

When Daddy Leaves Home

Minority L1 Attrition in a Primary Bilingual Child

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This study describes the minority L1 English attrition of a five-year-old boy over an 11-month period. As the child of a Japanese mother and an American father, the participant developed two L1s as a child. When he was 5;8 years old, the father left the home, resulting in attrition to the participant's minority English. The study aims to give an overall description of attrition in a participant whose language environment has not yet been covered in child attrition studies. Changes in lexical diversity are also tracked through analysis of word types, tokens and the type/token ratio (TTR). Finally, the study tests the Regression Hypothesis, which states that language last learned is first lost. For this, losses are tracked in specific vocabulary items known to be in the participant's lexicon prior to the onset of attrition and vocabulary that was learned immediately prior. This final result shows support for the Regression Hypothesis.

本研究は5歳の男子の弱い第一言語である英語力が11ヶ月間にわたり退化していく過程を述べたものである。彼はアメリカ人の父親と日本人の母親をもつ子供であるため、2つの第一言語が身についた。その子供が5;8の時、父親が家にいない期間があり、それが被験者の弱い英語力の退化の原因となった。この研究の主な目的はこの言語能力の退化について概略を述べることである。このような言語環境における被験者の研究はなされていない。彼の言語の多様性における変化はまた品詞、単語の数、そしてTTRの分析を使いながら研究する。最後に、この研究では最近習得したものから順に忘れていくという退化仮説“リグレッション仮説”について検証する。これを検証するため、被験者が以前知っていた特定の単語と最近習得した単語の中で忘れた単語を探っていた。この研究の最後では退化仮説“リグレッション仮説”を支持する結果がでている。

Introduction

To date, studies into child language attrition have focused almost exclusively on participants who have experienced language loss after moving from one language environment to another. No studies have looked into the effects that attrition might have on children who have been raised in a bilingual home and then for reasons such as divorce, death, or changes in the home environment have been denied access to sources of input and output in one of their home languages. The author's son, Keisuke, is one of these children. Since he lives in Japan and has a mother who is Japanese, it is not surprising that Japanese is Keisuke's dominant language. However, he also demonstrates a remarkable command of his minority language English, the L1 of his father and the language which is spoken at home by both parents. Unfortunately, when Keisuke was 5;8 years old, his father decided to leave the home in order to pursue his education outside of Japan, thereby denying Keisuke of the majority of the opportunities for input and output necessary for continued language acquisition. If acquisition were not taking place, it would seem natural that the opposite, attrition, would soon set in. The purpose of this study is to show some of the effects that attrition has taken on Keisuke's language skills in the absence of his father.

Theoretical Background

Bilingualism: A Working Definition

For the purpose of this study, the author will use a definition of childhood bilingualism based on Garcia's (1983) assertion that the child must have acquired two or more languages simultaneously during the first five years of life. Table 1 provides a more detailed description. This definition fits very well with what Houston (1972) calls *primary bilinguals*, those who picked up two languages at home as a

child, as opposed to *secondary* bilinguals, those who acquired more than one language by moving into a new language community. As defined by Garcia (1983) and Houston (1972), Keisuke, the participant in the present case study, will be described as a primary bilingual with two L1s – dominant Japanese and minority English.

Table 1 Conditions and Attributes of Childhood Bilingualism

Condition	Attribute
Linguistic	Child must be able to comprehend, produce, and discriminate between two or more languages. Proficiency is an important, but not limiting, factor.
Social	Child must have natural exposure to two language systems requiring a substantial bilingual environment in the first three to five years of life. Exposure often comes from within family organization but other types of exposure may apply.
Developmental	Linguistic development in both languages must be simultaneous to ensure both cognitive and physiological development as they relate to bilingual acquisition.

