

Measuring Reading Comprehension in Chinese and Japanese amongst Taiwanese Children Resident in Japan

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Abstract

In reading sentences, we make deductions by repeatedly reading certain parts, such as conjunctive words in the sentences and directions. This paper, by targeting learners who are Taiwanese native speakers resident in Japan, and learning Japanese as their second language, seeks to examine how much they understand sentences and with which parts they may have difficulties in reading. The subjects were divided up into three groups, according to the age at which they started to learn Japanese: before 7 years old; 7-10 years old; and after 11 years old. Firstly, a reading comprehension test for both Chinese and Japanese was administered. The reading comprehension questions for each language were divided into the tasks testing "reason", "conjunction", "explanation", "whole text", and "demonstration". Secondly, the degree of sentence comprehension was compared with native speakers of Chinese and Japanese by using Chinese and Japanese reading comprehension tests. The results showed that those who started to learn Japanese in at an older age found it easier to maintain their reading comprehension of Chinese. In the case of Chinese reading comprehension, tasks on "conjunction," "the whole text" and "demonstration" were the most difficult, whilst tasks on "conjunction" and "demonstration" were the most difficult for the Japanese reading comprehension. Also, there was a positive correlation between the reading comprehension levels for both Chinese and Japanese. In the case of Japanese comprehension, the Chinese knowledge of learners' mother tongue may have an influence on reading comprehension, considering that a high level of kanji is used in Japanese also. Thus, elder learners who have already learnt Chinese vocabulary may have an advantage in their reading comprehension of the Japanese language. It was suggested that the learning degrees of Taiwanese children in Japan were low in comparison with the native speakers of each same grade in terms of "conjunctions" and "demonstratives", where remarkable differences were seen between the two languages.

Key words : bilingualism, second language acquisition, reading comprehension, Chinese, Japanese

1. Introduction

We acquire information and knowledge by reading. As we read, we make deductions by repeatedly reading certain parts of sentences, such as conjunctions and referents. We then integrate all of these elements of the sentence, and come to understand it as a whole. Linguistic understanding in particular is posited to be one of the main factors contributing towards cognitive development in children, and it is therefore crucial that we understand children's linguistic proficiency. There are two aspects to linguistic proficiency (Cummins, 1980), namely, academic linguistic proficiency and social linguistic proficiency. The inter-linguistic transfer of reading and writing skills is a question of cognitive and academic linguistic proficiency, and it is academic linguistic performance that can be an issue in schools (Cummins, 1983). A need can therefore be seen to

measure the academic linguistic performance in bilingual children. In this paper, I will describe how I considered what method can best be used to measure reading comprehension ability in Chinese and Japanese, and draw up an evaluative scale for comprehension. These tests were then used to determine to what level school-age children living overseas are able to understand both their first (in this case, Chinese) and second (in this case, Japanese) languages when reading, and what problems they encountered.

2. Previous Research

According to the linguistic interdependence hypothesis, the linguistic proficiency between two languages will influence both language, encouraging progress, and language transfer in reading and writing will occur between the two languages (Cummins, 1983). Moreover, mistakes are related to the degree of difference between

the two languages. If the two linguistic systems are different, then the learning processes will differ also. In Cummins' Common Underlying Proficiency hypothesis (1989), it is suggested that the two languages are not, in fact, independent systems, but share a common deep structure. The most fundamental aspects (understanding, cognition etc.) contribute to a single system. Vocabulary and grammar may differ, but the skill of regularizing and deciphering characters, and strategies of comprehension, can be transferred from the first language to reading and writing competence in the second language. The idea that reading comprehension competence might be transferred between languages seems particularly credible for the language pair Japanese and Chinese in particular, since both use ideographic characters as their method of notation. Moreover, it has been suggested that, in order to examine fully the process of reading comprehension in a second language, one must assess reading comprehension in both the first and second languages (Alderson, 1984). What all of the above implies, therefore, is that it will be beneficial to establish what differences there might be in levels of reading comprehension between both the target language and the native language, and what elements of the reading process posed particular difficulties for readers.

In terms of the learning contexts that learners of Japanese find themselves in, the mistakes that these non-native speakers of Japanese make can differ according to their native language. For language acquisition between Chinese and Japanese, then, it is first important to establish just what is significant about the structural differences between the two languages. Previous research has focused mainly on Japanese language learning by non-native speakers of Japanese, and few studies have considered both languages simultaneously. In order, however, to consider the influence of a native language upon a non-native language, it seems reasonable to assume that there is a need to take a concurrent look at how both languages are being acquired.

