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Author(s)	Saiki, Masanao; Ikeda, Shoji
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Historical Shifts in Hanzi Glyphs: Changed and Unchanged Glyphs in the Hanzi Normative Glyphs (HNG) Database

Masanao SAIKI and Shoju IKEDA

Abstract: This paper uses the Hanzi Normative Glyphs (HNG) to discuss about two issues.

- (1) The extent of the difference between the “Early Tang Standard” and the “Kaicheng Standard”.
- (2) The extent to which printed works from the Song Dynasty implement the “Kaicheng Standard” Hanzi glyphs.

In doing so, it will serve as an empirical evaluation of the Ishizuka Model of glyph change.

This study uses 3 Early Tang Standard texts, 1 Kaicheng Standard text, and 8 Song printed works among 64 texts, which are available as of September 2010 in HNG.

The conclusions are as follows:

- (1) As regards the extent of the difference in Hanzi glyphs between the Early Tang Standard and the Kaicheng Standard, there was a 40% difference in the number of differing glyphs and a 30% difference in the cumulative total number of glyphs.
- (2) Then, as regards the extent to which the Song printed works implement the Kaicheng Standard, the rate is over 80% in terms of both number of differing glyphs and cumulative total of glyphs.

Keywords: Hanzi, Chang’an Court Handwritten Sutras, Kaicheng Stone Classics, Song Printed Works, Standard Glyphs

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1. Introduction

The Hanzi Normative Glyphs (HNG) database allows users to search freely for their desired Hanzi glyphs in standard texts from China, Japan, and other countries (64 texts are available as of September 2010, Ishizuka et al. (2005) and Ishizuka (2008)).

The HNG is based on the following understanding of the way glyphs change. In China, during the Early Tang dynasty (618-712), when the Unified Dynasty was established, there was a strong awareness of variant characters. The categories of “standard” (zheng 正), “vulgar” (su 俗), “common” (tong 通), and “corrupt” (e 訛) arose in order to classify these, leading to the establishment of a set of standard glyphs (we

will refer to these standard glyphs of the Early Tang period as the “Early Tang Standard”). The Early Tang Standard glyphs differ substantially from those used in the Kaicheng Stone Classics (開成石經, 837), which we will refer to as the “Kaicheng Standard” below. The Hanzi glyph standards in the Kaicheng Stone Classics and the Ganlu Zishu (干祿字書, transcribed in approximately 774 by Yan Zhenqing 顏真卿) were implemented and disseminated in the printed works of the Song dynasty. In Japan, meanwhile, the Early Tang Standard became broadly established as the Japanese standard. The influence of Song printed works was only partial, with the major changes coming in the early modern period and later. Subsequent major changes followed the publication of the Kangxi Dictionary (康熙字典, 1716), on which modern type-printing was based. This process is as summarized by Ishizuka (1999), and we will call this view of the way that Hanzi glyphs have changed the “Ishizuka Glyph Change Model.”

In recent years, there have been a number of studies that use the HNG to study Hanzi glyphs and to test the Ishizuka Glyph Change Model. For example, Toyama (2008) uses the HNG as a point of comparison in examining the Hanzi glyphs in the version of the Chang Hen Ge found in the Kanazawa Bunkobon Bai-Shi Wen Ji (金沢文庫本白氏文集 長恨歌). Meanwhile, Ikeda (2010) takes the Ruiju Myōgishō (類聚名義抄) as a reference in testing the Ishizuka Glyph Change Model.

This paper uses the HNG to discuss (1) the extent of the difference between the “Early Tang Standard” and the “Kaicheng Standard” and (2) the extent to which printed works from the Song Dynasty implement the “Kaicheng Standard” Hanzi glyphs. In doing so, it will serve as an empirical evaluation of the Ishizuka Glyph Change Model.

2. Quantifying Hanzi Glyphs

In order to quantify the number of Hanzi glyphs, there is a need for both theoretical studies on how to recognize different instances of Hanzi as sharing an identity, taking into account forms, glyphs, shapes, variants, and types, and also empirical studies concerning the selection of standard reference texts for each period and region. The HNG may be regarded as a database built to overcome these two issues.

The definitions of Hanzi “forms 書体,” “glyphs 字体,” “shapes 字形,” and “types 字種” used here are as given in Ishizuka (1984) and Ishizuka (2009).

Form: The conventional style of the shape of characters. In most cases, it depends on the intended purpose of the Hanzi text (e.g. block script 楷書, cursive script 草書, etc.).

Glyph: Within the scope of one form, the conventional norm of writing each character.