(adapted from Garcia, 1983)

Language Attrition

Language attrition (LA) studies have researched a broad spectrum of attrited languages, ages of participants, and environments in which both initial acquisition and subsequent attrition have occurred. As a result of these studies, a growing number of theories and hypotheses have been proposed in an attempt to describe the intricate processes involved in the loss of both first and second languages (see de Bot & Weltens, 1995; Hansen, 2001; Hansen & Reetz-Kurashige; and Yukawa, 1997a, for reviews). In addition to these important works, several studies which focus on attrition in Japanese children have added important insight to the field.

Studies in Japanese Child Attrition

In one of the earliest studies on Japanese child attrition, Yoshitomi (1999) looked at four participants who had acquired English as an L2 while living in the U.S and then suffered attrition in that L2 after returning to Japan. Although, the period of attrition used in the data analysis (one year) was consistent for these participants, the age at initial acquisition, the length of residence in the U.S., and most importantly, the length of time between returning to Japan and the beginning of the study were quite different (see Table 2). Yoshitomi described her participants as having evidenced little attrition during the period of study. More specifically, the findings showed very little loss of receptive skills and there were few errors in phonology. Although attrition occurred in the production of articles and verb morphology, Yoshitomi described these as “better than expected” (p. 90). Analysis of type-token ratios showed no clear evidence of lexical decline; however, occasional errors in word choice and an overgeneralization of simple verbs were reported. Finally, according to the author, the most evident indication of language loss was the weakening of the participants’ ability to combine sub-skills as seen in their growing inability to use complex structures, fewer error-free clauses, and an evolving use of compensatory strategies.

With a focal participant similar to Yoshitomi’s, Tomiyama (1999) reports on the early stages of a 4-year case study. Her participant, Ken, is also a Japanese child returning to Japan after an almost seven-year stay in the U.S. What distinguishes him from Yoshitomi’s (1999) participants is both the length of stay and the early age at which he started to learn his L2. As demonstrated through baseline testing, Ken was highly proficient at the time of his return to Japan. Except for the fact that his home environment in the U.S. was Japanese, Ken might be considered a primary bilingual, as defined above. Yoshitomi’s study tracks the first 19 months of his return to Japan. In that time, the author describes Ken’s attrition as dependant on the different sub-skills, with phonology and receptive vocabulary not affected during this period. The data did show some evidence of loss in lexical production, morphology, and syntax; however, this loss was slight even until the 19th month. Attrition in fluency was indicated by slower speech, increasing hesitations, pauses, self-repairs, and repetitions. In addition to these

compensatory strategies, Tomiyama also describes Ken's use of paraphrase, approximation, direct appeal, and avoidance as evidence of lessening communication skills, albeit, slowly.

Yukawa's studies (1997a, 1997b) on her children's L1 Japanese attrition is different in several ways from the previously reviewed articles. This is one of the few studies which tracks the L1 attrition of her daughter Shoko, and the L1 attrition/reacquisition/*reattrition* of her son Haruki as their family moved to and from different language environments. Her participants were her two Japanese/English bilingual children (age 3;10 and 5;5 at the beginning of the study) with whom she used an impressive array of measures to collect data. In the initial data collection on both children, Yukawa describes their attrition as "a drastic loss of their syntactic repertoires" (1997a, p. 279). While receptive skills and lexicon seemed immune to loss, both children suffered an almost total breakdown in productive ability by the fourth month. At that time, output was limited to one-word responses or routine phrases. In a later data collection starting at age 7;0, an older and more mature Haruki showed resistance to attrition and maintained his L1 Japanese skills after fully reacquiring those skills during a 14-month stay in Japan. At this later age, the only lack of fluency he experienced was in an increase in pauses and code-borrowing from English.