Komori et al (2004) carried out an empirical test on the relationship between sentence comprehension and vocabulary levels and the proportion of well-known words in a sentence on learners of Japanese in China, Taiwan and South Korea. The results showed a strong and positive correlation between words already known (the quantitative aspect of vocabulary knowledge) and the issue of sentence comprehension. Other studies, on analyzing compositions from Japanese language beginners, have implied that conjunctions are the most commonly misused (Nagatomo, Sakoda, 1988). Moreover, Uchida (1997) undertook a ten month longitudinal

study in the US on children at kindergarten through to fifth grade elementary school students, in order to establish the influencing factors in language education. On comparing the results of stories composed by children in their second language with those by children writing in their native languages, Uchida discovered mistakes in grammar such as causal conjunctions, pronouns, auxiliary verbs and verbs, with the exception of temporal conjunctions. In other words, it was established that grammatical performance is influenced by native language grammar, and becomes imperfect. Research focusing on adults showed that mistakes were still made in the use of demonstratives three years after Japanese language learning had begun, regardless of the differences between Japanese and the native language (Sakoda, 1996). It is clear, then, that incorrect usage occurs both in grammatical rules and reading comprehension. Will such mistakes be evident in the respective reading comprehension processes of Taiwanese children living in Japan, who are learning both Chinese and Japanese? I believe that there is merit in pursuing this question.

Various examinations exist for the purposes of establishing proficiency in Chinese and Japanese. Chinese proficiency can be measured by the 'Chinese Proficiency Test,' which is administered by The Society for Testing Chinese Proficiency, Japan. Most testees are private learners of Chinese, and university students learning Chinese as a second foreign language. There is also the Han Yu Shui Ping Kao Shi (HSK) proficiency test, which is often administered to would-be exchange students. The Test of Communicative Chinese (TECC) is designed to evaluate ability based on 'new standards for Chinese language ability in business and work.' To test ability in Japanese is the Japanese Language Proficiency Test, which is run by the Japan Foundation and Japanese Educational Exchange and Services and supported by the Ministry of Foreign Affairs and the Ministry of Education, Culture, Sports, Science and Technology. Other tests include the Completion Examination for the Intensive Japanese Language Program, and the Japanese Language Proficiency Test for persons working in the travel and entertainment industries. Various educational tests for Japanese are also carried out overseas. There is a Japanese language option, for example, in the European International Baccalaureate, and the Japanese Proficiency Test (JPT) and Educational Testing Service (ETS) are both Japanese language tests for native speakers of English, whilst the American Council on the Teaching of Foreign Languages offers an Oral Proficiency Interview (OPI) which tests the ability to speak a language. Of these, the Chinese Proficiency Test and the Japanese Language Proficiency Test represent the best examples of

tests displaying the clearest grammatical objectives.

The purpose of any test is to, having establishing objectives for the teaching and instruction of that foreign language, to try and grasp, during the learning and instruction process, whether or not the learning objectives have been achieved, and the learners are on track. As such, a criterion-referenced test can be considered the best way of evaluating the level of achievement for each area. The basis of this idea is wanting to evaluate each area separately. A criterion-referenced test can help us to establish exactly what has been achieved within reading comprehension. Rather than simply awarding, say, 80% for overall reading comprehension, then, it can tell us that a learner scored 70% on conjunctions and 85% on demonstratives, giving us a much clearer picture. One clear example of this kind of evaluation, based on achievement levels, is the level system used in the Japanese Language Proficiency Test.

In this research, then, I intend to examine results achieved by learners of Japanese in reading comprehension, using the Chinese Proficiency Test and the Japanese Language Proficiency Test as reference, and then compare these results with the reading comprehension displayed by native speakers.

3. Research Objective

In this research, I will formulate reading comprehension tests designed to evaluate different, specific areas of ability. Using both the Chinese and Japanese versions of these reading comprehension tests, I will examine which areas of reading comprehension are problematic in learning Chinese and Japanese for Taiwanese children resident in Japan, who are bilingual speakers of both languages. I will compare the level of sentence comprehension demonstrated by the Taiwanese children to that of native (monolingual) speakers, and examine the results shown in each specific area, as well as considering the outcome from the perspective of how old the Taiwanese bilingual children were when they started to learn Japanese.

4. Research 1

In order to establish how much learners understand when they read a text in their second language, and what problems they encounter, I sought to formulate reading comprehension tests. The tests were drawn up by extracting questions from previous Chinese Proficiency Tests and Japanese Language Proficiency Test.

