Title	Attrition of Orthographic Skill in Logographic Written Language: Case of Japanese-speaking Native Chinese in Japan
Author(s)	,
Citation	
Issue Date	2018-03
Type	Thesis or Dissertation
Text version	author
URL	http://hdl.handle.net/10119/15151
Rights	
Description	Supervisor: , ,

JAIST
JAPAN
ADVANCED INSTITUTE OF
SCIENCE AND TECHNOLOGY

Japan Advanced Institute of Science and Technology

Master's Thesis

Attrition of Orthographic Skill in Logographic Written Language: Case of Japanese-speaking Native Chinese in Japan

1610182   MILAYI AHEMAITI

Supervisor: Takashi Hashimoto
Main Examiner: Takashi Hashimoto
Examiners: Nam Van Huynh
Mitsuru Ikeda
Hiroyuki Honda

Attrition of Orthographic Skill in Logographic Written Language: Case of Japanese-speaking Native Chinese in Japan

MILAYI AHEMAITI

School of Knowledge Science
Japan Advanced Institute of Science and Technology
March 2018

‘Language attrition’ describes losing a language because of lack of use by speakers who have changed their language environment (Schmid 2011). In language use, four skills are needed: listening, speaking, reading, and writing. In attrition research, speaking and listening have been studied, for they are essential for communication, the attrition of reading and writing skills have not been paid enough attention, although such skills are important in the modern society.

An indispensable skill for reading and writing is the orthographic skill that is the ability to use orthographic knowledge to read and write words. In general, writing systems on which orthographies are based are divided into two: phonographic, such as using alphabetic characters, and logographic, such as using kanji characters. The attrition of orthography skills in a phonogram system has recently been found (Ntim 2016), but in logogram systems is still not clear. Psychological researches suggested an intrinsic difference concerning the processing mode of the two scripts (Biederman and Tsao 1979; Saito 1981; Park and Vaild 1995). Therefore, we aim to clarify a factor which can affect the attrition of orthographic skill in a first language with logographic written language.

As objects to investigate the attrition of orthographic skills in logographic written languages, we chose Chinese (L1) and Japanese (L2), the representatives of logographic written languages. Many kanji characters expressing similar meanings in both languages have similar but somewhat different writing structures due to divergent modification histories. Since this feature may confuse Chinese speakers who have learned Japanese, we hypothesized that the similarity

of characters in both languages affected on the attrition of orthographic skills in Chinese under exposure to Japanese environment regarding orthographic use. Particularly, we focused on answering the following questions:

i. Whether does Japanese influence on the orthographic perception of Chinese in logographic written language.

ii. Do proficient Japanese-speaking native Chinese in Japan likely to manifest signs of attrition in their Chinese handwriting?

iii. Can similarity of characters in both languages hinder to writing accurate characters for Japanese-speaking native Chinese in Japan?

We conducted a dictation task of sentences and words containing Chinese characters with various similarity to corresponding Japanese characters to measure the orthographic skills of Chinese speakers who have learned Japanese and currently living in Japan. Additionally, in order to observe the effect of Japanese Kanji on the written of Japanese-speaking native Chinese who live in Japan, we chose a group of the native Chinese speaker who has never learned or lived in Japan as our control group.

The dictation task tested about the correspondence between phonology and orthography by asking participants to write what they have heard. The number of characters mistakenly written were analyzed using a 2×3 mixed design ANOVA between groups (control, experimental; between subjects) and types of characters (High similarity, Low similarity, Different; within subjects), where the control group consisted Chinese native speakers who have not learned Japanese and have not lived in Japan. The result showed that there was a significant interaction between the group and the type of characters. Therefore, we examined the simple main effects of groups within each type. The results showed that there were significant for the all types between two groups. The simple main effects of three types of characters within each group was not significant in the control group, but significant in the experimental group. Moreover, the bonferroni test was conducted to determine which means differ in the three types of characters from the results of the experimental group. It revealed that there was no significant difference between the low similarity characters and different character type, but there was a significant difference between high and the other two types. These results suggested that the Chinese speakers who have learned Japanese and currently living in Japan failed to write accurate Chinese characters with high similarity to corresponding Japanese characters.

In order better learned whether there was other factor may influence the inaccuracy of experimental group. We have analyzed the relation between inaccuracy mean in dictation task and each influential factors (such as participants' age, length of living in Japan, tendency languages use in the term of orthography, etc), according the participants responded to the questionnaires. The results show that any of these factors involved in current research questionnaire was not related with the inaccuracy mean in dictation task. The reasons for this result could be various, such as the limitation number of participants, or could be the less long length of residences in Japan, on the contrary, the similarity character in both languages as the main factor was found in current research, which effect on the attrition of orthographic skill of

Japanese-speaking native Chinese in their Chinese characters written.

In conclusion, this study has examined language attrition in the orthographic writing skill in Chinese under the influence of Japanese. The results suggested that native speakers of Chinese tended to lose some aspects of the native orthographic skill in writing characters under exposure to Japanese environment regarding orthographic use. It was also suggested that the similarity of characters in both languages affected the attrition of orthographic skills in Chinese. They mean that the attrition of orthographic skill exists in logographic written language, at least in the situation of L1 as Chinese and L2 as Japanese. Current research also gives some indications that the attrition of orthographic skill in the first language may occur when both first and second languages belong to logographic written languages.

Acknowledgements

Several people made this research possible, to them I would like to express my gratitude. I am especially indebted to my supervisor, Prof. Takashi Hashimoto, I have benefitted greatly from his deep knowledge and inspiring ideas, and for that I could not be more grateful. He was extremely patient while teaching and guiding me throughout my project.

I would like to thank my Examining Committee for their support and advice: Prof. Huynh Van Nam, Prof. Mitsuru Ikeda, and Prof. Honda. Also I thank in particularly my second supervisor Prof. Fujinami, his effective feedback helped clarify my ideas and reach the final version of the thesis. I warmly thank them all for all the precious time invested to improve my research.

I would also like to acknowledge my lab members, for helping me throughout these past three years, and a specially thanks to Assistant Prof. Shigeto Kobayashi, also my senior Guanhong Li, TOYA Genta and FUJIWARA Masayuki, for their valuable suggestion on my research.

Finally, I would like to express my gratitude towards my parents, my sister and all my family for their love and encouragement. Thank you.

Contents

List of Figures

List of Tables

Chapter 1
Introduction

The thesis aims to clarify a factor which can affect the attrition of orthographic skill in first language with logographic written language. Particularly, focus attention on find out a possible factor can affect the attrition of orthographic skill in Chinese characters under exposure to Japanese environment regarding orthographic use. In this chapter, we introduce the background, purpose and structure of current research.

1.1. Research Background

'Language attrition' describes losing a language because of lack of use by speakers who have changed their language environment (Schmid 2011).

In language use, four skills are needed: listening, speaking, reading, and writing. In attrition research, speaking and listening have been studied, for they are essential for communication, the attrition of reading and writing skills have not been paid enough attention, although such skills are important in the modern society.

An indispensable skill for reading and writing is the orthographic skill that is the ability to use orthographic knowledge to read and write words. In general, writing systems on which orthographies are based are divided into two: phonographic, such as using alphabetic characters, and logographic, such as using kanji characters. The attrition of orthography skills in a phonogram system recently has been found by (Ntim 2016), but it is still not clear in logogram systems. Psychological researches suggested an intrinsic difference concerning the processing mode of the two scripts (Biederman and Tsao 1979; Saito 1981; Park and Vaild 1995). Current research tries to fill this gap.

1.2. Research Purpose

We aim to clarify a factor which can affect the attrition of orthographic skill in a first language with logographic written language.

We set our research question as the following:

i. Whether does Japanese influence on the orthographic perception of Chinese in logographic written language.

ii. Do proficient Japanese-speaking native Chinese in Japan likely to manifest signs of attrition in their Chinese handwriting?

iii. Can similarity of characters in both languages hinder to writing accurate characters for Japanese-speaking native Chinese in Japan?

In order to observe change of orthographic skill in L1 under the influence of L2 in logographic written language. Therefore, we choose Chinese (L1) and Japanese (L2) as an investigate target because of that many kanji characters expressing similar meanings in both languages have similar but somewhat different writing structures due to divergent modification histories. This feature may confuse Chinese speakers who have learned Japanese

1.3. Research Method

Since we mentioned before that similar feature may confuse Chinese speakers who have learned Japanese, we presume that the Chinese speakers who have learned Japanese and currently living in Japan may fail to write accurate Chinese characters with high similarity to corresponding Japanese characters. Thus, our hypothesis is the following:

Hypothesis: The similarity of characters in both languages affected on the attrition of orthographic skills in Chinese under exposure to Japanese environment regarding orthographic use.

We conducted a dictation task of sentences and words containing Chinese characters with various similarity to corresponding Japanese characters to measure the orthographic skills of

Chinese speakers who have learned Japanese and currently living in Japan. Additionally, in order to observe the effect of Japanese Kanji on the written of Japanese-speaking native Chinese who live in Japan, we chose a group of the native Chinese speaker who has never learned or lived in Japan as our control group. The dictation task tested about the correspondence between phonology and orthography by asking participants to write what they have heard.

Additionally, in order better learned whether there was other factor may influence the inaccuracy of experimental group. We have analyzed the relation between inaccuracy mean in dictation task and each influential factors (such as participants' age, length of living in Japan, tendency languages use in the term of orthography, etc), according the participants responded to the questionnaires.

1.4. Structure of this Thesis

The present dissertation is structured as follows:

Chapter 2 introduces the concept of language attrition, and about first language attrition as well. We also hypotheses model generally used in language attrition research. Furthermore, the related researches were reviewed.

Chapter 3 presents the topic formulation of this research. The necessity of current research from introducing the written systems with more detail information, the reasons of selecting Chinese and Japanese written languages as our research targets. In the end, we present our hypothesis.

Chapter 4 present the ideas on the experimental design for proving the research hypothesis, including participants, the experiment produce like measuring instruments and material used in the experiment.

Chapter 5 present the result analysis from the experiment. We also show the more specific analyzation on relation between the mean of inaccuracy in high similarity type of character and possible influential factors from questionnaire.

Chapter 6 present the summarization about the results from the experiment and discussed

on the suggestion based on the results. Limitations of the research conducted are considered.

Finally, Chapter 7 consists of explanation of conclusion, limitations of the research conducted are considered, and suggestions for future research into the topic were provided.

Chapter 2
Literature Review

In the last chapter, we addressed our research question based on the background issue which we try to clarify. In this chapter, we present the concept about language attrition and first language attrition. In addition, this chapter also present the hypotheses model that generally used in language attrition research. In the end part, review the related attrition research in orthographic skills.

2.1. Language attrition

Language attrition, as the opposite of language acquisition, is the process of losing a language. But using the term loss, should be more specific, because languages shift and language death, even aphasia and dementia are all consequences of a loss of a language.
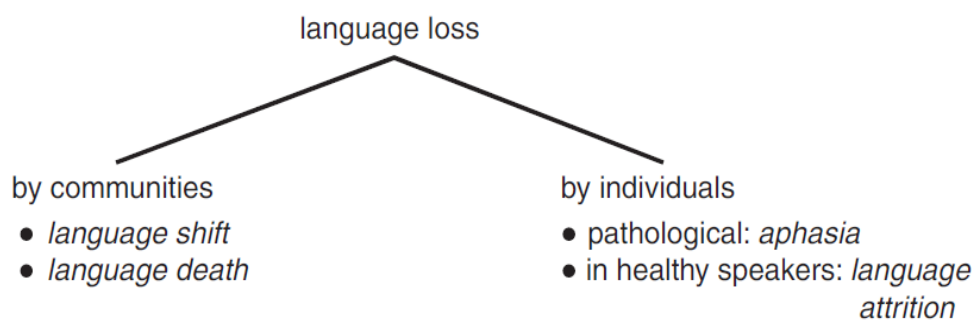
Figure 2-1. The Terminology of language loss (Schimid, 2011)

Schimid has classified the different types of language loss according to the affected group size. The first class is on a community level which includes both language shift and also language death. The other class is on the smaller group of individual level and includes both aphasia as well as language attrition. This classification is shown in Figure 2.1.

Language attrition refers to a process of decrease in the level of language proficiency. This can be gradual either for some of the language skills or parts of the language on a group level or an individual level. According Herdina and Jessner this is a slow process and not as obvious as sudden total language loss (Herdina & Jessner, 2002).

2.2. Attrition in First Language

Attrition of the first language skills (L1) can be thought of as the degradation in those skills of the native language of a bilingual individual or group while they are improving in another new language (L2). The degradation can affect the L1 system in different ways such as; mixing L1 with L2, dilution of L1, or just feeling uncomfortable or doubtful when using L1.

L1 attrition can generally be attributed to the following: first the gradual improvement of the L2 system. This improving of L2 skills manifests itself in the different linguistic skills of L1, which multilinguals usually experience. Seliger & Vago in 1991 referred to that degradation in the L1 system as the externally induced language change (Seliger & Vago 1991). They attributed this change to the rivalry and crosslinguistic influence. All Multilinguals show similar lingual contact some clearer than others. The second cause of language attrition can be expressed and felt in the decrease of L1 handling, as in long travel situations and possible altering from the internal induced language. Gradually the lack of handling of the L1 system causes over simplification of structure besides skills. Only both causes together can result in the struggle between L2 and L1 that can lead to language attrition (Seliger & Vago, 1991).

