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LEARNING EFFICIENCIES FOR DIFFERENT ORTHOGRAPHIES:
A COMPARATIVE STUDY OF HAN CHARACTERS
AND VIETNAMESE ROMANIZATION

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LEARNING EFFICIENCIES FOR DIFFERENT ORTHOGRAPHIES:  
A COMPARATIVE STUDY OF HAN CHARACTERS  
AND VIETNAMESE ROMANIZATION

by

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ABSTRACT

LEARNING EFFICIENCIES FOR DIFFERENT ORTHOGRAPHIES: A COMPARATIVE STUDY OF HAN CHARACTERS AND VIETNAMESE ROMANIZATION

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In order to address the question of whether or not to abandon Han characters (Hanji), it is important to evaluate empirically the efficiency of Han writing. The purpose of this study is to compare the efficiency of learning to read and write in Hanji versus learning to read and write in phonemic writing systems, such as Vietnamese Chu Quoc Ngu (CQN) or Mandarin Bopomo.

Three experiments were conducted in this study. The first experiment focused on a study of reading comprehension; the second one focused on a study of accuracy of writing dictation; and the last was a study of oral reading. A total of 453 subjects from Taiwan and 350 subjects from Vietnam were involved in the experiments. Subjects consisted of elementary school and college students.

The reading comprehension tests were divided into groups Hanji, Bopomo, and CQN, in which subjects were examined with reading texts in Hanji, Bopomo, and CQN, respectively. The results of the reading comprehension tests reveal no statistically significant difference between Hanji and CQN groups. However, students from the second
to fifth grades in the Bopomo group had significantly lower scores than students in the other groups.

In dictation tests, subjects were divided into groups Taiwanese and Vietnamese. Tests in each group were given in soft and hard articles. The statistical results of tests on soft article reveal that students in both Taiwanese and Vietnamese groups significantly increased their score each year until the fourth grade, by which time they had the same statistical score as college students. As for tests on hard article, Taiwanese students spent more years in the acquisition of Hanji, and even the sixth graders’ scores do not statistically reach the same level as college students. However, Vietnamese students had reached a college level at the fifth grade. Errors in the dictation tests were also analyzed, and twelve error types were found in the Taiwanese group. The major errors were made due to similarity in sound between correct and incorrect Han characters. The phonetic similarity errors account for 85.70% in the dictation test two.

In addition to dictation tests, CQN also showed superiority in oral reading tests. The results indicate that CQN beginners are able to produce about 90% accuracy in oral reading after three or four months of learning, and reach nearly 100% accuracy a year later.

In short, these results lead to the conclusion that Vietnamese CQN is more efficient than Chinese characters in learning to read and write.
Chiều thứ năm


博士論文台文摘要

漢字 hām 越南羅馬字 ê 學習效率比較

蔣為文

Chit ê 研究主要目的是 beh 用科學量化 ê 方式測量比較「漢字」、「越南羅馬字」kap 「華語注音符號」 ê “讀” kap “寫” ê 學習效率。

Chit ê 研究 lóng-chóng 包含三款實驗，分別是：閱讀理解、聽寫 kap 講讀測驗。Chit ê 研究分別包含 453 kap 350 ê 來自台灣 hām 越南 ê 受測者；受測者 ê 組成包含小學生 kap 大學生。

Tī 閱讀理解測試 lāi-té，受測者分做漢字組、注音符號組 kap 越南羅馬字組；In 分別用漢字、注音符號 kap 越南羅馬字所寫 ê 閱讀文章作測試。實驗結果顯示漢字和越南羅馬字二組之間 ê 受測者成績無統計上 ê 差別，m-koh 注音符號組 lāi-té ê 小學二年仔到五年仔 ê 成績 sió-khoá 比前二組 khah 低。

Tī 聽寫測試 lāi-té，受測者分做台灣漢字組 kap 越南羅馬字組；ták 組 ê 聽寫內容 lóng 包含軟式 kap 硬式短文各一篇。就軟式短文來講，漢字組 kap 羅馬字組 ê 受測者 ê 聽寫正確率 long tāk 年增加，而且兩組 long tī 國小四年仔 ê sī-chūn tī 統計上達到大學生 ê 聽寫正確率。M-koh，硬式短文 ê 偽測試結果顯示漢字組 ê 受測者 tī 小學六年仔 ê 時 tī 統計上 iâu boē 達到 hām 大學生 kāng-khōăn ê 正確率；羅馬字組 tī 國小五年仔就達到大學水準。Chit ê 結果顯示漢字 ài khai khah 久長 ê 時間來學習 chiāh ê-tāng 達到大學 ê 聽寫水準。本研究 koh 針對 ták 組 ê 聽寫錯誤做統計分析：漢字組 lāi-té lóng-chóng 有十二種錯誤類型，其中「類似音」(錯誤 ê 漢字 hām 正確 ê 漢字有類似 ê 發音) 是 siōng chiāp ê 錯誤，chit 項錯誤 tī 硬式短文 lāi-té 佔所有錯誤 ê 85.70%。