4-1. Method

4-1-1. Subjects

(1) Chinese native speakers: 100 high school students enrolled in public high schools in Taipei, Taiwan, with T-scores of around 55

(2) Japanese native speakers: 78 high school students enrolled in municipal high schools in Japan, with T-scores of around 55

4-1-2. Materials

Selecting the test tasks: Questions for the Japanese reading comprehension test were selected from past papers (1996-200) from Levels 1 and 2 of the Japanese Language Proficiency Test, as well as from high school (grades 1 through 3) Japanese language textbooks. In the same way, questions for the Chinese reading comprehension test were selected from past papers (1996-200) from Levels 1 and 2 of the Chinese Proficiency Test, as well as from high school (grades 1 through 3) Chinese language textbooks. I selected the questions according to those questions which were the most frequent, and which are vital for comprehension. Level 1 of the Japanese Language Proficiency Test assumes that learners have a high level of grammatical understanding, know a large number of kanji characters (around 2000 characters) and have a strong vocabulary (around 10,000 words). Such comprehensive Japanese language ability is assumed to have been reached after at least 900 hours of study. Level 2 demands a slightly lower level of grammatical understanding, knowledge of fewer kanji (around 1000 characters) and a smaller vocabulary (around 6000 words). Learners should be able to converse in Japanese, be able to read and write, and have studied Japanese for around 600 hours. For Level 1 of the Chinese Proficiency Test, the Society for Testing Chinese Proficiency, Japan requires that students have an advanced command of Chinese, with sufficiently high levels of comprehension and expression. For Level 2, students should have mastered Chinese grammar, and have the basic Chinese required for social interaction. Since the number of hours spent by my Japanese subjects learning Chinese and Japanese was greater than both periods noted above, I selected questions from Levels 1 and 2. Referring to the fact that the Japanese Language Proficiency Test categorizes its reading comprehension questions as testing one of five areas (Research Institute for Japanese Language Education, Tanaka 1999), and I classified each reading comprehension question as demonstrating understanding of one these five categories: reason, conjunction, explanation, whole text or demonstration (See Table 1).

Each of the reading comprehension tests was in a multiple choice format, with each answer to be selected from one of four options. I prepared one short text

Table 1 Reading Comprehension Tests : Tasks and Titles

	Task	Japanese (English translation)	Chinese (English translation)
Short text	Reason	From a Tokyo Electric advertisement, 25/03/1997	"I found some money"
	Conjunction	From "Intellectual Curiosity," Giyono Hatano & Kayoko Inagaki	"Greeting words"
	Explanation	From "Cats are sleepy on rainy days," Yoshiko Kato	"Life with fridges"
	Whole text	From "Talking Blank Spaces," Tatsuo Kira, from the Asahi Newspaper, 12/04/1911	"On dictionaries"
	Demonstration	From "The Logic of Proverbs," Shigehito Toyama	"Language and culture"
Long text	All tasks: reason, conjunction, explanation, whole text, demonstration	From "Trash and Urban Life," Isao Yoshimura	"Think about the sea - and protect it"

(around 280 characters for the Japanese, 285 for the Chinese) for each separate category, making a total of 5 short texts. I also prepared one long text (around 1250 characters for the Japanese, 660 for the Chinese), on which a question from each category was to be answered. This made the total number of questions ten for each test. I also carried out a preliminary study, on 9 high school students enrolled at a public high school in Taipei, Taiwan, and 3 Japanese high school students, before making my final selections on test questions.

4-1-3. Process

The tests were carried out simultaneously within school classrooms. I explained to the students that the tests were not designed to measure their academic ability, but rather the average levels of linguistic cognition amongst normal high school students. The subjects were passed question papers, and were asked to complete the test within one normal class period, around 40 minutes. On the front page of the test were printed the following instructions: This test has been designed with a view to establishing the native language proficiency of Japanese students. It has no relevance on your school scores. The test should be completed in 40 minutes. Please do not consult with dictionaries or discuss the answers with your friends. An example of how to complete the multiple choice answer sheet was shown, and the test was to begin once this front sheet was turned over.

4-2. Results

4-2-1. Can modes of reading comprehension be measured?

Tables 2 and 3 below indicate the mean values for each of the tasks on the reading comprehension tests, together with their standard deviations.

Table 2 Mean Value and Standard Deviation (SD) for each task on the Chinese reading comprehension test

	Mean (SD)
1. Reason	1.78 (0.50)
2. Conjunction	1.92 (0.34)
3. Explanation	1.93 (0.29)
4. Whole text	1.60 (0.57)
5. Demonstration	1.41 (0.71)

Table 3 Mean Value and Standard Deviation (SD) for each task on the Japanese reading comprehension test

	Mean (SD)
1. Reason	1.92 (0.31)
2. Conjunction	2.00 (0.00)
3. Explanation	1.77 (0.48)
4. Whole text	1.60 (0.59)
5. Demonstration	1.50 (0.68)

The variance analysis carried out on the figures for each task on the Chinese reading comprehension test (each task had a maximum possible score of 2.0) showed no significant difference between any of the tasks ($F(4,495) = 20.08, p < .01$). The results of a *Tukey* multiple comparison procedure showed no significant difference between 'conjunction' or 'explanation'. Marks for 'conjunction' and 'explanation' were significantly higher than those for 'reason' ($p < .05$). Marks for 'reason' were significantly higher than those for 'whole text' ($p < .05$), and marks for 'whole text' were significantly higher again than those for 'demonstration' ($p < .05$).