Still with both factors present some special cases might be more immune to language attrition. First, when bilingual individual(s) are maintaining their L1 linguistic traditions are less likely to suffer from language attrition. Also the case of limited influence of L2 or restricted struggle with L1 as in a supposedly desert-island case. Instead that case can cause language 'atrophy'. (Seliger & Vago, 1991).

2.3. Models of language attrition -- Activation Threshold Hypothesis

This section introduces the model from the Activation Threshold Hypothesis (Paradis 1993). Generally, it is used in language attrition research to explain the interaction between the different language systems.

Attrition has been expressed as two cognitive processes namely, L2 influence and the scarce use on L1 (Köpke, 2004: 17). Activation Threshold Hypothesis by (Paradis, 1993, 2007; see also Gürel, 2004; Köpke, 2002) implies that not practicing L1 increases the activation thresholds. Eventually this results into L2 interference as well as fading links in L1. Being able to recall past memories depends upon how often that specific memory is being used. Recalling also depends on how strong is the activation/inhibition framework. Brain activation and inhibition is responsible for the multitude of languages practiced which altering patterns of dominance (Kopke and Schmid 2004: 23).

2.4. Language attrition research in Orthographic skills

Most of attrition research were focus on spoken language, but in language use, the skills like reading and writing also very important in the modern society.

An indispensable skill for reading and writing is the orthographic skill that is the ability to use orthographic knowledge to read and write words. In general, writing systems on which orthographies are based are divided into two: phonographic, such as using alphabetic characters, and logographic, such as using kanji characters. As mentioned earlier, although (Ntim 2016) found the attrition of orthography skills in a phonogram system. While it is still not clear in logogram systems. Psychological researches suggested an intrinsic difference concerning the processing mode of the two scripts (Biederman and Tsao 1979; Saito 1981; Park and Vaild 1995). Therefore, we aim to clarify a factor which can affect the attrition of orthographic skill in a first language with logographic written language.

Chapter 3
Research Hypothesis Formulation

In last chapter, related literature was presented. In this chapter, through briefly introduce two different writing system, we explain the reason for chose Chinese and Japanese written language as our investigate target. Lastly, we address the research hypothesis of this research.

3.1. Writing Systems in Alphabetic and Non-alphabetic

In general, writing systems on which orthographies are based are divided into two: phonographic, such as sound-based using alphabetic characters, and logographic, such as using kanji characters.

Psychological researches suggested an intrinsic difference concerning the processing mode of the two scripts (Biederman and Tsao 1979; Saito 1981; Park and Vaild 1995). Compare with sound-based symbols, meanings obtain faster from logographs. On the other hand, reading loud is achieved faster than logographic in phonetic scripts.

3.2. Orthography in Chinese Characters and Japanese Kanji

As objects to investigate the attrition of orthographic skills in logographic written languages, we chose Chinese (L1) and Japanese (L2), the representatives of logographic written languages. Many kanji characters expressing similar meanings in both languages have similar but somewhat different writing structures due to divergent modification histories. Since this feature may confuse Chinese speakers who have learned Japanese, we hypothesized that the similarity of characters in both languages affected on the attrition of orthographic skills in Chinese under exposure to Japanese environment regarding orthographic use.

In Chinese, the characters called hanzi and in Japanese equivalent kanji.

In the first millennium the Japanese began to absorb Chinese civilization. Everything in modern Japanese orthography comes from Chinese characters. However, due to the great difference between the two languages, the process of rewriting Japanese characters is often highly indirect. The end result is a purely systematic script with system approximations. Japanese writing is a mixed system, with both logographic and photographic.

Despite both hanzi and kanji from the logographic writing system, characters correspond to morphemes in their own languages.

According to the Law of the People's Republic of China, Article 17, regarding the standard spoken and written Chinese language, the original traditional or its variant forms of the Chinese characters may be retained or used under the following cases:

(1) cultural relics and historic sites.

(2) surnames.

(3) works of art such as calligraphy and seal cutting.

(4) handwritten inscriptions and signboards.

(5) when required in the publishing, teaching and research.

Other special cases must be approved by the relevant departments under the State Council. (Lowinfochina, 2001).

3.3. Research Hypothesis

It is necessary to learn the fact about the attrition of orthographic skill in first language with logographic written language. In this research, we aim to clarify a factor which can affect the attrition of orthographic skill in a first language with logographic written language. Therefore, we chose orthography between Chinese characters and Japanese kanji as our investigate object.

We used dictation task to assess how the Japanese kanji affect the Chinese character. The dictation task tested about the correspondence between phonology and orthography by asking participants to write what they have heard. We suppose both languages have similar but somewhat different writing structures may confuse Chinese speakers who have learned

Japanese, we hypothesized that the similarity of characters in both languages affected on the attrition of orthographic skills in Chinese under exposure to Japanese environment regarding orthographic use.

Chapter 4
Experiment

In last chapter, we have presented the difference of orthographies between Chinese and Japanese in written languages. Based on that, we proposed our hypothesis. Therefore, this chapter describes the methodology of current study. Participants, materials and experimental procedures will introduce respectively.

4.1. Participants

As we described in last chapter, our hypothesis is that the similarity of characters in both languages affected on the attrition of orthographic skills in Chinese under exposure to Japanese environment regarding orthographic use. To measure the orthographic skills of adult Japanese-speaking native Chinese who lives in Japan, on their written language, we need to compare them with the adults native Chinese who have never learned Japanese or lived in Japan.

The control group participants were recruited native Chinese in China, who have never learned Japanese and been to Japan. The mean age of the control group was 24.1, range from 20 to 30 (SD = 1.6).

The experimental group participants were recruited the native Chinese who have learned Japanese, and also passed the Japanese language proficiency test N1 level. The mean age of experimental group was 25.4 ranged from 22 to 34 (SD = 2.1).

All of the participants' native language are Chinese. And They all do not have dyslexia.

4.2. Material

4.2.1. Stimuli

In order to investigate whether Japanese kanji will obstruct to the Japanese-speaking native

Chinese write standardized Chinese character. We selected the characters as our research subject based on following steps.

We selected 54 Chinese character as our test subject. All these characters belong to Table of General Standard Chinese Characters (2013), and their corresponding Japanese kanji are also belonging to the list of Jōyō kanji, the kanji for ordinary use. The reason we chose the Chinese characters from the range of regular used characters was that, we try to avoid the terminology which were used for special field. Because the characters in these kind words were forgotten simply because have not been used for a long time, but not due to the influence of Japanese Kanji's interference. Therefore, we choose the regular use characters in both Chinese and Japanese written languages as our research investigate subject.

We classify the 2136 regular used Japanese kanji with their corresponding Chinese characters are divided into three categories:

1. Chinese characters and Japanese kanji are the same
2. Chinese characters and Japanese kanji with part of the same structure
3. Chinese characters and Japanese kanji are completely different

In order to examine in whether the characters with similar but somewhat different writing structures between Chinese characters and Japan kanji, may interference the Japanese-speaking native Chinese in Japan, during their writing in Chinese characters. First of all, we eliminated the Japanese Kanji same with the Chinese characters. Secondly, we divide the completely different characters between Chinese characters and Japanese kanji into different character type, we used this type compare them with the high similarity type of characters. Then, we divided the categories of the Chinese characters and Japanese kanji with part of the same structure by counting the strokes of the characters. In the first step, we first counted the total strokes of Japanese kanji, and the corresponding Chinese character's total stokes. For the second step, we have calculated the number of same strokes in each Chinese-Japanese corresponding characters. During this work, we found that we could not decide the similarity between the Chinese and Japanese characters only by counting the same strokes that they have. Because there will be

two sets of Japanese with corresponding Chinese characters, their number of similar strokes is the same, however, the number of different strokes in two sets were unequal. Therefore, we sorted the list according to the different stroke in each set of Chinese and Japanese characters. The range of different strokes was from 1 to 18, and we divide it into three types: high similarity character type, which in the number of different strokes was from 1 to 6; the number of different strokes from 7 to 12 as the low similarity character type; and the number of different strokes from 13 to 18 join into the previous different character type, because although they have some similar strokes, but their number of different strokes far exceeds their similar strokes, and they almost look like two different characters, thus we chose to put them together.

We selected 54 Chinese characters by random selection use in current experiment. In each of the three types, we selected 18 Chinese characters, and divided into two parts, one parts for sentences dictation task and one for the words dictation. All the characters used for dictation experiments are shown in table 4-1 and 4-2.

Types	Simplified	Kanji	Traditional	Sentence
High	齿	齒	齒	这都是一些<u>不足挂齿</u>的小事。
	贝	貝	貝	退潮后沙滩上会出现许多<u>贝</u>壳。
	长	長	長	他跟大家分享了自己的成<u>长</u>历程。
	视	視	視	我们非常重<u>视</u>顾客提出的意见。
	愤	憤	憤	他的行为让周围的人都感到气<u>愤</u>。
	场	場	場	我们应该在公共<u>场</u>合注意自己的言行。
	资	資	資	这个国家有丰富的矿产<u>资</u>源。
	辈	輩	輩	我们对待长<u>辈</u>应该要有礼貌。
	规	规	規	客观<u>规</u>律是不以人的意志为转移的。
Middle	马	馬	馬	街上来往车辆很多，过<u>马</u>路一定要留神。
	习	習	習	经过反复练<u>习</u>，她的演奏水平有了提高。
	关	関	關	我们的目标是进一步巩固贸易<u>关</u>系。
	伟	偉	偉	他被认为是本世纪的最<u>伟</u>大作家之一。
	犹	猶	猶	你再这样<u>犹</u>豫下去就会错过这个机会。
	职	職	職	她具备从事这个<u>职</u>业的能力。
	针	針	針	没有目标就像出海航行没有指南<u>针</u>。
	难	難	難	这个实验的<u>难</u>度是非常大的。
	离	離	離	<u>分离</u>多年的母女终于相见了。
Low	书	書	書	爸爸笑容满面地看着我的获奖证<u>书</u>。
	惊	驚	驚	比赛结果使大家都感到很吃<u>惊</u>。
	妆	粧	妝	她对化<u>妆</u>有浓厚的兴趣。
	丑	醜	醜	那件<u>丑</u>闻足以使他身败名裂。
	艳	艶	豔	<u>鲜艳</u>的红旗迎风飘扬。
	顾	顧	顧	售货员热情地向<u>顾</u>客介绍商品。
	网	網	網	<u>网</u>络让我们的生活联系得越来越紧密。
	击	撃	擊	这突如其来的攻<u>击</u>，使他摸不着头脑。
	药	薬	藥	车站附近新开了一家<u>药</u>店。

Table 4-1. Stimuli used in sentences dictation

Types	Simplified	Kanji	Traditional	Words
High	气	気	氣	空气
	车	車	車	自动车
	风	風	風	风景
	连	連	連	连续
	冻	凍	凍	冷冻
	实	実	實	实验
	题	題	題	课题
	终	終	終	最终
	调	調	調	调查
Middle	鸟	鳥	鳥	鸟类
	乡	郷	鄉	故乡
	开	開	開	开发
	彻	徹	徹	彻底
	违	違	違	违法
	欢	歓	歡	欢迎
	愿	願	願	愿望
	钓	釣	釣	钓鱼
	驱	駆	驅	驱动
Low	优	優	優	优秀
	卫	衛	衛	防卫
	乐	楽	楽	快乐
	兴	興	興	兴奋
	忆	憶	憶	记忆
	众	衆	衆	群众
	杰	傑	傑	杰作
	怀	懐	懷	怀念
	后	後	後	后悔

Table 4-2. Stimuli used in words dictation

15

4.2.2. Dictation task

Both groups were given an experimental task: Chinese dictation task. This task tested on participants' orthographic written skill in Chinese characters. We chose to use dictation task in current study, because of the general experiment used in language attrition research did not directly meet the purpose of this study. In the preliminary experiment, we used the task of film retelling and transcription according from former research Ntim (2016) which was on attrition of orthographic skill in first language with alphabetic written language. This task tested about the correspondence between phonology and orthography by asking participants to retell and transcribe what they have seen from a silent film. Although this experiment reflected different level on the lexical diversity and lexical frequency profiles of participants, and we also have found inaccuracy in their transcription. However, in current research we were not focus on lexical level, more importantly, in the process of describing the film, some participants repeatedly using some simple words in their description. Although there were not many mistakes found in their transcription, but there was an assumption that they were deliberately avoiding the using more complex express. In addition, the measurement was getting difficult to deal with various description contents. Thus, we considered use dictation task was more suitable for testing orthographic written skill by giving the participants certain context.

As we mentioned last session, we compared the similarity between Chinese characters and Japanese kanji according to the list of Joyo kanji (regular-use Chinese characters). All of the selected Chinese characters were also existed in Table of General Standard Chinese Characters (2013), to make sure that these characters commonly used in both languages daily life. The reasons we chose to use Chinese characters based on these lists, was that to avoid the appearance of certain characters just used in certain field only. These kinds of Chinese character were forgotten simply because have not been used for a long time, but not due to attrition. As we introduced in the previous chapters, two internal and external factors which cause the attrition. Therefore, we choose the regular use characters in both Chinese and Japanese written languages as our research investigate object.

