuan Cui.”The number of books with point size 44 accounts for the biggest part, a total of 83, with the size

of about 0.9-1.1 centimeters. However, size 44 is never a representative point size used for ancient book volume names because, after all, it only stands for 83 books out of a total of 217 books. This is not an absolute majority and therefore, it cannot become a representative point size. The truth is that sizes 38 to 50 are the most commonly used point sizes such as the one in illustration 9.

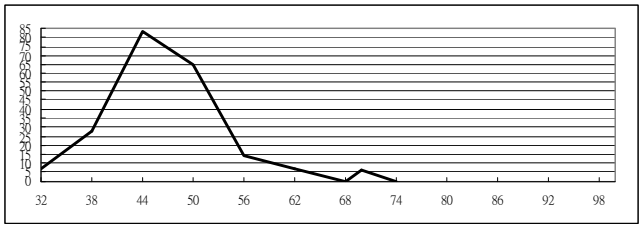


Figure 9. Curve for Volume Name Point Size Distribution

### *B. Distribution of Content Point Sizes*

Point size distribution for content is more aggregated as compared with the one for volume name. Most of them aggregated in the range of sizes for volume names. Their sizes ranged from size 32 to size 70. Differences in width and height between two typeface sizes are about 0.9 centimeter which is not big. Most point sizes distributed in the range from size 38 to size 50. This is roughly the same as finding from comparison and analysis on the survey mentioned above. Most of them are size 44 as presented in table 3. An obvious sharp curve can be observed from the examination of distribution curve on illustration 10.

TABLE 3 Content Point Size Distribution for Ming Dynasty Wangli Version

| Volume Name Point Size | 32 | 38 | 44 | 50 | 56 | 62 | 70 |
|---|---|---|---|---|---|---|---|
| Number of Books | 5 | 37 | 99 | 45 | 24 | 4 | 3 |

(statistics compiled from this research)

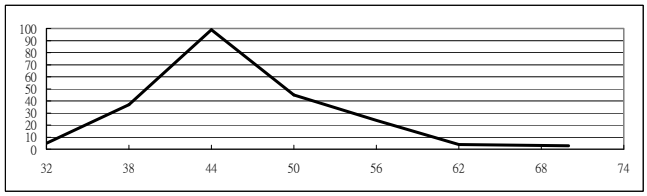


Figure 10. Curve for Content Point Size Distribution

### *C. Notes Point Size Distribution*

For notes presentation on ancient books, most of them were presented in the form of two lines written in one column. Therefore, typefaces for notes became relatively taller and longer. As compared with point sizes for above mentioned two items, the overall point size for notes is much smaller, with the largest of size 56 and the smallest of size 20. The number of books with size 56 is the biggest with a total of 29 books as presented in table 4. However, the total number under size 56 accounts for the majority of samples from the perspective of the analysis as a whole. This indicates that, as compared with other typefaces, point size for notes is the smallest among all typefaces in a layout. This is presented in illustration 13.

TABLE 4 Ming Dynasty Wangli Version Notes Point Size Distribution

| Volume Name Point Size | 20 | 24 | 28 | 32 | 38 | 44 | 50 | 56 |
|---|---|---|---|---|---|---|---|---|
| Number of Books | 2 | 2 | 7 | 12 | 25 | 23 | 27 | 29 |

(statistics compiled from this research)

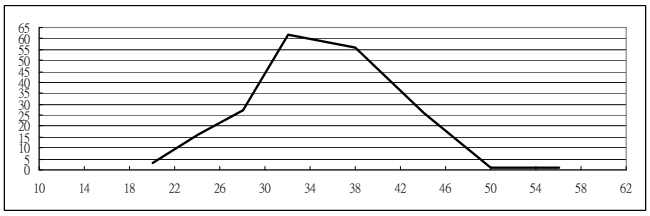


Figure 11. Notes Point Size Distribution Curve

## V. CONCLUSION

From the existing Chinese Ming Dynasty Wangli ancient books we find that there is no size limit on the utilization of typefaces. It is observed that, in the first volumes of ancient books, the number of cases with volume name point size larger than content point size is larger than the ones with content point size larger than volume name point size. During our comparison and analysis, it is observed that most books have same point sizes for their volume names and content. This indicates that there is a certain connection between column width and point size on ancient books. Regarding typefaces for volume name and content, there were no differences in point sizes during editing. They all follow the rule of one bamboo book for one line of words. As for applications of notes in content, in most cases, two lines of notes were written, side by side, in one column. Most typefaces for notes are smaller than the ones for content and none of them are larger than the ones for contents. In the case of two lines of notes listed side by side in one column, their typefaces would shrink and lengthen from squeezing. Such a characteristic of long typefaces had become its most distinctive feature which is presented in illustration 12.

Figure 12. “San Guo Ji” Notes

It is observed from the survey in this research that it was a common phenomenon that volume name point size for Chinese Ming Dynasty Wangli version ranged from size 38 to size 50. Point size distribution for content is more aggregated as compared with the one for volume name. Most of them aggregated in the range of sizes for volume names. Most content point sizes distributed in the segment from size 38 to size 50, with the number for size 44 accounts for the most part. The largest point size for notes is size 56 while the smallest is size 20. The number of size 56 accounts for the most part. Overall, the number of point sizes smaller than size 56 accounts for the majority of samples. This indicates that, among all typefaces in a layout, point sizes for notes are the smallest as compared with the ones for other typefaces.

If we compare this with point sizes on Chinese Sung dynasty version, we can find that most point sizes for volume names on Sung dynasty version ranged from size 44 to size70 and most content point sizes are also distributed in the segment from size 44 to size 70. The largest point sizes for these two are all size 70. There are very few cases with point sizes larger than size 70. However, for point sizes distribution on Ming Dynasty Wangli version, most of them are distributed in the segment from size 38 to size 50, with the number for size 44 accounts for the biggest part. With this, we can find that, for volume name and content point size distributions on both Sung dynasty and Ming Dynasty Wangli version, sizes for volume name and content are the same. As for notes point sizes for Sung dynasty version, most of them are in size 38. There are also a lot of cases with sizes smaller than size 38 but only a few cases with sizes larger than size 38. The largest point size for Ming Dynasty Wangli version is size 56 while the smallest is size 20, with cases of size 56 account for the biggest part. As a result, it is observable that there are some differences in point sizes between the two.

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