

Two Case Studies of L2 Attrition Due to the Change in School Medium Language from L2 to L1 in the L1 Environment

Asami Nakagawa

Abstract

This paper investigates whether language attrition occurs due to the change of environments in the initial six months. The two participants of the study, L and M, have acquired their L2 (English) through school instruction at an international school in their L1 country (Japan). In the spring of 2011, they both transferred to a Japanese school. From the transfer, their L2 immerse decreased largely. From these environmental changes, it was observed whether language attrition would occur to the two. Language attrition was observed from five linguistic aspects, fluency, lexicon, accuracy and writing skills. The instruments used to collect data varied from the storytelling task to free conversation interview. Three research questions were set in order to seek the participants' linguistic changes. (1) Will language attrition occur to those whose classroom instructions changed largely from their L2 to L1 in the initial six months? (2) If attrition can be seen, in which order of the skills such as fluency, accuracy and lexicon will attrition be observed? (3) Will motivation and personalities of the participants' effect language attrition or retention? Over the six months, the two participants both stabilized their linguistic skills in a high level. However, there was a subtle decline seen in both participants' productive lexicon, fluency and complexity rate of the writing test. The study revealed possible signs of language attrition in the initial stage.

Keywords: L2 attrition, L1 environment, school medium language, productive lexicon, lexical frequency level

1. Literature Review

1.1 Rationale

The phenomenon of language attrition has been formally recognized at the Conference on the Attrition of Language Skills at the University of Pennsylvania in 1980. Since this conference, language attrition has been understood widely as “the decline of linguistic skills whether of individuals or speech communities” (Taura, 2008a).

My own experience of being a Japanese returnee inspired me to choose the present research topic of “language attrition”. Since my return from the U.S.A to Japan, I have been struggling to maintain my English knowledge while adapting to Japanese society. After more than ten years had passed since my return, I found myself totally adjusting back into Japanese schools, making friends and getting used to society itself. However, I also found myself trying to cope with a decline in my English skills particularly my speaking. From this experience I have always had a question on my mind, which is “Is language attrition inescapable when there is a change of language environments?” I believe this is a question many returnees and L2 learners face. I hope the present study will contribute in a small way, to reduce the difficulties many returnees and L2 learners like myself face.

The phenomenon of language attrition is defined in the present research as “permanent or temporary regression from the subjects’ previous linguistic performance in any linguistic skills, such as speaking, listening, reading and writing” (Yukawa, 1997). Language regression due to pathological attrition such as aphasia is excluded from the definition in this research. A person who displays such phenomena is called an “attriter” in this research.

This section will introduce key variables in language attrition studies, namely pre-attrition proficiency, motivation and personality, along with various aspects that attrition studies examine.

1.2 Prediction variables

1.2.1 Pre-attrition proficiency

Many researchers (Tomiyama, 1999, 2000 and 2008; Reetz-Kurashige, 1999; Yoshitomi, 1999) claim that the attriter’s pre-attrition proficiency plays a key role in language attrition.

Tomiyama (1999 and 2000) examined the initial and second stages of a Japanese male returnee student in a longitudinal case study, which lasted for a total of 33 months. The subject Ken, left Japan at the age of 1;03 (year age; months) and came back to Japan after seven years. Judging from his language profile along with his length of residence, Ken was labeled as a high-proficient subject with acquired skill in literacy. The research at the initial stage commences with month two of his return and continues until month nineteen. Five instruments were used to observe how Ken’s language skills changed over time. Data from a free conversation interview between the researcher and Ken were analyzed to measure Ken’s morphological, syntactic and conversational discourse skills. The Peabody Picture

Vocabulary Test (PPVT) was used to examine the extent of the subjects' vocabulary acquisition. The Bilingual Syntax Measure (BSM) and data of storytelling using two picture books were used to measure Ken's morphological skill, fluency and sentence structures.

Ken's frequent use of code-switching and some deterioration in his morphology and syntax were seen in the initial observation period, but the phonology and receptive lexicon remained robust throughout the whole period. Tomiyama's observation of Ken continued after the initial stage 2nd to 19th month back. The second stage of observation comprises month 20 through month 33. The second stage was characterized as a phase of change in Ken's syntax and morphology and stability in fluency and productive lexicon. Tomiyama finished her longitudinal study by concluding that although there was some attrition seen in Ken's morphology, his attained proficiency level and acquired literacy skills' contributed to the prolonged retention of his L2 ability.

In 2008, Tomiyama also investigated whether there is a difference in the attrition pattern of second language between two siblings in terms of grammatical complexity, grammatical accuracy, lexical complexity and lexical productivity. The subjects in this research were one male (older sibling) and one female (younger sibling) returnee, who were called by the pseudonyms, Eugene and Lily. Eugene was 5;08 and Lily was 2;08 when they moved to the United States. After their four years and four months' stay in the United States, they returned to Japan and were placed in a local public school in Japan. Eugene was 10;00 and Lily was 7;0 at that time. Data were collected from a story telling task, which used the picture book by Mayer and Mayer (1971), *A Boy, A Dog, A Frog and A Friend*. The observation lasted for 31 months.

Throughout the 31 months, Eugene and Lily showed some similar attrition patterns regarding their grammatical complexity, lexical complexity and lexical productivity. Despite the age gap between the two siblings, the younger sibling did not show a great difference in attrition pattern from the older sibling. Tomiyama claimed from this result that, their overall attained proficiency in English at the grade norm level included the acquisition of literacy skills was significant. Regarding the younger sibling, who belonged to an age group reported to be more vulnerable to attrition, Lily showed attrition patterns similar to her older brother who belonged to an age group reported to be more robust. Tomiyama concluded that this result came about because the younger participant had reached a high proficiency level and this was a factor of maintaining her L2 in terms of grammatical complexity, lexical complexity and lexical productivity.

Reetz-Kurashige (1999) also observed a difference in attrition pattern in the use of lexical and morphosyntax between the three groups of subjects. The three subject groups were 18 returnees, 10 Japanese children of elementary school age living in Honolulu and attending local English-speaking schools, and 14 native English speakers in the same age range. Storytelling was the task used to measure the changes in verb use by the subjects. Pica's (1983) Target-Like Usage formula with its

method of using morpheme quantification, was used to assess the subjects' accuracy in morphology. The Target-Like Usage formula is calculated as the number of correct cases divided by the number of total cases.

Reetz-Kurashige (1999) claimed that being older did not guarantee high retention. From the researcher's observation, it was found that the initial proficiency scores were the best predictors of retention. Among the subjects, those children whose age was over eight years old and their length of residence included at least two years of school abroad retained over 80% TLU. Near native-level English speaking ability was virtually always required for minimal attrition. In other words, high competence at study onset was the most predictive factor of minimal L2 attrition. Reetz-Kurashige's (1999) findings support the inverse hypothesis which was hypothesized by Bahrck (1984) that highly proficient learners plateau for several years before language attrition starts. Since the more highly proficient subjects showed a lower degree of attrition in Reetz-Kurashige's research, this led her to conclude that the inverse hypothesis was supported. This study also found that the more than age or length of time abroad, proficiency in speaking was the best predictor for retaining accuracy in speaking.

1.2.2 Motivation and personality

Gardener, Lalonde and MacPherson (1985) observed the effects of attitude and motivation on second language attrition using a retrospective design. Students who participated in a six-week course in French rate of how good they perceived second language skills to be throughout the intensive course, by answering questionnaires. They also rated their present skill levels. From the questionnaires, measures using twelve variables such as attitudinal/ motivational were obtained.

As a result, attrition in medium-level language skills of speaking and understanding were found. Also, those with favorable attitudes and high motivation showed little attrition, while those with less favorable attitudes and motivation showed significant language loss. It can be said from this research that, positive attitudes and intensive use of the second language are associated with high levels of skills in second language. In comparison to Tomiyama's (1999, 2000 and 2008) longitudinal research, this research examined the students over a six-week course and it can not be discussed in the same way from a longitudinal perspective.

Yoshitomi (1999) examined the language attrition pattern in four female Japanese returnee students taking a multiple case study approach. The girls differed in age and incubation period. The term incubation period is used by Gardener and Lysynchuck (1990) to refer to the period between the termination of language training and the time when retention is assessed. The subjects were divided into groups according to their chronological age and their incubation period. The subjects were referred to as JYS (younger, shorter incubation), JYL (younger group, longer incubation), JOS (older group, shorter incubation), JOL (older group, longer incubation). All subjects lived in large metropolitan areas in

America. They all went to local American schools on weekdays and attended supplementary Japanese schools on Saturdays. After their return to Japan, some subjects had a chance to attend English classes for returnee students. However, despite the subjects' strong willingness to maintain at their English schools, their opportunities to use English were still fairly limited. Yoshitomi collected the data four times over a year with three months in between each session. Five tasks were adopted in order to collect the data. (1) Free interaction: a free conversation interview was held between the subject and the examiner. (2) Story description: Each subject was asked to describe stories by looking at picture books. (3) Planned speech: the subject was asked to think about a topic that was discussed during the free interaction, expand on the topic, and plan a short speech about it. (4) Listening comprehension: A controlled listening comprehension test was given using Comprehensive Language Evaluation (CYCLE) which was used to measure the subjects' formal linguistic knowledge. (5) Interview and questionnaire: Interviews were conducted in Japanese between the researcher and the subjects. Interviews with the subjects' parents were also held.

Yoshitomi found some differences in the subjects' use of vocabulary due to their personalities. It was found that the more talkative returnees produced more types and tokens of vocabulary items and seemed to benefit more from planning. From this fact, it was concluded that personality plays an important role in the use of communication strategies. The more talkative returnees used paraphrasing and progressive retrieval. For example, the subject JYL was a risk taker who used the largest number and the widest variety of communication strategies. Yoshitomi claims that JYL was talkative and fluent and showed the strongest motivation to retain her L2. In addition, her attitude toward the data-collection was highly positive. From these findings, Yoshitomi concluded that personality and motivation has an influence on the linguistic performance.

1.3 Linguistic aspects of attrition

In this section, various linguist aspects on attrition will be introduced.

1.3.1 Fluency

In Tomiyama's (2000) study, Ken's fluency changed on a parallel with code-switching and lexical attrition. Tomiyama observed pauses, repetitions and self-repairs from the storytelling data. From this data Tomiyama revealed that Ken paused more and longer as time progressed. In addition, Ken progressively made more repetitions. As a conclusion, Ken's language fluency was defined by his pauses, repetitions and self-repairs and it deteriorated progressively.

Yoshitomi's (1999) research found possible signs of attrition in the subjects' fluency as well. She found attritional patterns in the average number of clauses per repair and the average number of clauses per false start. The average number of clauses per repair decreased for JOS and JYS. The average number of clauses per false start decreased for JOL and JYS. In other words, all the subjects except for

JYL showed a small degree of regression in fluency. They all showed a frequent use of repairs and false starts in their speech which increased over time. However, in terms of the amount of speech per time unit, no evidence of attrition was found.

1.3.2 Morphosyntax

Tomiyaama (2000) found some evidence of attrition in Ken's morphology. The grammatical morphemes that were focused in this research were the plural verbs, third person singular, progressive, auxiliary, copula, regular past and irregular past verbs. Most of his morphemes stayed stable, except for the plural form and third person singular. Ken's use of the plural revealed a severe degree of attrition which dropped to as low as 65% in accuracy rate. Irregular past and regular past verbs showed a gradual decline as well.

Reetz-Kurashige's (1999) research also found some evidence of attrition in her subjects' use of morphology. Common attrition patterns seen in the subjects were errors such as dropping the bound "ed" morpheme in the regular past tense, the "s" for the third person singular, omitting the auxiliary verb in the progressive form, or failing to have the auxiliary agreement.

1.3.3 Lexicon

Russell (1999) examined the patterns of lexical maintenance and attrition among 65 native English-speaking learners of Japanese as a second language (JSL). The subjects were university students in their early twenties who had recently returned from their two years of missionary service in Japan. All subjects in the study had taken an intensive two-month language training course and spent 22 months in the host country, acquiring the L2. The subjects, divided into two groups participated in three tests. One group consisted of learners with a significant amount of additional formal instruction in Japanese (eight or more semester hours) over the two-year period of the study, and the other group consisted of learners without any such instruction. After that, 10 subjects were selected randomly from each of the two groups. Oral monologue data were collected from the two groups three times over a period of two years. The subjects were asked to record their oral responses in Japanese to each of the six questions. The oral data were transcribed and processed using the *Word Cruncher* (1988) software to generate lists of words and their frequencies. The type-token ratios were also calculated using these lists. The relative frequencies of content words (nouns, verbs, adjectives, and adverbs) versus function words (postpositions, conjunctions and fillers) were also analyzed and compared with each of the groups.

As a result, significant differences were found in the following areas. (1) a decrease in vocabulary size, (2) a decrease in the number of sentences and of lexical error-free sentences, and (3) an increase in the ratio of English tokens to total tokens. There was no clear evidence of attrition found in lexical variability, lexical density, lexical errors per T-unit, tokens per error-free T-unit, the relative frequency

of filler words and loan words.

In Tomiyama's (2008) study, both Eugene and Lily showed a gradual decline in lexical complexity, with Eugene experiencing a steady regression except for the second last session, while Lily showed more fluctuation. Both of them ended up showing lower scores compared to the first session. Compared to Eugene, Lily showed more frequent and a larger magnitude of fluctuations in her lexical complexity. Tomiyama indicated this to be because of Lily's unstable language condition compared to Eugene. While the two subjects showed some decline in lexical complexity, their lexical productivity seemed to have been maintained or had only declined slightly.

1.3.4 Compensatory strategies

Compensatory strategy is a communication strategy generally triggered by insufficient linguistic knowledge. This type of strategy is used by attriters to compensate for their deficient language. In Yoshitomi's (1999) interview and questionnaire, the subjects reported that they used compensatory strategies such as paraphrasing or circumlocution to compensate for their lack of ability. Circumlocution is defined as an indirect way of speaking; the use of more words than necessary to express an idea.

Faerch and Kasper (1983) label compensatory strategies as formal reduction strategies, code-switching and interlingual transfer. When using a formal reduction strategy, speakers communicate by means of a reduced system to avoid using specific linguistic rules and items (Faerch and Kasper 1983). The compensatory strategy of code-switching is an often observed phenomenon in the process of L2 attrition (Tomiyama 1999). In Tomiyama's (1999) research, some changes in Ken's code-switching frequency were found. He started code-switching to his L1 from the 8th month since returning to Japan. Code-switching took place with interjections and emotional utterances such as expressing frustration and excitement. Conversational fillers were also seen as susceptible to code-switching. Also, as Ken started to show some lexical retrieval difficulty, so he used a number of strategies to compensate for his deficiency such as code-switching, paraphrasing, avoidance and approximation. In Tomiyama's research of 1999, interjections, fillers and emotion-laden utterances were likely to be switched to Ken's L1.

