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Reading Disabilities: Are There Fewer In Japan?

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Abstract

Comparative reading research offers us an avenue to study a universal process — learning to read — in cultures and societies with different customs, traditions and writing systems. Such studies provide insights into how we learn, and fail to learn, and information about methods for meeting the reading needs of different students in our own country. In studying learning to read in another writing system there is always the temptation to make comparisons in terms of which is better or worse, easier or harder. In the past, research from Japan indicated that learning to read in Japanese produced fewer reading disabilities due to its writing system. Both past and more recent research on comparative differences in reading disabilities, particularly in Japan, have been examined to determine whether in fact more recent findings corroborate these beliefs.



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Different writing systems

The study of the evolution of writing systems shows historical development from pictographic or ideographic orthographies, to the development of syllabaries, to the development of alphabets. Syllabaries are orthographies in which the symbol represents a syllable as opposed to an isolated phonemic sound as in an alphabet. Japanese is an example of a modern day syllabary which in addition also uses Chinese characters for about 30 percent of its written language. Most of the remainder of written text is written in

either of two syllabaries. The *hiragana* syllabary is used to write syntactic morphemes such as the endings of verbs and other necessary grammatical functions of the language. This syllabary, widely used, constitutes about 65 percent of the written text in Japanese. The second syllabary is called *katakana* and is used to write foreign loan words and onomatopoeic words. This comprises only four percent of written text. *Kana* is the term used to refer to both syllabaries (Sheridan, 1985; Taylor and Taylor, 1983). Because of its blend of Chinese characters, or *kanji*, with its own syllabaries or *kana*, Japanese has a unique place on the linguistic continuum between ideographic and phonetic writing systems. Because of this it has often been used in comparative reading research on orthographies.

Beginning reading instruction in Japan

When children are taught to read in Japan, the *hiragana* syllabary is introduced first. Both the *hiragana* and *katakana* syllabaries have 46 different symbols. When various diacritical marks are added to these symbols, they can represent 71 different syllables (Sakamoto, 1976). Each *kana* symbol is simple in appearance with from one to six strokes per letter and an average of three strokes necessary to write them (Muraishi, 1976; Stevenson, Stigler, Lucker, and Lee, 1982; Taylor and Taylor, 1983). They are almost always read the same way and begin with a consonant and end with a vowel (Sakamoto, 1976). Another advantage of the *kana* syllabary is that mirror images of the letters do not exist, so that if a child does reverse a letter it does not become a different letter, only one that is backwards (Sakamoto and Makita, 1973). So the problems associated with letters such as *p*, *q*, *d* and *b* do not exist in learning *kana*. The fact that *hiragana* is relatively easy to learn to read has been supported by the work of Japanese researchers in the past who reported that only

one percent of the children who entered first grade could not read *any* hiragana symbols, and in the past some Japanese experts reported that they had never seen a dyslexic (Makita, 1968; Sheridan, 1982). As a unit of pronunciation, the syllable is considered to be easier to learn, and results in less cognitive confusion than does learning a phonemically based alphabet (Downing, 1973).

Preschool education in Japan

Since 1960 there has been a boom in preschool education in Japan. Although it is not compulsory, 64 percent of children between three and five years old attend some kind of nursery, kindergarten or day care center (Izumoji, 1981). Sakamoto (1981) reports the research of Sugiyama and Saito and of Izumoji who found that mothers in Japan began reading to children usually by age one and generally from the child's own books. Japanese mothers of preschoolers report that the reason they give their children books is to help them develop appreciation for and interest in reading (Izumoji, 1981). One preschool publication for children sells over a million copies a year (Sakamoto, 1981). Half of children's publications in Japan are intended for preschoolers and primary age children (Namekawa, 1976). Sakamoto (1981) states that in Japan mothers are considered to be the most important factor in children's learning to read.