Tī 講讀測試 lāi-té，受測者 hông 要求 kā 事先準備好 ê 軟式及硬式短文各一篇大聲 唸出來；chit 項 kan-tā” 針對越南學生做測試。統計結果顯示羅馬字學習者 tī 經過三、四個月 ê 學習 liâu 就 ê-sái 達到 90% ê 講讀正確率，一冬後就 ê-tāng 達到 kiông beh 百分之百 ê 正確。

簡單講，chit ê 研究結果指出羅馬字比漢字 khah 好學、學生 ê-tāng khah kin 具備聽寫 kap 講讀 ê 能力。
博士論文中文摘要

漢字和越南羅馬字的學習效率比較

蔣為文

本研究主要目的在以科學量化的方式測量比較「漢字」、「越南羅馬字」及「華語注音符號」的“讀”和“寫”的學習效率。

本研究共包含三種實驗，分別為：閱讀理解、聽寫及說讀測驗。本研究分別包含 453 及 350 位來自台灣和越南的受測者；受測者的組成包含小學生和大學生。

在閱讀理解測驗中，受測者共分為漢字組、注音符號組及越南羅馬字組；各組分別以漢字、注音符號及越南羅馬字所書寫的閱讀文章作測驗。實驗結果顯示漢字和越南羅馬字二組間的受測者成績沒有統計上的差別，但注音符號組中的二至五年級的成績略低於前述二組。

在聽寫測驗中，受測者共分為台灣漢字組及越南羅馬字組；各組的聽寫內容均包含軟式及硬式短文各一篇。就軟式短文而言，漢字組及羅馬字組的受測者的聽寫正確率均逐年增加，且兩組均在國小四年級的時候統計上達到大學生的聽寫正確率。然而，硬式短文的測驗結果顯示漢字組的受測者在小學六年級時統計上仍未達到和大學生一樣的正確率；羅馬字組則在國小五年級已達到大學水平。這結果顯示漢字必須花較長的時間來學習才能達到大學的聽寫水平。本研究也針對各組的聽寫錯誤做統計分析：漢字組中共有十二種錯誤類型，其中「類似音」(錯誤的漢字和正確的漢字有類似的發音)為最多數的錯誤，在硬式短文中佔所有錯誤中的 85.70%。

在說讀測驗中，受測者被要求唸出事先準備好的軟式及硬式短文各一篇；本項僅針對越南學生做測驗。統計結果顯示羅馬字學習者在經過三、四個月的學習後就能達到 90%的說讀準確率，一年後則能達到幾乎百分之百的準確。

簡而言之，本研究結果指出羅馬字比漢字容易學習以具備聽寫和說讀的能力。
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CHAPTER 7
CONCLUSIONS

In this chapter, important experimental findings are reviewed in section 7.1. Conclusions and implications are provided in section 7.2, and recommendations for further studies are given in section 7.3.

7.1 Summary of the findings

A total of 803 subjects, comprised of 453 students from Taiwan and 350 students from Vietnam, participated in this study. The subjects consisted of elementary school students and collegians. Subjects in reading comprehension tests were divided into three orthographic groups: Hanji, Bopomo, and Chu Quoc Ngu (CQN). The results of the reading comprehension tests reveal no statistically significant difference between the comprehension scores of the Hanji and CQN groups. However, students from the second to fifth grades in the Bopomo group received significantly lower scores than students in the other groups. The mean scores of all grades in the three groups are illustrated in Figure 26.
Why does Figure 26 show no significant difference between Hanji and CQN? Recall that reading is not a character-by-character recognition process, but a process of forward and backward saccades. In addition, reading comprehension requires prior knowledge of the subject in the text (Smith 1994: 66). Because not all characters are read in the process of reading, it is not necessary for Hanji readers to be familiar with all of the characters written in the text. In other words, they can still predict meaning of sentences even though they do not know each and every character. Consequently, the scores of the Hanji readers are not as low as we originally might have expected. As for the CQN readers, although they can read aloud all words in the text, this does not ensure their comprehension of the text. In other words, it is not likely for CQN readers to score well without prior knowledge of the text. This result reveals that prior knowledge plays a more important role in reading comprehension than does orthography.