Compensatory strategy such as formal reduction strategies was also seen in Tomiyama's (2000) research. From the storytelling data, there was a structural change in Ken's modification of nouns, from post-noun modification to pre-noun modification. Tomiyama claims that Ken's structural change was a subtype of formal reduction strategy called "syntactic reduction". She indicates that by using pre-noun modification, two of the devices for post-modification of nouns in English, relativization and prepositional phrases can be avoided. The first pattern of Ken's structural change seen was the pre-modification of head nouns by other nouns, such as "a tiger mom". The pre-modification of nouns by -s genitives was also frequently seen for example in the phrase, "the window's place". Multiple pre-modification of nouns such as "a one tire baby car=stroller" was seen as well. Also, changes in a

particular structure, vocabulary and morpheme use was observed under a controlled environment. The free conversation interview revealed Ken's increasing use of pre-noun modification patterns.

1.4 Hypotheses of language attrition

1.4.1 Regression hypothesis

The regression hypothesis is a widely used theory in describing the phenomenon of language attrition. The regression hypothesis was hypothesized by Jakobson (1968 English translation, cited in Lynne Hansen, 1999, p9). The hypothesis describes that the process of language attrition is the reverse order of the process of acquisition. In other words, the regression hypothesis postulates that what is learned last is lost first.

To date, the regression hypothesis is partially supported. Cohen (1975), for instance observed the attrition pattern of three children with their L1 being English and L2 being Spanish. The data was collected longitudinally for a period of 19 months, which reflected observational data and data from structured test of morphology and syntax and from storytelling. The three children's acquisition and attrition patterns were observed in their use of tense, article, adjectives and ser/estar ("to be") distinction. As a result of the observation, two subjects showed results to uphold the regression hypothesis. However, Cohen's data also revealed counter evidence of the hypothesis in one of the subjects. Thus, the regression hypothesis is only partially upheld in Cohen's study.

In Taura's (2008a) study, his subjects showed results to support the regression hypothesis. In his study, approximately 150 returnees who were divided into two groups, depending upon their educational background, participated in this study. Three experiments were conducted, investigating receptive skills and productive skills. The productive skills were observed from the data collected by the storytelling and story writing task. In examining the subjects' accuracy, Taura adopted the 4-M model by Myers-Scotton (2002), which will be detailed in 1.4.2, and examined the subjects' changes in accuracy based on four morphemes. From the observation, Taura concluded that his accuracy analysis revealed that his subjects' attritional order followed the regression hypothesis, and supported the hypothesis.

While the regression hypothesis was partially seen or upheld in the literatures, Tomiyama's (2008) showed another different result. Through the two siblings observation, Tomiyama found there was a "fluctuation" in their attritional order. Fluctuation was defined in the study as a change in the direction (i.e. improvement/ decline) from the previous session. In addition, the degree of fluctuation differed between the younger sibling and older sibling. From the result, Tomiyama concluded that the two siblings' attritional patterns were not a linear decline but showed a fluctuation, which does not quite follow the regression hypothesis.

From these studies, we can see that the regression hypothesis is a widely used theory in the field

of language attrition. However, we can also see research findings that are still indeterminate that to conclude whether the hypothesis is upheld or not.

1.4.2 4-M model

According to Myers-Scotton's (2002) 4-M model, the acquisition and attrition process does not follow the process as the regression hypothesis. The 4-M model hypothesizes that the attrition pattern follows the same path as the acquisition process. In the 4-M model proposed by Myers-Scotton (2002), the morphemes are divided into 4 types. They are the content, early system, two late system morphemes, which are called the bridge late system and the outsider late system morpheme. Content morphemes are directly elected by a speaker's intentions to map conceptual structure onto the lemma, assign or receive a thematic role. Early system morphemes pattern with the content morphemes. The other two types of morphemes are structurally assigned later in the production process. Examples of the content morphemes are nouns, verbs, adjectives. Examples of the early, bridge and outsider system morphemes are the definite article "the", copula "be" and irregular past tense, respectively. According to Myer-Scotton's (2002) hypothesis, a learner acquires and loses their morphemes in the order of content, early system, bridge late system and outsider late system morpheme.

Taura's (2008a) study adopted the 4-M model for accuracy analysis, but found attritional orders in his subjects that was completely in a reverse order of Myers-Scotton's implicational scale for language attrition. He found that the content morphemes were the most immune to loss, followed by the early system morphemes, bridge late system morphemes and the outsider late system morphemes. From the finding in Taura's (2008a) literature, we can see that the validity of the 4-M model, or the implicational scale proposed by Myers-Scotton (2002) to be tested in the attrition field.

1.4.3 The speed of attrition

When mentioning the attrition speed, the notion of an "initial plateau" must be considered. An initial plateau is proposed by Weltens and van Els (1986) and Bahrick (1984), which is defined as a period where linguistic skill levels remain relatively stabled during the first few years after the disuse of the L2.

Tomiyama (1999) compared the speed of attrition with the subject in Kuhberg's (1992) study and Kaufman & Aronoff's (1991) subject. Kuhberg's subjects showed a rapid speed of attrition, which led him to terminate the study after by the 15th month of study. The subject in Kaufman and Aronoff's study, attrition speed were even faster and to be reported that by the 12th month, the subject showed difficulty in his language use. Compared to those subjects, the subject of Tomiyama, Ken was still speaking spontaneously after the 19th month of observation. From this observation, Tomiyama concluded the possibility that Ken was in an "initial plateau" at this point.

From the research findings, we can assume that there is an “initial plateau”, but it differs between the subjects and still is indeterminate to conclude the precise period of an initial plateau.

1.5 Research questions and possible predictions

1.5.1 Research question 1: Will language attrition occur in those whose classroom instructions changed greatly from their L2 to L1?

A great number of findings of attrition patterns can be seen in the literature review. However, many of the subjects for the research we examined were students who have gone to another country and acquired their L2 naturally and then they have come back to their L2 environment. The L2 attrition patterns of these students have been observed in many studies.

Few studies have focused on subjects who live in their L1 country, and acquired their L2 naturally, for example, through classroom instruction at schools where the school instruction language is in the L2 to rather than the L1. Therefore, attention will be paid to those students in the present study.

Prediction 1: Severe language attrition will not take place, but some linguistic skills will show a decline.

From children’s L2 attrition studies (Tomiya, 2000; Yoshida, 1990; Yukawa, 1998; Taura, 2008a), it is claimed that receiving an L2 literacy education for the first 2 years at elementary school in an L2 environment assures no attrition for six to eight months (Taura, 2008). In addition, it is also said that four years of such an education will help stabilize the learner’s L2 literacy skills and prevent attrition from setting in for at least one year (Taura, 2008a). The subjects of this research who will be introduced in detail in Chapter 2, did not acquire their L2 in an L2 environment like typical-returnee students, however they grew up in Japan, and acquired their L2 naturally through the school curriculum and instructions at an international school and through daily conversations with their family and friends. From the environment they were raised in, it can be said that they have acquired their L2 naturally like returnee students do. From the fact that they have had approximately 10 years of an L2 literacy education in such an environment, it can be predicted that language attrition will not set in over the observation period, which is approximately six months. Therefore, from the literatures, a prediction will be made that severe language attrition will not be observed. However, it will also be predicted that minor attrition in some skills may be seen, which will be detailed below.

1.5.2. Research Question 2: If attrition can be seen, in which order of the skills- fluency, accuracy and lexicon, will attrition be observed?

Prediction 2: Attrition will occur in the order of the participants’ lexicon, fluency and accuracy.

Prediction 1, considers that severe language attrition will not be observed. However, although severe attrition may not be seen, this does not indicate that nothing is lost. By observing the subjects’ L2

skills from different perspectives, such as fluency, accuracy and lexicon, attrition patterns may be revealed.

According to the literature, predictions can be made that the participants will show small signs of attrition in their skills in the order of lexicon, fluency and accuracy. Many L2 language loss research studies show evidence of lexical loss such as Tomiyama (2000), Yoshida *et al.* (1989) and Hansen (2001). From an hypothesis put forward by Andersen (1982), lexical items the least frequently used by an attriter are the most susceptible to loss, which leads to the prediction that those words that are not frequently used in daily conversations and classes for the subjects will show signs of decline first among all the skills.

Regarding morphosyntactic attrition, as Moorcroft and Gardener (1987) and Weltens (1989) claim in their research, the attriter's proficiency is a key factor connected to language attrition. Low proficiency learners are said to lose more of their grammatical skills than their vocabulary skills. In contrast, highly proficient learners' vocabulary skills are said to be more susceptible to loss than their grammar skills. The present researcher's two participants can be qualified as highly proficient learners from their baseline data, so it is predicted that their lexical skills will show signs of attrition than their grammar.

1.5.3 Research Question 3: Will motivational level and the personality of the participants effect language attrition or retention?

Prediction 3: If the participants retain a high motivation to keeping their English skills, motivation will play a key role.

Factors such as the learner's motivation, attitude and use in relation to language attrition have been studied by Gardener *et al.* (1985), Gardener, Lalonde, Moorcroft and Evers (1987). Gardener *et al.* (1985) examined 20 to 30 year old subjects' attitudes towards the target language (French) and their language learning as well as the use of the French during the incubation period (6 months after the instruction had started and before the second assessment) using their questionnaires. The research revealed that subjects who had favorable attitudes, tended to maintain their French. In contrast, those who showed less favorable attitudes retained less. Also, the use of French during their incubation period showed a possible effect on the degree to which the subjects maintained their speaking skills. From this research, it can be seen that motivation and attitudes leads to the subjects' frequent use of the target language, which results in an even higher degree of maintenance of the language.

From the literature on motivation and attitudes, predictions will be made that the participants' high motivational level will play a key role in maintaining their L2. The chances for the participants in the present author's research, to use English will decrease after their change in school environment. Despite this, their high motivation will help them to make full use of the any occasion available to them

to use English in their daily lives such as conversations with their families and friends back in their former school.

2. Methodology

2.1 Demographic data of the participants

There are two participants, L and M, in the present study. Table 1 summarizes their demographic data.

Table 1. *Demographic data of the participants*

	school instruction language		
	English	Japanese	
		(pre-test)	(post-test)
Participant L	5:00 ~ 14:11	15:00	15:06
Participant M	5:00 ~ 17:06	17:05	17:11

Participant L, is a 15-year-old Japanese female. L attended an international school in Hokkaido since she was 5 years old. She used English in classes at school and with her international school friends. At home, she uses English when she talks to her younger sister who also went to the same international school. She entered a Japanese senior high school in Hokkaido from April, 2011 at the age of 15;00.

The other participant, M is 17 years old. She is the child of a Brazilian mother and a Japanese father. M uses English with her mother and talks in Japanese with her father. She has also attended an international school in Hokkaido since she was 5 years old. In the international school, she had all her classes in English. She used Japanese only in the Japanese class, which was held once a week. However, during the summer vacations in the international school, M had some opportunities to go to a public Japanese school and participate in after school activities up until elementary school 4th grade. M transferred to the Japanese senior high school in Hokkaido at the age of 17;05 in March 2011, one month earlier than L. The pre-data were taken from both girls two weeks after M's entry into the senior high school.

Both participants had been going to the same international school before they entered the Japanese senior high school. The international school is a school mostly for returnee students who have lived abroad or for students with either one or both of their parents who is from another country. All classes in the international school, which the two participants went to, were taught by native English speakers. Native English teachers instruct all classes in English, such as history, math, science, physical education, music, art, English grammar and literature. During the week, Japanese class was held once or twice. The Japanese class was taught by a native Japanese speaking teacher. The class content varied from week to week, but students were mainly taught about Japanese culture, *Kanji* and Japanese

literature.

The Japanese senior high school, which the two participants entered, is a private school in Hokkaido. In this school, all the subjects including math, science and P.E were taught by a Japanese native teacher in Japanese. The total number of classes of English held per week differed slightly each school year. L entered as a first grade high school student, and receives six English classes in a week. However, among the six classes, only one class is taught by a native English speaker. English grammar and English reading classes occupy the other five classes, which are all taught in Japanese by a Japanese English teacher. M entered the Japanese school as a second grader, receiving eight English classes a week. However like L, she has only a small number (two) of classes taught by a native English teacher.

From this information, we can see that the opportunities for L and M to receive native English teachers' classes in English decreased sharply after their entrance into the Japanese senior high school.

The pre-attrition proficiency in attrition studies is an important factor, which must be made clear before the research starts, since the relevant literatures found that highly proficient subjects are more prone to attrition (Tomiyama, 1999, 2000 and 2008; Reetz-Kurashige, 1999; Yoshitomi, 1999). Data were collected from L and M to specify their baseline data.

The pre-test was carried out in March, two weeks after M's entry, and right before L entered the Japanese high school. L's raw score was 164 on the Peabody Picture Vocabulary Test (PPVT), an age equivalent to the age of 16;04 though her chronological age was 15;00. Meanwhile, M's raw score was 148 on the PPVT, an age equivalent of 12;08 when her chronological age was 17;05. As an indication of the participants' baseline data, the PPVT results show that L's lexical level is age appropriate, while M's lexical level is below her chronological counterparts in the United States.

2.2 Data collection procedure

All data were collected from the participants twice. The first data was collected in March 2011, after the participants left the international school where they were educated for approximately 12 years in the English language (L2). Participant L was 15;00 at the point she joined the Japanese school, and entered from the first grade of senior high school. Participant M was 17;05 when she entered the second grade of the senior high school. The post-data were collected in September 2011. This was exactly six months after the pre-data were collected.

2.3 Linguistic Aspects

In the present research, the phenomenon of language attrition was observed from many angles of the linguistic skills through four instruments, which is summarized in Table 2. In addition to the four linguistic aspects, the motivational changes of the participants were observed from the interview data.

Table 2. Linguistic aspects and instruments

	Fluency	Lexicon	Accuracy	Writing Skills	Motivation
The Peabody Picture Vocabulary Test					
Storytelling					
Writing Test (TOWL-3)					
Interview					

2.3.1 Fluency

The participants' fluency in using English was measured from the storytelling test and writing test (TOWL-3). To observe the participants' fluency, pause analysis and word count per sentence were conducted on storytelling. As for the written data, the numbers of types, token, sentences and clauses per minute were calculated as fluency indices.

2.3.2 Accuracy

Two types of accuracy were analyzed- (1) morphosyntactic accuracy and (2) complexity rate.

The morphosyntactic accuracy is examined on the storytelling and writing data. The collected data were analyzed by using the theoretical framework of the 4-M model proposed by Myers-Scotton (2002), which will be explained in section 2.5.3.

Along with the morphosyntactic accuracy, the lexicon complexity rate was also calculated using the formula from Taura (2008a). The numerical formula used was, complexity rate = (the number of total subordinate clauses + the number of total passive form sentences) divided by the total number of sentences.

2.3.3 Lexicon

The participants' lexical ability was measured from the Peabody Picture Vocabulary Test, storytelling and writing test. In detail, the Peabody Vocabulary Test observed the participants' receptive lexicon levels. The storytelling test and the writing test are used to examine the participants' productive lexical level and lexical complexity. The lexical complexity was calculated by the "Complete Lexical Tutor" (<http://lex tutor.ca/vp/bnc/output.pl>) along with the lexical productivity. This software produces the number of types, tokens, the lexical density in terms of the type-token ratio and the frequency level of each word used in the context.

2.3.4 Writing skills

The participants' writing skills were examined in the writing test of TOWL-3 that looks at contextual convention, contextual language and story construction.