4.2.3. Questionnaire

With the purpose to understand the participants' basic personal information, language learning background and tendency use of language, we conducted the Personal Language Background Questionnaire (Appendix 1). This questionnaire only target for the participants from experimental group.

It consisted of participants' basic information age and gender, the length of learning Japanese, and length of residence in Japan. We also measure participants' Japanese proficiency level by the score of Japanese-Language Proficiency Test for Japanese Advanced level N1. From asking the participants these questions, we tried to found out more additional factors may affect the inaccuracy in dictation task.

4.3. Experiment Procedure

The conducted experiment in current research consisted of three parts, as shown in Figure 5-1. Because of current experiment tested participants' orthographic skills, we did not want any introduction document used in this experiment may influence the result. Therefore, we used voice material instead of introduction documents involved before the dictation task.

Sentences Dictation	➡	Words Dictation	➡	Questionnaire

Figure 4-1. Flowchart of the experiment

Step 1. Sentences Dictation

The sentences dictation task test about the correspondence between phonology and orthography by asking participants to write the sentences they have heard.

This test consists of 27 sentences. Each sentence will be read three times. There will be a

10 second break every 7 sentences. Any modification not allow during in the break time.

Step 2. Words Dictation

The sentences dictation task to the correspondence between phonology and orthography by asking participants to write the words they have heard.

This test consists of 27 words. Each word will be read once. There will be 10 seconds break every 10 words. Any modification not allow during in the break time.

Step 3. Questionnaire

The questionnaire was to understand the participants' basic personal information, language learning background and the tendency of language use in daily life.

Chapter 5
Results

As we presented our scheme of the methodology used in conducting current study in the previous chapter. In this chapter, we present the data derived from both experimental task and questionnaires. We mainly analysis and compare the performance of two groups in dictation task. Additionally, examine data of the three types of character in each groups. We used a repeated-measures ANOVA with Bonferroni post-hoc tests to achieve our purpose, which allowed comparisons not only between the two groups but also the intragroup comparisons. And we also observe the relation between different various in questionnaire and result of dictation task.

5.1. Result 1: Dictation Task

5.1.1 Inaccuracy rate of Dictation Task

The number of characters mistakenly written were analyzed using a 2×3 mixed design ANOVA between groups (control, experimental; between subjects) and types of characters (high similarity characters, low similarity characters, different characters; within subjects), where the control group consisted Chinese native speakers who have not learned Japanese and have not lived in Japan. There was a significant interaction between the group and the type of characters, $F(2, 116) = 17.42$, $p < .0001$. Therefore, we examined the simple main effects of groups within each type. They were significant for the all types; $F(1, 58) = 34.13$, $p < .0001$ for high similarity; $F(1, 58) = 19.11$, $p < .0001$ for low similarity; $F(1, 58) = 20.84$, $p < .0001$ for different character type. The simple main effects of three types of characters within each group was not significant in the control group $F(2, 87) = 1.14$, $p = 0.32$, but significant in the experimental group, $F(2, 87) = 14.31$, $p < .0001$.
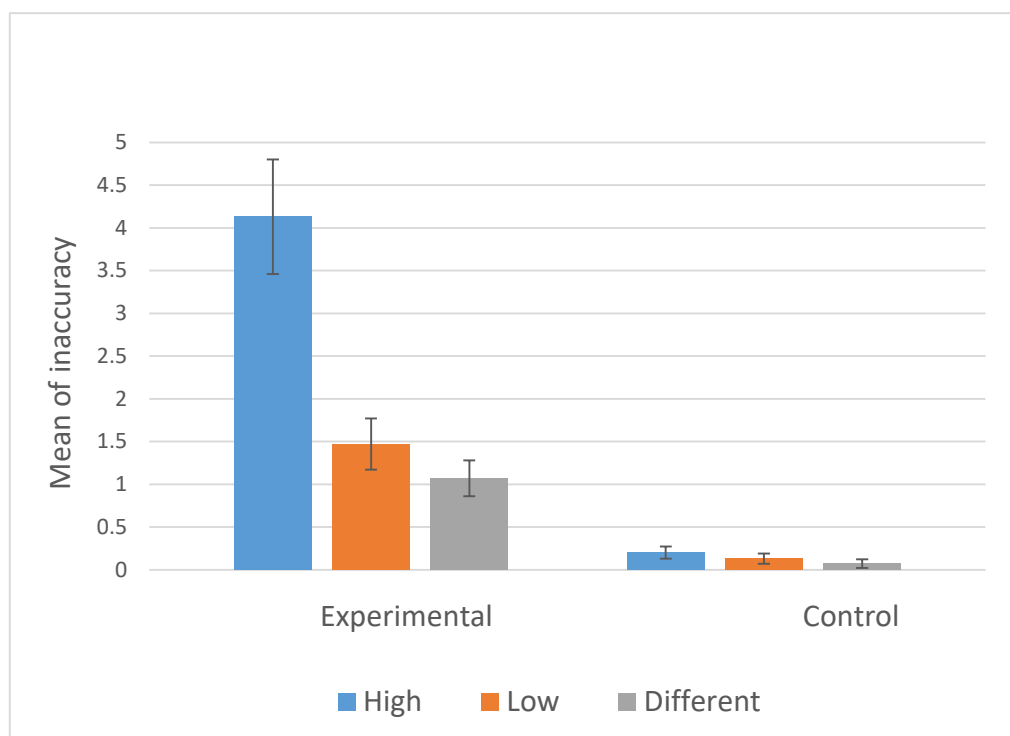
**Figure 5-1. Mean of Inaccuracy in Dictation Task
(the error bars are standard errors)**

The Bonferroni test was conducted to determine which means differ in the three types of characters from the results of the experimental group. It revealed that there was no significant difference between the low similarity and different character types (p = .099), but there was a significant difference between high and the other two types ($p < 0.001$). These results suggested that the Chinese speakers who have learned Japanese and currently living in Japan failed to write accurate Chinese characters with high similarity to corresponding Japanese characters.

5.1.2 Mean of participants who made mistake in Three types of Characters

To examine whether the similarity of characters is a factor for inaccurate output by the experimental group, the results were analyzed using one-way ANOVA for three types of characters. There was a statistically significant difference among three types of characters, F (2,51) = 21.30, $p < 0.001$. A Tukey post hoc test revealed that there was no significant difference

between the low similarity and different types (p = .099). But there was a significant difference between high and the other two types (p < 0.001).
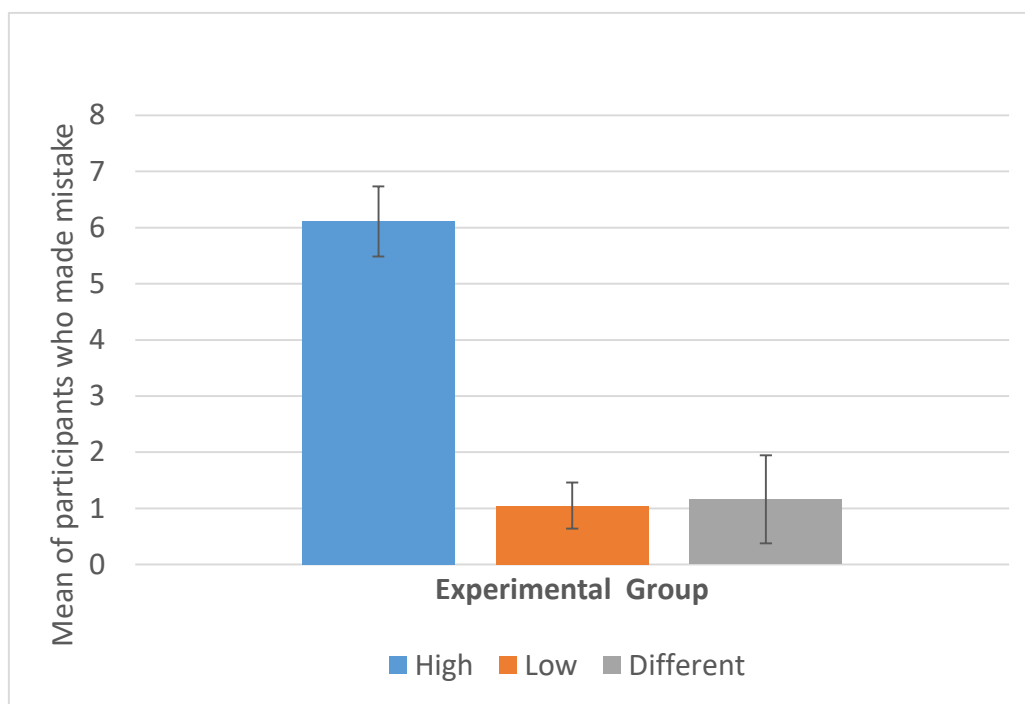

Figure 5-2. Mean of participants who made mistake in three types of characters (the error bars are standard errors)

5.2. Result 2: Questionnaire

In order to determine the general information about age, sex, and use of language background, these variables have effects on the accuracy of Japanese- speaking native Chinese in dictation task. Therefore, we examined the relations between mean of inaccuracy rate and each variable were administrated in questionnaire. In order to examine more closely, we examined the relations between mean of inaccuracy in high similarity type of characters and each variable from the questionnaire as well.

5.2.1. Relations between Participants' Gender and Inaccuracy of Dictation Task

Figure 5-3 compares the mean of inaccuracy between female and male in experimental group by using one-way ANOVA. The ANOVA result showed that there was not a significant main effect between the mean of inaccuracy and participants' gender $F (1, 28) = 4.20$, $p = 0.058$.
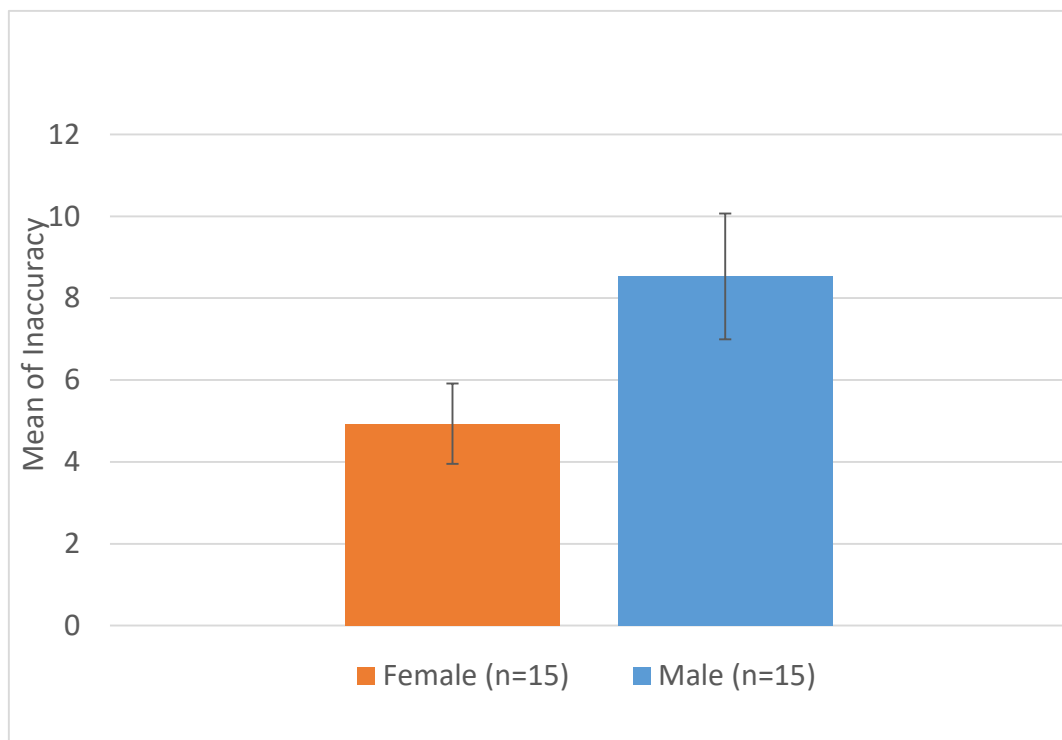
**Figure 5-3. Mean of inaccuracy between female and male
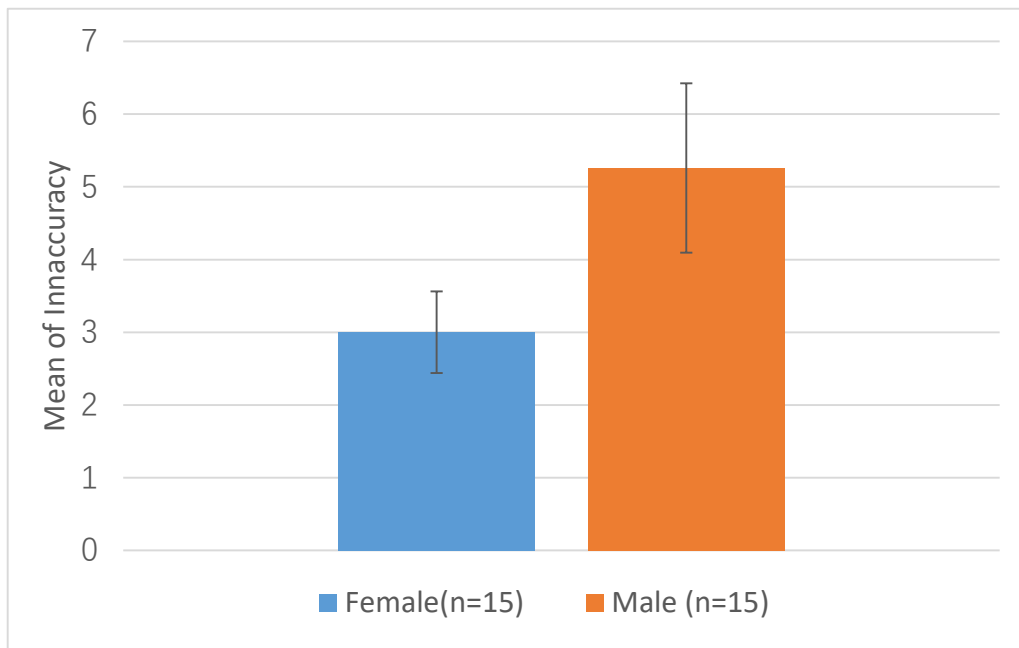(the error bars are standard errors)**

Figure 5-4.　Mean of inaccuracy in similarity type of character between female and male

Figure 5-4 compares the mean of inaccuracy in high similarity type of character between female and male in experimental group by using one-way ANOVA. The ANOVA result showed that there was not a significant main effect between the mean of inaccuracy and participants' gender $F (1, 28) = 4.19$, $p = 0.090$.