Shape: Within the scope one glyph, the physical appearance of how a particular character was written (or printed).

Type: The sum total of glyphs recognized by society as one character, which are interchangeable and usually have the same pronunciation and meaning.

In the HNG, the glyph(s) with the fewest occurrences among multiple glyphs of a particular type in the same text is considered a variant. Adopting this definition allows the normative value of the HNG material to be measured by the rate of character variants. The rate of character variants is the rate at which different glyphs appear when a character is written multiple times in the same text, and is calculated using the following formula:

$$\text{Rate of character variants} = \frac{\text{Total No. of variants}}{\text{Total No. in text} - \text{Total No. of sole occurrences}} \times 100$$

“Sole occurrences” are character types that appear in a text only once, and since no information is available regarding their variation, they are excluded from the calculation.

3. Texts Included in the Study

This study uses 3 Early Tang Standard texts, 1 Kaicheng Standard text, and 8 Song printed works. Table 1 shows the details of the texts, and Table 2 summarizes their rates of character variants, etc. Below, the texts are referred to by their abbreviated names.

The Early Tang Standard texts are known as the Chang’an Court Handwritten Sutras (長安宮廷寫經). These were transcribed between 671 and 677 in superb block script, using fine linen paper, at the Chang’an Court’s sutra copying offices. Typical of the finest examples of this style, dozens survive among the Dunhuang manuscripts (Fujieda 1981).

The HNG uses as its reference material three texts from the Miaofa Lianhuajing (妙法蓮華經, the Lotus Sutra) that contain a certain number of characters.

The Kaicheng Stone Classics are a set of standard Confucian texts inscribed by the Palace Library (秘書省, the government office in charge of books) onto a stone monument, now held at the Xi’an Beilin Museum. It was customary for this kind of inscription to be set up at the Imperial Academy in the capital, and the glyphs it contained were also used for the Imperial examination.

In the second half of the eighth century, there was a movement to regularize block script, thus setting new standards for glyphs. The HNG uses the Lunyu (論語, the Analects), Xiaojing (孝經, the Classic of Filial Piety), Yi Jing (易經, the Book of Changes) as sources, and in this study, the Lunyu will be used as a representative example. As Dunhuang was politically separated from mainland China at this time, the old style of block style writing was still in use, and the new glyphs were yet to be introduced (Fujieda 1981). Most of the Dunhuang manuscripts are Buddhist scriptures. Of the Chinese manuscripts, such as the Lunyu, many are undated fragments that have been ineptly transcribed for private study. A comparison of the glyphs in the Dunhuang Lunyu with those in the Kaicheng Lunyu does not reveal any change in the standard glyphs.

Table 2 shows that the rate of variants in the three Early Tang Standard texts ranges from 0.29 to 0.80%, while the rate in the Kaicheng Lunyu is particularly low, at 0.04%. Overall, there are few variants, and these can be regarded as standard texts for the Early Tang (618-712) and Late Tang (827-907) periods

Table 1 Kaicheng Stone Classic Texts and Early Tang Standard Texts used in this Study

Classification	Name (Era)	Held by	Abbreviation	Year of Publication
Kaicheng Stone Classics	Lunyu 論語 (837)	Tōyō Bunko Rubbings	Kaicheng Lunyu	2004
Chinese manuscript	Miaofa Lianhuajing, Juan 5 妙法蓮華經卷五 (671)	Mr. Eiji Imanishi	Gongting Imanishi	2004
Chinese manuscript	Miaofa Lianhuajing, Juan 3 妙法蓮華經卷三 (675)	Kyoto National Museum	Gongting Moriya	2004
Chinese manuscript	Miaofa Lianhuajing, Juan 6 妙法蓮華經卷六 (675)	Bibliothèque nationale de France	P2195	2007

Table 2 Rate of Character Variants and Character Counts in the Kaicheng Lunyu, Gongting Imanishi, and Gongting Moriya

Text	Rate of character variants	1 glyph	2 or more glyphs (variants)	Sole occurrences	Overall
Kaicheng Lunyu	0.04%	847 types, 13,791 characters	5 types, 63 (5) characters	471 characters	1,323 types, 14,325 characters
Gongting Imanishi	0.68%	408 types, 4,014 characters	12 types, 90 (28) characters	213 characters	633 types, 4,345 characters
Gongting Moriya	0.80%	423 types, 5,379 characters	7 types, 107 (44) characters	155 characters	585 types, 5,685 characters
P2195	0.29%	400 types, 4,106 characters	7 types, 60 (24) characters	205 characters	612 types, 4,371 characters

respectively.