2.3.5 Motivation

The semi-structured interviews were qualitatively analyzed to see the emotional changes such as the participants' motivations after they have transferred to the Japanese school.

2.4 Instruments

Four types of data were collected using the following instruments.

2.4.1 The Peabody Picture Vocabulary Test (PPVT)

The Peabody Picture Vocabulary Test was used to examine the subjects' receptive vocabulary level. To administrate, the researcher presents a series of pictures to the subject. There are four different pictures on each page. The researcher gives a word describing one of the pictures and asks the subject to point to the picture that matches the word given.

The result is converted into raw scores which are calculated using the standardize score sheet attached to the test. The total raw score is then converted to a percentile rank and the equivalent age of native English speakers as a comparison. Research such as Tomiyama's (1999 and 2000) has employed this instrument to examine the extent of Ken's vocabulary acquisition.

2.4.2 "Frog, where are you?" (Mayer, 1971)

This picture book has been widely used as a device to elicit participants' storytelling. The book is one of Mayer's frog series, which are now commonly used by attrition researchers (e.g, Tomiyama 2000). It has 24 pages of detailed pictures without any written text. (see Appendix 1) The storyline of this picture book is that the main characters - a boy and his pet dog, go searching for their missing pet frog first in their house and then in the forest. While they search, they encounter many different characters, objects and actions. The task required the participants to use words that they would have learned while they were attending English-speaking classes at the international school. These words include such items as bees, owls, moles, reindeer, jar, beehives, holes, cliffs, ponds and logs. The participants were given some preparation time to look at the pictures before they told their story following the storyline as depicted in the pictures. They were told to take as much time as they wished to tell their story. The recorded storytelling data were transcribed and then subjected to a numerical analysis of their fluency, accuracy and lexicon as explained below.

- (1) Pause analysis was carried out to observe the participants' fluency. Pauses that lasted longer than 200ms were detected using the Audacity 1.3.12 device. The Audacity device is a multilingual audio editor and recorder, which shows the length of the sounds and pauses. Pauses shorter than 200ms were excluded since they are physiologically caused pauses. Pauses were classified into inter-sentential pauses and intra-sentential pauses. Inter-sentential pauses occur between sentences

and intra-sentential pauses occur in the middle of a sentence. It is said that native English speakers have a tendency to have more pauses between sentences, which is called an inter-sentential pause, and English learners tend to use more intra-sentential pauses, during a sentence when the sentence is not completed. These intra-sentential pauses are used when a person is trying to retrieve a specific vocabulary item (Taura, 2008b). The more intra-sentential pauses are found, the more it can be assumed that the person is having lexical retrieval difficulties.

- (2) The 4-M model analysis by Myers-Scotton (2002) was used to measure the participants' morphosyntactic accuracy. The 4-M model is relevant to our study for two reasons. First, the model place its focus on both acquisition and attrition order of a language. Secondly, the model is systematic in a way that the participants' attrition order can be explained by the four morphemes. By using the 4-M model and classifying the participants' morphemes, we assume that the attritional pattern will be revealed. Along with the 4-M analysis, the lexicon complexity rate was also calculated using the formula from Taura (2008a) as explained in 2.4.2.
- (3) Lexical analysis. In the lexical analysis, types, token, type-token ration (TTR) and frequency level were calculated. TTR is commonly used (e.g. Yoshitomi, 1994; Yukawa 1998) in studies to assess the lexical density or diversity in attrition on Japanese subjects. TTR is calculated by the ratio of different words (type) to total words (token) in a text.

The transcription of the data excluded the following elements. (1) self-corrected words, (2) self-repeated words (3) nonlexical filled pauses (e.g. um, uh) and (4) Japanese utterances.

2.4.3 TOWL-3

The Test of Written Language (TOWL-3) by Hammill and Larsen (1996) was employed to measure the participants' ability to write in English. Participants were shown a particular picture (see Appendix 2) and were told to write a story spontaneously within the 15 minutes they were given. The writing data were also transcribed by the researcher. Grammatical mistakes and spelling mistakes by the participants were transcribed as they were originally written. The transcribed data were also subjected to a numerical analysis of the writing skills, fluency, accuracy and lexicon.

- (1) Writing skills. The participants' writing tests were scored according to the TOWL-3 manual (See Appendix 3). The scores were classified into three sections, CC (contextual convention), CL (contextual language) and StC (story construction). CC measures the mastery of arbitrary conventions in written language such as punctuation, spelling and capitalization. CL measures the use of language in writing. StC measures the story construction and evaluates the students' use of prose, action, sequence and theme. There are 11 to 14 items in each subset of CC, CL and StC. There are 12 items in CC such as, "all sentences begin with a capital letter" and "uses an apostrophe in a contraction." There are 14 items in CL such as, "uses coordinating conjunctions other than

and.” StC contains items such as “plot” and “characters show feelings/ emotions”. Each section’s raw scores were calculated using the TOWL manual and were converted into the levels of a native English speaker with the same writing knowledge.

- (2) Fluency analysis for the writing data was conducted as explained in 2.3.1.
- (3) The 4-M model analysis by Myers-Scotton (2002) used in the storytelling data was also used in the writing data to measure the participants’ morphosyntactic accuracy.
- (4) Lexical analysis was conducted using the same method for the storytelling data.

2.4.4 Free conversation interview

The interview was semi-structured in that the questions concerned specific topics, which were given by the researcher to the participants to answer freely in English or Japanese. The topics centered around the participants’ English knowledge and their lives when they were at the international school. Questions were asked such as “What was the most exciting event you remember at international school?” and “Is English easier for you to speak in than Japanese?” In addition, questions by the researcher were asked in both English and Japanese. The total interview time ranged from approximately 30 minutes to 50 minutes. The interview data were audiotaped and transcribed for qualitative analysis to observe the participants’ emotional changes such as their motivations.

3. Results

This chapter summarizes the results collected from each instrument.

3.1 The Peabody Picture Vocabulary Test

The results of The Peabody Picture Vocabulary Test (PPVT) are summarized in Table 3. The Table reveals that L’s raw score was 164 on the pre-test, which fell slightly to 160 on the post-test, with their standard scores being 164 and 160, respectively. While L’s chronological age was 15;00 when she took the pre-test, her age equivalent changed from 16;04 at the time of the pre-test to 15;03 at the post-test. In short, L showed a higher receptive lexical level than her chronological age in the pre-test. However, her lexical level had declined by one after six months, resulting as her receptive lexical level being the same as her chronological age.

M’s results indicate a slight improvement in her raw score, which changed from 148 on the pre-test to 155 in the post-test, with the standard scores of 87 and 90, respectively. M’s age equivalent changed from 12;08 to 14;01 while her chronological age was 17;05 when she took the pre-test. In the pre-test, she showed a receptive lexical level 5 years younger than her actual chronological age. However, after six months she showed a progress of approximately two years lexical level. Still, her receptive lexical level was for 4 years below than her actual chronological age.

Table 3. *PPVT results*

	L		M	
	pre	post	pre	post
Raw score	164	160	148	155
Standard score	104	99	87	90
Percentile Rank	61	47	19	25
Normal Curve Equivalent	56	59	32	36
Stanine	6	5	3	4
Age Equivalent	16;04	15;03	12;08	14;01
Chronological Age	15;00	15;06	17;05	17;11

3.2 Storytelling

3.2.1 Fluency

Table 4 summarizes the pause analysis results. Regarding L's data, her total number of sentences was 78 in the pre-test. The number of inter-sentential pauses was 22, which results in the number of intra-sentential pauses totaling 56. Her total pause duration was 1m 42s 633ms. Out of the total pauses, her total inter-sentential pauses were 45s 838ms and intra-sentential pauses were 56s 795ms. In other words, 44.6% were inter-sentential pauses out of the entire pauses detected. 55.3%, which is more than half of the total pauses were intra-sentential pauses. The tendency of L's intra-sentential pauses being slightly longer than her inter-sentential pauses did not change in her post-test. Moreover in her post-test, her intra-sentential pauses were longer than in her pre-test, that is 60.7% or 51s 110ms of pauses.

Table 4. *Pause analysis result of the storytelling*

	L		M	
	Pre	Post	Pre	Post
Total duration time	3m 7s 36ms	2m 13s 24ms	2m 54s 897ms	2m 18s 654ms
Total pause duration (ratio)	1m 42s 663ms (52.8%)	51s 110ms (38.4%)	1m 41s 47ms (57.7%)	1m 8s 948ms (49.7%)
Total speaking time (ratio)	1m 24s 403ms (45.1%)	1m 21s 914ms (61.5%)	(42.2%)	1m 9s 706ms (50.2%)
Number of sentences	78	50	78	73
Number of inter-sentential pause	22	15	22	20
Number of intra-sentential pause	56	35	56	53
Total inter-sentential pause (ratio)	45s 838ms (44.6%)	20s 076ms (39.2%)	54s 580ms (54.5%)	20s 705ms (30.0%)
Total intra-sentential pause (ratio)	56s 795ms (53.3%)	31s 034ms (60.7%)	45s 547ms (45.4%)	48s 243ms (69.9%)

M's total number of sentences was 78 in the pre-test and slightly decreased to 73 in the post-test. The number of inter-sentential pause was 22 in the pre-test and this decreased to 20 in the post-test. The number of intra-sentential pauses also showed a slight decrease in the post-test to 53 from 56 in the pre-test. Although M's total number of sentences, inter-sentential pause and intra-sentential pause did not show a significant change, the ratio of each pause showed a big change between the pre-test and post-test. In the pre-test, M's inter-sentential pauses were 54s 580ms, with a ratio of 54.5%. Her intra-sentential pause was 45s 547ms, which was 45.4%. From this result, we can see that M's total

inter-sentential pauses accounted for more than half of the total pauses in the pre-test. However in her post-test, M's inter-sentential pauses accounted for only 30.0%, and her intra-sentential pauses accounted for 69.9%. This result shows that more than half of the total pauses detected were intra-sentential pauses in M's post-test.

3.2.2 Accuracy

3.2.2.1 Morphosyntactic accuracy

The participants' morphosyntactic accuracy was examined using the 4-M model proposed by Myers-Scotton (2002). Table 5.1 shows the results of L's pre-test and post-test. L showed a decline in the use of articles and copula "be" from 96% to 85% and from 100% to 83%, respectively. However, the total accuracy percentage for each morpheme showed improvement, content morphemes turned from 97% to 100%, early system morphemes from 88% to 91%, bridge late system morphemes from 88% to 90%, and outsider late system morphemes from 97% to 100%.

Table 5.1 *L's Morphosyntactic accuracy results of the storytelling*

content morphemes	correct		error		accuracy (%)	
	pre	post	pre	post	pre	post
noun/ pronoun	60	44	4	0	94	100
verb	32	32	0	0	100	100
auxiliary verb	1	0	0	0	100	0
adjective/ adverb	36	13	0	0	100	100
demonstrative	0	0	0	0	0	0
conjunction	24	21	0	0	100	100
relative	1	0	0	0	100	0
preposition	17	18	2	0	89	100
interjection etc	0	0	0	0	0	0
total	171	128	6	0	97	100
early system morphemes	correct		error		accuracy (%)	
	pre	post	pre	post	pre	post
article	23	17	1	3	96	85
possessive pronoun	0	4	0	0	0	100
determiner: demonstrative	0	0	0	0	0	0
plural "s"	0	5	3	0	0	100
present participle	1	2	0	0	100	100
past participle	4	1	0	0	100	100
verb phrase	0	0	0	0	0	0
infinitive	0	0	0	0	0	0
total	28	29	4	3	88	91
bridge late system morphemes	correct		error		accuracy (%)	
	pre	post	pre	post	pre	post
possessive "of"	0	0	0	0	0	0
possessive "s"	2	2	2	0	50	100
formulaic article	0	0	0	0	0	0
formal subject: it/there	0	2	0	0	0	100
copula "be"	11	5	0	1	100	83
parataxis "and"	0	0	0	0	0	0
infinitive (adjective usage)	1	0	0	0	100	0
total	14	9	2	1	88	90
outsider late system morphemes	correct		error		accuracy (%)	
	pre	post	pre	post	pre	post
third person singular present	0	0	1	0	0	0
regular past tense	15	11	0	0	100	100
irregular past tense	10	15	0	0	100	100
"be" verb past tense	10	8	0	0	100	100
auxiliary verb: be/have/do	0	1	0	0	0	100
clitics affixes	0	0	0	0	0	0
infinitive (adverbial usage)	1	1	0	0	100	100
total	36	36	1	0	97	100

Table 5.2 compares the errors L made in her pre-test and post-test, regarding articles and copula "be". The underlined part shows the errors made. The words inside the parentheses show what was omitted. What the participant did not include in the storytelling is written as "not mentioned" in parentheses. Regarding L's use of articles in the pre-test, she used "the" where she should have said

“woke up with a start”. In the post-test, we can see some significant errors. She made three errors regarding the use of articles. She omitted articles, where she should have used them for all three errors.

Table 5.2 *L's errors in articles and the copula "be"*

	pre	post
article	Bobby woke up with <u>the</u> start. (not mentioned) (not mentioned) (not mentioned)	(not mentioned) he looked in (an) owl thing. and (an) owl flew out. and soon, (a) deer took Bob
copula "be"	there he saw his pet frog with his family.	there <u>was</u> two frogs

Table 6.1 shows the results for participant M. M's total accuracy percentage showed improvement in every morpheme. Her content morpheme accuracy improved from 95% to 99%, early system morpheme from 84% to 90%, bridge late system morpheme from 17% to 60% and outsider late system morpheme from 75% to 81%. What should be noted here is that among all the improvements, M's bridge late system morphemes showed the most improvement. M's accuracy of the copula "be" use was 13% in the pre-test, which improved to 80% in the post-test. This resulted in an improvement in the total accuracy percentage in the bridge late system morphemes. Among all these improvements, there were also declines as seen in M's use of regular past tense. The accuracy rate of M's regular past tense declined from 85% to 71%.

Table 6.1 *M's Morphosyntactic accuracy results of the storytelling*

	correct		error		accuracy (%)	
	pre	post	pre	post	pre	post
content morphemes	54	72	5	0	92	100
noun/pronoun	25	29	2	0	93	100
verb	2	3	0	0	100	100
auxiliary verb	36	15	1	0	97	100
adjective/ adverb	0	1	0	0	0	100
demonstrative	30	25	0	0	100	100
conjunction	0	0	0	0	0	0
relative	16	30	0	2	100	94
preposition	0	0	0	0	0	0
interjection etc	0	0	0	0	0	0
total	163	175	8	2	95	99
early system morphemes	correct		error		accuracy (%)	
	pre	post	pre	post	pre	post
article	33	30	4	2	89	94
possesive pronoun	0	0	0	0	0	0
determiner: demonstrative	0	0	0	0	0	0
plural "s"	2	3	1	1	67	75
present participle	2	2	0	0	100	100
past participle	1	1	2	1	33	50
verb phrase	0	0	0	0	0	0
infinitive	0	0	0	0	0	0
total	38	36	7	4	84	90
bridge late system morphemes	correct		error		accuracy (%)	
	pre	post	pre	post	pre	post
possessive "of"	0	0	0	0	0	0
possessive "s"	0	0	0	0	0	0
formulaic article	0	0	0	0	0	0
formal subject: it/there	0	0	0	0	0	0
copula "be"	1	3	5	2	17	60
parataxis "and"	0	0	0	0	0	0
infinitive (adjective usage)	0	0	0	0	0	0
total	1	3	5	2	17	60
outsider late system morphemes	correct		error		accuracy (%)	
	pre	post	pre	post	pre	post
third person singular present	0	0	0	0	0	0
regular past tense	11	5	2	2	85	71
irregular past tense	8	13	3	4	73	76
"be" verb past tense	4	4	1	0	80	100
auxiliary verb: be/have/do	0	1	3	0	0	100
clitics affixes	0	2	0	0	0	100
infinitive (adverbial usage)	1	0	0	0	100	0
total	24	25	8	6	75	81

Table 6.2 compares the errors M made in her pre-test and post-test, regarding her use of regular past. All the errors she made in the pre-test and post-test, were in her use of the verb “look”. She used the word “look” in present form when she should have used it in the past tense. This resulted in an error for the regular past morpheme.