5.2.2. Relations between Participants' Age and Inaccuracy of Dictation Task

Figure 5-5 compares the mean of inaccuracy between below and above mean of participants' age in experimental group by using one-way ANOVA. The ANOVA result showed that there was not a significant main effect between the mean of inaccuracy and participants' age, $F (1, 28) = 4.20$, $p = 0.63$.
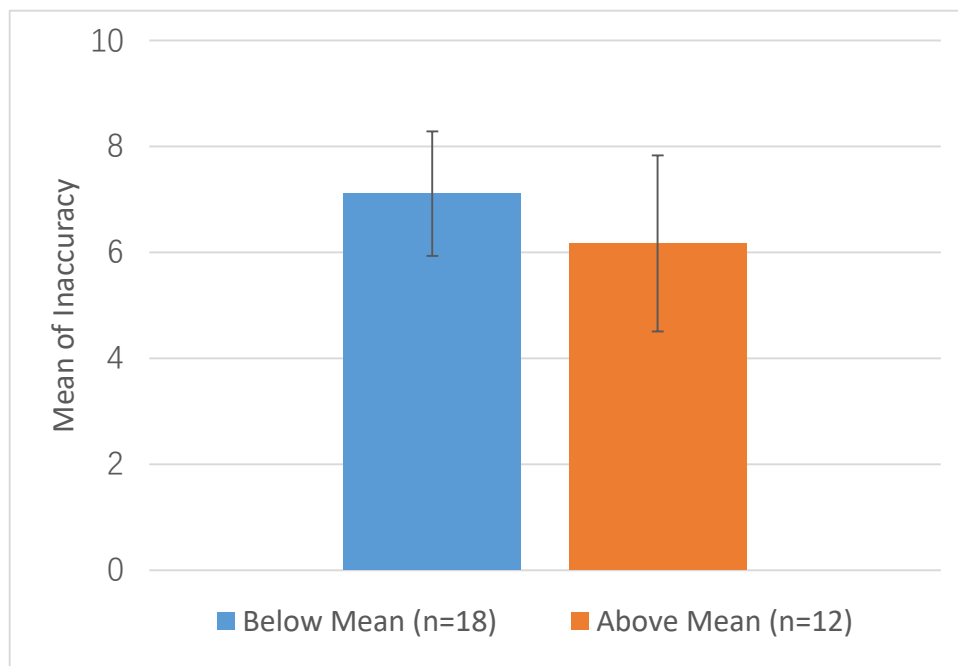
Figure 5-5. Mean of inaccuracy between below and above mean of participants' age (the error bars are standard errors)

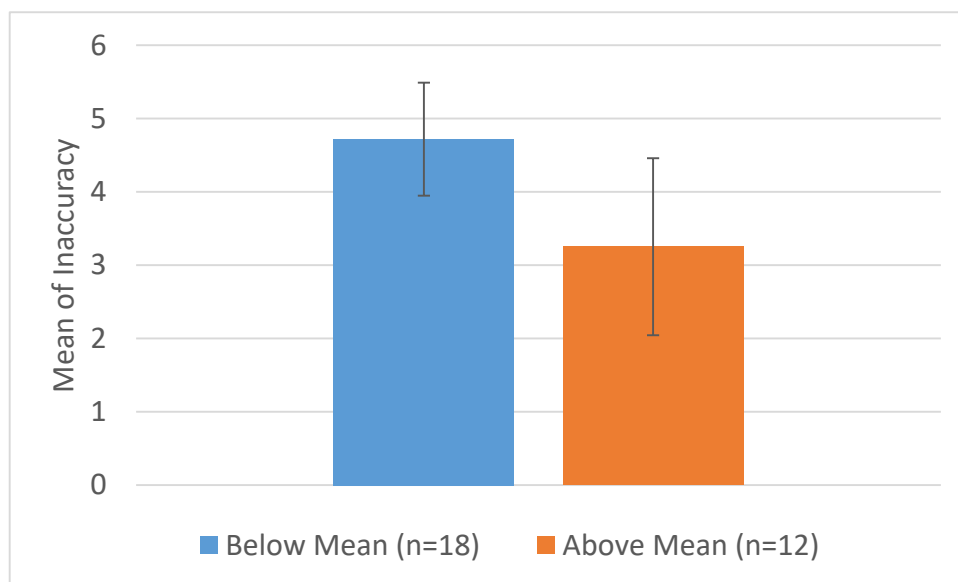**Figure 5-6. Mean of inaccuracy in similarity type of character between below and above of participants' age (the error bars are standard errors)**

Figure 5-6 compares the mean of inaccuracy in high similarity type of character between below and above mean of participants' age in experimental group by using one-way ANOVA. The ANOVA result showed that there was not a significant main effect between the mean of inaccuracy and participants' age $F(1, 28) = 4.19$, $p = 0.2889$.

5.2.3. Relations between Length of Learning Japanese and Inaccuracy of Dictation Task

Figure 5-7 compares the mean of inaccuracy among the mean of participants' length of learning Japanese in experimental group by using one-way ANOVA. The ANOVA result showed that there was not a significant main effect between the mean of inaccuracy and participants' length of learning Japanese, $F(2, 27) = 3.35$, $p = 0.17$.
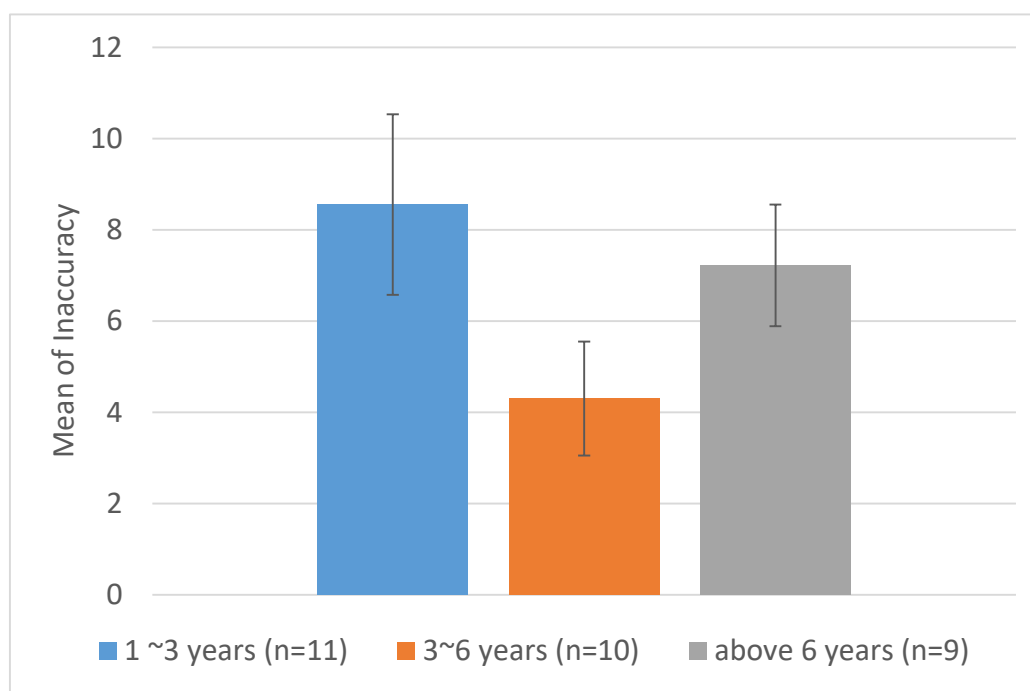
Figure 5-7. Mean of inaccuracy among mean of participants' length of learning Japanese (the error bars are standard errors)
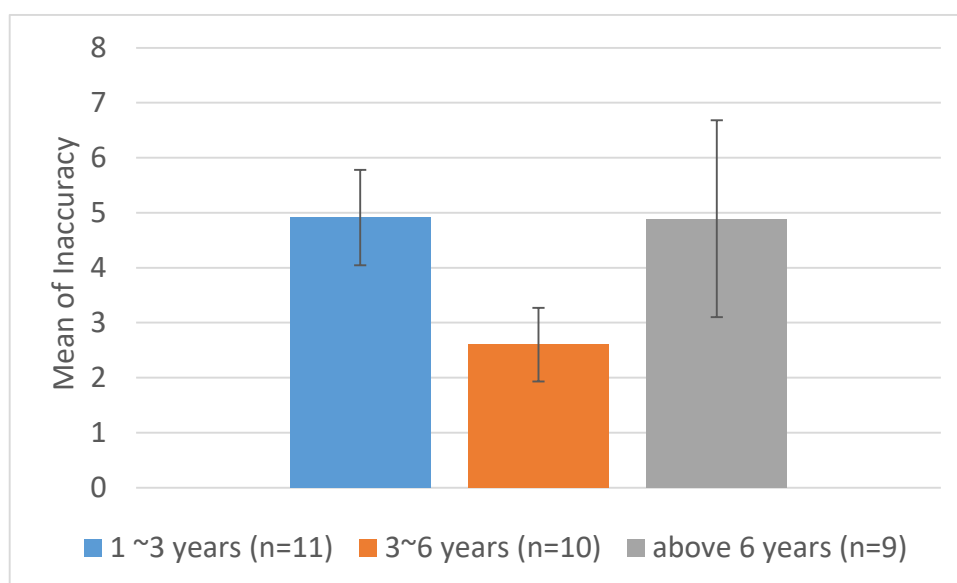
Figure 5-8. Mean of inaccuracy in similarity type of character among the mean of participants' length of learning Japanese (the error bars are standard errors)

Figure 5-8 compares the mean of inaccuracy in high similarity type of character among the mean of participants' length of learning Japanese in experimental group by using one-way ANOVA. The ANOVA result showed that there was not a significant main effect between the mean of inaccuracy and participants' length of learning Japanese $F(2, 27) = 3.35$, $p = 0.2776$.

5.2.4. Relations between Length of Living in Japan and Inaccuracy of Dictation Task

Figure 5-9 compares the mean of inaccuracy between below and above mean of participants' length of living in Japan by using one-way ANOVA. The ANOVA result showed that there was not a significant main effect between the mean of inaccuracy and participants' length of living in Japan, $F(1, 28) = 4.19$, $p = 0.54$.
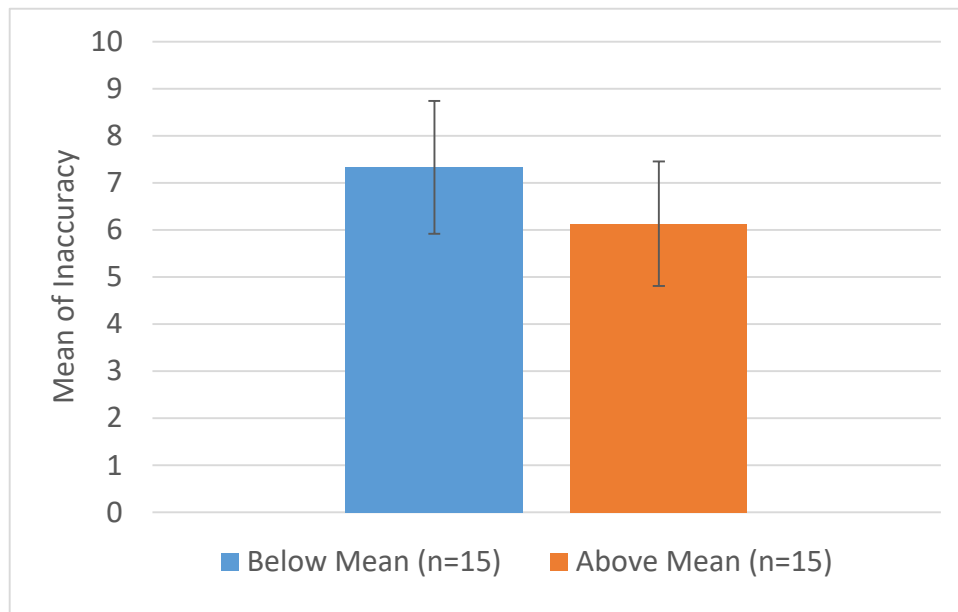
Figure 5-9. Mean of inaccuracy between below and above mean of participants' length of living in Japan
(the error bars are standard errors)

Figure 5-10. Mean of inaccuracy in similarity type of character between below and above mean of participants' length of living in Japan
(the error bars are standard errors)

Figure 5-10 compares the mean of inaccuracy in high similarity type of character between

below and above mean of participants' length of living in Japan by using one-way ANOVA. The ANOVA result showed that there was not a significant main effect between the mean of inaccuracy and participants' length of living in Japan $F(1, 28) = 4.19$, $p = 0.2383$.