Why are students’ comprehension scores in the Bopomo group significantly lower than those in Hanji and CQN groups? Perhaps it is because relatively limited resources and
attentions are devoted to the teaching and learning of Bopomo since it is regarded as only an auxiliary tool to the learning of Han characters. More research is needed to confirm this assumption.

Although the results of reading comprehension tests do not show significant differences between Hanji and CQN, differences do occur in the dictation tests.

Subjects in dictation tests were divided into Taiwanese and Vietnamese groups. Each group heard two passages, the first one adopted from a soft article and the other from a hard article, and were required to write each word they heard.

In the first dictation of the Taiwanese group, the statistical results reveal that elementary school students significantly increase their score on dictation, and statistically achieve the same level as collegian by the fourth grade. The results of the second dictation show that the pupils’ scores significantly increase over the years. However, even the sixth graders’ scores do not statistically reach the same level of the college students. In other words, the results indicate that it takes more than six years for Hanji learners to be able to statistically have the same dictation ability as collegians. The mean score of Taiwanese students in dictation tests is illustrated in Figure 27.

![Figure 27. Mean score of Taiwanese students in dictation tests.](image)
Errors in the dictation tests were also analyzed. Twelve error types were found in the Taiwanese group. The major errors were made due to similarity in sound between correct and incorrect Han characters. The phonetic similarity errors account for 85.70% in the dictation test two. In the tests, Bopomo was used by the students as a supplementary tool to compensate for a lack of knowledge of particular characters. The data indicate that the percentage of Bopomo used in writing decreases over time and pupils no longer need the assistance of Bopomo by about the fifth grade.

As for the dictation tests in the Vietnamese group, the results of dictation test one reveal that students significantly increase their score until the fourth grade, by which time they have the same statistical score as the college students. In dictation test two, the statistical results show that pupils have reached a college level by the fifth grade. The mean score of Vietnamese students in dictation tests is illustrated in Figure 28. Errors in Vietnamese dictation tests were also analyzed. Because the results of error analysis are voluminous, they will not be detailed here; for details, readers may refer to section 6.3.

![Figure 28. Mean score of Vietnamese students in dictation tests.](image-url)
In addition to dictation tests, CQN also shows superiority in oral reading tests. Oral reading tests were only conducted with the Vietnamese group because there is no way for the Hanji beginners to be able to read unknown Han characters unless they have acquired the characters in advance.

The statistical results of the oral reading tests reveal that the first graders attained an average score of 93.82% and 87.68% accuracy in oral reading one and two, respectively. The score of second and third graders were not significantly different from each other, and they achieved nearly 100% accuracy. These results indicate that CQN beginners are able to produce about 90% accuracy in oral reading after three or four months of learning, and reach nearly 100% accuracy a year later.

The major difference between subjects in oral reading tests was the time required to complete the task. In oral reading test one, first graders spent an average of 257.59 seconds; second graders 47.55 seconds; third graders 38.15 seconds, and collegians 24.61 seconds. In test two, first graders spent an average of 398.35 seconds; second graders 68.16 seconds; third graders 52.70 seconds; and collegians 26.84 seconds.

7.2 Conclusions and implications

In this study, Han characters and Vietnamese CQN were examined in three aspects: 1) reading comprehension, 2) writing dictation, and 3) oral reading. Although students’ scores were not significantly different between Hanji and CQN groups with regard to the reading comprehension tests, students in the CQN group demonstrated more proficiency than the Hanji group in both writing dictation and oral reading.

In the reading comprehension tests, the performance of the Taiwanese students was not as “terrible” as we originally might expect. Recall that the reading texts were written in modern spoken Chinese and consisted of 492 different Han characters, of which 391 were listed in the first 999 frequently used characters, and 93 were ranked between the 1,000-
2,999 frequently used characters. In other words, the vast majority of the characters (about 98%) were among the first 3,000 frequently used, which were very likely to be learned by the sixth grade in elementary school. This situation indicates that readers of Hanji can achieve the same performance in reading comprehension once the Han characters are acquired. Nevertheless, we need to keep in mind that this conclusion may only apply to texts written to reflect spoken Chinese rather than classical Han writing; literary Chinese requires much greater skills in reading comprehension.

The superior efficiency of Romanized CQN is apparent in writing dictation and oral reading. In general, it takes about only one year for literacy beginners to be able to read aloud texts written in CQN accurately, and it takes about five years to be able to write dictation at the college level. On the contrary, there is no way for Hanji beginners to read aloud Han characters correctly unless they have prior knowledge of them, and they have to spend more than six years to achieve college-level abilities in written dictation. These results also indicate that efficiency in oral reading is more obvious than in learning to write.