Table 6.2 *M’s errors in the regular past tense*

regular past	pre	post
	they looked around	and they <u>look</u> around in many places
	the dog still <u>looks</u> for the frog.	(not mentioned)
	(not mentioned)	They <u>look</u> out the many places
	and when they <u>look</u> around	so they looked into the other side

3.2.2.2. Complexity rate

The numerical formula by Taura (2008a) as introduced in 2.4.2 was used to calculate the lexicon complexity rate. Table 7 summarizes the results for each participant.

From the calculation, L’s complexity rate slightly improved from 23.3% in the pre-test to 25.0% in the post-test. M’s complexity rate showed a large decline from 31.5% in the pre-test, to 22.7% in the post-test.

Table 7. *Complexity rate results of the storytelling*

	L		M	
	Pre	Post	Pre	Post
Total number of subordinate clauses	4	5	6	4
Total number of passive form sentences	3	1	0	1
number of sentences	30	24.00	19	22
Complexity rate	23.3%	25.0%	31.5%	22.7%

3.2.3 Lexicon

The analysis results of lexical related variables are discussed below.

3.2.3.1 Type, Token and TTR analysis

Table 8 summarizes the results of the lexical analysis of the storytelling test.

From the table, we can see that L’s total words (tokens) used in storytelling decreased from 234 to 194. However, the variation of words (types) she used all together in the storytelling showed an increase from 89 to 93 words. Also, her type-token ration (TTR) improved from 0.38 to 0.48. In other words, no

significant changes were seen in L's lexicon and her lexical content seemed to be maintained. Meanwhile, M's tokens used in the data increased from 211 in the pre-test to 231 in the post-test. Although there was an increase in the total number of words used, the types of words she used did not show an increase. The types she had used changed from 88 in the pre-test to 86 in the post-test. M's TTR showed a slight decrease from 0.42 in the pre-test, to 0.37 in the post-test. M's lexical analysis shows that, although there were some slight changes, no significant change was found and lexical stabilization was observed.

Table 8. *Lexical analysis results of the storytelling*

	L		M	
	Pre	Post	Pre	Post
Types	89	93	88	86
Tokens	234	194	211	231
Type-token ratio	0.38	0.48	0.42	0.37

3.2.3.2 Lexical frequency level analysis

The "Complete Lexical Tutor" (<http://lexutor.ca/vp/bnc/output.pl>), also calculated the vocabulary frequency level. This level shows the percentage of words a learner uses at different vocabulary frequency levels. Each level of the word in the storytelling test was classified into twenty frequency levels.

Table 9.1 shows L's lexical frequency level in the storytelling test. Word levels higher than 5 were combined as "other words". From the data, we can see that approximately 90% of L's lexical use accounted for vocabulary levels of 1 to 5. However, we can also see that some words higher than level 5 were used in the storytelling.

Table 9.1 *L's lexical frequency level analysis results of the storytelling*

Frequency level	Type		Token		Token Coverage (%)	
	pre	post	pre	post	pre	post
Level 1 words	66	70	184	155	78.63	79.90
Level 2 words	6	4	6	6	2.56	3.09
Level 3 words	4	5	8	7	3.42	3.61
Level 4 words	1	2	8	2	3.42	1.03
Level 5 words	2	4	11	11	4.70	5.67
total					92.73%	93.30%
other words	3	3	4	3	1.71	1.56
off list	7	5	13	10	5.56	5.15
total	89	93	234	194	100%	100%

Table 9.2 shows detailed information of the words higher than level 5. From the table, we can see that L used the same word "hive" in both pre-test and post-test, which belongs to the frequency level 7. From this, we can see that the word "hive" was retained. The highest frequency word that L used in the

pre-test was “antennas” which belongs to level 14. However, this was a mistake that L made in the pre-test, because she was supposed to use the word “antlers” in this section. In the post-test, L used the correct word, “antlers” which is frequency level 9.

What we should note here is the level 13 word, “scolded”, used in the pre-test. L used this word when she said “Bobby then scolded the dog” in the pre-test. In the post-test when she described the same picture, she said “Bob was angry at him”. She had replaced the word “scolded” for “angry” which only belongs to level 5. From this, we can see that there were changes in L’s lexical frequency levels although the types, tokens and type-token ratio did not change greatly.

Table 9.2 *L’s storytelling frequency level words*

	pre	post
Level 3 words		angry
Level 6 words		
Level 7 words	hive	hive
Level 8 words		
Level 9 words		antlers
Level 10 words		
Level 11 words		
Level 12 words		
Level 13 words	scolded	
Level 14 words	antennas	

Table 10.1 shows the frequency level analysis of M’s storytelling data. From the table we can see that M’s lexical use included words only from level 1 to level 5 in both pre-test and post-test. From this number it can be said that, no significant change was observed when comparing the pre-test and post-test.

Table 10.1 *M’s lexical frequency level analysis results of the storytelling*

Frequency level	Type		Token		Token Coverage (%)	
	pre	post	pre	post	pre	post
Level 1 words	73	76	186	211	88.15	91.34
Level 2 words	3	1	3	1	1.42	0.43
Level 3 words	6	5	6	7	2.84	3.03
Level 4 words	1	0	1	0	0.47	0.00
Level 5 words	3	2	13	9	6.16	3.90
total					99.04%	98.70%
other words	0	0	0	0	0	0
off list	2	2	2	3	0.95	1.30
total	88	86	211	231	100%	100%

Table 10.2 shows the frequency level of the lexicon M used in her storytelling. Although there were no significant changes seen, there were also some changes in M’s lexical frequency level, within the frequency levels of 1 through 3. For example, M used level 1 word “realized” in the pre-test. Her use changed to “found out” in the post-test, which is also a level 1 word. The word “pond” is frequency level 3, and the word “lake” she used in the post-test is also frequency level 3. From these examples, we

can see that although M used different words between the pre-test and post-test, her frequency level did not change largely.

M's use of the word "branch" showed a slight decline in frequency level. She used the word "branch" in the pre-test which belongs to frequency level 2. In the post-test, she used the frequency level 1 word "wood" as a substitute. A small decline was seen in this part. In addition, from the table we can see that some lexical phrases were retained throughout the pre-test and post-test. A typical example of this is the phrase used in the beginning of the storytelling, "once upon a time". M used this phrase both in the pre-test and post-test. M also used the word "cliff" in both pre-data and post-test. We can assume that the phrase and word, "once upon a time" and "cliff" were retained.

Table 10.2 *M's storytelling frequency level words*

	Pre	Post
Level 1 words	once upon a time	once upon a time
	realized	found out
		wood
Level 2 words	branch	
Level 3 words	cliff	cliff
	pond	lake

3.3 Writing test (TOWL-3)

3.3.1 Raw score and Age conversion

Table 11.1 and 11.2 show the raw scores and age conversion results of the participants' writing tests. The raw scores suggest that L's score did not undergo much change. Her raw score on the CL and StC increased, but her age conversion did not change and was 17;09 on both the pre-test and post-test. Her CC showed a slight decrease and her age conversion of her CC result changed to 16;03 from 17;09. However, L's chronological age was 15;00 on the pre-test, and 15;06 on the post-test. Comparing the age conversion with L's actual age, it can be said that L had a high ability of writing skill and her initial proficiency was high from the start.

M's scores show improvement in each of the sections. Her total score improved from 29 in the pre-test to 37 in the post-test. From this result, M's age conversion showed improvement in all three sections. M's StC which showed the most improvement in the age conversion was 11;0 in the pre-test, but improved to 16;3 in the post-test. Her CL showed also showed an improvement to 17;09 which was approximately her chronological age. This indicates that although M's L2 environment changed, her writing skills did not show a decline but even showed a progress. She especially showed advancement in her skills of StC, which is the skill to construct a story from the start to the end.

Table 11.1 *Raw scores results*

	CC	CL	StC	Sum
L (pre)	13	20	13	46
L (post)	9	22	16	47
M (pre)	6	13	10	29
M (post)	7	18	12	37

Table 11.2 *Age conversion results*

	CC	CL	StC	Quotient	Chronological age
L (pre)	17;9	17;9	17;9	134	15;00
L (post)	16;3	17;9	17;9	136	15;06
M (pre)	10;6	14;0	11;0	98	17;05
M (post)	11;6	17;9	16;3	115	17;11

3.3.2 Fluency

Table 12 summarizes the fluency analysis account of the writing data. From the data, we can see that L showed some decline in her fluency of types and tokens. She showed a slight increase in her number of sentences. Looking at this result, L's data virtually did not show any change. Her fluency in writing can be said to have been retained.

Regarding M's result, she showed an increase in all types, tokens and the number of sentences. From this result we can say that M's writing fluency was retained and even more, improved.

Table 12. *Fluency analysis results of the writing test*

	L			M		
	Pre	Post	Fluency (Pre/Post)	Pre	Post	Fluency (Pre/Post)
Types	123	144	8.2/7.5	65	105	4.3/7.0
Tokens	1239	226	15.9/15.0	105	107	7.0/12.1
Number of sentences	22	19	1.5/1.7	9	19	0.6/1.3

3.3.3 Accuracy

3.3.3.1 Morphosyntactic accuracy

Table 13.1 shows the result of L's morphosyntactic accuracy of the writing test. L's total accuracy of content morphemes virtually stayed the same, 99% and 100% respectively. However, her early system morphemes, bridge late system morphemes and outside late system morphemes showed a decline overall, from 97% to 96%, 94% to 88% and 100% to 97%, respectively. What showed the most declines in L's writing test was her accurate use of copula "be", which declined to 88% in the post-test from 94% in the pre-test.

Table 13.2 compares L's errors regarding her use of copula "be" in the pre-test and post-test. She tended to make mistakes such as omitting the copula "be" or using the singular form "was" where she should have used the plural form "were". For example, "Forty men was going to be needed" was written in her post-writing test.

In contrast to L, M's accurate use of morphemes showed improvement in all four morphemes as can be seen in Table 14.1. The only part that showed decline was M's use of the regular past tense. Her

accuracy percentage was 100% in the pre-test, which had declined to 50% in the post-test. In the pre-test, M's use of the past tense was only once without any error, resulting in 100% of accuracy. In the post-test, her use of the past tense occurred twice and the number of errors was also twice. This indicates that, although her use of regular past tense showed a slight increase, her errors also increased which resulted in her accuracy percentage declining to 50%. While her use of past tense showed a decline, her total accuracy percentage in the use of outsider late system morphemes improved to 88% in the post-test, from 57% in the pre-test. This is due to the fact that although her use in past tense declined, her use of the third person present singular "s" improved greatly in the post-test. Her third person present singular "s" was 25% in the pre-test, and this had changed to 100% in the post. From this result, her total accuracy of outsider late system morphemes was 63% in the pre, and 88% in the post-test.

Table 13.1 *L's Morphosyntactic accuracy results of the writing test*

content morphemes	correct		error		accuracy (%)	
	pre	post	pre	post	pre	post
noun/ pronoun	79	68	2	0	98	100
verb	39	34	0	0	100	100
auxiliary verb	2	2	0	0	100	100
adjective/ adverb	25	45	0	0	100	100
demonstrative	0	0	0	0	0	0
conjunction	18	15	0	0	100	100
relative	3	1	0	0	100	100
preposition	22	20	1	0	96	100
interjection etc	0	0	0	0	0	0
total	188	185	2	0	99	100
early system morphemes	correct		error		accuracy (%)	
	pre	post	pre	post	pre	post
article	17	11	1	1	94	92
possessive pronoun	0	0	0	0	0	0
determiner: demonstrative	0	0	0	0	0	0
plural "s"	10	20	0	1	100	95
present participle	3	7	0	0	100	100
past participle	2	3	0	0	100	100
verb phrase	0	1	0	0	0	100
infinitive	0	3	0	0	0	100
total	32	45	1	2	97	96
bridge late system morphemes	correct		error		accuracy (%)	
	pre	post	pre	post	pre	post
possessive "of"	0	0	0	0	0	0
possessive "s"	0	0	0	0	0	0
formulaic article	0	0	0	0	0	0
formal subject: it/there	0	0	0	0	0	0
copula "be"	16	15	1	2	94	88
parataxis "and"	0	0	0	0	0	0
infinitive (adjective usage)	0	1	0	0	0	100
total	16	16	1	2	94	89
outsider late system morphemes	correct		error		accuracy (%)	
	pre	post	pre	post	pre	post
third person singular present	0	0	0	0	0	0
regular past tense	11	7	0	0	100	100
irregular past tense	9	7	0	0	100	100
"be" verb past tense	13	15	0	1	100	94
auxiliary verb: be/have/do	0	0	0	0	0	0
clitics affixes	2	0	0	0	100	0
infinitive (adverbial usage)	2	2	0	0	100	100
total	37	31	0	1	100	97

Table 13.2 *L's errors in the copula "be"*

	pre	post
copula "be"	One of the lead programmers <u>were</u> on the space craft.	found wolves and nothing that (was) big. Forty men <u>was</u> going to be needed

Table 14.1 M's Morphosyntactic accuracy results of the writing test

content morphemes	correct		error		accuracy (%)	
	pre	post	pre	post	pre	post
noun/ pronoun	30	60	2	1	94	98
verb	17	21	0	0	100	100
auxiliary verb	3	6	0	0	100	100
adjective/ adverb	12	34	1	0	92	100
demonstrative	0	0	0	0	0	0
conjunction	6	8	0	1	100	89
relative	1	1	0	0	100	100
preposition	13	9	2	0	87	100
interjection etc	0	0	0	0	0	0
total	82	139	5	2	94	99

early system morphemes	correct		error		accuracy (%)	
	pre	post	pre	post	pre	post
article	11	9	4	2	73	82
possessive pronoun	0	1	0	0	0	100
determiner: demonstrative	0	0	0	0	0	0
plural "s"	9	10	0	0	100	100
present participle	6	2	0	0	100	100
past participle	1	0	0	0	100	0
verb phrase	0	1	0	0	0	100
infinitive	0	2	0	0	0	100
total	27	25	4	2	87	93

bridge late system morphemes	correct		error		accuracy (%)	
	pre	post	pre	post	pre	post
possessive "of"	0	0	0	0	0	0
possessive "s"	0	2	0	0	0	100
formulaic article	0	0	0	0	0	0
formal subject: it/there	0	0	0	0	0	0
copula "be"	6	8	0	0	100	100
parataxis "and"	0	0	0	0	0	0
infinitive (adjective usage)	1	0	0	0	100	0
total	7	10	0	0	100	100

outsider late system morphemes	correct		error		accuracy (%)	
	pre	post	pre	post	pre	post
third person singular present	1	1	3	0	25	100
regular past tense	1	2	0	2	100	50
irregular past tense	1	2	0	0	100	100
"be" verb past tense	0	1	0	0	0	100
auxiliary verb: be/have/do	1	2	0	0	100	100
clitics affixes	0	5	0	0	0	100
infinitive (adverbial usage)	1	1	0	0	100	0
total	5	14	3	2	63	88

Table 14.2 compares the errors in M's use of the regular past tense in the pre-test and post-test. M did not make any errors in the pre-test and made two errors in the post-test. Both errors she made related to unifying the tense. She should have used the past tense form but, she used the present form for both the errors that she made.