The Song printed works dealt with here are the eight texts listed in Table 3, while Table 4 summarizes the rate of character variants for the Song texts. The *Kyohaku Jinbo* (京博金般), *Dongchan Pipo* (東禪毘婆), *Kaiyuan Shenzu* (開元神足) are Buddhist scriptures (translated sutras), the *Fazang Heshang* (法藏和尚) is a text on Buddhism (a biography), the *Tong Dian, Juan 1* (通典卷一) is a book of governmental documents (a record of political, economic, cultural, and other institutions from ancient times to the Tang Dynasty), the *Qimin Yaoshu* (齊民要術) is an agricultural text, and the *Guangwudi Ji* (光武帝紀) is a history book.

Table 3 List of Song Printed Works used in this Study

Classification	Name (Year of Compilation)	Held by	Abbreviation
Northern Song	Jin'gang Borejing 金剛般若經 (Northern Song period?)	Kyoto National Museum	Kyohaku Jinbo
Northern Song	Tong Dian, Juan 1 通典/卷一 (11th Century)	Imperial Household Agency Archives and Mausolea Department	Tong Dian, Juan 1
Northern Song	Dongchan-si Edition Abidatsuma Daibibasharon, Juan 107 東禪寺版阿毘達磨大毘婆沙論/卷百七 (1100)	Kōsan-ji	Dongchan Pipo
Northern Song	Qimin Yaoshu, Juan 5 齊民要術/卷五 (Late Northern Song period)	Kyoto National Museum	Qimin Yaoshu
Northern Song	Kaiyuan-si Edition Shenzu Wuji Bianhuaqing 開元寺版神足無極變化經 (1126)	Hokkai Gakuen University	Kaiyuan Shenzu
Southern Song	Huayanjing Neizhangmen Deng Za Kongmu, Juan 1 華嚴經內章門等雜孔目卷一 (1146)	Kōsan-ji	Huayan Kongmu
Southern Song	Fazang Heshang Zhuan 法藏和尚傳 (1149)	Kōsan-ji	Fazang Heshang
Southern Song	Hou Hanshu Guangwudi Ji 後漢書光武帝紀 (1198)	National Museum of Japanese History	Guangwudi Ji

Table 4 Details and Rates of Character Variants of the Song Printed Works used in this Study

Text	Rate of character variants	1 glyph	2 or more glyphs (variants)	Sole occurrences	Overall
Kyohaku Jinbo	0.64%	293 types, 5,012 characters	8 types, 262 (34) characters	140 characters	442 types, 5,414 characters
Tong Dian, Juan 1	0.95%	675 types, 5,849 characters	26 types, 236 (58) characters	425 characters	1,126 types, 6,510 characters
Dongchan Pipo	0.61%	261 types, 6,646 characters	10 types, 247 (42) characters	86 characters	357 types, 6,979 characters
Qimin Yaoshu	1.91%	543 types, 4,659 characters	53 types, 407 (97) characters	398 characters	994 types, 5,464 characters
Kaiyuan Shenzu	1.08%	431 types, 5,098 characters	17 types, 204 (57) characters	226 characters	674 types, 5,528 characters
Huayan Kongmu	0.64%	541 types, 16,297 characters	34 types, 466 (107) characters	204 characters	779 types, 16,967 characters
Fazang Heshang	0.82%	890 types, 6,138 characters	35 types, 177 (52) characters	652 characters	1,577 types, 6,967 characters
Guangwudi Ji	0.86%	716 types, 5,963 characters	33 types, 216 (53) characters	443 characters	1,192 types, 6,622 characters

4. Methodology for Investigating Changes in Hanzi Glyphs

The method adopted here for investigating the changes in Hanzi glyphs involves treating the 847 types used for glyphs in the Kaicheng Stone Classics (837) Lunyu¹ as typical of the “Kaicheng Standard.” Using the Kaicheng Standard as a reference, we performed a comparison with three Early Tang Standard texts and eight Song printed works. However, using the Kaicheng Lunyu as a standard poses two main problems. The first is missing strokes 欠画 due to taboo avoidance 避諱, and the second is glyph layout based on interpretation of character origins. “Missing strokes” refers to leaving out the final stroke of an Emperor’s real name. Taking Chen Yuan (1956) as a principal reference, Tang period examples can be found for Gaozu Li Yuan (高祖李淵), Taizu Li Hu (太祖李虎), Taizong Li Shimin (太宗李世民), Dezong Li Shi (德宗李适), Shunzong Li Song (順宗李誦), Xianzong Li Chun (憲宗李純), and Muzong Li Heng (穆宗李恒) (e.g. 唐世民适誦純恒). Similar conditions are found in the Song printed works, and the HNG includes examples for Taizu Zhao Kuangyin (太祖趙匡胤), Taizu’s Father Zhao Hongyin (太祖父趙弘殷), Yizu Zhao Jing (翼祖趙敬), and Renzong Zhao Zhen (仁宗趙禎). Glyph layout based on the