Reading readiness

Probably as a result of this early childhood education, Japanese children were reported, based on a standardized reading test, to be ready to begin reading instruction by age 4.5 (Sakamoto and Makita, 1973). Various researchers report that 83 percent of five years olds and 31 percent of three year olds can read all the hiragana letters (Sakamoto and Makita, 1973; Sakamoto, 1981; Sheridan, 1982). Namekawa (1976) stated that almost all first graders in

urban areas could both read and write the hiragana letters, enabling them to read the many books for young children which are printed entirely in hiragana (Namekawa, 1976). As mentioned earlier, in one report only one percent of five year olds could not read any hiragana five months before they entered first grade (Sakamoto, 1981).

In elementary schools in Japan, children are taught all the hiragana letters before any kanji characters are introduced. Groups of kanji are introduced beginning in first grade. By the end of elementary school, children are expected to have learned 1,000 characters. The official list of kanji characters is 1,945 kanji which students are expected to master by the end of ninth grade (DeFrancis, 1984; Sheridan, 1985). Perhaps because they have perceived so few children as having reading problems per se, the Japanese note other kinds of problems. They report concern for children who read excessively, those who do not finish books they start, those who only read one kind of book, and those who want to read books for older children or adults (Sakamoto and Makita, 1973).

Early reading disability research in Japan

One of the earliest reports of the low incidence of reading disability in Japan was the research of Makita (1968). He conducted a survey of 247 primary school teachers of over 9,000 students in the metropolitan Tokyo area, asking them how many of their students showed evidence of reading disabilities. They were specifically asked whether students experienced more difficulty in reading either the kana or the kanji. The teachers reported slightly less than one percent of the children as experiencing reading difficulties, and a smaller percentage of that number were reported as mentally retarded. Difficulties with kana decreased by grade level so that by fourth grade no

children were reported as dyslexic in either kana script. Eight children were reported as having difficulty with kanji in fourth grade and above out of the 9,195 children whose teachers were surveyed. No doubt as a result of findings such as this, reading disabilities were not perceived to be a serious problem in Japan (Makita, 1968).

Cognitive processing of different scripts

Some interesting reading research has been conducted with brain injured Japanese subjects to determine whether kana or kanji reading was more affected. In the first study, Sasanuma and Fugimura (1971) studied patients in a large metropolitan rehabilitation center who suffered from aphasia, some of whom also had apraxia or speech disabilities. Lhermitte and Gautier (1969) defined aphasia as a disorder in the reception and expression of spoken and/or written speech resulting from a cerebral lesion. Both reading and writing were assessed in the Japanese study. Those aphasics with speech difficulties made significantly more errors in reading and writing kana, the syllabic script, than in kanji, the morphemic script. Aphasics without apraxia exhibited no such discrepancy. In a follow-up study, Sasanuma and Fujimura (1972) examined the writing errors in both kana and kanji among aphasics and non-aphasics. Both groups made the most errors in kanji in a visual or graphical way. There was a difference between the performance in writing of aphasics and non-aphasics in favor of non-aphasics. Aphasics with apraxia, compared to those without, made a much higher percentage of errors in kana, demonstrating phonological confusion, substantiating the results of the earlier research that there is selective impairment and that the two scripts can be processed differently.

Sasanuma (1974) studied impairment in written language in adult Japanese aphasics and found that selective

impairment in kana script was related primarily to patients experiencing damage to Broca's area of the frontal lobe in the left hemisphere. These people also had problems with speech difficulties (Sheridan, 1983). Sasanuma also found that selective impairment in kanji of adult aphasics was related to damage in the temporal-parietal lobes of the left hemisphere, a rare condition called Gogi's aphasia. A third type of impairment to the temporal lobe of the left hemisphere resulted in Wernicke's aphasia, a condition which resulted in impairment in both kana and kanji. While these results suggest different areas of the brain differentially affecting kana or kanji scripts, Sasanuma also stated that it was reasonable to assume some phonological activity in the processing of kanji characters. A similar conclusion was drawn by Hung and Tzeng (1981) who reviewed studies dealing with comparisons between ideographic, syllabic and alphabetic scripts. They found that differences existed in processing in lower level activities such as visual scanning but not in higher level concept driven processes. No differences were found with respect to word recognition, comprehension, inferences and working memory strategies. They concluded that the evidence suggested that reading was "a universal property, a culture-free cognitive activity, once people in different language systems (had) acquired the ability to decipher written systems" (p. 406).