Table 14.2 M's errors in the regular past tense

	Pre	Post
regular past tense		They <u>hunt</u> buffalo, deer or mammoth. Therefore many people <u>dies</u> from this battle.

3.3.3.2 Complexity rate

Table 15 summarizes the results of the complexity rate using the same numerical formula from the storytelling test. L's complexity rate was 81.8% in the pre-test, and had changed turned to 47.3% in the post-test. While M's complexity rate declined in the storytelling, it also declined in the writing data. Her complexity rate was 44.4% in the pre-test, with a decline to 26.3 % in the post-test.

Table 15. *Complexity rate results of the writing test*

	L		M	
	Pre	Post	Pre	Post
number of total subordinate clauses	13	6	3	4
number of total passive form sentences	5	3	1	1
number of sentences	22	19	9	19
complexity rate	81.8%	47.3%	44.4%	26.3%

3.3.4 Lexicon

3.3.4.1 Type, Token and TTR analysis

Table 16 shows the results of L's lexical analysis. L's types decreased from 123 to 114. Her tokens decreased as well, to 226 in the post-test from 239 in the pre-test. L's TTR showed virtually no decrease - 0.51 in the pre-data and 0.50 in the post-test, respectively. Meanwhile, M's types almost doubled to 105 in the post-test from 67 in the pre-test. Her tokens were 105 in the pre-test, which also increased to 175 in the post-test. Although M's types and tokens both showed an increase, her TTR showed a slight decrease from 0.64 to 0.60.

Table 16. *Lexical analysis result of the writing data*

	L		M	
	Pre	Post	Pre	Post
Types	123	114	65	105
Tokens	239	226	105	107
Type-token ratio	0.51	0.50	0.64	0.60
Complexity rate	82%	47%	44%	26%

3.3.4.2 Lexical frequency level analysis

The lexical frequency level of the writing test was also calculated. Table 17 shows the result of L's lexical analysis. From the data we can see that levels 1 to 5 accounted for approximately 95% of the words she used in the writing test. There was a slight difference in her use of words higher than level 5, which changed from 1.26% in the pre-test to 4.42% in the post-test. However, the picture used to elicit the writing data differed between the pre-test and post-test, so it is not valid to compare the vocabulary used in detail.

Table 17. *L's lexical analysis results of the writing test*

Frequency level	Type		Token		Coverage	
	pre	post	pre	post	pre	post
Level 1 words	96	93	203	194	84.94	85.84
Level 2 words	18	7	23	9	9.62	3.98
Level 3 words	2	6	4	6	1.67	2.65
Level 4 words	1	1	1	1	0.42	0.44
Level 5 words	0	3	0	3	0.00	1.33
total					96.65%	94.24%
other words	2	2	1	10	1.26	4.42
off list	5	2	5	3	2.09	1.33
total	124	114	237	226	100%	100%

Table 18 shows the lexical analysis result of M's writing test. More than 90% of the lexical levels 1 to 5 accounted for her data. From the data we can see that levels higher than 5 were more frequently used in the post-test.

Table 18. *M's lexical analysis results of the writing test*

Frequency level	Type		Token		Coverage	
	pre	post	pre	post	pre	post
Level 1 words	54	77	86	135	81.9	77.14
Level 2 words	5	11	9	16	8.57	9.14
Level 3 words	2	4	2	5	1.90	2.86
Level 4 words	4	1	5	1	4.76	0.57
Level 5 words	0	1	0	1	0.00	0.57
total					97.13%	90.28%
other words	3	3	3	9	2.85	5.14
off list	0	8	0	8	0.00	4.57
total	67	105	105	175	100%	100%

3.4 Free conversation interview

The pre-interview and post-interview were qualitatively examined to see if there were any possible emotional changes in L and M.

3.4.1 Motivation changes observed from the interview

In the pre-interview, L expressed her anxiety about entering a Japanese high school. When the researcher asked about it, she answered "I am a little bit worried if I can follow the classes like social studies and science." However, she did not show any worries related to making friends. She also showed positive emotions about adapting to the school, such as joining the volleyball club. In the post-interview, L explicitly verbalized that she had become accustomed to the Japanese school environment, although she answered "not really" to the question whether the classes at school were enjoyable or not. She expressed that she was building good relationships with her school friends by saying her favorite time of the day is "lunch time, with my friends". She had also joined the volleyball club as she had said she would in the pre-interview. She said that her best friend she made at the Japanese school was also in the volleyball club, and that she was spending most of the time with her. L also showed that she was adapting well in her home room class. She said that the most exciting experience she had had in the six months so far was the school festival that she participated in with her homeroom class. In addition, towards the end of the post-interview when she was asked if she had any worries during high school, she answered "I'm a little worried whether I can study enough while belonging to the volleyball club. But I have no worries about my relations with my friends. Well, I'm not sure what's going to happen if my class changes." From this answer, we can see that she is adapting to her homeroom class well, and enjoying her experiences at the Japanese school.

Regarding M, she transferred to the Japanese school earlier than L. It was in her second week after the transfer when she took the pre-test and pre-interview. Therefore, her interview questions centered on her impression of the Japanese school after the transfer. In the pre-interview her image of the Japanese school was described as, "It seems fun. Everybody seems to be nice." However her reply seemed still uncertain from the fact that it was only a few weeks since her transfer. Also in the pre-interview, she showed high motivation to be studying at the Japanese school. She stated that she had the goal to enter a Japanese college, and that this was the main reason for her transfer. From the time of her pre-interview, she seems to have been highly motivated to adapt to the Japanese school.

However in the post-interview, M's emotionally negative statements were evident. There were two negative statements by M in the post-interview- (1) missing her school life in the international school and (2) showing negative feelings towards her friends at the Japanese school.

Regarding her emotional feelings about her international school, she often used the expression, "I miss" and "I wish my teacher/ friend was here". When the researcher asked about her favorite subject in class, she said it was chemistry. She explained that chemistry is her favorite subject because she was good at it at international school, and how amazing her chemistry teacher was at the international school. She talked about the international school chemistry teacher saying, "He is awesome. I wish he was here". She also replied "yes" when the researcher asked, "Do you miss his class?" Moreover, she expressed how much she missed her international school friends. She said, "I really wish Y (her friend) was here and studying with me." When the researcher asked about the English speech contest held at the Japanese school M said, "I wish Y was here on the English contest. It would be so much better. It would make so much difference". M's answer shows how much she misses her friend in the international school, and how much her friend means to her. She also said during the interview, "I can't see my international friends so much. I miss teachers, I miss friends, I miss some elementary school students. And soon I won't be able to catch what's going on in international school. Then I would be "Who is he? Who is she?" and "Who am I?" in international school. People wouldn't know who I am. I thought that's really sad, because I really love people in international school." This statement shows a strong feeling of how much M misses her friends and school. It also shows how much the international school meant to her.

M also showed negative feelings towards her friends she made at Japanese high school. When M was asked about the friends she has made she answered, "One friend, she's really nice. Before I talked to her, I didn't trust so much people in my class. I had a friend, they trusted me, but I didn't trust them so much." To this reply, the researcher asked the reason why she does not trust her friends. She answered, "I realized that students in Japanese school, not boys but Japanese girls are more critical about many things. They get pissed off with small things." She showed how she upset she was by her reply as, "I'm not saying being critical is bad but I think it's good something to let go of their stress, but

not like everyday.” These statements show how she is not adapting that well to her new environment and friends. Although M showed some negative emotions in the post-interview, she still showed the same high motivation as she did in the pre-interview, to study at the Japanese school to get into a college in Japan. When the researcher asked if it was a good thing that she had transferred to the Japanese school, M answered “Yes. I’m pretty sure my goal is closer than when I was in international school.” This shows how motivated she is to study towards the future in the Japanese school.

3.5 Summary of the results

3.5.1 Fluency

The participants’ fluency was examined from the storytelling and writing tests. The pause analysis of the storytelling data revealed similarities between L and M’s length of pauses. They both had inter-sentential pauses that lasted more than 45 seconds in the pre-test. However in the post-test, their inter-sentential pauses both shortened to 20 seconds. This is almost half of the time of their pre-test result.

The intra-sentential pauses showed different results between L and M. L’s intra-sentential pause lasted 56.795ms in the pre-test, which had shortened to 31.034ms in the post-test. In contrast, M’s intra-sentential pause did not undergo such a change. Her pause lasted 45.527ms in the pre-test, and 48.243 in the post-test.

As a result of the pause analysis, it was found that both L’s inter-sentential and intra-sentential pauses had shortened in the post-test and M’s pause analysis data showed different results between the inter- and intra-sentential pauses. As for the writing test, both participants’ fluency can be said to have been retained or slightly improved.

3.5.2 Accuracy

3.5.2.1 Morphosyntactic accuracy

The participants’ morphosyntactic accuracy was observed from two different forms of data- the storytelling and the writing test data. L’s accuracy and morphosyntax of articles and the copula “be” showed a decrease in both data formats. Regarding to her use of articles in the storytelling data, her total accuracy declined to 85% in the post-test from 96% in the pre-test. Her correct interpretation of articles decreased from 23 in the pre-test to 17 in the post-test. Her error-free interpretation overall showed a decline and her errors increased from 1 to 3. This resulted as in 11% decline of her total accuracy of articles. In her writing test, her interpretation had shown a decline as well. Her correct interpretation was 17 in the pre-test, which decreased to 11 in the post-test. This resulted in a decline in her total accuracy of article use, from 94% to 92%. From these results, we can see that her correct interpretation of articles had both declined by six points in both the storytelling and writing test. Regarding L’s use of

copula “be”, her correct interpretation decreased and errors increased in the storytelling and writing test. Her decline in the total accuracy of copula “be” declined from 100% to 83% in the storytelling, and 94% to 88% in the writing test. Her correct interpretation showed a decline especially in the storytelling data, which was less than half in the post-test compared to the pre-test, 11 to 5 respectively. While L’s use of articles and copula “be” declined, her accurate use of nouns and her total content morpheme accuracy rate showed some improvement.

Compared to L, M’s accurate use of articles showed improvement in both storytelling and writing test. She also showed improvement in the use of nouns/ pronouns and adjectives in both data. On the other hand, her accuracy rate showed a decline in the use of regular past tense in both data samples. The number of correct interpretations she made in the storytelling data were 11 in the pre-test, and decreased to less than half in the post-test, which is 5. In her writing test, the number of correct interpretations of regular past tense increased from 1 to 2. While there was a slight increase, her errors also increased from 0 in the pre-test to 2 in the post-test. This resulted from the decline in M’s total accuracy rate of the regular past tense verb.

According to Myers-Scotton’s 4-M model, the attrition process does not follow the process of the regression hypothesis. Myers-Scotton hypothesizes that a learner acquires and loses his or her morphemes in the order of content, early system, bridge late system and outsider late system morphemes. Regarding the result of L’s morphosyntax based on the 4-M model, the morphemes of articles and copula “be” which showed a decline, is classified as early system morphemes and bridge late system morphemes, respectively. Although there was no decline in the content morphemes, this pattern of decline follows Myer-Scotton’s 4-M model pattern. The noun morpheme, which showed an improvement is classified into the content morphemes. These results will be discussed in Chapter 4.

Regarding M’s results, she showed improvement in the use of nouns/pronouns and adjectives, which are the content morphemes. She also showed improvement in articles, which are the early system morphemes. She showed a decline in the use of regular past tense verb, which belongs to the outsider late system morphemes. M’s decline pattern does not follow Myer-Scotton’s pattern, but seems to be following the regression pattern. These results will also be discussed in Chapter 4.

3.5.3 Lexicon

The lexical analysis on the data collected in the form of storytelling and writing test, showed that there was a common point in both the tokens showed a decrease in L. While L’s token decreased, her TTR showed an increase. In the storytelling data, her TTR increased from 0.38 to 0.48. In the writing test, L’s TTR was 0.51 in the pre-test, and this changed to 0.50 in the post. Looking at this number it is true that there was a slight decrease, but it can be said that her TTR did not change greatly. On the contrary, M’s two data samples showed an increase in the number of tokens. However, M’s TTR was in

decline in samples taken.

The lexical frequency level analysis revealed that both participants showed changes in their use of lexical frequency level. L especially showed some decline in particular usages of vocabulary.

4. Discussion

4.1 Summary

The answers for the three research questions will be given. Before these answers are discussed, the results will be summarized for each research question.

4.1.1 Fluency

Discussion for the fluency analysis will be made in the order of storytelling and writing test.

4.1.1.1 Storytelling fluency

A pause analysis method was used to measure the participants' fluency. The pause analysis revealed two major findings: (1) a decrease in the total pause duration in both participants, (2) an increase in the ratio of as high as 60% in both participants' intra-sentential pause and (3) possible signs of lexical retrieval difficulties for both participants (see Table 4).

L's total pause duration was 1m 42s 633ms in the pre-test, which decreased to approximately half that time, 52s 110ms in the post-test.

M's total pause duration also showed a decrease. Her total length of pauses was 1m 41s 107ms in the pre-test, and this is decreased to 1m 8s 948ms in the post-test. The decrease in the total length of pauses in both participants may be due to the fact that both participants took less time to tell their story in the post-test. L took 3m 7s 36ms to finish her task in the pre-test, and 2m 13s 47ms in the post-test. M's time to finish the task also shortened from the pre-test to the post-test, 2m 54s 897ms and 2m 18s 654ms, respectively. From this we can see that both participants shortened their time to finish the task from the pre-test to the post-test.

What should be noted is the intra-sentential ratio, since intra-sentential pauses are used when the speaker is trying to retrieve a specific lexicon (Taura 2008b). Although the total time of the pauses shortened, there was an increase in the participants' intra-sentential pause ratio.

L's intra-sentential pause accounted for 60.7% of the whole pause detected in the post-test while her intra-sentential pause accounted for 55.3% in the pre-test. M's intra-sentential pause was 45.4% in the pre-test, which increased to 69.9% in the post-test.