¹ The details of this method are described in Saiki (2010). This study investigated and discusses examples of changed and unchanged glyphs, focusing on the differences between the Early Tang Standard and the Kaicheng Standard.

interpretation of character origins includes distinctions such as interpreting the 甚 glyph as a compound formation of 甘 and 匹, thereby creating 甚; writing two 八, one on top of the other, in characters that contain 谷 or 谷 (俗, 容, 欲, 浴, etc.); writing the grass radical with four strokes; and writing the upper left part of 敬 as 卅 (e.g. 甚容欲草敬).

With these distinctions in mind, a comparison will be made between the Early Tang Standard, the Kaicheng Standard, and the Song printed works.

5. Early Tang Standard and Kaicheng Standard

5.1 Survey of Glyphs in P2195 and the Kaicheng Lunyu

In comparing the Kaicheng Lunyu (847 one-glyph types) and the Early Tang Standard court sutras, we will first look at P2195. The correspondences between the two texts are shown in Table 5. The columns show the type categories and totals for glyphs in the Kaicheng Lunyu, while the rows show the type categories and totals for glyphs in P2195. The section of Table 5 indicated with a bold line is the focus of this survey. Correspondences for two-glyph types and sole occurrences in the Kaicheng Lunyu are also shown for reference.

In the cell showing the correspondence between the one-glyph types in the Kaicheng Lunyu and the one-glyph types in P2195, “153/235” indicates that there are 235 types that the two share in common, and that of those, the glyphs are the same for 153 types. This gives a match rate of 65.1%. In the instances in which the one-glyph types from the Kaicheng Lunyu show correspondence with the two- or three-glyph types from P2195, if any of the multiple glyphs found in P2195 match that in the Kaicheng Lunyu, they are regarded as having a glyph in common. Accordingly, in the cell showing the correspondence between the one-glyph types in the Kaicheng Lunyu and the two-glyph types in P2195, “2/4” indicates that there are four types that the two texts share in common, and that of those, there are two types where one of the two glyphs found in P2195 matches that in the Kaicheng Lunyu. Overall, there are 388 types for which a comparison is possible, and of those, the glyphs match in 235 types.

This gives a match rate of 60.6%, with the Gongting Imanishi and the Gongting Moriya also showing similar results.

Table 5 Correspondences (Differences) between P2195 and the Kaicheng Lunyu

P2195/Lunyu		Lunyu				Not in Lunyu	P2195 total
		1 glyph	2 glyphs	Sole occurrences	Subtotal		
P 2 1 9 5	1 glyph	153/235	1/2	18/36	172/273	127	400
	2 glyphs	2/4	0	0/1	2/5	1	6
	3 glyphs	1/1	0	0	0/1	0	1
	Sole occurrences	50/85	0/1	12/23	62/109	96	205
	Subtotal	206/325	1/3	30/60	235/388	224	612
Not in P2195		522	2	411	935		
Lunyu total		847	5	471	1,323		

5.2. Correspondences between the Kaicheng Lunyu (847 one-glyph types) and the Court Sutras

Next, we conducted a survey of the glyph match rate in the 432 types for which a comparison is possible (one-glyph, two or more glyphs, sole occurrences) between the Kaicheng Lunyu (847 types) and the three Early Tang court sutras. The results were as shown in Table 6.

Explanation:

Number of types: Number of types for which a comparison is possible with Kaicheng Lunyu

Number of glyphs: The number of types plus the number of glyphs in two- and three-glyph types in the court sutras

Cumulative total: Cumulative total of glyphs in each text

Kaicheng differences/Kaicheng cumulative total: Number of differing glyphs/cumulative total of glyphs out of those also found in the Kaicheng Lunyu

Non-Kaicheng differences/Non-Kaicheng cumulative total: Number of differing glyphs/cumulative total of glyphs out of those not found in the Kaicheng Lunyu

Based on Table 6, we can give an initial answer as to the extent of the difference in Hanzi glyphs between the Early Tang Standard and the Kaicheng Standard. There is about a 40% difference in the number of differing glyphs and a 30% difference in the cumulative total number of glyphs. That is to say, the extent of the change to new glyphs as a result of the late eighth-century movement to regularize block script was, in terms of the number of differing glyphs, about 40%. This study is the first to uncover this fact.