5.2.5. Relations between N1 Score and Inaccuracy of Dictation Task

Figure 5-11 compares the mean of inaccuracy between below and above mean of participants' N1 scores in experimental group by using one-way ANOVA. The ANOVA result showed that there was not a significant main effect between the mean of inaccuracy and participants' N1 scores, $F(1, 28) = 4.19$, $p = 0.11$.

Figure 5-11. Mean of inaccuracy between below and above mean of participants' N1 scores
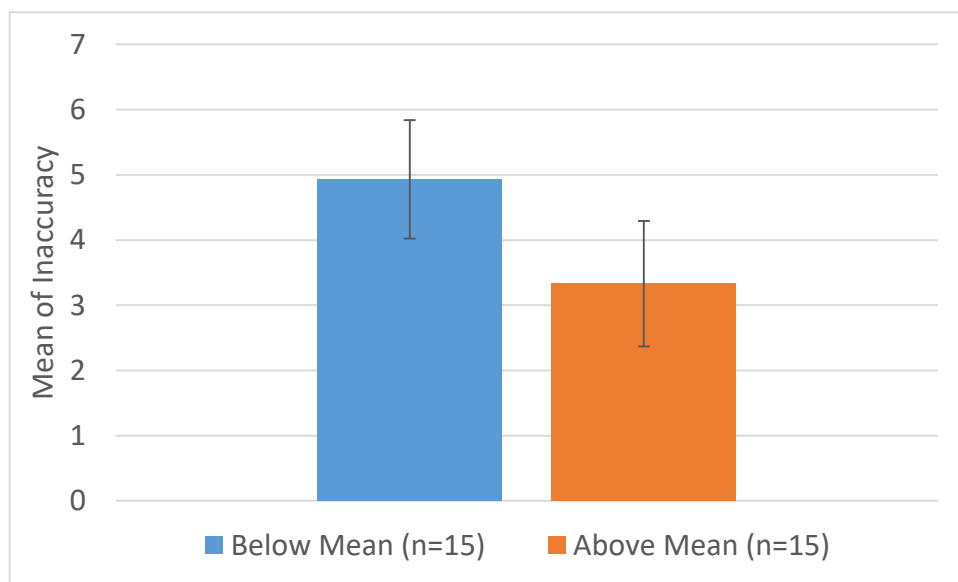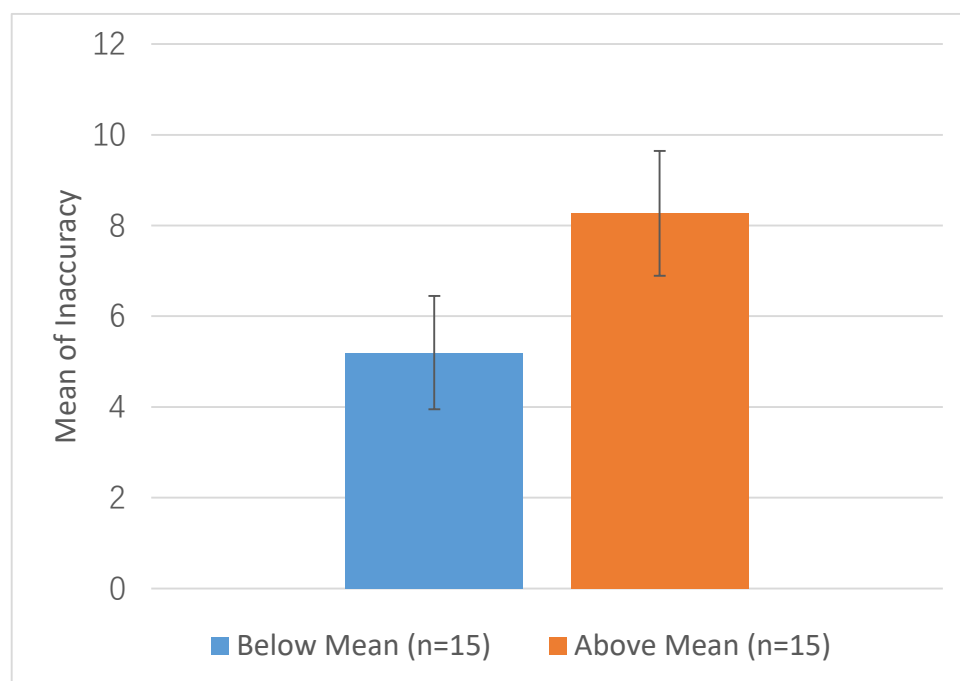**(the error bars are standard errors)**
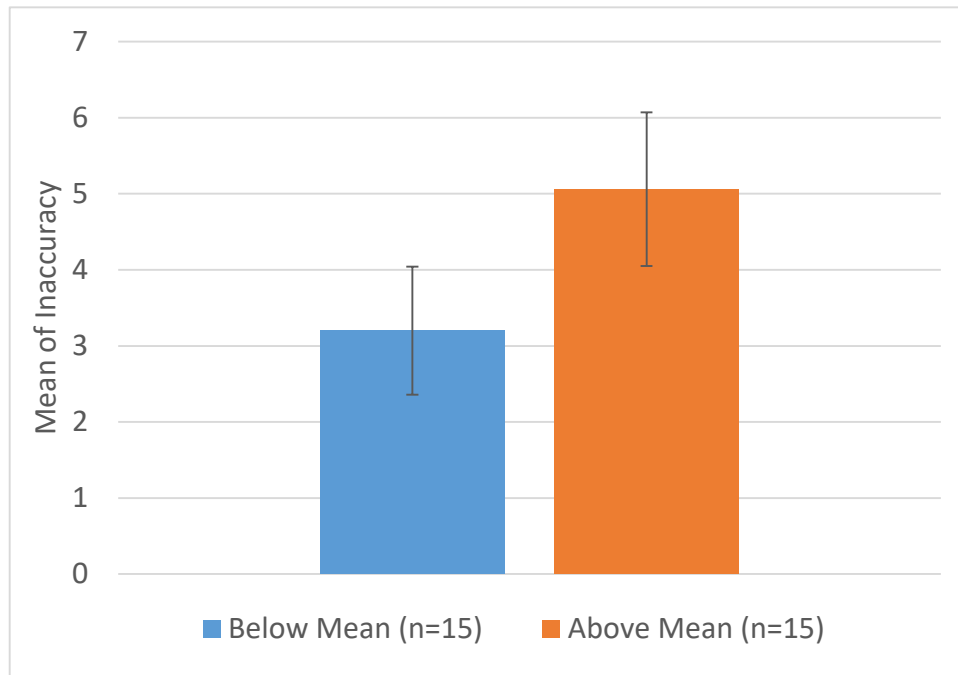
Figure 5-12. Mean of inaccuracy in similarity type of character between below and above mean of participants' N1 score (the error bars are standard errors)

Figure 5- 12 compares the mean of inaccuracy in high similarity type of character between below and above mean of participants' N1 scores in experimental group by using one-way ANOVA. The ANOVA result showed that there was not a significant main effect between the mean of inaccuracy and participants' N1 score $F(1, 28) = 4.19$, $p = 0.1669$.

5.2.6. Relations between Daily Use of Languages and Inaccuracy of Dictation Task

Figure 5-13 compares the mean of inaccuracy among the participants' daily used language in experimental group by using one-way ANOVA. The ANOVA result showed that there was not a significant main effect between the mean of inaccuracy and participants' daily used language, $F(2, 27) = 3.35$, $p = 0.76$.

Figure 5-13. Mean of inaccuracy among the participants' daily used language (the error bars are standard errors)

Figure 5-14. **Mean of inaccuracy in similarity type of character among the participants' daily used language**
(the error bars are standard errors)

Figure 5-14 compares the mean of inaccuracy in high similarity type of character in among the participants' daily used language in experimental group by using one-way ANOVA. The ANOVA result showed that there was not a significant main effect between the mean of inaccuracy and participants' daily use of languages $F_{(2, 27)} = 3.354$, $p = 0.6443$.

5.2.7. Relations between Languages Use in Reading and Inaccuracy of Dictation Task

Figure 5-15 compares the mean of inaccuracy among participants' language use in reading by using one-way ANOVA. The ANOVA result showed that there was not a significant main effect between the mean of inaccuracy and participants' language use in reading, $F_{(2, 27)} = 3.35$, $p = 0.20$.
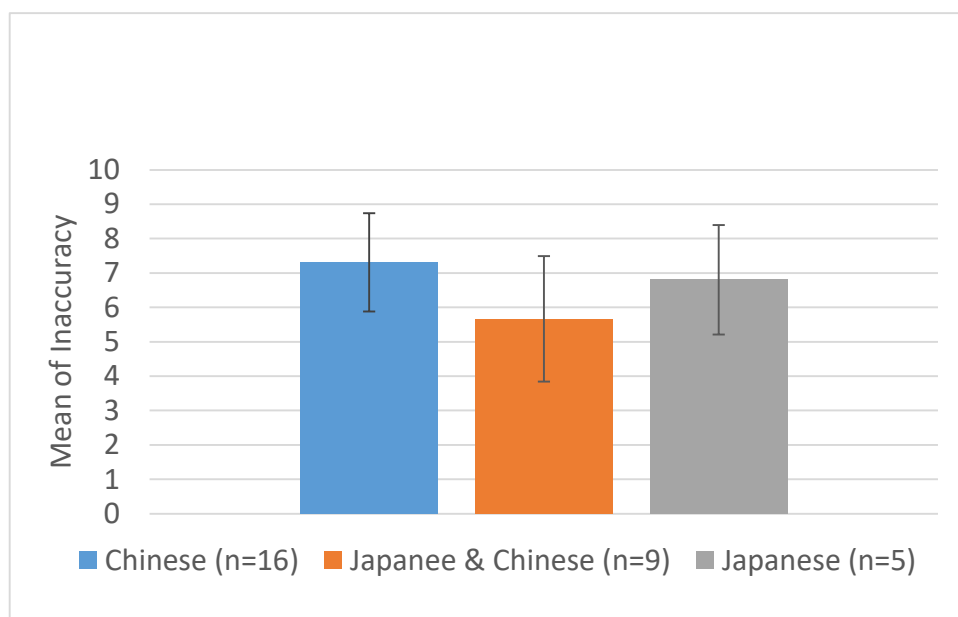
Figure 5-15. mean of inaccuracy among participants' language use in reading (the error bars are standard errors)

Figure 5-16. Mean of inaccuracy in similarity type of character among participants' language use in reading (the error bars are standard errors)

Figure 5-16 compares the mean of inaccuracy in high similarity type of character among participants' language use in reading in experimental group by using one-way ANOVA. The ANOVA result showed that there was not a significant main effect between the mean of inaccuracy and participants' language use in reading $F_{(2, 17)} = 3.354$, $p = 0.2776$.