The increase of these intra-sentential pauses of both L and M may be evidence of their lexical retrieval difficulties. For example in the post-test, when L described a scene where an owl flew out from a hole in a tree, she showed difficulty in expressing the scene. When describing the scene, she first

talked and then paused for 2,495ms and said “owl, owl owl thing” and paused for 522ms again and said “owl flew out”. This may show her difficulty in expressing this scene and possibly a retrieval difficulty of the word “owl”. The number (1) below provides the transcription of the pre-test and post-test with the pauses in milliseconds in the parentheses. The pauses that are not mentioned in this section are excluded from the transcription. Even though L did not mention about the owl in the pre-test and we can not compare directly, we can assume that her 2,459ms of pause is used to retrieve a specific lexical item to express the hole in the tree and the owl by looking at the transcription and the storyline.

(1-pre) (no mention of owl)

(1-post) Um, he looked in uh, (2,495) owl, owl owl thing, and owl flew out.

In addition, L tends to pause before using irregular past tense words, such as “found”, “fell” and “took” for 986ms, 1,799ms and 928ms, respectively. These pauses may show the time taken for her lexical retrieval for each irregular past tense word. The (2) through (4) below also provide the transcription of the pre-test and post-test. Although L still used the same word “fell” in (3), we can see clearly that she pauses before using the irregular past tense. We can see that her pause increased before saying the word “fell”, from 757ms in the pre-test to 1,799ms in the post-test.

(2-pre) And, he he saw that there was no one there.

(2-post) Bob (986) found and saw their the um frog lost.

(3-pre) And the dog (757) fell out the window.

(3-post) And he when they looked out the window, the little dog (1,799) fell.

(4-pre) he was he was stuck in a deer’s antennas.

(4-post) deer (928) took Bob by its antlers.

M also showed an increase in her intra-sentential pauses. In the pre-test, she showed no difficulty in using the word “cliff”. However in her post-test, she paused for 2,459ms and uttered some fillers before she used the word “cliff”. The utterance and pause may be because of her retrieval difficulty of the word “cliff”. In addition, M used the word “branch” in the pre-test, when expressing a scene where the frog was found beside a log. Number (6) below provides the transcription. Although she did use the wrong word by saying “branch”, she did not show any difficulty in using the word in her pre-test. However, in the post-test, she paused for 1,730ms before saying “wood” as a substitute of the word “branch.” From this, we can observe that she took a pause to retrieve the lexical item “branch.” She may

have substituted the word “branch” with the word “wood” to compensate for her difficulty. Number (5) and (6) below shows the transcription of the pre-test and post-test.

(5-pre) threw the dogs and the boy off from the cliff.

(5-post) threw off from the (2,459) uh, cliff.

(6-pre) by the branch.

(6-post) Other side of the (1,730) wood.

4.1.1.2 Writing Fluency

The participants’ fluency was also observed from the writing data (see Table 12). L showed some decline in the fluency of types and tokens. Her type fluency decreased from 8.2 in the pre-test to 7.5 in the post-test. Her token fluency was 15.9 in the pre-test and decreased to 15.0 in the post-test. Although this shows a slight decrease, judging from the degree, it can be said that L’s writing fluency overall was stable.

M’s writing fluency showed an improvement in the post-test compared to the pre-test. Her fluency of types, tokens and the number of sentences were, 4.3, 7.0 and 0.6 in the pre-test respectively. Her types, tokens and number of sentences all improved to 7.0, 12.1 and 1.3 in the post-test respectively. However, while M was taking the pre-writing test, she erased everything she wrote and started all over. This may have resulted in her low raw score in the pre-test. Compared to the pre-test, M smoothly finished the task in the post-test, due to a possible learning effect in taking the writing task again. In sum, M’s fluency analysis results showed a great improvement, but we cannot generalize that her fluency had progressed.

In sum, a subtle decline was observed from the storytelling test, which may be possible signs of the participants’ lexical retrieval difficulties. Despite this decline, L’s writing fluency showed stability and M showed an improvement. From these results, we can assume that fluency in speaking was more affected than the fluency in writing.

4.1.2 Accuracy

L and M’s morphosyntactic accuracy was measured from the storytelling and the writing test. There were two accuracy analyses conducted; the morphosyntactic accuracy analysis used the 4-M model postulated by Myers-Scotton (2002) and the complexity rate analysis used the formula by Taura (2008a). Discussion will be made by combining the results of the storytelling and writing test.

4.1.2.1 Morphosyntactic accuracy

The accuracy of some morphemes showed a decline in both participants. L showed a decline in her use of articles and the copula “be” in both storytelling and writing data. M showed a decline in her use of the regular past in her verbs. However, we incidentally found some morphemes, which L and M did not seem to have acquired in the first place.

Table 19.1 summarize the errors L made in the pre-test and post-test, regarding her use of articles and the copula “be” in the storytelling and writing tasks. From the table, similarities in L’s errors can also be seen. L’s errors were mostly due to the omission of articles. Looking at L’s copula “be” errors, using the singular form where plural forms were supposed to be used was the common error L made. Judging from the fact that both error types- articles and the copula “be”, were made throughout the pre-test and post-test, it can be interpreted that L’s morphemes of the article and the copula “be” were not “acquired” from the beginning of the observation period. If our interpretation is right, and the decline of L’s articles and the copula “be” morphemes should not be considered, although some morphemes showed a slight decline, it can be seen that L’s accuracy level never dropped below 80% in both pre-test and post-test. This percentage level means the language is “acquired” in second language acquisition research (Tomiya, 2008). From this we can see that L’s morphosyntactic accuracy showed stability in all morphemes (see Tables 5.1 and 13.1).

Table 19.1 *L’s errors in articles and the copula “be”*

	storytelling data		writing data	
	pre	post	pre	post
article	Bobby woke up with <u>the</u> start.	he looked in (an) owl <u>thing</u> and (an) owl flew out. and soon, (a) deer took Bob	rocks to take back to (the) earth	they never heard such (a) thing.
copula "be"	no error	there <u>was</u> two frogs	one of the lead programmers <u>were</u> on the space craft.	found wolves and nothing that (was) big. Forty men <u>was</u> going to be needed.

Table 19.2 summarizes the errors M made in regular past tense in the pre-test and post-test. The Table also reveals similar errors between the pre-test and post-test in both storytelling data and writing data. In both tests, M used the words “look”, “hunt” and “die” in present tense form where she should have used the past tense form. The same interpretation as made with L can be suggested for M’s errors in the regular past tense, that is, her regular past morphemes were not acquired from the beginning.

If our interpretation is again taken into account, we can see that M showed an improvement in her total accuracy of bridge late system morphemes in the storytelling test and outsider late system morphemes in the writing test (see Tables 6.1 and 14.1). Among the improvements, M especially

showed an improvement in her bridge late system morphemes, which changed from 17% in the pre-test to 60% in the post-test. As can be seen from the table, her improvement in the bridge late system morphemes accounted for her improvement in the use of the copula “be”.

Table 19.2 *M's errors in the regular past tense*

	storytelling data		writing data	
	pre	post	pre	post
regular past	the dog still <u>looks</u> for the frog. and when they <u>look</u> around,	and they <u>look</u> around in many places they <u>look</u> out the many places.	no error	they <u>hunt</u> buffalo, deer or mammoth Therefore many people <u>dies</u> from the battle.

Table 20 summarizes the total use of the copula “be” in the storytelling data of M. Since M made no errors in the use of the copula “be” in the writing data, Table 20 only summarizes M’s storytelling test. In the Table, the mistake is underlined, and omission (no mention) is written in the parentheses. To compare, the corresponding transcription in the pre-test and post-test is included. From the table we can see that M’s errors were mostly made using the same singular form instead of plural form in both pre-test and post-test. Her number of errors had decreased in the post-test, but she still made the same mistake saying “there was a boy and a dog” and “found out that the frog was gone”. Although there were still some errors made, M showed correct use of the copula “be” with a new expression that was not used in the pre-test.

Table 20. *M's errors in the copula “be”*

	storytelling data	
	pre	post
copula “be”	there <u>was</u> a little boy and a little dog. the little boy and the dog <u>was</u> sleeping realized that the frog <u>was</u> gone the frog couldn't (be) found the dog <u>was</u> looking for the dog (no mention) (they were thrown) into the pond (no mention)	there <u>was</u> a boy and a dog (no mention) found out that the frog <u>was</u> gone (no mention) (no mention) while the boy was looking for the frog he <u>was</u> threw off that was a good thing

As can be seen from the table below, M’s copula “be” use was sometimes correct and sometimes incorrect in the pre-test. We can see that she still has not acquired the use of the copula completely when the post-test was conducted. However, compared to the pre-test, her errors did show a decrease in the post-test. Judging from the result, we can interpret that there was a “residual learning” affect on M’s copula “be”. Residual learning is defined as apparent improvement of second language skills during periods of diminished use. (Cohen 1975; Weltens *et al.* 1989).

As a summary of the morphosyntactic accuracy results, there were declines seen in the use of

particular morphemes in both participants, that is the articles, the copula “be” and regular past test. However, the comparison of the pre-test and post-test revealed that those decline were not a sign of attrition, but they were not acquired in the first place. For our interpretation, L’s morphosyntactic accuracy we can say that there was a high degree of retention. M showed improvement in some morphemes. We conclude that her improvement was due to residual learning. From the perspective of the 4-M model of Myers-Scottons (2002), the attritional pattern of both participants cannot be generalized whether it upholds the 4-M model or not, from the data collected in the present research. A further observation is needed to judge from the 4-M model perspective.

4.1.2.2 Complexity rate

The complexity rate calculation using the formula of Taura (2008a) revealed two results: (1) a lower complexity rate in the storytelling data for both participants compared to the writing data and (2) a significant decline in both participants’ complexity rate in their writing test.

The first result supports the universally accepted fact that the writing context has a more complicated structured more complicatedly than spoken context. So, the lower complexity rate in the storytelling data compared to the writing data of both participants is a natural result.

The complexity rate also showed a significant decline in both participants’ writing tests. In discussing this result, the notion of “BICS” and “CALP” purposed by Cummins (1978 and 1979) should be taken into account. Cummins divides language competence into two different components, which are BICS and CALP. He says that “BICS” stands for “basic interpersonal communication skills”, which are the linguistic skills that are necessary for functioning in everyday contexts. A typical linguistic skill of BICS is “speaking”. On the other hand, CALP stands for “cognitive academic language proficiency”, which includes the more cognitively demanding tasks required outside everyday communication situations. An example of CALP is writing skills. Cummins claims that BICS develops fairly easily through communicative tasks in classrooms. In contrast, CALP takes a good deal of time, as much as seven years in order to develop, while BICS is said to develop within two to three years. From Cummins’s notion of BICS and CALP, we can see that the two components differ in the degree of the complexity each task requires and the time taken for each to develop. Regarding to the two tasks conducted in the present study, the storytelling task is under the umbrella of BICS and the writing task, which is more cognitively demanding, is CALP-oriented. From this perspective of BICS and CALP, the difference in the complexity rate between the storytelling task and writing task is understandable. However, we can see that the degree of the decline in the complexity rate in the writing data of the two participants is severe. In other words, the result showed that both participants had dropped their scores by half of their for CALP, after only six months, even though their cognitive academic language proficiency (CALP) had developed over a long period of time.

For a qualitative analysis of the complexity rate, Table 21 summarizes the complexity rate results of the participants. In addition to the complexity rate, the total number of tokens per sentence were calculated. As described in section 4.2.1.2, the complexity rate of M's writing data cannot be judged properly due to the difference in test treatment. Therefore, a comparison of the pre-test and post-test results will be made with L's storytelling test and writing test results and M's storytelling test results only. (excluding the writing test)

Table 21. *Complexity rate results of L and M*

	L				M			
	storytelling		writing		storytelling		writing	
	Pre	Post	Pre	Post	Pre	Post	Pre	Post
number of total subordinate clauses	4	5	13	6	6	4	3	4
number of total passive form sentences	3	1	5	3	0	1	1	1
number of sentences	30	24	22	19	19	22	9	19
complexity rate	23.3%	25.0%	81.8%	47.3%	31.5%	22.7%	44.4%	26.3%
number of tokens	234	194	239	226	211	231	105	175
number of tokens per sentence	7.8	8.2	10.8	11.9	11.1	10.5	11.6	19.4

As can be seen from the Table, among the decline of complexity rates, L's pre-writing test showed a severe decline. Her pre-test resulted was as high as 81.8%. However, her post-test resulted in a 45.2% drop to 47.3%. In L's pre-test, most of the sentences written contained either a subordinate clause or passive form. The total number of sentences in her pre-test was 22. There were only 4 sentences out of 22 that did not use a subordinate clause or passive form. In contrast, Among the 19 sentences written in the post-test, only 7 sentences used either a subordinate clause or passive form. From this comparison, we can see how L used simpler structured sentences in the post-test. In addition, the calculation of number of words per sentence supports the result that L's sentences in the post-test were more simplified. In L's writing test, her total number of words in a sentence were 10.8 in the pre-test. However, in the post-test this numerical value had increased to 11.9 words per sentence. In other words, the number of words L used in one sentence did not show much change between the pre-test and post-test, while the complexity rate declined severely in the post-test. From this we can see how much each sentence had been simplified in L's post-writing test.

In the pre-test, there were times when L used subordinate clause more than once. In addition, she sometimes used a subordinate clause and passive form more than once in just one sentence. Number (7) and (8) below are example sentences from L's pre-writing test with more than one subordinate clause and the passive form used. The subordinate clause is underlined and words the italic indicate the passive form. In contrast, number (9) below is an example sentence from L's post-writing test. We can see from the example that she frequently uses the conjunction "and" to continue the sentence instead of using more complex structures such as subordinate conjunctions and passive forms.

- (7) The “nerd” was the only quiet one who told us to do what *we were supposed to do*.
(8) *We were so excited* for landing that we almost forgot what we were doing here.
(9) They quickly took out their spears and weapons and tried to take them down.

The complexity rate analysis of the storytelling data showed different results between the two participants. L showed a slight improvement, from 23.3% in the pre-test to 25.0% in the post-test. In the post-test, the number of passive forms showed a slight decrease but in exchange, the number of subordinate clause increased, which resulted in an increase in the complexity rate. From this result we can say that L’s storytelling complexity rate was maintained or even slightly improved.

While M’s writing complexity rate showed a decline, her storytelling complexity rate declined as well. The reason for M’s decline is due to the increase in the total number of sentences and decrease in the number of subordinate clauses.

Although there was no significant drop seen in both participants’ morphosyntactic accuracy, both participants showed a decline in their complexity rate. This result is somewhat similar to the result of Tomiyama’s (2008) subject, Lily’s grammatical complexity and accuracy. In Tomiyama’s study, Lily showed an improvement in grammatical accuracy while her grammatical complexity declined. Tomiyama concluded that there was a trade-off between her accuracy and complexity. In addition, a factor analysis conducted by Skehan and Foster (1997), revealed that higher accuracy is associated with lower complexity. Also, Skehan (1998) claims that to improve in one area seems to be at the expense of another. From these studies, one way of interpreting our data is that L and M demonstrated a trade-off between their accuracy and complexity, since both participants showed some improvement in their accuracy while their complexity declined.

As a summary, there were incidental findings that the similar error patterns by L and M in the use of particular morphemes were due to the fact that they were not acquired from the beginning. In other words, none of the morphemes seemed to have been seriously affected or lost. However, the complexity rate revealed a significant decline in L’s storytelling data. The decline was due to L’s use of simpler formed sentences.