5.3. Changed and Unchanged Glyphs in the Kaicheng Lunyu and the Three Court Sutras

Now we will compare the Kaicheng Lunyu with the three court sutras (the Gongting Imanishi, the Gongting Moriya, and P2195), showing those types with glyphs that change, and those types with glyphs that do not. There are 212 types in the three court sutras that correspond, either as one-glyph types or sole occurrences, to the 847 one-glyph types in the Kaicheng Lunyu. A breakdown of these is given in Table 7.

Table 6 Comparison of the Early Tang texts and the Kaicheng Lunyu

Text	No. of types	No. of glyphs	Cumulative total	Kaicheng differences	Kaicheng cumulative total	Non-Kaicheng differences	Non-Kaicheng cumulative total
Gongting Imanishi	331	336	3,084	198 (59%)	2,019 (65%)	138 (41%)	1,065 (35%)
Gongting Moriya	313	317	4,198	207 (65%)	3,057 (73%)	110 (35%)	1,148 (27%)
P2195	325	331	3,090	206 (62%)	2,114 (68%)	125 (38%)	976 (32%)

Table 7 Correspondences between the Kaicheng Lunyu and the Early Tang texts

Number of unchanged glyphs	134 (63.2%)
Number of changed glyphs	60 (28.3%)
Number of glyphs showing variation	18 (8.5%)
Total	212 (100.0%)

The following 134 types have the same glyphs in both the Kaicheng Lunyu and the three court sutras (63.2%)². These are those glyphs that remained unchanged despite the movement to regularize block script from the late eighth century onwards.

一三上下不丘中乃久之也二于云五亦人他令以仰何佛便信億入六共其
出利則力動勿十千南卽又及取可各合同名告命四因在地坐大天女如子
家小尼山常弟彼得心思恭我故斯方日是時有未末本樂樹死比水求河法
深滅然父王生由畏白百皆相眾知空老者而聞自至舍色華行衣見言語諸
身近進過道重量長間雖非面風高

Most of these can be identified as the same glyphs as in the list of Jōyō Kanji 常用漢字表 (published November 2010)³. The eight underlined types are those written with a different glyph from that which appears in the Table of Jōyō Kanji. Actual examples are shown as images below. In each pair, the image from the left is from the Kaicheng Lunyu, and that on the right is from P2195. These differences relate to the changes that followed the Kangxi Dictionary (1716).

「佛」-「佛」「本」-「本」「樂」-「樂」「皆」-「皆」「過」-「過」「華」-「華」「間」-「間」「高」-「高」

The glyphs found in the three court sutras match one another, and of those, the types that did not match the glyphs in the Kaicheng Lunyu are the 60 given below (28.3%). In these we can see the typical glyphs of the Early Tang Standard. That is, these are the glyphs that changed as a result of the movement to regularize block script starting in the late eighth century.

事今來切前功勝周國土安定實尊少師彌後從復微德恆惡成憂所擊敬於
既明曾欲歎流清無爲爾猶甚異發益神禮聲能脩若萬虛解說譬足難願養

The glyph differences are shown in images below. In each pair, the image on the left is from the Kaicheng Lunyu, and that on the right is from P2195⁴.

「事」-「事」「今」-「今」「來」-「來」「切」-「切」「前」-「前」「功」-「功」「勝」-「勝」「周」-「周」
「國」-「國」「土」-「土」「安」-「安」「定」-「定」「實」-「實」「尊」-「尊」「少」-「少」「師」-「師」
「彌」-「彌」「後」-「後」「從」-「從」「復」-「復」「微」-「微」「德」-「德」「恆」-「恆」「惡」-「惡」
「成」-「成」「憂」-「憂」「所」-「所」「擊」-「擊」「敬」-「敬」「於」-「於」「既」-「既」「明」-「明」

2 The glyphs of the listed types are those used as entry headings in the HNG database. The ordering and glyphs are also based on the HNG. The glyphs used for the HNG entry headings, meanwhile, take the Daijiten (大字典) as a standard.

3 The six characters 云, 其, 勿, 坐, 斯, and 而 are found in both the list of Hyōgai Kanji and the list of Jimmeiyō Kanji, the two characters 于 and 雖 are found on the list of Hyōgai Kanji, and the four characters 乃, 之, 也, and 亦 are found on the list of Jimmeiyō Kanji. The other 121 are Jōyō Kanji. In addition, 畏 was found on the list of Hyōgai Kanji, and was subsequently added to the list of Jōyō Kanji.

