A Comparative Study of Aphasics' Abilities in Reading and Writing Hangul and Hanja

Heui-Beom Kim

English Language and Literature Department, Kosin University

In Korean, as with Kana and Kanji in Japanese, two kinds of word-writing systems--Hangul (the Korean alphabet) and Hanja (the Chinese character; Kanji in Japanese)--have been and still are being used. Hangul is phonetic while Hanja is ideographic. A phonetic alphabet represents the pronunciation of words, wheras ideographs are where a character of a writing system represents a concept. Aphasics suffer from language disorders following brain damage. The reading and writing of Hangul and Hanja by two Korean Broca's aphasics were analyzed with two goals. The first goal was to confirm the functional autonomy of reading and writing systems in the brain that has been argued by other researchers. The second goal was to reveal what difference the subjects show in reading and writing Hangul and Hanja. As experimental materials, 50 monosyllabic words were chosen in Hangul and Hanja respectively. The 50 word pairs of Hangul and Hanja have the same meaning and are also the most familiar monosyllabic words for a group of normal adults in their fifties and sixties. The errors that the aphasic subjects made in performing the experimental materials are analyzed and discussed here. This analysis has confirmed that reading and writing systems are located in different parts in the brain. Furthemore, it seems clear that the two writing systems of Hangul and Hanja have their own respective processes.

INTRODUCTION

Aphasics(失語症) generally suffer from disorders in spoken language: that is, in the production and/or the comprehension of utterances. But what about their abilities in reading or writing letters, words or sentences in a written language? It has been argued that "aphasic disturbances of production and comprehension of spoken languages are usually associated with a disruption in the encoding and decoding of written language (agraphia(失書症) and alexia(失讀症))."(Kaplan, 1991:313).

Among the four language modalities-auditory (or listening), reading, oral production (or speaking) and writing (Sasanuma & Park, 1995), the reading and writing of Hangul and Hanja by two Korean Broca's aphasics were analyzed with two goals. The first one was to confirm the functional autonomy of reading and writing systems in the brain, something that has been argued by other researchers. The second one was to reveal what difference the subjects show in reading and writing Hangul and Hanja.

METHODS

Subjects. Two Korean patients with stroke-induced aphasia, that is Broca's aphasia,

served as subjects. The subjects had some difficulties in speaking but their oral co mprehension was intact. Their abilities to read and write Hangul and Hanja were normal before the onset of their disease. Table 1 shows the details concerned with th ese two subjects. It is notable that there is the difference between subject A and B i n the time it took them to learn Hanja in school.

TABLE 1
Subject Summary

Subject	Sex	Age	Onset	Work	Education
B.R. Jeon (Subject A)	F	75	6/13/94	none	6 *(2)
B.H. Kwak (Subject B)	M	63	2/12/96	ship inspector	university *(16)

(*: The number in a parenthesis means the period of the subject's learning Hanja.)

Materials The reading and writing materials used here consist of 50 monosyllabic words each. The 50 word pairs of Hangul and Hanja were commonly chosen as ones with high fre-quency (1st to 50th) among 163 words, based on the word-familiarity te st of 22 normal adult-s in their fifties and sixties. Four categories were devised, bas ed on the characteristics of Hangul words,: (a) abstract noun (native word), (b) abstr act noun (Hanja word), (c) concrete noun (native word), and (d) concrete noun (Han ja word). The Hanja words had the same meaning as the Hangul words. So they were grouped into the same categories as those of the Hangul words. The number of test words varied according to the category: (a) 16, (b) 8, (c) 19, and (d) 7. Table 2 indicates some examples of each category.

TABLE 2
The samples of Hangul and Hanja pair in four categories

Category	Contents
A. abstract noun (native word)	일 事 "affair," 봄 春 "spring," 힘 力 "power"
B. abstract noun (Hanja word)	법 法 "law," 덕 德 "virtue," 복 福 "bliss"
C. concrete noun (native word)	달 月 "moon," 집 家 "house," 손 手 "hand"
D. conctete noun (Hanja word)	강 江 "river," 양 羊 "lamb," 은 銀 "silver"

In Category B and D, both the Hangul and its Hanja counterpart are pronounced t he same, because the Hangul words orignated from Hanja. Therefore, the Hangul wor

ds in those cate-gories may be called 'loan words.' On the other hand, in Category A and C, the pronunciation of the Hangul and its Hanja counterpart are different, due to the fact that the words in those categories are rooted in Hangul, not in Hanja.

Procedures Two aphasic subjects were twice put on the test (Table 1) at Kosin Un iversity's Gospel Hospital on, July 12, 1996 and September 13, 1996. On the basis of given experimen-tal materials, the reading and writing abilities were tested in Hangul and Hanja. The writing experiment was followed by the reading experiment, so as to minimize the learning effect of them. The writing experiment was given twice, durin g which time the subject had to write the spoken words on paper. First, the subject heard only the pronunciation of each Hangul word, then that person heard both the m eaning and pronunciation of each Hanja word(for ex-ample, 봄/bom/(meaning) '춘'/tʃu n/(pronunciation)). In reading, subjects read all Hangul words included in the four cat egories, then they read all the corresponding Hanja words. All the er-rors found in wr iting and reading the words were counted in terms of modalites--writing and reading-- and in terms of categories. The number of errors in each category was an impor- ta nt factor in the analysis of this paper.