4.1.3. Lexicon

The participants’ results of the receptive lexicon and productive lexicon will be discussed below.

4.1.3.1 Receptive lexicon

The receptive lexicon was observed through the Peabody Picture book Test. L showed a slight decline in her post-test, but overall remained stabilized. This result supports the result from Tomiyama’s

subject Ken (1999 and 2000) in that his receptive lexicon skills remained intact for the whole observation period of 33 months.

Regarding M's receptive lexicon, she showed an improvement. The improvement in her receptive skills may have been due to some of the classes such as the "English reading" class she participates in at her Japanese high school. In M's English reading class, she is taught to go over the many new words used in the textbook and was tested on those words in every class. It can be assumed that she still has the opportunity to study a lot of English vocabulary in her new school. In sum, these English classes may have lead to M's improvement in receptive vocabulary.

4.1.3.2 Productive lexicon

The lexical analysis showed there were no significant changes in the participants' types, tokens and type-token ratio in their storytelling and writing test. However, changes in the frequency level of the participants' storytelling data were seen in both participants.

L showed a significant change in the use of the word "scolded" as previously mentioned. In the pre-test, she used the frequency level 13 word "scolded". However, her use of this word changed to a frequency level 3 word "angry" in the post-test. From this analysis we can see that L showed the strategy of using an easier word in the post-test compared to the pre-test. To compare the result of L's frequency level with the relevant research, the researcher personally analyzed the transcription of Tomiyama's (2000) subject Ken's storytelling provided in the study and observed the changes in Ken's lexical frequency level. From the observation, replacement of a particular word in a lower frequency level as L did was also seen in Ken's storytelling. When Ken was carrying out the task of storytelling using the instrument Wacky Wednesday (LeSieg, 1974) he replaced the word "sewer" with "hole." He used the word "sewer" which belongs to the frequency level of 5, in the 12th month of the observation period. However, in the 24th month, he replaced it with the word to "hole", which is a frequency level 2 word. From this replacement, it can be seen that Ken had replaced a forgotten word with a lower level word. In other words, Ken's strategy of replacement is very similar to what L also did in her post-storytelling test. Compared to Ken, we can see that the speed of L's change in frequency level is much faster since it occurred within six months, while Ken's change was observed in the 12th month. In addition, we can also see that the degree of L's decline in frequency level is larger in than Ken, since L's word choice declined from frequency level 13 to level 3. This may be due to difference in situation, in that Ken was a returnee student and L has acquired L2 through school instructions in a L1 environment.

M also used the strategy of using easier words in the post-test compared to the pre-test as previously mentioned. In her pre-test, she used the word "branch" which is a frequency level 2 word. In the post-test, the word "branch" had changed to a frequency level 1 word, "wood". The replacement of words using lower frequency level ones can be seen again in Tomiyama's (2000) subject, Ken. In the

storytelling test, Ken used the frequency level 2 word “chase” in the 6th month of observation. After 18 months, Ken’s use of “chase” had changed to “catch”, which is a level 1 word. From this we can see that M’s use of frequency level word changes from high to low frequency is an identical result to that of Ken’s. In addition, Table 22 shows a particular phrase M used in her storytelling data. As can be seen from the table, M retained the phrase, “once upon a time”. She correctly used this phrase in both pre-test and post-test. However, there was a change in the use of the phrase, “lived happily forever”. In many narratives, the phrase “once upon a time” is used in the beginning of the story, and “happily lived ever after” is used to conclude the story. M succeeded in using these two phrases in the pre-storytelling task to some extent. However, in the post-test, although she succeeded in using the phrase “once upon a time”, she did not use “lived happily ever after” in the end.

Table 22. *M’s phrase use in the storytelling*

phrase use	pre	post
"once upon a time"	<u>Once upon a time</u> , there was a little boy, a little dog and a little frog.	<u>Once upon a time</u> there was a boy and a dog.
"happily lived forever"	went back to his house and house and <u>happily lived forever</u> .	and went back to his house

In conclusion of the lexical analysis, the receptive lexicon was noted to be less susceptible to attrition. Regarding the productive lexicon, types, tokens and type-token ratio did not change significantly. However, the lexical frequency level analysis revealed certain attritional changes in the vocabulary use in each participant. In addition, the decline in the frequency word level showed similar results to Ken in Tomiyama’s research (2000).

4.1.4 Writing skills

The writing test showed some improvement and decline in L’s raw scores. However, L’s age conversion results mainly remained stable and marked a higher conversion age than her actual age.

M showed an improvement in all the categories of CC (contextual convention), CL (contextual language) and StC (story construction). M’s CC changed slightly from 6 to 7 in the post-test, her CL from 13 to 18 and StC from 10 to 12. This result also led to the improvement in her age conversion results for the three sections. M showed the most improvement in the CL section, which measures the grammar in writing. Her increase in the use of compound sentences, coordinating conjunctions, subject verb agreements and appropriate articles resulted as an increase of the raw score of the CL section. In the post-interview, M stated that she thinks that her writing skills in English had improved through her English classes at the Japanese school. M’s statement supports the fact that her writing skills had actually improved in the post-test.

As a summary, both participants' showed improvement. M especially showed progress, which is thought to come from the opportunities she receives to write in the classes at her new school.

4.2 Research Question 1: Will language attrition occur in those whose classroom instructions changed greatly from their L2 to L1?

Prediction 1: Severe language attrition will not take place, but some linguistic skills will show a decline.

The overall results appear to support our prediction that severe attrition would not be in evidence. However, subtle declines in the results were seen as we predicted, in the participants' fluency, complexity rate and lexical frequency level. The attrition pattern of these skills will be discussed in detail in section 4.2

4.3 Research Question 2: If attrition can be seen, in which order of the skills- fluency, accuracy and lexicon, will attrition be observed?

Prediction 2: Attrition will occur in the order of the participants' lexicon, fluency and accuracy.

The same answer applies here as with research question 1, that there were some changes seen in the participants' fluency, complexity rate and lexical frequency level.

The pause analysis of the storytelling data revealed some changes in the participants' fluency. The participants showed small signs of lexical retrieval difficulty, resulting in an increase in their intra-sentential pauses. Although slight signs of decline were seen in the pause analysis, the writing fluency seemed to stay stable in both participants.

Our productive lexical analysis, namely the lexical frequency level analysis revealed qualitative changes in the participants' lexical use. L's change in her lexical use was conspicuous. Her use of a high frequency level 13 word, which was used in the pre-test changed to a low frequency level 3 word in the post-test. M's lexical use also changed within the low frequency level word groups, from level 3 words to level 1 words. She also used some particular phrases, which were seen in the pre-test but omitted in the post-test. Our lexical frequency level analysis, proved to be supportive to our prediction that attrition would occur in the participants' lexicon, although the degree was very subtle. In addition, from the fact that the subject Ken, in Tomiyama (2000) also showed some decline in frequency level in the initial stage of observation, it can be said that productive lexicon, especially the frequency level of words used by the participants are the most prone to language attrition after language disuse.

From the results, we can say that our lexical frequency level analysis and the pause analysis proved to support our prediction that the participants would show attrition in the order of lexicon and fluency. What may be noted here is the attrition order of the participants' lexicon and fluency. The participants' slight decline in fluency can be said to have been affected by the subtle decline in their

lexicon. Their small signs of lexical retrieval difficulty may have led to the increase in their intra-sentential pauses and decline. So, regarding the attritional order, it can be said that attrition occurs in the order of lexicon then fluency. The morphosyntactic analysis showed no significant attrition, which also supported our prediction that accuracy was the least prone to attrition.

Although we did not make any predictions regarding the writing skills, the present study results showed that writing skills remain intact in the first six months of language disuse. However, this may be because the participants' CC, CL and StC skills remained stable, and these categories account for a large part of the overall writing skills. However, there was one skill that showed a significant change, which is the complexity rate. By comparing the pre-test and post-test transcription, it was made clear that the participants used more simple structured sentences in the post-test. One interpretation is that their rate may have shown a decline due to the trade-off between their high accuracy and sentence structure complexity. As a whole, when looking at the writing skills, the participants' CC, CL and StC were well stabilized. However, a small fragment in the complexity rate showed a decline out of all the writing skills in general.

As a summary for the answer to research question 2, a subtle decline, which may be evidence of attrition was found in the order of lexicon, fluency and accuracy. The fluency loss was thought to be affected by the participants' lexical retrieval difficulties, due to the decline in their productive lexicon. Morphosyntactic accuracy and writing skills were stabilized and the most resistant to language attrition. However, the element of complexity rate showed a decline when examining all the writing skills.

4.4 Research question 3: Will motivational level and the personality of the participants effect language attrition or retention?

Prediction 4: If the participants retain a high motivation to keeping their English skills, motivation will play a key role.

From the pre-interview, different personalities of the participants were observed. L showed an impression of having a quiet and shy personality. Compared with L, M was active and outgoing. Although the two showed different personalities, both participants expressed a high motivation to maintain their English after changing schools. In the post-interview, some emotional changes were observed between the two participants.

L showed some more positive feelings after her entrance into the Japanese school. In the pre-test, L had been somewhat quiet and shy. However, in the post-interview, her expression had become more cheerful, and she showed how smoothly she was adapting to her new environment. She expressed how she had a good relationship with her friends in the volleyball club and in her homeroom classroom too. While she showed that she had adapted well to the new environment, she showed a low motivation towards her English ability. When the researcher asked how she was doing with her English tests, she

said “I’ve never been first place in English. And there’re so many people who are better than me”. To this reply, the researcher asked “Doesn’t that feel frustrating? Don’t you want to be first?” To this question L answered, “Well, not really”. From these series of interactions, we can see that L was accepting of the fact that her English grade was not the top in the class yet she was not motivated strongly to be in the top place. She also revealed that her contact with international school friends and her sister using English had decreased since her entrance into the Japanese school. From this fact we can see how L’s opportunity for interactions in English decreased greatly after moving to the new school. These factors may have resulted in her slight decline in lexical frequency levels and fluency. On the other hand, L claimed that she still frequently watched English TV shows and movies to make up for her reduced English interaction opportunities. It can be thought that these extra efforts that L made may have helped her to maintain many of her linguistic skills.

Compared to L, M repeatedly showed negative emotions towards her new environment. She showed a strong motivation towards getting high scores in her English tests, but then the researcher asked about M’s previous English test results. M answered that her English test results were not exactly what she had expected, and she was shocked by the result. After this reply, she expressed how eager she was to become the top in her class, and how she did not want to lose. Also, during the interview, the researcher asked if M herself has felt that her English ability was decreasing. M answered that she started to feel that she had some lexical retrieval difficulties, especially when using theoretical vocabulary and difficult words. M also shared that, to compensate with her lexical retrieval difficulty she spends time to look through dictionaries and old notebooks that she used to use in international school. Although M’s post-interview centered on some negative emotions, she showed high motivation about studying at the Japanese school. This is due to her clear goal- to enter a Japanese college. From observation of M’s post-interview answers, it can be predicted that her high motivation to study at the Japanese school make up for her difficulty in adapting to the new environment. We also predict that her strong motivation has actually helped her to progress in her linguistic skills, including her receptive lexicon, accuracy and writing skills.

As we can see, the participants showed emotional changes after change over to the Japanese high school, which led to their changes in motivation. From the post-interview, we can interpret that M’s increase in some of the data were due to her high motivational level.

As a summary of the answer to research question 3, the comparison of the pre-interview and post-interview, revealed emotional differences in the participants. L, who seemed to have adapted well to the Japanese school showed lower motivation toward her English skills compared to M. Her opportunities of using English also became very limited after her change in school environment. Her motivation and more limited use of English perhaps correspond to her decline in some skills, such as in her lexical levels. M showed negative emotions throughout the post-interview. However, she was highly

motivated in maintaining and improving her English skills. Although M also showed a small decline in her lexical levels, her high motivation may have corresponded to her improvement in the results of receptive lexicon, writing skills and some morphosyntactic accuracy.

5. Conclusion

5.1 Summary of the findings

The present study was a case study of two participants who had acquired their L2 through English instructions at school but moved to a school where the instruction language changed to their L1. L2 attrition was observed through the several linguistic aspects, such as the participants' fluency, accuracy, lexicon and writing skills.

Through the research, it was found that small but qualitative change in the productive lexicon levels appeared to the two participants during the six months incubation period. The decline in the lexical frequency levels seen in both participants is in the line with Tomiyama's (2000) subject, Ken. From this, we can say that attrition sets in first, in the attriter's productive lexicon, especially in the use of their lexical frequency levels. Although productive lexicon showed a subtle decline, the participants' receptive lexicon seemed to be maintained or improved. This supports the findings regarding the lag between productive and receptive skills (Weltens, 1989; Tomiyama, 1999; Yoshitomi, 1992). In these studies, the subjects' productive skill in the lexicon was first to be affected in the process as evidenced by their lexical retrieval difficulty.

In the storytelling test, decline in the participants' fluency was also detected. It can be thought that the lexical retrieval difficulties the participants showed, as manifested in lexical frequency levels, led to the decline in their fluency. Although the two sub-skills of productive lexicon and fluency showed some decline, both were very subtle, which may be the very first sign of attrition.

Another sub-skill, which showed a decline, was both participants' complexity rate. The two participants especially showed a severe decline in the complexity rate of the writing test, although the raw scores of the writing test itself showed stability or even an improvement in both participants. From this result we can say that the participants' writing skill, which requires the notion of CALP, was generally retained, but a small piece of it, which is the complexity rate, showed some signs of attrition.

In the present research, although subtle decline was observed, most of the participants' lexical skills seemed to have stayed intact with attrition. Regarding participant M, she even showed some improvement in morphosyntactic accuracy, receptive lexicon and writing skills. The interview data revealed possible evidence for her improvement, which is M's high motivation toward her English. Despite the negative emotions M expressed, she also showed high motivation in keeping her English abilities and had clear purpose of studying at the Japanese senior high school. This motivation may have played a key role in M's improvement. In contrast to M, participant L showed a somewhat lower

motivation. She claimed that her English was not such a special knowledge among her classmates in the Japanese school. She also showed high adaptation to her new environment. By comparing the results of each test and the interviews, we can see that motivation may have influenced the participants' L2 retention.

5.2 Significance of the findings

The most significant contribution of this study to the field of language attrition studies is the evidence supporting that the attrition speed is subtle and slow but starts right after language use is discontinued. Although many of the linguistic skills observed of the two participants were intact, some sub-skills showed signs of decline. For example, the participants' writing skills which require the notion of cognitive academic language proficiency (CALP) showed stability and improvement, but some parts in their CALP such as their complexity rate showed a decline. In addition to their complexity rate, their productive lexicon and fluency showed subtle decline. From the results we can see that attrition processes in a slow and gradual speed after language disuse.

The second contribution of this study is that it highlights the attritional order of a relatively high proficient L2 learner. This study supports the relevant literatures (Tomiyama 1999, 2000 and 2008) that language attrition occurs in the order of productive lexicon, followed by fluency. The present research shows that the decline in lexical frequency levels occurs in the initial stage after L2 disuse sets in and that it leads to lexical retrieval difficulty. In addition, the lexical retrieval difficulties influenced the participants' fluency to decline. The present study also supports the findings that accuracy is the least affected (Tomiyama, 1999).