5.2.8. Relations between Languages Use in Writing and Inaccuracy of Dictation Task

Figure 5-17 compares the mean of inaccuracy among participants' language use in writing by using one-way ANOVA. The ANOVA result showed that there was not a significant main effect between the mean of inaccuracy among participants' language use in writing, $F_{(2, 25)} = 3.38$, $p = 0.15$.
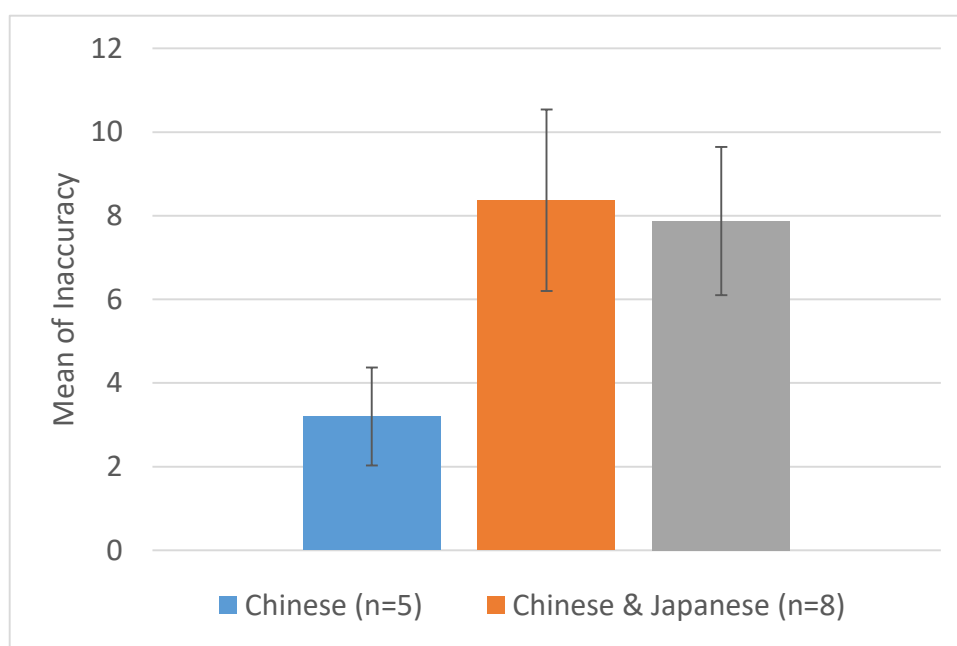
Figure 5-17. Mean of inaccuracy among participants' language use in writing (the error bars are standard errors)
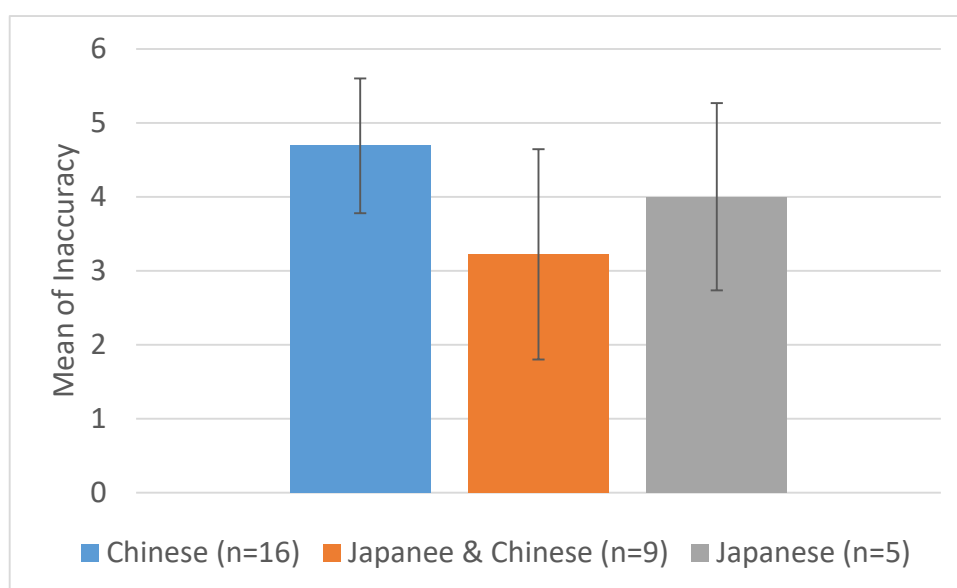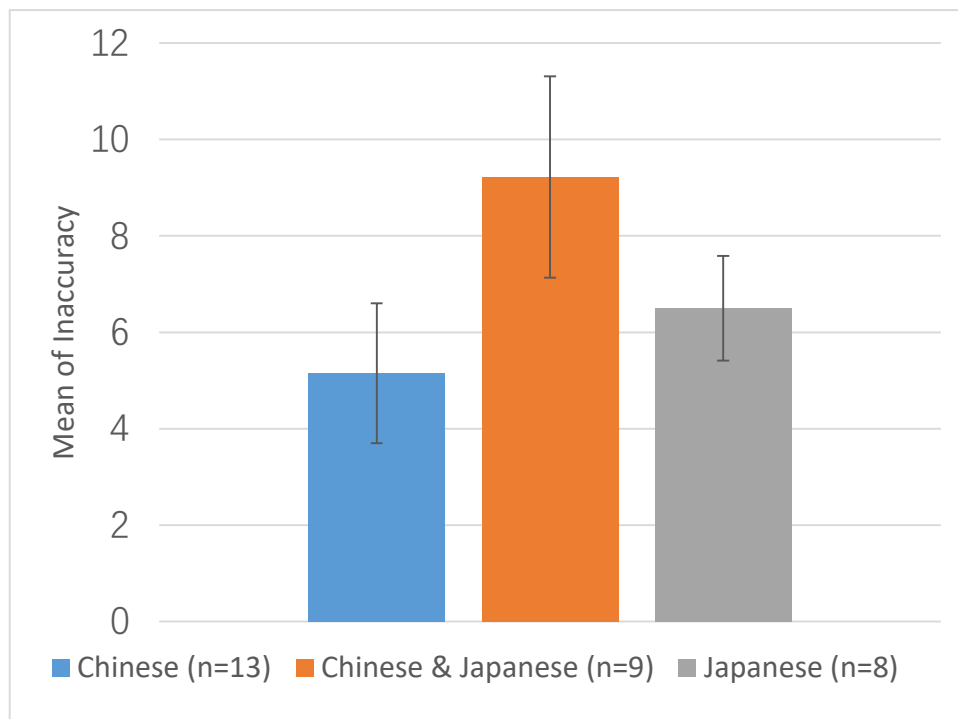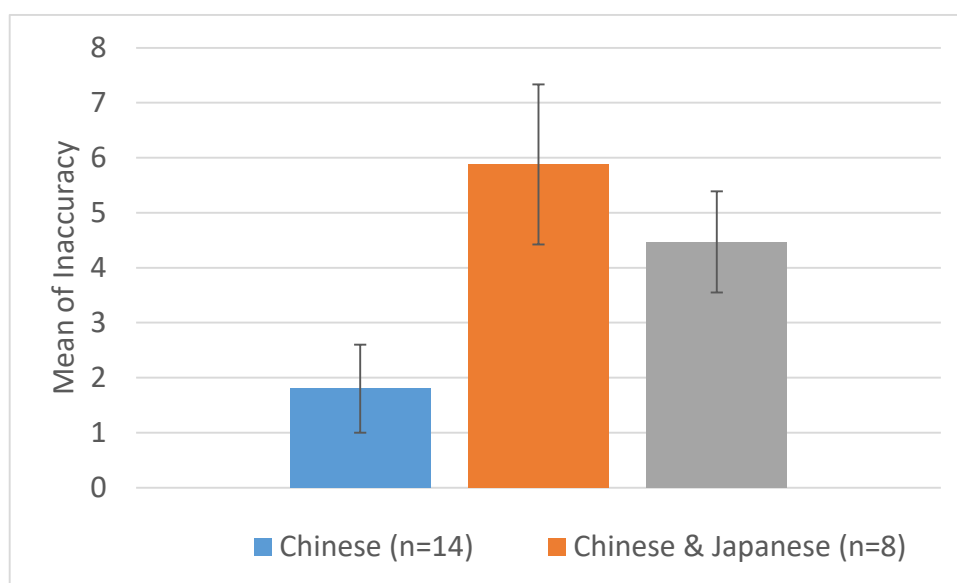
Figure 5-18.Figure 5-18. Mean of inaccuracy in similarity type of character among participants' language use in writing
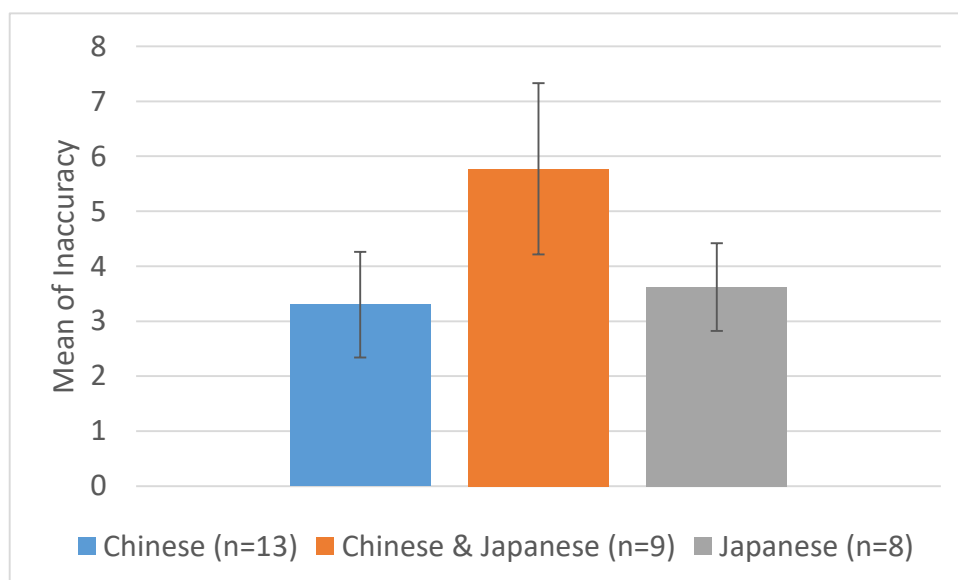**(the error bars are standard errors)**

Figure 5-18 compares the mean of inaccuracy in high similarity type among participants' language use in writing in experimental group by using one-way ANOVA. The ANOVA result showed that there was not a significant main effect among the mean of inaccuracy and participants' language use in writing $F(2, 25) = 3.38$, $p = 0.1471$.

5.2.9. Relations between Level of L1 and Inaccuracy of Dictation Task

Figure 5-19 compares the mean of inaccuracy among participants' Chinese proficiency by using one-way ANOVA. The ANOVA result showed that there was not a significant main effect between the mean of inaccuracy among participants' Chinese proficiency, $F(2, 27) = 3.35$, $p = 0.48$.

Figure 5-19. Mean of inaccuracy among participants' Chinese proficiency
(the error bars are standard errors)
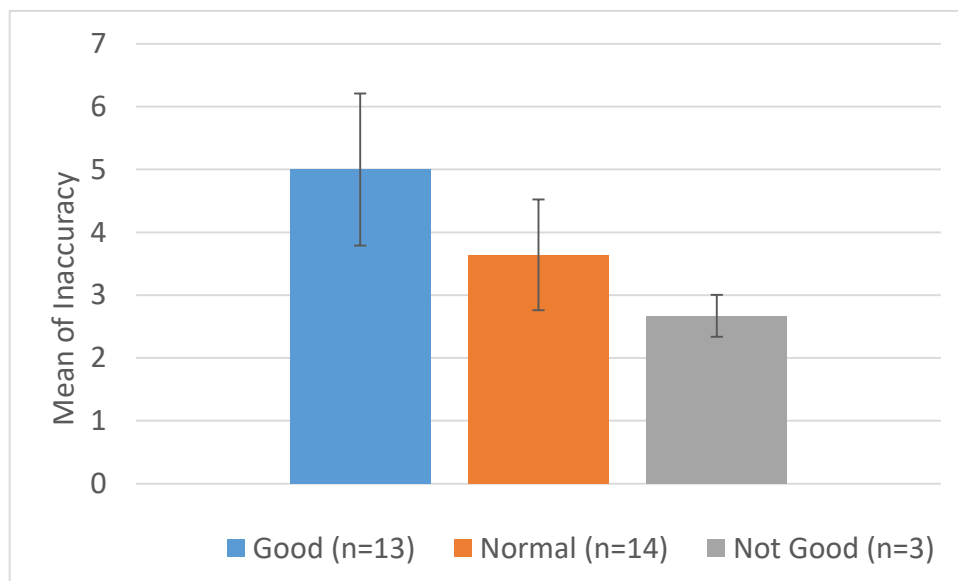
Figure 5-20. Mean of inaccuracy in similarity type of character among participants'
Chinese proficiency
(the error bars are standard errors)

Figure 5-20 compares the mean of inaccuracy in high similarity type of character among participants' Chinese proficiency in experimental group by using one-way ANOVA. The ANOVA result showed that there was not a significant main effect between the mean of

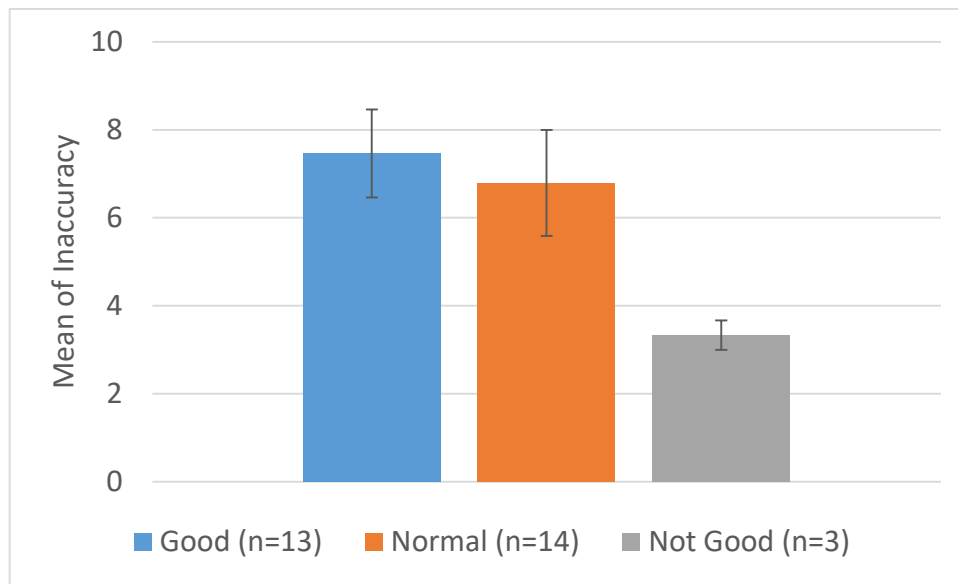inaccuracy and participants' Chinese proficiency $F(2, 27) = 3.354$, $p = 0.4982$.