As compared to Han characters, the apparent superiority of Romanized CQN very likely originates from its nature: 1) a limited number of alphabetic forms, and 2) relatively more simple and consistent spelling rules.

The efficiency issue can be examined through the perspective of the Universal Orthography proposed in chapter three, i.e., manners of correspondence and space of placement. The manners of correspondence refers to the sound-symbol correspondence in writing systems. Vietnamese CQN, as a phonemic writing system, has relatively fewer orthographic symbols (i.e., the existing Roman letters plus a couple of diacritics) compared to the tremendous number of Han characters. This fact contributes to the observed learning advantage of CQN.
Space of placement refers to how the orthographic symbols are arranged over space; this is usually referred to the spelling rules in alphabetic writing systems or the placement of components (i.e., radical and phonetic) in Han characters. In general, the easier rules a system has, the easier it is to learn. In Vietnamese CQN, all graphemes are arranged from left to right in a linear placement with relatively consistent and regular spelling rules. However, components of Han characters are arranged in a two dimensional space with relatively inconsistent and irregular rules.\textsuperscript{86} As Tzeng (2002: 8) has summarized from recent research on reading Chinese, regularity and consistency are two crucial factors in naming Han characters. In general, regular and consistent characters are named faster; and consistency is a better index than regularity in the sound-symbol relationship of Han characters (Tzeng 2002: 10). “Regularity” here was defined as “whether the sound of a character is identical with that of its phonetic radical, ignoring tonal difference,” and “consistency” was defined as whether or not “all the characters in its set of orthographic neighbors have the pronunciation of the phonetic radical they all share” (Tzeng 2002: 7). In short, the inefficiency in writing and oral reading of Han characters can be attributed to their irregular and inconsistent nature.

The inefficiency of learning to write in Han characters is more apparent in writing hard articles. Comparing Figure 27 to Figure 28, the difference between scores in soft and hard articles received by Taiwanese students are greater than those in Vietnamese group. For example, the second graders in Taiwanese group scored a mean of 51.4\% of correct Hanji for the soft article, but only 19.52\% for the hard article. In contrast, the second graders in the Vietnamese group earned a mean of 64.28\% for the soft article and remain 50.91\% for the hard article. This result reveals that Vietnamese CQN is relatively easier to

\textsuperscript{86} For example, Zhou (1978) reported that less than 48\% of radical-phonetic characters have exactly the same pronunciation as indicated by their phonetic components (quoted in Tzeng 2002: 6).
learn to write for both soft and hard articles; however, learners of Hanji may encounter more difficulties in writing hard articles than soft ones. This fact indicates that phonemic writing systems, such as CQN, are easier to learn to write in any type of articles once their learners acquire the relatively fewer orthographic symbols and rules. On the contrary, Hanji learners have to keep learning new characters and rules which are very likely to appear in hard articles. This is why it takes more years for Hanji learners to be able to write hard articles at the same level of soft ones.

Given the results of this research, one might ask why Han characters have not been replaced by some from or Romanized script. Usually, many factors are involved in the choice and shift of orthography. Whether or not orthography reform will be accepted by the public in a society depends on various linguistic and non-linguistic factors. As Smalley (1963: 34) has pointed out, “maximum motivation for the learner, and acceptance by its society and controlling groups such as government” is considered the most important factor. In other words, a linguistically perfect orthography may not be accepted by the members of society if it lacks learners’ motivation. Chiung’s (2001a) survey on 244 Taiwanese college students also reveals that non-linguistic factors, such as place of residence, academic major, national identity, and assertion on Taiwan’s national status play a role in choosing orthographic scheme for writing Taiwanese. Since non-linguistic factors are not controllable, any body in support of orthography reform would be most effective by drawing attention to the issue from the perspective of linguistics and literacy.

Given that the experimental results in this study lead to the conclusion that Vietnamese CQN is more efficient than Chinese characters in learning to read and write, it might be recommended that reforming Han characters is worthwhile in terms of improving learning efficiency.
Compared to Taiwan, Vietnam has very limited resources for national education. Even in this less developed education situation, Vietnamese pupils can learn to read in a year and be able to write by fifth grade at the college level. On the contrary, Taiwanese students have to keep learning new characters after they graduate from elementary school. In the course *Kuowen* or National Writing, Taiwanese students have to spend most time in learning new characters and classical Han writing instead of paying attention to modern works of literature. As a matter of fact, those Han characters learned after elementary school are not likely to be used in daily life. For example, about 80% of the characters used in the reading texts in this study is listed in the first thousand frequently used characters, and 98% of them is ranked in the first three thousands frequency order. Since the characters students learned after elementary school are not usually used in daily life, why do not we save their time in learning new characters and allow them to appreciate more modern literature or devote themselves to other subjects, such as art, music, and foreign languages?