The third contribution is the L2 attrition and retention observed in the participants who have acquired their L2 in an L1 environment. Many language attrition studies have observed the process of language attrition and retention in L2 learners, such as returnee students who have acquired their L2 in an L2 environment. However, the present study's participants have both acquired their L2 through school medium language in their L1 country. The L2 attrition and retention process observed in these rare participants is one contribution to the study of language attrition.

Lastly, is the differences revealed from the interview of the participants. From the interview, L showed high adaptation to her new environment, but showed a relatively low motivation in her English skills. On the contrary, M expressed negative statements in her post-interview but showed high motivation in studying. It can be thought that M's high motivation led her to the improvement in some of her linguistic skills.

5.3 Limitations and Implications

Despite the several findings this study revealed, some potential flaws and shortcomings should be

mentioned. Firstly, the observation period was relatively short for a language attrition study. Since language attrition is a phenomenon that occurs gradually over the months, a longitudinal observation is more effective to find obvious evidence. A longitudinal observation in the present study should have been done to seek difference between the two participants' attritional patterns. The second limitation concerns with the analysis of M's writing test. As written, in 4.2.1.2, M erased the story she had written and rewrote the story from the beginning. This led to her relatively low raw scores of her types and tokens. Using this pre-test result as a comparison with the post-test may have showed unclear results between the two tests.

Turning to pedagogical implications this study managed to disclose, we can suggest the following two: (1) to provide the learners with more opportunities to use English in classes. Since the present research revealed that highly proficient English learners' productive lexicon is the most prone to attrition, opportunities for learners to speak in English, especially academic related topics is needed. (2) to encourage the learners to keep their high motivations in studying English, since high motivation in studying turned to be an important factor in retaining and improving their L2. Learners may be motivated in retaining their English, if they had the chance to study English in special leveled classes suitable for returnee students and highly proficient learners. In addition, the returnees and highly proficient English learners themselves should also make every effort to make as much opportunities as possible to speak in English after their environmental changes.

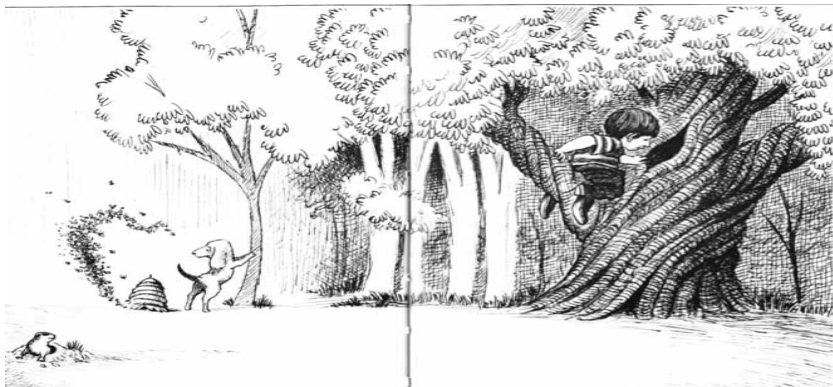
References

- Anderson, R. (1982). Determining the Linguistic Attributes of Language Attrition. In R. Lambert & B. Freed, (Eds.), *The Loss of Language Skills*. (pp. 82-118). Rowley, MA: Newbury House.
- Audacity 1.3.12: The Free, Cross-Platform Sound Editor [Computer software]. Retrieved from <http://audacity.sourceforge.net>
- Bahrck, H. (1984). Fifty years of second language attrition: Implications for programmatic research. *Modern Language Journal*, 68, 105-111.
- Cohen, A. D. (1975). Forgetting a second language. *Language Learning*, 25, 127-138.
- Commins, J. (1978). Bilingualism and the development of metalinguistic awareness, *Journal of Cross-Cultural Psychology* 9, 131-149.
- Commins, J. (1979). Cognitive/academic language proficiency and linguistic interdependence, the Optimum Age question and some other matters, *Working Papers on Bilingualism* 19, 197-205.
- Complete Lexical Tutor <http://lextutor.ca/vp/bnc/output.pl>
- Faerchm, C., & Kasper, G. (1983). *Strategies in inter-language communication*. New York: Longman.
- Gardner, R. C., Lalonde, R. N., & MacPherson, J. (1985). Social factors in second language attrition. *Language learning*, 35, 519-540.

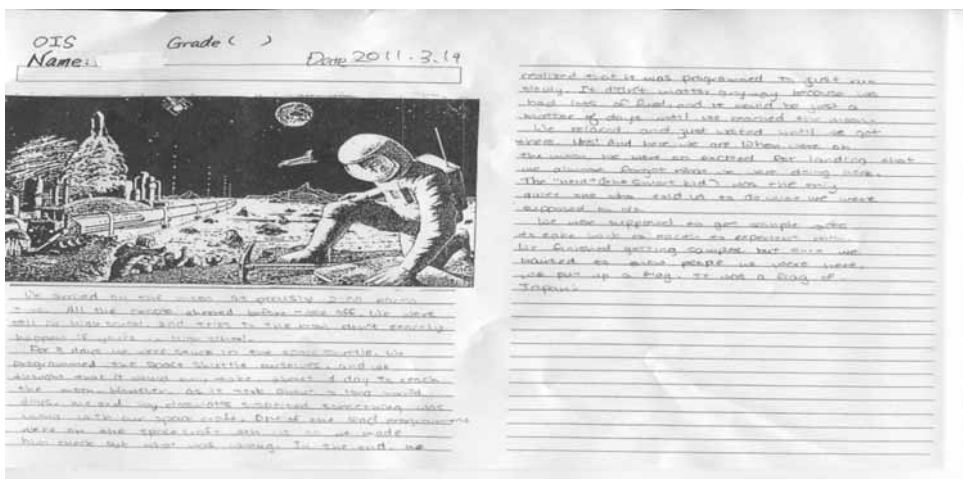
- Gardner, R. C., & Lysynchuck, L. M. (1990). The role of aptitude, attitudes, motivation and language use on second-language acquisition and retention. *Canadian Journal of Behavioral Science*, 22, 3, 254-270.
- Godsall-Myers, J. (1981). The attrition of language skills in German classroom bilinguals: A case study. *Dissertation Abstracts International*, 43, 57A.
- Hammill, D. D., & Larsen, S. C. (1996). *Test of Written Language* (3rd edition). Austin, Texas: pro-ed.
- Hansen, L. (2001). Language Attrition: the fate of the start. *Annual Review of Applied Linguistics*, 21, 60-73.
- Jacobson, R. (1941). *Kindersprache, Aphasie und Allgemeine Lautgesetze*. Uppsala: Almqvist and Wiksell. (English translation, 1968: *Child Language, Aphasia, and Phonological Universals*). The Hague: Moulton.
- Kaufman, D., & Aronoff, M. (1991). Morphological disintegration and reconstruction in first language attrition. In H. W. Seliger, & R. M. Vago, (Eds.), *First language attrition*, New York: Cambridge University Press.
- Kuhberg, H. (1992). Longitudinal L2-attrition versus L2-acquisition, in three Turkish children: Empirical findings. *Second Language Research*, 8(2), 138-154.
- LeSieg, T. (1974). *Wacky Wednesday*. New York: Random house.
- Mayer, M. (1971). *Frog where are you?* New York: Penguin Books.
- Moorcroft, R., & Gardner, R. C. (1987). Linguistic factors in second-language loss. *Language Learning*, 37, 3, 327-340.
- Myers-Scotton, C. (2002). *Contact Linguistics: Bilingual Encounters and Grammatical Outcomes*. Cambridge, UK: Cambridge University Press.
- Pica, T. (1983). Methods of morpheme quantification. *Studies in Second Language Acquisition*, 6, 69-78.
- Reetz-Kurashige, A. (1999). Japanese Returnees' Retention of English-Speaking Skills: Changes in Verb Usage over Time. In L. Hansen, (Ed.), *Second Language Attrition in Japanese Contexts*. (pp. 21-49). Oxford, UK: Oxford University Press.
- Russell, R. (1999). Lexical Maintenance and Attrition in Japanese as a Second Language. In L. Hansen, (Ed.), *Second Language Attrition in Japanese Contexts*. (pp. 114-141). Oxford, UK: Oxford University Press.
- Skehan, P. and P. Foster. (1997). Task type and task processing conditions in narrative retellings, *Language Teaching Research*, 1, 185-211.
- SuperLab Pro. (2002). CA: Cedrus Corporation.
- Taura, H. (2008a). *Language Attrition and Retention in Japanese Returnee Students*. Tokyo: Akashi Shoten.

- Taura, H. (2008b). *Bilinguality & Bilingualism in Japanese School-Aged Children*. Tokyo: Akashi Shoten.
- Tomiyama, M. (1999). The First Stage of Second Language Attrition: A Case Study of a Japanese Returnee. In L. Hansen, (Ed.), *Second Language Attrition in Japanese Contexts*. (pp. 59-79). Oxford, UK: Oxford University Press.
- Tomiyama, M. (2000). Child Second Language Attrition: A Longitudinal Case Study. *Applied Linguistics*, 21, 3, 304-332.
- Tomiyama, M. (2008). Age and Proficiency in L2 Attrition: Data from Two Siblings. *Applied Linguistics*, 30, 2, 253- 275.
- Weltens, B., & A. D. Cohen. (1989). Language Attrition Research: Introduction. *Studies in Second language Acquisition*, 11, 2, 127-134.
- Weltens, B., & Van Els, T. (1986). The attrition of French as a foreign language: Interim results. In De Bot, K., Weltens, B., & Van Els, (Eds.), *Language Attrition in Progress*, 205-211.
- Yoshida, K., & Arai, K. (1990). *Kikokushijo no gaikokugorisuningunoryoku no hojinikansurukosatsu* [On the retention of listening skills of returnees]. In *Kikokushijo no gaikokugohoji ni kansuru chosakenkyuhokokusho* [A survey on the foreign language retention of returnees] (pp. 9-28). Vol. 2. Tokyo: KaigaiShijo Kyoiku Shinko Zaiden.
- Yoshitomi, A. (1999). On the Loss of English as a Second Language by Japanese Returnee Children. In L. Hansen, (Ed.), *Second Language Attrition in Japanese Contexts*. (pp. 80-111). Oxford, UK: Oxford University Press.
- Yukawa, E. (1997). Language attrition from the psycholinguistic perspective: A Literature Review, *Rapporter om tvåspråkighet*.
- Yukawa, E. (1998). *L1 Japanese Attrition and Regaining*. Tokyo: Kuroshioshuppan.

Appendix 1: Example page of “Frog, where are you?”



Appendix 2: Data collected in the pre-writing test and post-writing test



Appendix 3: TOWL-3 score sheet

Subtest 6 Contextual Conventions		Subtest 7 Contextual Language		Subtest 8 Story Comprehension	
Score	Items and Scoring Criteria	Score	Items and Scoring Criteria	Score	Items and Scoring Criteria
1.	All sentences begin with a capital letter 0 = no 1 = yes	1.	Punctuation 0 = no 1 = yes	2.	Story beginning 0 = none, absent 1 = some, beginning, middle/end 2 = interesting, pleasing
3	Paragraphs 0 = none, 1 1 = 2 2 = 3 or more	3.	Compound sentences 0 = none 1 = 1 or more	3.	Story outcome makes no picture 0 = no 1 = yes
0	Uses exclamation marks (! or ?) 0 = no 1 = yes	4.	Introductory phrases or clauses 0 = none 1 = 1 or more	4.	Identifies refers to a specific event occurring before or after the picture 0 = no 1 = yes
0	Uses commas to set off a direct question 0 = no 1 = yes	5.	Uses coordinating conjunctions other than and (but or not, for, yet, or, etc.) 0 = none 1 = 1 or more	5.	Story structure 0 = none, a series of random statements 1 = coherent, but not some sequence 2 = moves smoothly from start to finish
0	Uses an apostrophe in a contraction (e.g., isn't) 0 = no 1 = yes	6.	Subunit with superlatives 0 = none, absent 1 = 1 or more 2 = 2 or more	6.	Plot 0 = none, no mention, statements in random order 1 = some, irregular, quirky 2 = logical, complete
0	Uses a colon, semicolon, or hyphen (:, ;, -) 0 = no 1 = yes	7.	Complexity in paragraph 0 = 1 paragraph, 2 sentences 1 = 2 paragraphs, 2 or more sentences 2 = 2 or more paragraphs, 2 or more sentences in at least 1 paragraph	7.	Character's story background 0 = no 1 = some, nondescript/flat story line 2 = strong emotion/complex picture in at least one character
0	Uses an em-dash (—) or ellipsis (...) 0 = no 1 = yes	8.	Complexity in sentence 0 = mostly fragments, run-ons, or badly constructed sentences 1 = mostly simple sentences with introductory phrases 2 = sentences in compound, complex, and compound sentences complete with embedded clauses	8.	Character's story background 0 = no 1 = some, nondescript/flat story line 2 = strong emotion/complex picture in at least one character
1	Uses an underlined point (•) 0 = no 1 = yes	9.	Complexity in paragraph 0 = mostly fragments, run-ons, or badly constructed sentences 1 = mostly simple sentences with introductory phrases 2 = sentences in compound, complex, and compound sentences complete with embedded clauses	9.	Character's story background 0 = no 1 = some, nondescript/flat story line 2 = strong emotion/complex picture in at least one character
0	Capitalizes proper nouns (e.g., Dr., Bob, Mary, Billie, Betty) 0 = no 1 = sometimes 2 = yes, always	10.	Complexity in sentence 0 = none 1 = 1 or more 2 = 2 or more	10.	Character's story background 0 = no 1 = some, nondescript/flat story line 2 = strong emotion/complex picture in at least one character
1.	Overall punctuation and capitalization is 0 = poor 1 = average 2 = good	11.	Number of correctly spelled words having seven or more letters (count a word only once) 0 = 0 1 = 1 or 2 2 = 3 or 4 3 = 5 or more	11.	Character's story background 0 = no 1 = some, nondescript/flat story line 2 = strong emotion/complex picture in at least one character
2	Number of misspelled words misspelled 0 = 0 or none 1 = 1 or 2 2 = 3 or more	12.	Number of words with three syllables or more that are spelled correctly (count a word only once) 0 = 0 or none 1 = 1 or 2 2 = 3 or more	12.	Character's story background 0 = no 1 = some, nondescript/flat story line 2 = strong emotion/complex picture in at least one character
1.	Spelling is 0 = none 1 = average 2 = good	13.	Number of words with three syllables or more that are spelled correctly (count a word only once) 0 = 0 or none 1 = 1 or 2 2 = 3 or more	13.	Character's story background 0 = no 1 = some, nondescript/flat story line 2 = strong emotion/complex picture in at least one character
9	Raw Score	14.	Number of words with three syllables or more that are spelled correctly (count a word only once) 0 = 0 or none 1 = 1 or 2 2 = 3 or more	14.	Character's story background 0 = no 1 = some, nondescript/flat story line 2 = strong emotion/complex picture in at least one character
		Raw Score		Raw Score	