Table 3 shows the results of a variance analysis

carried out on the Japanese reading comprehension test. With the exception of 'conjunction,' which showed a variance of 0, significant differences showed between each category of task ($F(3,231)=10.26$, $p<.01$). The results of a *Tukey* multiple comparison procedure showed that marks for 'reason' were significantly higher than those for 'whole text' and 'demonstration' ($p<.05$). Marks for 'explanation' were also higher than those for 'demonstration' ($p<.05$). No significant difference was shown between 'reason' and 'explanation,' or between 'whole text' and 'demonstration.' As such, the results imply that it is possible to measure the categories of mistakes made in both Chinese and Japanese through reading comprehension test.

4-2-2. What are the evaluative criteria of the tests?

In order to establish valid evaluative criteria for the tests, I calculated the average number of marks, based on the total number of correct answers, from the results gained from administering both tests to native speakers of Chinese and Japanese (Figure 1).

The Chinese and Japanese reading proficiency tests made use of Levels 1 and 2 of the Chinese Proficiency Test and the Japanese Language Proficiency Test, which are highly regarded, and the result of which are used as reference material in determining university entrance. As figure 1 shows, both groups of native speaker high school students achieved over 85% in the respective tests. Reading is a complicated process, involving a sequential integration towards understanding through knowledge of vocabulary and comprehension skills. At high school level, students will use advanced levels of deduction and awareness to clarify the author's position, and furthermore there can be significant differences between the comprehension abilities of students. The average score of 85% plus for both tests, then, can be considered extremely reasonable. Moreover, having chosen Japanese and Taiwanese high school students with balanced T-scores in order to determine a

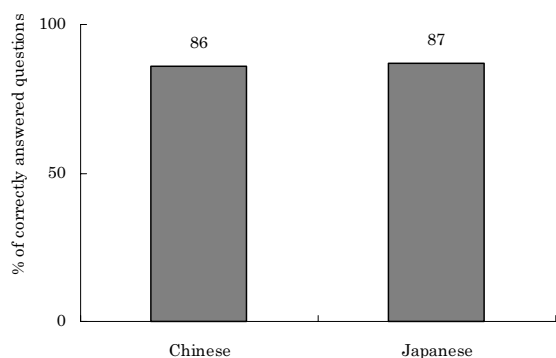


Figure 1 Ratio of correct answers in the Chinese and Japanese reading comprehension tests

native speaker sample also backs up the validity of the tests.

It would be possible, then, to use the questions in the reading comprehension tests to establish what children were achieving to a high level, and what they were not, and use them as an evaluative study. I determined the mean values for native speakers of Chinese and Japanese using reading comprehension tests based on the Chinese Proficiency Test and the Japanese Language Proficiency Test. The results showed the reading comprehension tests drawn up to be reliable and highly valid. As such, they were to be used to determine what areas prove problematic amongst the different aspects of reading in both languages for bilingual Taiwanese children living in Japan, the ultimate subjects of this research. The results gleaned would be compared with the data extracted from the native speaker group (the control group), and problem areas could then be typified.

The next task, then, was to determine the levels of reading comprehension in each category amongst Taiwanese children resident in Japan, using the reading comprehension tests already formulated.

5. Research 2

The purpose of this research was to examine which elements of reading comprehension posed problems in learning for Taiwanese children resident in Japan who were speakers of both Chinese and Japanese. The results on levels of reading comprehension were to be compared with the scores shown by the native speaker group, and each category examined individually.

5-1. Method

Research Design : A bifactorial design looking at 5 tasks (reason, conjunction, explanation, whole text and demonstration) and 2 levels of linguistic proficiency (Japan resident group and control group¹). The first factor is a within-subject factor, the second a between-subject factor.

5-1-1. Subjects

12 students whose native language was Chinese, with Japanese as their second language. All were second year Taiwanese high school students, resident in Japan. They will be referred to, hereinafter, as the Japan resident group. I divided them into three groups, according to when they started learning Japanese (in other words, when they came to Japan) as follows : under seven years old, between seven and ten years old, and over eleven years old². There were 5, 3 and 4 students in each respective group. Either one or both of the parents of

these subjects was Taiwanese, and the age at which they came to Japan varied greatly between having been born in Japan to arriving at age 14. They were, however, all enrolled in the same school, and were receiving the same language education. The language education used at their school was the immersion method³.