If orthography reform is considered important and urgent, I would suggest some proposals follows:

Primary consideration should be given to replacing Han characters with Roman script. In other words, Taiwanese society should adopt a policy whereby Taiwanese and Mandarin Chinese would be exclusively written in Roman script. For Taiwanese, the traditional Romanized Peh-oe-ji should be considered the most likely candidate since it has an orthographic convention over a hundred years old. Although Romanization is the ideal proposal from the perspective of efficiency, it might be the most difficult one to carry out in a Hanzi dominant society. How to eliminate Hanji users’ bias and discrimination against Romanization is thus the most important challenge for reformers. Perhaps promotion of English could draw people’s attention to the issue of Romanization.
If Romanization is considered too extreme, Han characters could be exclusively or partially replaced with Bopomo for writing Mandarin Chinese. To do so, the first step would be to rename Bopomo. Recall that Bopomo is used as phonetic system for transcribing Mandarin. A more appropriate name for Bopomo would thus be ㄅㄆㄇ字母 or ‘Bopomo alphabet.’ As for writing Taiwanese, the so-called Han-Lo scheme or ‘combination of Han characters with Roman scripts’ might be adopted. In either case, writing in Taiwanese and Mandarin would ultimately be similar to the hybrid system of Japanese, where Hanji and Kana are both used in writing.

If people are not willing to abolish Han characters, the number of characters in daily use must be limited. Perhaps a reasonable number could be reduced to 2,000 or up to 3,000, so literacy learners could acquire all of them in elementary school. The best way to set the restriction on Han characters is to remove all of the less frequently used characters from the character set provided on computers. In addition, it would be helpful to take all classical Han writing out of textbooks in high school. Classical Han writing usually includes rare characters. The demand for Han characters could be greatly reduced if classical Han writing is dismissed from current education. Study in classical Han should be regarded as professional job for researchers rather than for everyone in the society.

In short, whether Han characters will be abolished or restricted or whether they shall remain is more likely determined by socio-political factors than linguistic factors. The political relationship between Taiwan and China will definitely play an important role in the orthographic reform in Taiwan.

7.3 Recommendations for further studies

While this study has uncovered some aspects of learning efficiency in learning Han characters and Romanized Chu Quoc Ngu, these results should be looked upon as
preliminary. Subsequent research is necessary to test and expand the conclusions drawn here. To explore the efficiency issue in more details, the following suggestions are offered.

First, it is recommended that reading comprehension tests be conducted again with hard articles. Because of the limitations of time, reading comprehension tests were conducted with only soft articles. It might show some significant differences between Hanji and CQN groups if the texts are written in hard articles. If the results show no statistical difference, we can simply exclude reading comprehension ability from our further discussion on the issue of learning efficiency.

Second, it is also recommended to conduct further study of early literacy beginners of CQN and Hanji with regard to reading comprehension. In this study, although there is no overall significant difference between CQN and Hanji in reading comprehension tests, the scores of first graders in CQN group are relatively lower than those in Hanji group. Further study of the first graders is needed to find out the factors.

Third, it is suggested that the second dictation test be conducted again with high school students in Taiwan. Although the results in this study have reveal that it takes more than six years for Hanji learners to be able to have statistically the same dictation ability as collegians, it will allow us to precisely point out the exact number of years based on the examination on high school students.

Fourth, it is also suggested to conduct oral reading tests again with Taiwanese students. Because of limitation of time, oral reading were only tested with Vietnamese students in this study. It would make a solid comparison if Taiwanese students were included in the oral reading tests.

Fifth, it would be worthwhile to apply the same methodology and experiments to the examinations on other writing systems, particularly the Korean Hangul and English. As shown in Table 99, Han characters represent an orthography with two-dimensional
placement, and multiple correspondence between sound and symbol. In contrast, CQN is a writing system with one-dimension and one-to-one correspondence. Because of the limitations of time and cost, only Han characters and Vietnamese Romanization were compared in this study. It will make the study more significant and influential to include Hangul and English in the comparison.

**Table 99. Orthographic types by placement and correspondence**

<table>
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<tr>
<th>Sound-symbol corresp.</th>
<th>Placement in space</th>
<th>Two-dimension (non-linear)</th>
<th>One-dimension (linear)</th>
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<td>More like one to one relationship</td>
<td></td>
<td>Hangul</td>
<td>CQN</td>
</tr>
<tr>
<td>More like multiple relationship</td>
<td></td>
<td>Hanji</td>
<td>English</td>
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