RESULTS

The subjects' errors in the reading and writing of Hangul and Hanja were calculat ed ac- cording to category. The distribution of errors is found in Table 3. The numbe r of test items in either writing or reading is 50 and the subjects were tested twice, s o the total number of test items in each modality is 100. The total numbers in each category were the following: A. abstract noun; native word--32; B. abstract noun; Han ja word--16; C. concrete noun; native word--38; and D. concrete noun; Hanja word--1 4. The percentages in Table 3 indicate how many errors have occurred in each catego ry (for example, 12 errors in Category A comes out to 37.5%).

TABLE 3

The error percentages in the writing and reading of Hangul and Hanja in Subject A and B

	Writing Hangul		Writing Hanja		Reading Hangul		Reading Hanja	
	A	B	A	B	A	B	A	B
Category A	37.5	0	93.8	28.1	0	0	18.8	0
Category B	31.3	18.8	93.8	50	18.8	0	62.5	0
Category C	18.4	7.9	81.6	34.2	0	0	31.6	2.6
Category D	7.1	7.1	71.4	35.7	0	0	28.6	0
Total	25	7	86	35	3	0	35..4	1

Overall errors The occurrence percentages of overall errors were the following: in subject A, Writing Hanja--86%; Reading Hanja--35.4%; Writing Hangul--25%; Reading Hangul--3%; in subject B, Writing Hanja--35%; Writing Hangul--7%; Reading Hanja--1%; Reading Hangul --0%. These results show that the two subjects had more difficulty in writing than in reading words, both with Hangul and Hanja (subject A--Hanja(86:35.4), Hangul(25:3); subject B--Hanja(35:1), Hangul(7:0)). In writing Hangul and Hanja, both subject A and B had more difficulty with Hanja than with Hangul (subject A--86:25; subject B--35:7). In reading, subject A had much more difficulty with Hanja than with Hangul (35.4:3), while subject B had almost no difference between Hanja and Hangul (1:0).

The errors in each categoy In both writing and reading, several characteristics were noted in connection to the category. They are the following: (1) In writing, subject A had more difficulty in the abstract nouns than in the concrete nouns, both with Hangul and Hanja. The concrete nouns--Category D--were the easiest ones for her to write. (2) In the reading of Hangul and Hanja, subject A had the most difficulty with Category B--abstract nouns. (3) In the writing of Hangul and Hanja, subject B found abstract nouns more difficult to write than with concrete nouns, except concrete nouns--Category C--in Hangul only. The most difficult kind of a noun to write was an abstract noun--Category B, and the easiet one was a concrete noun--Category A. Finally (4) In the reading of Hangul and Hanja, subject B performed tasks almost perfectly, so actually there was little difference among the four categories.

DISCUSSION

In this paper, we can find several characteristics relative to language abilities. First, the prominent difference of error percentages between reading and writing both Hangul and Hanja (that is, the degree of error occurences in writing > reading) confirms the theory that reading and writing abilities have different locations in the brain. This shows the autonomy of two language abilities. Secondly, the two subjects had more difficulty writing Hanja than Hangul, irrespective of the categories. But subject B ,who has accustomed to reading Hanja as a college graduate, showed no difference in reading abilities between Hangul and Hanja. Of course, subject A, who never used Hanja, except during the 2 years she studied it, while still a teenager, showed more difficulty in reading Hanja than Hangul. This fact suggests that there may be different writing routes with Hangul and Hanja, to some degree. Another factor may be the degree of familiarity and contact with Hangul and Hanja in daily life. Thirdly, in the writing of Hangul and Hanja, the two subjects commonly showed more comparative difficulty with abstract nouns than with concrete nouns. This may have resulted from the fact that abstract nouns may require more complicated

operation to process in the mind/the brain than concrete nouns. There was one exception in the writing of abstract nouns--Category A--by subject B. He performed well in Category A despite the abstract- ness. The soultion to the problem has not been answered. The studies of Kana and Kanji in Japanese including those of Yamada (1992), Sasanuma (1994), Sasanuman & Park (1995) etc. may give some clues into it.

REFERENCES

Kaplan, Edith (1991). "Aphasia-Related Diorders," in Martha Taylor Sarno, ed., *Acquired Aphasia* (2nd edition), 313-38. San Diego: Academic Press, Inc.

Sasanuma, Sumiko (1994). "Neuropsychology of Reading: Universal and Language-specific Features of Reading Impairment," in Paul Bertelson, Paul Elen, and Gery d'Ydewall, ed., *International Perspectives on Psychological Science. Vol. 1: Leading Themes*, 105-25. Hove, East Essex: Lawrence Erlbaum Associates Ltd.

Sasanuma, Sumiko, and Hea Suk Park (1995). "Patterns of Language Deficits in Two Korean-Japanese Bilingual Aphasic Patients--A Clinical Report," in M. Paradis, ed., *Aspects of Bilingual Aphasia*, 111-22. Oxford: Elsevier Science Ltd.

Yamada, Juin (1992). "Why are Kana Words Named Faster than Kanji Words?" *Brain and Language* 43.4, 682-93.