5-1-2. Methods

The reading comprehension tests drawn up for Research 1 were used for this research also. These tests divided up the reading comprehension tasks into five categories: reason, conjunction, explanation, whole text and demonstration. Each of the reading comprehension tests was in a multiple choice format, with each answer to be selected from one of four options. I prepared one short text (around 280 characters for the Japanese, 285 for the Chinese) for each separate category, making a total of 5 short texts. I also prepared one long text (around 1250 characters for the Japanese, 660 for the Chinese), on which a question from each category was to be answered. This made the total number of questions ten for each test. The maximum mark for each question was ten.

5-1-3. Process

The test was carried out one by one in a classroom at the students' high school. I asked each student not to reveal the contents of the test to students who had not yet taken the test. I handed out one copy each of the Chinese and Japanese tests, and asked for each one to be completed within one normal class period, around 40 minutes. I also explained that the purpose of the test was not to compare the academic ability of the test subjects, but to analyze the circumstances of language learning which persons living in bilingual environments (of Chinese and Japanese) experience, and to subsequently utilize this information as reference in providing guidance on learning second languages.

5-2. Results

I calculated the mean values for the reading comprehension test in each language, and examined the results. There were five categories of question in the reading comprehension test, with one question for each category, and each question having a possible score of ten.

5-2-1. Where are mistakes easily made in reading comprehension?

Firstly, I calculated the mean values for the overall group (Japan resident group), and compared these with the results shown by the native speaker groups (control groups) for both languages. Figure 2 below shows the mean values for the Japan resident and the control groups.

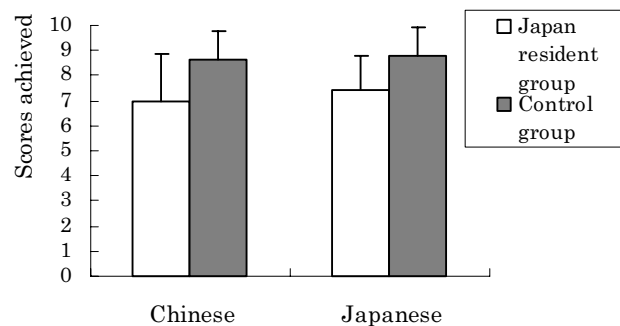


Figure 2 Average scores for Chinese and Japanese reading comprehension

Table 4 Mean value and Standard Deviation (SD) for reading comprehension in Chinese and Japanese

	Chinese	Japanese
Japan resident group	7.0 (1.9)	7.4 (1.4)
Control group	8.6 (1.2)	8.8 (1.2)

Table 4 shows the mean values and the standard deviation for reading comprehension in Chinese and Japanese for the Japan resident group, and for the native speakers of the respective languages. The distribution was not homogenous, so I conducted a Welch's t-test. The results of this showed a 1% difference between the reading comprehension results of the Japan resident group, and the respective control group for each language (two-tailed test: $t(12) = -2.98$). This revealed, then, that the mean values of the control group were higher than those of the Japan resident group.

Next, I compared the results from the Japan resident group for each separate category with those from the control group. For the Chinese reading comprehension test, the subcategories were divided as follows: reason, conjunction, explanation, whole text and demonstration. The mean values were calculated for each, and compared with the control group. The mean values for both the Japanese resident group and the control group are shown below in Figure 3. The mean values and standard deviation for each category are shown in Table 5.

Firstly, I examined reading comprehension ability in Chinese. One point was allocated to each question, and the total number of points calculated. I conducted a t-test on the results from the two groups, the Japan resident group, comprising of Taiwanese children resident in Japan, and the control group, comprising of native Chinese speakers living in Taiwan. The results show a difference of around 1% in the result for 'whole text' and 'demonstration' (two-tailed test: $t(110) = -2.84$; $t(110) = -3.45$ respectively). For 'reason' and 'explanation' there were no differences throughout the

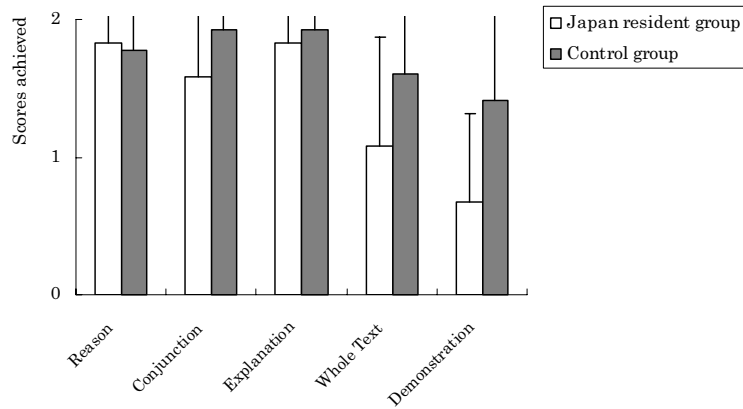


Figure 3 Average scores for Reading Comprehension in Chinese

Table 5 Mean Value, Standard Deviation (SD) and *t*-value for Reading Comprehension in Chinese