4 For example, in the case of 事, there is a difference in the center of the glyph: in the glyph from the Kaicheng Lunyu, the horizontal stroke breaks through on the right, but that in the glyph from P2195 does not. See Saiki (2010) for details on glyph differences in other types.

「曾」-「𠄎」 「欲」-「𠄎」 「歎」-「歎」 「流」-「流」 「清」-「清」 「無」-「无」 「爲」-「爲」 「爾」-「尔」
 「猶」-「猶」 「甚」-「甚」 「異」-「異」 「發」-「發」 「益」-「益」 「神」-「神」 「禮」-「礼」 「聲」-「聲」
 「能」-「能」 「脩」-「脩」 「若」-「若」 「萬」-「万」 「虛」-「虚」 「解」-「解」 「說」-「說」 「辭」-「辭」
 「足」-「足」 「難」-「難」 「願」-「願」 「養」-「養」

Of these, 恆 results from a missing stroke to avoid writing the real name of Muzong Li Heng (穆宗李恒). The rest are a result of shifts to new glyphs following the movement to regularize block script that began in the late eighth century. These lead further to the Kangxi Dictionary (1716), and some of them (such 曾, 說, 譬, etc.) have been further modified, leading to modern type-printing. Meanwhile, the Early Tang Standard illustrated above was adopted as glyphs for Japan’s postwar Tōyō Kanji 当用漢字 (e.g., 清, 礼, 万, etc.) and these are now listed as “vulgar” glyphs in Chinese-Japanese character dictionaries. The remaining 18 types (8.5%) are those that show variation in the three court sutras. Images and individual descriptions for these are omitted.

分 受 善 堅 多 希 散 數 正 盡 瞻 等 義 草 莊 議 餘 鼓

6. The Kaicheng Lunyu and the Eight Song Printed Works

6.1 Survey of Glyphs in the Kaicheng Lunyu and the Dongchan Pipo

Next, we will look at the Song printed works. Correspondences with the Kaicheng Lunyu, taking the Dongchan Pipo as an example, are shown in Table 8.

The section of Table 8 indicated with a bold line is the focus of this survey. There are 163 types that correspond as one-glyph types between the Kaicheng Lunyu and the Dongchan Pipo, of which the glyphs match in 137, a match rate of 84%. Overall there are 250 types, of which the glyphs match in 207, a match rate of 82.8%. Considering that in the court sutra P2195, the rate at which one-glyph types correspond to the Kaicheng Lunyu is 65.1%, with an overall match rate of 60.6%, we can say that there is a high level of agreement between the Song printed works and the Kaicheng Lunyu. As such, we can say that the Song printed works implement the Kaicheng Standard at a rate of over 80%.

Table 8 Correspondences (Differences) between the Dongchan Pipo and the Kaicheng Lunyu

Tōzen/Lunyu		Lunyu				Not in Lunyu	Dongchan Pipo total
		1 glyph	2 glyphs	Sole occurrences	Subtotal		
D o n g c h a n	1 glyph	137/163	2/2	18/24	157/189	72	261
	2 glyphs	0	0	4/5	4/5	4	9
	3 glyphs	1/1	0	0	1/1	0	0
	Sole occurrences	35/43	0	10/12	45/55	0	1
	Subtotal	173/207	2/2	32/41	207/250	107	357
Not in Tōzen		640	3	430	1,073		
Lunyu total		847	5	471	1,323		

6.2 Correspondences between the Kaicheng Lunyu and the Eight Song Printed Works

The high match rate for the glyphs in the Kaicheng Lunyu and the Song printed works is backed up by a survey of the glyph match rate in the 744 types for which a comparison is possible (one-glyph, two or more glyphs, sole occurrences) between the Kaicheng Lunyu (847 one-glyph types) and the eight Song printed works. The results are shown in Table 9. The columns from “Number of types” to “Non-Kaicheng cumulative total” represent the same as those in Table 6, so further explanation is omitted. Although we must acknowledge that, because this is a survey of multiple texts, there are some areas where the criteria for glyph recognition are inconsistent, we can see that the glyph match rate for the Song printed texts and the Kaicheng Lunyu is around 80% for the number of differing glyphs, and between 80 and 90% for the cumulative total of glyphs.