Chapter 6
Discussion

In the last chapter, we presented the analyzed the results of the experiment. In this chapter, we discuss the findings of this study from relating to the research questions. Extendedly, we discuss on a classification of types of inaccuracy characters in experimental group. Subsequently, we considered the limitations of the current research.

6.1. Discussion on Research Questions and Hypothesis

6.1.1. Research Questions and Hypothesis Reviewed

The aim of current research is to clarify a factor which can affect the attrition of orthographic skill in a first language with logographic written language. Based on this purpose, we addressed our research question as we presented in chapter 1 as below:

i.   Whether does Japanese influence on the orthographic perception of Chinese in logographic written language?

ii.   Do proficient Japanese-speaking native Chinese in Japan likely to manifest signs of attrition in their Chinese handwriting?

ii.   Can similarity of characters in both languages hinder to writing accurate characters for Japanese-speaking native Chinese in Japan?

We conducted a dictation task of sentences and words containing Chinese characters with various similarity to corresponding Japanese characters to measure the orthographic skills of Chinese speakers who have learned Japanese and currently living in Japan. Additionally, in order to observe the effect of Japanese Kanji on the written of Japanese-speaking native Chinese who live in Japan, we chose a group of the native Chinese speaker who has never learned or lived in Japan as our control group.

6.1.2. Summary of the Experimental Results

Result 1-1: The inaccuracy mean of experimental group was higher than control group in all the three types of characters (Section 5.1.1, Fig. 5-1).

Result 1-2: The inaccuracy means in the three types of characters within each group shown that there was not significant in the control group, but significant in the experimental group (Section 5.1.2, Fig. 5-2).

Result 2-1: The participants' gender did not correlate with both the inaccuracy mean of dictation task (Section 5.2.1, Fig 5-3); and the inaccuracy mean in the type of high similarity characters (Section 5.2.1, Fig 5-4).

Result 2-2: The participants' age did not correlate with both the inaccuracy mean of dictation task (Section 5.2.2, Fig 5-5); and the inaccuracy mean in the type of high similarity characters (Section 5.2.2, Fig 5-6).

Result 2-3: The participants' length of learning Japanese did not correlate with both the inaccuracy mean of dictation task (Section 5.2.3, Fig 5-7); and the inaccuracy mean in the type of high similarity characters (Section 5.2.3, Fig 5-8).

Result 2-4: The participants' length of living in Japan did not correlate with both the inaccuracy mean of dictation task (Section 5.2.4, Fig 5-9); and the inaccuracy mean in the type of high similarity characters (Section 5.2.4, Fig 5-10).

Result 2-5: The participants' N1 score did not correlate with both the inaccuracy mean of dictation task (Section 5.2.5, Fig 5-11); and the inaccuracy mean in the type of high similarity characters (Section 5.2.5, Fig 5-12).

Result 2-6: The participants' daily most use language did not correlate with both the inaccuracy mean of dictation task (Section 5.2.6, Fig 5-13); and the inaccuracy mean in the type of high similarity characters (Section 5.2.6, Fig 5-14).

Result 2-7: The participants' most used language in reading did not correlate with both the inaccuracy mean of dictation task (Section 5.2.7, Fig 5-15); and the inaccuracy mean in the type

of high similarity characters (Section 5.2.7, Fig 5-16).

Result 2-8: The participants' most used language in handwriting did not correlate with both the inaccuracy mean of dictation task (Section 5.2.8, Fig 5-17); and the inaccuracy mean in the type of high similarity characters (Section 5.2.8, Fig 5-18).

Result 2-9: The participants' Chinese proficiency did not correlate with both the inaccuracy mean of dictation task (Section 5.2.9, Fig 5-19); and the inaccuracy mean in the type of high similarity characters (Section 5.2.9, Fig 5-20).

The results 1-1 and 1-2 from experimental task were positively proved our hypothesis, the Chinese speakers who have learned Japanese and currently living in Japan failed to write accurate Chinese characters with high similarity to corresponding Japanese characters.

Nevertheless, in order to verify whether using Japanese kanji in Japan cased the result of inaccuracy written in Chinese characters, still need support from additional factors, for example, length of resident, length of learning Japanese and so on. The current results from questionnaire, none of one factor related to the result from dictation task. We considered several reasons for this outcome. Firstly, the relatively short period of residence. In general attrition research, length of the participants' residence was above 5 years or even more. While the participants in current research, their length of residence range was from 1 to 5 years (mean = 3.04, SD = 0.95). Compare with the participants' residence in general attrition research, later one more like in their preliminary stage of residence in second language environment. This may suggest that, at the preliminary stage of residence, the attrition of orthographic skill shown a sign in logographic written language. Secondly, the limited number of participants. The data were collected from the 30 participants in experimental groups. As we discussed in first reason, with a relatively short period of residence, it may need more population to show the effect of these factors on the attrition of orthographic skills.

Based on the dictation task results 1-1 and 1-2, they showed that the Japanese-speaking native Chinese in Japan failed to write accurate Chinese characters with high similarity to

corresponding Japanese characters. It was also indicated that orthographic skill in first language with logographic written language manifest a sign of attrition at the preliminary stage of residence in second language.

6.2 Inaccuracy in Dictation Task

As we mention before, in current research, our measurement in dictation task was the inaccurate written characters. These inaccurate written mean that the character written in orthography in Japanese kanji instead of Chinese characters. Beside the inaccuracy like wrote the characters directly into Japanese kanji, participant also wrote characters used mixed the orthographies, partly Chinese character and partly Japanese kanji in one character. The examples shown in Figure 6-1 and 6-2.
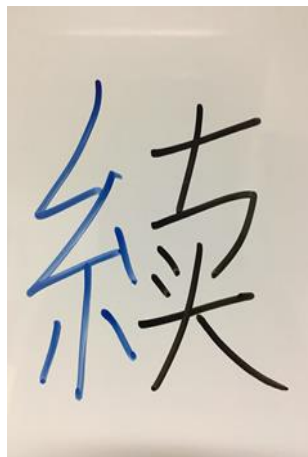
Figure 6-1 Inaccuracy on mixed the orthographies

Figure 6-2 Inaccuracy on mixed the orthographies

In this case, participants may still remember the structure of character, but the detail on combination of radicals shown the interference of Japanese kanji. Specially, the character shown in Figure 6-2, 14 participants wrote inaccurate in Chinese character"顾", 10 of them wrote this character as Figure 6-2 shown, 4 of them wrote it into Japanese kanji, "顧". The later participants all involved in research felid in business service, or having part time job in service industry at that time took the experiment. We could see there was a degree on the level of inaccuracy based on personal characters using experiences. The inaccuracy shown in figure 6-2, means that participant still remember the structure of the character and partly radical. But the later 4 participants, they wrote entirely in Japanese kanji, may indicated that the inaccuracy due to the character using habit in their major and work under the Japanese language environment.

Moreover, the inaccuracy also shown when Japanese kanji and Chinese characters' structure was different. For example, "愿" in Chinese character and "願" in Japanese kanji. These two characters, shared partly with the radical "原" but in different structures. The participants who wrote inaccurate means that, the structure was interference by Japanese kanji. The inaccuracy in this level, may also influence by other additional factors. It is worth to

considered more carefully in further.

6.2. Limitation of Current Research

This study has examined language attrition in the orthographic writing skill in Chinese under the influence of Japanese. From experimental result, it was suggested that the Chinese speakers who have learned Japanese and currently living in Japan failed to write accurate Chinese characters with high similarity to corresponding Japanese characters. They mean that the attrition of orthographic skill exists in the case of Chinese character under influence of Japanese kanji in Japanese language environment. It gives some indications that the attrition of orthographic skill in the first language may occur when both first and second languages belong to logographic written languages.

Chapter 7
Conclusion

In last chapter, based on the analysis experiment result, we discussed our finding and limitation on current research. In this chapter, we provide our conclusion based on a summary of the founding from current research. In the end, some suggestions for future studies are presented.

7.1. Summary of the research

In this study, we investigated on the first language attrition with logographic written language in orthography domain. And we aim to clarify a factor which can affect the attrition of orthographic skill in a first language with logographic written language.

The research hypothesis of current research is that the similarity of characters in both languages affected on the attrition of orthographic skills in Chinese under exposure to Japanese environment regarding orthographic use.

In order to test our hypothesis, we conducted the dictation task. The dictation task tested about the correspondence between phonology and orthography by asking participants to write what they have heard. This dictation task containing Chinese characters with various similarity to corresponding Japanese characters to measure the orthographic skills of Chinese speakers who have learned Japanese and currently living in Japan. To test whether there was interference of Japanese kanji in their dictation result. Moreover, in order to learned better the extra factors such as age, length of residence, tendency use of language in the term of orthography and so on, may influent on the inaccuracy mean of dictation task, were examined according the participants responded to questionnaires

Participants consist of experimental group, the Japanese-speaking native Chinese who live in Japan; and control group, the native Chinese in China, who have never learned Japanese, or

been lived in Japan.

We obtained the following results according the statistical analysis the experimental data.

Result 1-1: The inaccuracy mean of experimental group was higher than control group in all the three types of characters (Section 5.1.1, Fig. 5-1).

Result 1-2: The inaccuracy means in the three types of characters within each group shown that there was not significant in the control group, but significant in the experimental group (Section 5.1.2, Fig. 5-2).

Result 2-1: The participants' gender did not correlate with both the inaccuracy mean of dictation task (Section 5.2.1, Fig 5-3); and the inaccuracy mean in the type of high similarity characters (Section 5.2.1, Fig 5-4).

Result 2-2: The participants' age did not correlate with both the inaccuracy mean of dictation task (Section 5.2.2, Fig 5-5); and the inaccuracy mean in the type of high similarity characters (Section 5.2.2, Fig 5-6).

Result 2-3: The participants' length of learning Japanese did not correlate with both the inaccuracy mean of dictation task (Section 5.2.3, Fig 5-7); and the inaccuracy mean in the type of high similarity characters (Section 5.2.3, Fig 5-8).

Result 2-4: The participants' length of living in Japan did not correlate with both the inaccuracy mean of dictation task (Section 5.2.4, Fig 5-9); and the inaccuracy mean in the type of high similarity characters (Section 5.2.4, Fig 5-10).

Result 2-5: The participants' N1 score did not correlate with both the inaccuracy mean of dictation task (Section 5.2.5, Fig 5-11); and the inaccuracy mean in the type of high similarity characters (Section 5.2.5, Fig 5-12).

Result 2-6: The participants' daily most use language did not correlate with both the inaccuracy mean of dictation task (Section 5.2.6, Fig 5-13); and the inaccuracy mean in the type of high similarity characters (Section 5.2.6, Fig 5-14).

Result 2-7: The participants' most used language in reading did not correlate with both the inaccuracy mean of dictation task (Section 5.2.7, Fig 5-15); and the inaccuracy mean in the type

of high similarity characters (Section 5.2.7, Fig 5-16).

Result 2-8: The participants' most used language in handwriting did not correlate with both the inaccuracy mean of dictation task (Section 5.2.8, Fig 5-17); and the inaccuracy mean in the type of high similarity characters (Section 5.2.8, Fig 5-18).

Result 2-9: The participants' Chinese proficiency did not correlate with both the inaccuracy mean of dictation task (Section 5.2.9, Fig 5-19); and the inaccuracy mean in the type of high similarity characters (Section 5.2.9, Fig 5-20).

7.2. Conclusion

This study has examined language attrition in the orthographic writing skill in Chinese under the influence of Japanese. Based on the results we presented in last section, we could answer the following research questions:

i.   Whether does Japanese influence on the orthographic perception of Chinese in logographic written language.

     Answer: Japanese could influence on the orthographic perception of Chinese in logographic written language.

ii.   Do proficient Japanese-speaking native Chinese in Japan likely to manifest signs of attrition in their Chinese handwriting?

     Answer: Proficient Japanese-speaking native Chinese in Japan likely to manifest signs of attrition in their Chinese handwriting.

iii.   Can similarity of characters in both languages hinder to writing accurate characters for Japanese-speaking native Chinese in Japan?

     Answer: Similarity of characters in both languages can be hinder to writing accurate characters for Japanese-speaking native Chinese in Japan.

     The findings of current research can be summarized as below.

Finding I: Native speakers of Chinese tended to lose some aspects of the native orthographic skill in writing characters under exposure to Japanese environment regarding orthographic use.

Finding II: The similarity of characters in both languages affected the attrition of orthographic skills in Japanese-speaking native Chinese in Japan.

7.3. Implication for Future Research

From our current research experiment result, it suggested that Japanese-speaking native Chinese tended to lose some aspects of the native Chinese orthographic skill in writing characters under exposure to Japanese environment regarding orthographic use. However, in order to be more certify with attrition of orthographic written skill in logographic written language, we need more results from further study involve in logographic written language.

Based on the **Finding I,** I have found out the attrition of orthographic written skill in Japanese-speaking native Chinese in Japan, but we still not sure whether the native Chinese who have acquired Japanese in China, the attrition of orthographic will be occur as well. More further, as we mention in chapter 6, 6.1.2. The relatively short period of residence could be the reason for current inaccuracy non-relative with any extra factors were administrated in questionnaire. Thus, a longitude research is necessary for this confusion, by given the same task to the same participants. We may more close to examine the process of attrition in orthographic skills with logographic written language.