Category	Japan Resident	Control	<i>t</i> -value	Significance probability <i>p</i>
Reason	1.8 (0.4)	1.8 (0.5)	.35	.72
Conjunction	1.6 (0.5)	1.9 (0.3)	-2.21*	.047*
Explanation	1.8 (0.4)	1.9 (0.3)	-1.04	.30
Whole text	1.1 (0.8)	1.6 (0.6)	-2.84	.00**
Demonstration	0.7 (0.7)	1.4 (0.7)	-3.45	.00**

***p*<.01 **p*<.05

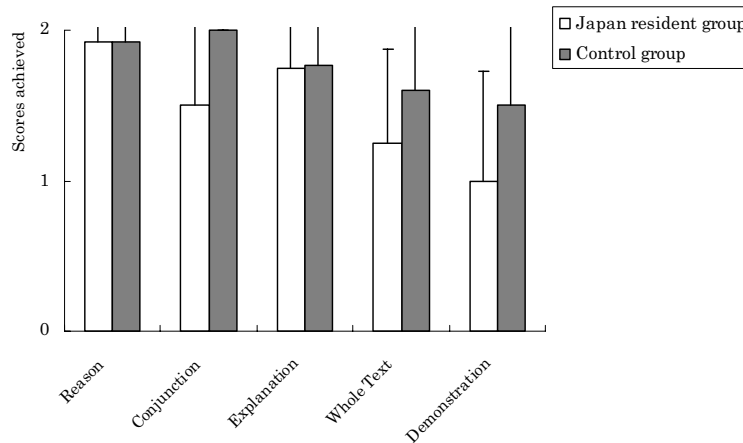


Figure 4 Average scores for Reading Comprehension in Japanese

Table 6 Mean Value, Standard Deviation (SD) and *t*-values for Reading Comprehension in Japanese

Category	Japan Resident	Control	<i>t</i> -value	Significance probability <i>p</i>
Reason	1.9 (0.3)	1.9 (0.3)	-0.07	.95
Conjunction	1.5 (0.8)	2.0 (0.0)		
Explanation	1.8 (0.5)	1.8 (0.5)	-0.13	.90
Whole text	1.3 (0.6)	1.6 (0.6)	-1.92	.06
Demonstration	1.0 (0.7)	1.5 (0.7)	-2.35	.02*

**p*<.05

results (two-tailed test : $t(110)=0.35$; $t(110)=-1.04$, *n.s.*) respectively).

The distribution in the results for ‘conjunction’ was not homogenous, so I conducted a Welch’s t-test, which showed a difference of 5% (two-tailed test : $t(12)=-2.21$). Overall, this indicated that, in Chinese reading comprehension, the Taiwanese children resident in Japan showed lower performance in the ‘conjunction’, ‘whole text’ and ‘demonstration’ categories.

In Japanese reading comprehension also, questions were divided into subcategories of reason, conjunction, explanation, whole text and demonstration, and the average results for each were calculated and compared with the control group. The results for each category from the Japan resident group and control group are shown in Figure 4, and the mean values and standard deviation are shown in Table 6.

Next, then, I examined reading comprehension ability in Japanese. One point was allocated to each question, and the total number of points calculated. I conducted a t-test on the results the two groups, the Japan resident group, comprising of Taiwanese children resident in Japan, and the control group, comprising of native Japanese speakers living in Japan. The results show a difference in the result for ‘demonstration’ ($t(88)=-2.35$, $p<.05$). For ‘reason’, ‘explanation’ and ‘whole text’ there were no differences (respectively, $t(88)=-0.07$; $t(88)=-0.13$; $t(88)=-2.35$; *n.s.*). For ‘conjunction’, the ratio of correct answers by the Japan resident group was 75%, where this had been 100% for the control group. This led me to presume that differences would be seen in both groups. Overall, this indicated that, in Japanese reading comprehension, the Taiwanese children resident in Japan showed lower performance in the ‘conjunction’ and ‘demonstration’ categories.

From the above results, we can see that, in terms of the acquisition of reading comprehension achieved by Taiwanese children resident in Japan, these children make more mistakes in both languages than do the respective native speakers. Moreover, the results demonstrated that, in Chinese the categories of conjunction, whole text and demonstration, and in Japanese the categories of conjunction and demonstration, posed the greatest difficulties. What this means is that the level to which Taiwanese children resident in Japan have mastered the conjunctive and demonstrative parts of speech, where the most prominent differences between Chinese and Japanese can be seen, is lower than the level demonstrated by native speakers.

5-2-2. Is bilingual reading comprehension connected to the age at which second language learning began?