6.3 Changed and Unchanged Glyphs in the Kaicheng Lunyu and the Song Printed Works

Finally, in order to examine which glyphs change and which do not, we will compare the Kaicheng Lunyu with the Song printed works. That is, we will examine in detail how the new glyphs that emerged from the movement to regularize block script (the Kaicheng Standard) from the late eighth century onwards were spread and implemented in the printed works from the Song dynasty (960-1279). Because using all eight of the Song texts for the comparison will complicate the correspondences, here we will show the results from the Dongchan Pipo only. There are 163 one-glyph types in the Dongchan Pipo that correspond to those in the Kaicheng Lunyu. A breakdown of these is given in Table 10.

The following 137 types have the same glyphs in both the Kaicheng Lunyu and the Dongchan Pipo, of which glyphs that remained unchanged.

一七三上下不中乃之九二五亦人他令以位何作來便信先入六其分切利
力功加動十卽及受句同名問善四因國在地執大天如姓子宗定察實對少

Table 9 Comparison of Glyphs in the Song Printed Works and the Kaicheng Lunyu

Text	No. of types	No. of glyphs	Cumulative total	Kaicheng differences	Kaicheng cumulative total	Non-Kaicheng differences	Non-Kaicheng cumulative total
Kyohaku Jinbo	260	264	3,942	211 (80%)	3,425 (87%)	53 (20%)	517 (13%)
Tong Dian, Juan 1	524	534	4,545	457 (86%)	4,251 (94%)	77 (14%)	294 (6%)
Dongchan Pipo	207	209	4,629	173 (83%)	3,725 (80%)	36 (17%)	904 (20%)
Qimin Yaoshu	370	394	3,417	320 (81%)	3,151 (92%)	74 (19%)	266 (8%)
Kaiyuan Shenzu	323	335	4,196	254 (76%)	3,573 (85%)	81 (24%)	623 (15%)
Huayan Kongmu	379	398	12,873	308 (77%)	11,780 (94%)	90 (23%)	720 (6%)
Fazang Heshang	563	576	4,302	472 (82%)	3,804 (88%)	104 (18%)	498 (12%)
Guangwudi Ji	528	542	4,483	414 (76%)	3,838 (86%)	128 (24%)	645 (14%)

Table 10 Correspondences between the Kaicheng Lunyu and the Dongchan Pipo (one-glyph types only)

Number of unchanged glyphs	137 (84.0%)
Number of changed glyphs	26 (16.0%)
Total	163 (100.0%)

尚已幾彼後得復微德心必怨或所手損故數文斯方於既是時有木未樂次
止正治法滅無然猛王生由異發皆相知空等義習者而能自至色行見言說
論諸謂豈足身近遊過道邪重量集非願餘

Most of these can be identified as the same glyphs as those found in the list of Jōyō Kanji⁵. The 17 underlined types are those written with a different glyph from that in the Jōyō Kanji. Actual examples are shown as images below. In each pair, the image on the left is from the Kaicheng Lunyu, and that on the right is from the Dongchan Pipo.

「來」-「來」 「善」-「善」 「國」-「國」 「實」-「實」 「對」-「對」 「微」-「微」 「德」-「德」 「怨」-「怨」
「數」-「數」 「既」-「既」 「樂」-「樂」 「發」-「發」 「皆」-「皆」 「習」-「習」 「說」-「說」 「過」-「過」
「餘」-「餘」

The glyph differences between these types and those in the Jōyō Kanji relate to the influence of the Kangxi Dictionary (1716) and post-war national language policy, but these will not be discussed further here. What is more important is the difference with the Early Tang texts. Accordingly, let us check whether the 137 glyphs that do not differ between the Kaicheng Lunyu and the Dongchan Pipo are the same as those found in the Early Tang texts. Of these 137 types, 103 correspond to types in the three court sutras. A breakdown of these is given in Table 11.

Out of those glyphs which remain unchanged between the Kaicheng Lunyu and the Dongchan Pipo, about 70% are also the same as those found in the Early Tang texts. In other words, these block script glyphs did not undergo any changes between the Tang and Song periods. The types with glyphs that differ from the Early Tang texts were the following 21: 來, 切, 功, 國, 定, 實, 少, 後, 復, 微, 德, 所, 於, 既, 無, 異, 發, 能, 說, 足, and 願. Representing around 20% of the total, these are the types for which the new Kaicheng Standard glyphs became widespread and established in the Song printed works. The following 8, around 10% of the total, displayed variation in the Early Tang texts: 分, 受, 善, 數, 正, 等, 義, and 餘. These types showed a mixture of same and different glyphs between the Early Tang texts and the Kaicheng Lunyu, but in the Song printed works, they match the glyphs found in the Kaicheng Lunyu. If we take 受 as an example, the Early Tang texts shows variation in the 又 part of 受, where 又 alternates with 丈, but in the Kaicheng Lunyu and the Tōzen Biba, they are unified as 又 to give 受. Let us now return to