Additionally, from the **Finding II**, only from one case is not enough for explain all of the logographic written language. Whether the similarity character in both languages with logographic written language cause the attrition occur in orthographic skills, needs the results from other case study, for example, when first language is Japanese and Chinese as second language, the factor of similarity still could be found.

References

Biederman, I., & Tsao, Y. C. (1979). On processing Chinese ideographs and English words: Some implications from Stroop-test results. *Cognitive Psychology*, 11(2), 125-132.

Gürel, A. (2004). Selectivity in L2-induced L1 attrition: a psycholinguistic account. *Journal of Neurolinguistics,* 17(1), 53-78.

Herdina, P., & Jessner, U. (2002). *A dynamic model of multilingualism: Perspectives of change in psycholinguistics*. Clevedon: Multilingual Matters.

Köpke, B. (2002). "Activation thresholds and non-pathological L1 attrition". In F. Fabrro (Ed.), *Advances in the Neurolinguistics of Bilingualism: Essays in Honor of Michel Paradis*, 119-142.

Köpke, B. & Schmid, M. (2004). First language attrition: The next phase. In M. Schmid, B. Köpke, M. Keijzer & L. Weilemar, L. (Eds), *First language attrition: Interdisciplinary perspectives on methodological issues*. Amsterdam: John Benjamins.

LowinfoChina. (2000, October 31). *Standing Committee of the National People's Congress,* Retrieved from http://www.lawinfochina.com/display.aspx?lib=law&id=6233&CGid

Ntim, S. (2016). Does first language attrition of bilinguals implicate orthographic skills in native Ghanaian Akan speakers? A psycholinguistic perspective. *Journal of Applied Linguistics and Language Learning*, 2(1), 17-28.

Paradis, M. (1993). Linguistic, psycholinguistic, and neurolinguistic aspects of" interference" in bilingual speakers: The activation threshold hypothesis. *International Journal of Psycholinguistics*, 9, 133-145.

Paradis, M. (2007). L1 attrition features predicted by a neurolinguistics theory of bilingualism. In Köpke, B., Schmid, M. S., Keijzer, M., & Dostert, S. (Eds.). *Language Attrition: Theoretical Perspectives*. John Benjamins.

Park, K. & Vaid, J. (1995). Lexical representation of script variation: evidence from Korean biscriptals. In I. Taylor & D. R. Olson. *Scripts and Literacy: Reading and learning to read alphabets, syllabaries and characters.* Dordrecht: Kluwer Academic Publishers.

Saito, H. (1981). Use of graphemicca and phonemic encoding in reading Kanji and Kana. *The Japanese Journal of Psychology,* 52, 266-273.

Schmid, M. S., Köpke, B., Keijzer, M., & Weilemar, L. (Eds.). (2004). *First language attrition: Interdisciplinary perspectives on methodological issues*, 28. John Benjamins Publishing.

Schmid, M. S. (2011). *Language Attrition*. Cambridge University Press.

Seliger, H. W., & Vago, R. M. (Eds.). (1991). *First language attrition*. Cambridge University Press.

Ministry of Education of the People's Republic of China. (2013) *Table of General Standard Chinese Characters.*

Appendix 1
Personal Language Background Questionnaire

个人基本信息，语言学习背景及使用倾向信息

个人基本信息
1. 姓名：_____
2. 学号：_____

请在下列符合您情况的选项打勾。
3. 性别：1)男　　2)女
4. 年龄：
5. 专业：
6. 现持有最终学历：1)学士　2)硕士　3)博士　4)其他
7. 职业：1)学生，（大学生/硕士生/博士生）学年：_____
　　　　2)职员
　　　　3)其他

8. 学习日语多久了　　　_____年____月到_____年____月

9. 来日本有多久了　　　_____年____月到至今

10. 你的日语能力考试（JLPT）等级为（*请写出大概得分）
　　1)．N1，分数_____　　　2)．N2，分数_____　　　　　3)．没有参加过

11. 在日常生活用使用哪个语言最多？
　　1)．日语　　　　　　　　2)．汉语　　　　　　　　3)．日语和汉语一样多
　　4)．其他语言,该语言为_____

12. 平时会阅读（新闻，小说,电子网络等任何内容）吗？
　1)．每天都会阅读　　　　　　　2)．每周阅读 4 到 6 天
　3)．每周阅读 1 到 3 天　　　　　4)．每个月阅读 1 到 3 天
　5)．每年阅读 1 到 11 天

13. 阅读的时候，你用哪一个语言多一些？
　1)．日语　　2)．汉语　　3)．日语和汉语一样多
　4)．其他语言,该语言为_____

14. 平时会书写（笔记，日记等任何内容）吗？
　1)．每天都会书写　　　　　　　2)．每周书写 4 到 6 天
　3)．每周书写 1 到 3 天　　　　　4)．每个月书写 1 到 3 天

5). 每年书写 1 到 11 天

15. 书写的时候，你用哪一个语言比较多？
   1). 日语   2). 汉语   3). 日语和汉语一样多
   4). 其他语言,该语言为_____

Appendix 2
Experimental Agreement and Instruction of Main Experiment

「外国語環境におけるバイリンガル話者の母語書字」に関する実験の説明および同意書

本実験を次のように実施いたします。実験の目的や実施内容等をご理解いただき、本実験にご参加いただける場合は、同意書にご署名をお願いいたします。実験に参加しない、あるいは一度参加を決めた後に途中で辞退されることになっても、不利益を被ることはありません。この同意書をよく読んでください。この同意書の内容を十分理解していただく必要があるため、何か質問がありましたら、実験者にご質問ください。あなたの意思で、実験にご参加いただけましたら幸いです。

1. 実験の意義・目的
本研究は、外国語環境での生活がバイリンガル話者の母語の書字にどう影響するかを明らかにすることを目的としています。言語知識間の相互作用の検討を通じて、バイリンガル教育に役に立つと思っております。

2. 実験方法
本実験は、短文と語彙のディクテーション（書き取り）テスト、アンケートインタビュが含まれています。

3. 実験者として選定された理由
この実験の参加者は日本にいる母語は中国であり、かつ日本語能力試験 N1 合格者である方を対象とさせていただきます。

4. 予測されるリスク、危険、心身に対する不快な状態や影響
この実験の参加には、何ら身体的な危険は伴いません。また、実験参加によるリスクはありません。

5. 実験の辞退について
本実験に参加することは試験者本人の意識に基づくため、リスニングテストが開始する前に参加することを中止することが可能です。リスニングテスト中に試験に参加することを中止する場合、ほかの試験者に迷惑をお掛けしないために、リスニングテストが終了するまで席でお待ちしていただきますようお願い申し上げます。辞退される場合、それまでの実験データの扱いについて、廃棄を希望されるかどうかをお聞かせいただければ、それに従ってデータを取り扱います。

6. 守秘や実験データの取り扱いについて
この実験で得た内容を実験成果報告及び学術実験目的以外に用いることはなく、守秘をお約束いたします。実験で得られたデータは、学会発表や論文としての発表などの学術的な目的のみで使用いたします。これらのデータは、実験者（ミヒライ アヒマティ・橋本敬）の責任下にて分析に必要な期間（実験日より 5 年）保管し、個人が特定できるような形で公表されることはありません。本同意書は、少なくとも実験日より 5 年、それ以降は実験者にて必要とする期間、保管いたします。

7. 実験に関する情報の守秘のお願い
実験参加者が実験の内容及び体験したことを第三者に伝えることは、今後の実験の実施に困難が生じたりデータの信頼性が損なわれたりする可能性がありますので、守秘をお願いいたします。

8. 実験者、および問い合わせ先について

この実験は、北陸先端科学技術大学院大学・修士課程のミヒライ アヒマティ、北陸先端科学技術大学院大学・教授の橋本敬が共同で実施するものです。実験内容に関するご質問がある際には、下記の連絡先までご連絡ください。

実　験者:	ミヒライ（北陸先端科学技術大学院大学・修士課程）	橋本敬（北陸先端科学技術大学院大学・教授）
	住所〒923-1211 石川県能美市旭台 1-8	住所〒923-1292 石川県能美市旭台 1-1
	連絡先 E-mail: milayi@jaist.ac.jp	連絡先 E-mail: hash@jaist.ac.jp

実験参加の同意書

私は、「外国語環境におけるバイリンガル話者の母語書字」に関する実験について、以上の事項について説明を受けました。実験の目的、方法等について理解し、実験に参加いたします。

参加者（署名）　_____

日付： 　　　　年　　　　月　　　　日

「在外语环境下双语者的母语书写」实验知情同意书

　　您将被邀请参加一项关于「在外语环境下双语者的母语书写」的问卷实验，本知情同意书提供给您一些信息，在您决定是否参加这项实验之前，请尽可能仔细阅读以下内容。它可以帮助您了解该项研究以及为何要进行这项实验。决绝参与实验或者中途退出实验不会给您带来的任何风险和不适。请您仔细阅读，如有任何疑问请向研究人员提出，并请研究人员给予解释，直至您对本项研究完全理解。衷心希望您能够自愿参与本次问卷实验。

　　　　1.　　实验的目的及意义
　　本次实验的目在于，通过测试生活在外语环境下的双语者母语书写，来考察非母语环境给双语者的母语书写带来的影响。探讨语言间的相互作用，有益于双语教育的进行。

　　　　2.　　实验方法
　　此次实验，包括汉字的句子和词语的听写测试，以及问卷调查采访。

　　　　3.　　实验对象
　　本次实验是以在日母语为汉语并且日本语能力试验 N1 合格者。

　　　　4.　　参加本次实验可能出现的风险和不适
　　参加本次实验，不会给您带来的任何风险和不适。

　　　　5.　　实验及中途退出实验
　　在听写正式开始前和结束后，您可以拒绝参加本次实验，在听写测试途中您若不想继续，为了不打扰其他参与者进行实验，请您耐心等到听写测试结束后再离场。中止实验后，实验数据将会按照您的意愿进行公开/废弃处理。

　　　　6.　　个人信息及实验数据的保密
　　本次实验获得的内容，将不会使用于研究结果报告和学术研究以外的任何目的，并将严格保密。该实验数据，仅使
用于以学会及论文发表等学术研究为目的的活动。实验数据将由研究人（米拉依·阿合买提，桥本敬）负责在分析所需必要期间(实验之日起至少 5 年)内保管、是不会以个人形式将其公开。
　　请注意，本问卷实验同意书将自实验之日起至少 5 年内，由实验人负责保管。

　　　　7.　　实验人、及联系方式
　　本次实验由北陆先端科学技术大学院大学硕士课程米拉依·阿合买提，北陆先端科学技术大学院大学教授桥本敬共同实施。如果您有任何与本次实验有关的疑问或不理解的事情，请参照下记联系方式联系我们。

实验人：米拉依·阿合买提（北陆先端科学技术大学院大学硕士课程）
　　　　地址 〒923-1211 石川县能美市旭台 1-8
　　　　联系方式 E-mail: milayi@jaist.ac.jp

　　　：桥本敬（北陆先端科学技术大学院大学硕士教授）
　　　　地址 〒923-1292 石川县能美市旭台 1-1

联系方式 E-mail: hash@jaist.ac.jp

<div align="center">问卷实验同意书</div>

我已经阅读了上述「在外语环境下双语者的母语书写」问卷实验同意书，而且理解本次实验的目的及方法，我知道参加本研究可能产生的风险。我决定同意参加本项研究。

参加人（签名）＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿＿

日期：＿＿＿＿＿年＿＿＿月＿＿＿日

实验说明

感谢参加本次实验。您将参与关于在外语环境下的双语者的母语书写的研究。

实验目的

本次实验目的是为了了解两语言间的相互作用的影响。

实验流程

本次实验包括 3 个部分，听写测试，问卷调查，试后采访。听写测试的目的是为了调查你能否写出对应的汉字。问卷调查的目的是为了了解个人基本信息，语言学习及使用的相关信息。事后采访的目的是为了了解通过测试对自己母语书写能力的评估。因为本次实验为书面测试，试前相关材料介绍将以语音的形式进行，试后发放语音介绍的相关书面材料。

实验用时

本次实验共计一个小时

实验说明及同意书内容介绍 10 分钟

听写测试 20 分钟

问卷调查 10 分钟

实验步骤说明

1. 请听实验同意书的内容，听完并口头表明是否愿意参加实验
2. 请确认面前的测试卷页数为 4 页，确认后在测试卷右上侧的空格内填写姓名，
3. 日期，测试时间；准备好后开始进行听写测试，

   请将所听内容写在测试卷编号顺序相对应的位置。记录过程中，如有写错的字，请勿涂画，画一道线后将正确的字写在旁边即可。如有不会写的字，请空出位置继续书写

后面的内容。请尽可能记录完整所听内容。

本测试包括 27 个句子和 27 个词语，句子每个会读三遍，每写完 5 个句子之后会有 10 秒的休息时间，休息期间请勿对之前记录内容做出任何修改。词语听写，每个词只读一遍，每写完 10 个词，会有 10 秒休息，休息期间请勿对之前记录内容做出任何修改。

如果对上述听力测试要求有任何疑问，请举手示意，研究人员会做出相应解释。

4. 请阅读同意书内容是否与语音介绍内容一致，如没有问题请签上姓名

5. 请填写问卷

6. 请头回答关于测试卷相关问题