The Japan resident group was also divided up into 3 age groups according to when the subjects started to learn Japanese : pre-schooling age (under 7 years old), schooling age (between 7 and 10 years old) and the post-sensitive age (11 years old +). The relationship between this group categorization and second language reading comprehension ability was then examined. A variance analysis was carried out, between the age that learning started (3)×reading comprehension (2). The first factor was a within-subject factor, the second a between-subject factor. Figure 5 below shows the average correct scores achieved.

I conducted a variance analysis on the age that learning started (3)×reading comprehension (2), for reading comprehension in both languages. The results showed a meaningful interaction between the age at which learning began and the comprehension scores achieved ($F(2, 9)=4.35$, $p<.05$). The main effect of the age at which learning began was also significant ($F(2, 9)=6.52$, $p<.05$). Having conducted a Tukey multiple comparison analysis, the level of Chinese reading comprehension showed by those children who had started learning Japanese in the post-sensitive age period (11 years old +) was significantly higher than that shown by either of the remaining groups, namely the pre-schooling age group (under 7 years old) and the schooling age group (between 7 and 10 years old). There was, by contrast, no significant difference in the Japanese reading comprehension ability demonstrated by any of the three groups. What this suggests is that the higher the age at which children start to learn a second language, the easier it is to maintain Chinese reading comprehension ability. Furthermore, the age at which children start to learn Japanese appears to bear no relation on Japanese reading comprehension.

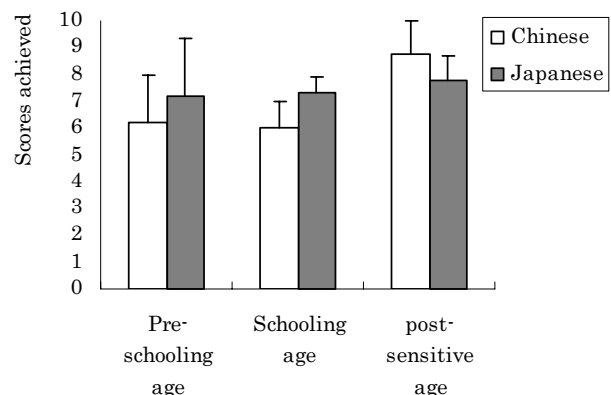


Figure 5 Correct Scores Achieved in Reading Comprehension for each Age Group

6. Observations

In this research, I have attempted to examine what influence the differences in language structure have on language learning, in the case of children learning both Chinese and Japanese. In addition to an investigation into the influence of language structure difference on the upkeep of Chinese language proficiency, and the study of the Japanese language for bilingual learners, I have also considered the question from the perspective of how old learners were when they began to study Japanese, their second language.

The acquisition of reading comprehension ability poses certain problems in each language: for Chinese, these were shown to be located in the categories of ‘conjunction’, ‘whole text’ and ‘demonstration’, and for Japanese in the categories of ‘conjunction’ and ‘demonstration’. Conjunctions serve to help the reader’s textual comprehension, by clarifying the relationship between sentences, and helping to construct the overall meaning of the text. Chinese often expresses logical relationships without recourse to conjunctive phrases; this could well be the reason that conjunctions can prove problematic in reading comprehension. For the subjects of my research, conjunctions were also a problem when tackling Japanese texts. Also difficult for the subjects were contextual demonstratives, which indicate whether or not precedent predicative content agrees with subsequently clarified content. Such demonstratives are useful in grasping the overall meaning of a text during reading comprehension, and are significant as such. Research by Morizuka (2003), which reviewed Japanese demonstratives and the research on acquisition that has been carried out thus far, referred to the “idea that full understanding and acquisition of Japanese demonstratives is difficult even at advanced levels”. In particular, Japanese uses three distinctions for demonstratives (ko (here), so (there - away from speaker but close to listener), and a (there - away from both speaker and listener)), whilst Chinese uses only two (equivalent to the Japanese ko and a). It is perhaps likely that these concepts of demonstrative differentiation are hard to grasp, and acquisition becomes thus difficult.

Moreover, there appears to be a relationship of mutual influence between first and second languages. A significant positive correlation ($r=.71$, $p<.05$) was shown between the Japanese and Chinese reading comprehension tests. This suggests that children with high levels of reading comprehension ability in Chinese have similarly high levels of reading comprehension ability in Japanese, and development of one language contributes

to development in the other. This is a similar result to that suggested by Cummins (1983) in his hypothesis on linguistic interdependence, in which an interdependent development relationship establishes itself between both languages. Japanese texts, moreover, utilize a large number of kanji characters, and it is likely that there is a positive transference of character knowledge from the subjects’ native language of Chinese into their Japanese language learning.