Table 11 Correspondences between the Kaicheng Lunyu, the Dongchan Pipo, and the Early Tang texts

Number of glyphs same as Early Tang texts	74 (72.0%)
Number of glyphs different from Early Tang texts	21 (20.0%)
Number of glyphs showing variation in the Early Tang texts	8 (8.0%)
Total	103 (100.0%)

5 The six characters 其, 已, 或, 斯, 而, and 謂 are found in both the list of Hyōgai Kanji 表外漢字 and the list of Jimmeiyō Kanji 人名用漢字, while the four characters 乃, 之, 亦, and 於 are found on the list of Jimmeiyō Kanji. Excluding these and 豈, the remaining 126 are found in the list of Jōyō Kanji (怨 was previously on the list of Hyōgai Kanji, and was subsequently added to the list of Jōyō Kanji).

a comparison of the Kaicheng Lunyu and the Dongchan Pipo.

Of the 163 one-glyph types that correspond between the Kaicheng Lunyu and the Dongchan Pipo, those with glyphs that differ between the two are as follows (26 types):

世 今 別 前 勝 厭 多 尊 成 曾 欲 漢 爲 爾 用 益 盡 聖 脩 與 若 草 處 觀 解 間

Images showing the difference between the two are given below. In each pair, the image on the left is from the Kaicheng Lunyu, and that on the right is from the Dongchan Pipo.

世 is an exception, showing a missing stroke to avoid writing the real name of Muzong Taizong Li Shimin (太宗李世民).

「世」-「世」 「今」-「今」 「別」-「別」 「前」-「前」 「勝」-「勝」 「厭」-「厭」 「多」-「多」 「尊」-「尊」
 「成」-「成」 「曾」-「曾」 「欲」-「欲」 「漢」-「漢」 「爲」-「爲」 「爾」-「爾」 「用」-「用」 「益」-「益」
 「盡」-「盡」 「聖」-「聖」 「脩」-「脩」 「與」-「與」 「若」-「若」 「草」-「草」 「處」-「處」 「觀」-「觀」
 「解」-「解」 「間」-「間」

Of the 25 types listed other than 世, 20 (excluding 別, 厭, 漢, 用, 聖, and 觀) can be compared with the three Early Tang texts. Out of these 20, 今, 前, 成, 曾, 欲, 爾, and 益 have the same glyph in the three Early Tang texts, thus appearing to retain the Early Tang standard. The Kaicheng Lunyu demonstrated glyph layouts based on the interpretation of character origins, but it is thought that these differences were too minor to be passed down to the Song printed works. 前, 成, 欲, 盡, 若, and 草 fall into this category. It should be noted that in the above examples, other than 厭 and 爾, the differences in glyph are very slight. Furthermore, the fact that the Kaicheng Lunyu is a stone carving built with the authority of the government of the day, while the Dongchan Pipo is a woodblock-printed book published by a private temple (Fuzhou Dongchan Dengjueyuan, 福州東禪等覺院) may also be of some relevance here.

7. Conclusion

As shown above, the two questions posed at the beginning of this paper can be answered as follows.

As regards the extent of the difference in Hanzi glyphs between the Early Tang Standard and the Kaicheng Standard, there was a 40% difference in the number of differing glyphs and a 30% difference in the cumulative total number of glyphs.

Then, as regards the extent to which the Song printed works implement the Kaicheng Standard, the rate is over 80% in terms of both number of differing glyphs and cumulative total of glyphs.

Based on this discussion, these two points can be rephrased as follows: (1) the proportion of “unchanged glyphs” between the Early Tang Standard, the Kaicheng Standard and the Song printed works is 60%; (2) the remaining 40% change between the Early Tang Standard and the Kaicheng Standard; (3) in the Song printed works, around 20-30% of these “changed glyphs” are replaced with Kaicheng Standard glyphs, while the rest either retain the Early Tang standard or undergo changes in glyph layout for other reasons (missing strokes, etc.).

We can say that the results of this study are largely in line with the Ishizuka Glyph Change Model, However, as regards the spread and implementation of the Kaicheng standard in the Song printed works,

missing strokes due to taboo avoidance and small changes in glyph layout owing to interpretations of character origins should be regarded as exceptions. Going forward, we will test the suppositions (hypotheses) in (1)-(3) using other texts, as well as using quantitative and empirical techniques to investigate to what extent the Early Tang Standard and Kaicheng Standard were adopted in Japan.

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