Cross-cultural comparisons in reading disability

Until recently we have not had any truly valid comparisons on the incidence of reading disabilities in learning to read in different orthographies. Kuo (1978) in Taiwan claimed similar findings to the Japanese for the rarity of reading disabilities in learning to read in Chinese. Since, depending on the criteria used, anywhere from 10 to 25 percent of American school children are considered to have some kind of reading problem, these reports have been

troublesome (Sheridan, 1983). They have suggested that learning to read, at least in the Latin alphabet, is more difficult than learning in other orthographies.

Recent research conducted by Stevenson and co-researchers (1982; 1984a; 1984b; 1984) has provided much insight and data on the nature of reading disabilities related to literacy acquisition in different writing systems. Stevenson, Stigler, Lucker and Lee (1982) sought to find evidence to support the hypothesis that orthography was a major factor in the incidence of reading disabilities in countries with different writing systems. Stevenson et al (1982) compared the reading ability of first and fifth grade children in the United States, Taiwan and Japan. Since the Japanese and Taiwanese children were a very homogeneous group, the American children studied resided in Minneapolis, Minnesota, a more homogeneous population than usual in the United States. Comparable reading tests were constructed to assess the reading abilities of children in Taiwan, Japan and the United States. Fifth grade children were studied, and those children whose IQs were below 70 were eliminated from the study. Children with average IQs who were reading more than two grades below their current grade placement (a traditional definition of reading disability in the U.S.) were compared to average readers at the same grade level in the same country (Stevenson, 1984b; Stevenson et al., 1982).

While the Taiwanese have not adopted the simplified characters used in mainland China but maintain the traditional characters, Taiwanese children also learn 3,000 characters during the course of elementary school. As there is no achievement testing of a comparable nature in the People's Republic of China, the Stevenson et al. study (1982) is the only one to date which so thoroughly

compares learning to read in Chinese, Japanese and English. In fact, prior to this study no individually administered reading test existed in Taiwan or Japan though group tests are used in Japan (Stevenson, 1984a; Hirose and Hatta, 1988). Identifying those who were more than two years behind grade level, Stevenson et al. (1982) found that the percent of fifth graders in the study who were found to meet this description were three percent of the American children, two percent of the Taiwanese children, and eight percent of the Japanese children. There were no significant differences in the incidence of reading disabilities found among the three countries.

Based on a battery of tests given to the children in each country, the causes of reading failure tended to differ among the countries. Chinese children had more problems with comprehension, while Japanese and American children had problems in both vocabulary and comprehension. There was a significant correlation between the scores of Chinese children on the reading test and a test in math indicating a more general learning problem than among Japanese and American children. From this battery of cognitive tests, several factors were found to significantly affect reading ability in the three countries. These included general information for all three countries, verbal memory for Japan and Taiwan, memory for words in Taiwan, and coding (which is often a cue for a learning disability on the WISC) in the United States.

Since the degree of reading disability in English could not be predicted from cognitive scores, reading speed or math achievement, the data tended to support the idea that reading disabilities in English were a more distinctive feature than among the Chinese and Japanese. Interestingly, there was also much less variance in the

scores among the children in Taiwan with a much larger percentage of children scoring at grade level. A possible explanation for the reduced variance in the scores of Chinese children might be due to the fact that while new words written in an alphabet or a syllabary can be sounded out, in Chinese this is much more difficult and more dependent on instruction.

There were different kinds of reading problems for the children in the three places; for example, phonetic coding was a problem for some children learning the alphabet, but not a problem for children in Japan or Taiwan. However, Stevenson et al. (1982) found no support for the belief that there was a greater incidence of reading disabilities in English as compared to Chinese or Japanese or that such disabilities were related to the particular writing system. To the contrary, they found that problems occurred regardless of whether the children learned to read in characters, a syllabary or an alphabetic system.