Discrepancies were seen in the levels of reading comprehension acquired by bilingual children, according to the age at which Japanese language learning was begun. The overall trend appeared to imply that it was children who began learning Japanese in the post-sensitive age group (11 years old +) who found it easiest to both acquire reading comprehension ability in a second language and maintain it in their first. There is no doubt that this is because older children coming to reside in Japan will have spent more years in their native country, and as such vocabulary, grammatical understanding, and reading comprehension are better retained. In terms of acquiring reading comprehension in Japanese, however, there appeared to be no relationship between the age at which Japanese language learning was begun, and the level to which comprehension had been acquired. Despite the fact that, out of all three groups, the post-sensitive group (11 years old +) had been resident in Japan for the fewest number of years, the results showed similar levels of comprehension acquisition. One possible reason for this would be that, since it is easier for older learners to retain their native language, this same native language exercises a positive influence on the acquisition of the second language.

Moreover, the results showed that despite having vocabularies similar to those of native speakers, children who had been living in Japan since a very early age were demonstrating insufficient levels of reading comprehension. The schools at which the research subjects were enrolled employed the immersion method of education, and did carry out some classes in both languages, but these results imply that, for younger children, the acquisition of reading comprehension ability in two languages can be difficult. By contrast, the results implied that those children who moved to Japan after 11 years old (the post-sensitive group) found it easy to both acquire a second language, and maintain their first.

The findings of this research, therefore, imply that the retention of reading comprehension ability in one’s native language is easier after the post-sensitive period. Similar results were shown by research by Cummins

and Nakajima (1985) which focused on the development of reading comprehension ability in English and the retention of Japanese language amongst young Japanese children attending a local school in Canada. However, this research had demonstrated that it was children who had moved to Canada between 7 and 9 years old who found it easiest to achieve T-scores in reading comprehension equivalent to those of native English speakers, followed by those aged between 10 and 12. The findings of this research, which indicate that children who start learning aged 11 and above find language acquisition the easiest, point to a slightly different age group. Since, however, the school-age children (7 to 10 years old) examined in this research were, when they arrived in Japan, at a stage whereby they were learning characters, more vocabulary and more difficult grammar. Their first language would also still have been at a formative stage, and thus one can surmise that, when learning two languages simultaneously, considerable effort would have been required to process both the first and second languages, making the retention and acquisition of vocabulary more difficult. Ability in reading comprehension is, fundamentally, based on vocabulary (Takahashi, 2001), and we can conclude that, for school-age children, the retention and acquisition of strong vocabularies become difficult, which subsequently creates problems with reading comprehension. The fact that Japanese uses a high number of kanji characters within its texts is likely one of the reasons why knowledge of characters from native Chinese can have such an influence on Japanese reading ability.

Overall, the results shown by this research make it possible to say that, whether looked at from the perspective of the relationship between the age at which children start learning a second language and the linguistic systems of those languages, or from the perspective of a comparatively strong correlative relationship between reading comprehension abilities in the two languages, children who newly acquire a second language having already built up firm foundational knowledge in the first do not suffer any decline in Chinese reading comprehension abilities, and enjoy greater progress in their Japanese reading comprehension skills.

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(Notes)

1 Subjects for the formulation of the reading comprehension (research 1). For comparative purposes, the data from the reading comprehension tests drawn up for research 1 were used in the analysis of research 2. The subjects of the Chinese reading comprehension test were 100 high school students enrolled in a public high school in Taipei, Taiwan, with T-scores of around 55. For the Japanese reading comprehension test, the subjects consisted of 78 high school students, enrolled in a municipal high school, with T-scores of around 55.

2 Having started school, children begin to learn practical

activities and skills in reading and writing, making a transition gradually from spoken to written language (Shimizu, Uchida : 2001). As children notice the functions of writing, so their ability to learn consciously and systematically is promoted. Learning reading and writing skills on starting school, then, is an extremely important stage in linguistic development. Moreover, at age 11, school children move from the concrete operational stage to the formal operational stage, and the development of language that will form the basis of thought structure thus has an important role to play. In addition, Lenneberg's (1967) critical period hypothesis refers to the period lasting until the early teens, which is why this research chose to split the subjects into age groups at the boundaries of 7 and 11.

- 3 An immersion program is a method of bilingual education that attempts to encourage the simultaneous development of two languages by using one or other of the languages in school for different subjects (e.g. social studies in Japanese, math and sciences in Chinese, etc.), regardless of the language used by children at home. In other words, the second language is not the object of the class, but rather is used as

a tool in teaching a class in a second language to children of a differing native language. Immersion programs are classified differently according to the number of classroom hours, but the subjects in this research used Japanese language textbooks in social studies, math, history and science, and Chinese language textbooks in geography, art, Chinese language, and home economics. The teachers and students use the language of the relevant textbook to conduct the class. The teachers are split evenly between Japanese and Taiwanese teachers. There are 35 class hours per week.

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