The Stevenson et al. (1982) study represented a contradiction of the previous research on reading disabilities in Japan and Taiwan. While no comparable experimental data on reading disabilities are available from China there are some statistics on literacy. The mainland Chinese census data report that 23.6 percent of their population is illiterate (State Statistical Bureau of China, 1982). The actual figure is probably higher since the same census data reported that only 40 percent of the total Chinese population have completed elementary school (Guthrie, 1984). However, while the language is the same as in Taiwan, China is an entirely different population from either Taiwan or Japan. The latter two are smaller, more urban, more economically developed and have had mandatory primary education for many years.

Both the Kuo (1978) and the Makita (1968) studies reporting extremely low incidence of reading disability explained their findings as attributable to the characteristics of the writing systems. Makita cited the Japanese syllabary's sound/syllable consistency, and Kuo the fact that Chinese characters represent morphemes instead of just phonetic elements. While there is consistency in syllable/sound in Japanese, nonetheless readers must still recognize characters as well. However, DeFrancis (1984) reports that while average Japanese adults can probably read the 1,945 official kanji, they can probably only write about 500 of them and must resort to writing them in kana. In the Chinese case, the fact that characters are morphemes doesn't necessarily make them easy to learn.

Using a newly developed standardized test of reading ability and an intelligence test, Hirose and Hatta (1988) conducted a study of the incidence of reading disability of Japanese fifth grade 11 year olds with IQs of 85 and above. According to their criteria for a reading disability, the child had to have an IQ of 85 or above and be two or more years below the grade level score. They found approximately 11 percent of the children in their study had reading disabilities. Males were almost twice as likely to have a reading disability as females with no difference between rural and urban children. The incidence of reading disability was strongly associated with sentence memory and reasoning ability and not with word discrimination abilities, suggesting a cognitive as opposed to a perceptual factor.

In light of the Stevenson et al. (1982) and the Hirose and Hatta (1988) studies, the previous research about the low incidence of reading disabilities in Japanese must now be regarded as questionable. In discussing their results Stevenson et al. (1982) proposed several explanations for

this disparity. One problem in making comparisons across cultures is that there is no direct linguistic equivalent of the term *reading disability* in Japanese. They mention the fact that the closest translation for reading disability in Japanese is *nandokusho* which means that the reader is having a problem reading the kanji characters, not the kana syllables. Some Japanese researchers have suggested that the eight percent of Japanese children in the Stevenson et al. (1982) study who were reading below grade level were slow learners, not reading disabled. Considering that 63.6 percent of the children who were found to have reading disabilities in the Hirose and Hatta study (1988) had IQs below 100, this may be a more accurate description. Hirose and Hatta state that previous misconceptions regarding the incidence of reading disability in Japan have been due to the lack of translation of such studies into English and the fact that only since 1984 has there been a standardized group reading test available in Japan.

There are some cultural factors at work here. In the United States educational funding formulas are often based on categorizing children. Of course standardized testing has long been a tradition. There is no equivalent in China, Taiwan and Japan to the large-scale testing and classification of elementary school students into special reading programs which occurs in the United States. Stevenson et al. (1982) point out some other cultural factors affecting perception of reading problems in Taiwan and Japan. They found that Asian parents were more likely to attribute a reading problem to lack of effort or improper teaching (Stevenson et al., 1984). They speculated that perhaps the Asian parents viewed a reading problem as something that could be overcome rather than as a lasting disability.

Of course there are other cultural differences between the United States and Japan which also make comparative reading and educational research interesting. Japanese schools encourage more conformity than do American schools. Respect for discipline, teachers and authority figures is more common in Japan and other Asian countries than in the United States. Factors which complicate comparative reading research include the lack of parallel concepts and culturally different perceptions of human nature as well as the difficulty of constructing parallel testing instruments. What the recent comparative studies of the incidence of reading disabilities in Chinese, Japanese and English suggest is that there is no perfect orthography, and that a small percentage of children will have difficulty in learning to read regardless of the script used to write it.

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