Table 2 Comparison of Studies on Japanese Child Attrition

Study	Yoshitomi (1999)	Tomiyama (1999)	Yukawa (1997a)	Yukawa (1997b)	Reetz-Kurashige (1999)
Participant	JYS, JOS JYL, JOL	Ken	Haruki	Haruki Shoko	Group of 18 children
Attrited Language	L2 English	L2 English	L1 Japanese	L1 Japanese	L2 Japanese
Age at Onset of Study	9;7, 11;3 9;6, 11;3	8;2	5;5	7;0 3;10	6;5 to 13;7 (9;0 average)
Residence in Attrited Language Environment	5;10 – 9;6 6;3 – 11;2 3;0 – 8;5 6;9 – 10;0	1;3 – 8;0	1;5 – 5;5	5;10 – 7;0 0 – 3;10	1 to 5 years (2.4 years average)
Period of Attrition	1 year	19 months	5 months	16 months	12 to 18 months
Method of Data Collection	<ul style="list-style-type: none"> ◆ Free interaction ◆ Storytelling ◆ Planned speech ◆ Listening test ◆ Interview in L1 	<ul style="list-style-type: none"> ◆ Peabody Picture Vocabulary Test ◆ Bilingual Syntax Measure ◆ Storytelling ◆ Picture description 	<ul style="list-style-type: none"> ◆ Natural L1 conversations ◆ Storytelling ◆ Language games ◆ bilingual conversation ◆ fiction-making task 	<ul style="list-style-type: none"> ◆ natural conversations ◆ interview ◆ translation task ◆ Reynell Development Language Scales test ◆ Sentence repetition task 	<ul style="list-style-type: none"> ◆ qualifying literacy exam ◆ storytelling

The final study to be reviewed is Reetz-Kurashige's (1999) impressive study on eighteen returnees. The most recent and arguably the most impressive in terms of both findings and research design, Reetz-Kurashige used both a cross-sectional and qualitative methodology to look at the language loss experienced as her subjects returned from living in the U.S. Using a "simple is best" approach to data collection, only two storytelling tasks administered two or three times over the length of the study provided the language samples to be analyzed. The data analysis of these samples focused on (a) Token/Type Ratios to determine the lexical density and variety of the speech samples, and (b) calculation of the Targetlike Usage (TLU) in order to track changes in verb morphology. The TLU scores were then used to rank participants in order to compare the independent variables of age, time spent abroad, and time back to the dependant

variable of retention. Although specific findings are too numerous to describe here, Reetz-Kurashige's most significant findings are that for this group, attrition caused common changes and shifts in verb morphology and that these changes seemed to be based on the level of pre-attrition proficiency.

Issues in Child Attrition

Although limited, the studies reviewed above have begun to shed light on the process of language attrition in young Japanese bilinguals. Using these studies and the growing body of research to date, I would now like to introduce some important issues that this research has generated with particular reference to the current study on minority L1 attrition in a primary bilingual child.

Evidence of Loss

The research to date has shown that when denied access to input and opportunities for output due to changes in the language environment, bilingual children will eventually experience a deterioration in their language skills. However, how and to what degree that loss is manifested differs from study to study. Child attrition studies (*e.g.*, Berman & Olshtain, 1983; Cohen, 1975, 1989; Kuhberg, 1988, 1992; Kaufman & Aranoff, 1991; Olshtain, 1986, 1989; Tomiyama, 1999; Turian & Altenberg, 1991; Yoshitomi, 1999; and Yukawa, 1997a, 1997b) have demonstrated to varying degrees the following evidence of language loss: increasing deviation in verb morphology; increasing syntactical errors; loss in productive lexicon; difficulty in lexical retrieval; greater interference by the non-attriting language; increase in code-switching; and increases in the use of compensatory strategies such as avoidance, pauses, self-repairs, and repetitions.

The Regression Hypothesis

One of the original theories on the process of attrition, the Regression Hypothesis argues that attrition occurs in the reverse order of acquisition. Several studies (*e.g.* Berman & Olshtain, 1983; Cohen, 1975; Hansen, 1980, as cited in Hansen & Chen, 2001; Kuhberg, 1992; and Olshtain, 1989) show support for the validity of this hypothesis with the most support demonstrating that, in the reverse of acquisition, productive skills deteriorate much faster than receptive skills after the onset of attrition. However, much of this support is based on L1 acquisition models (Berman & Olshtain, 1983; Olshtain, 1989) or comparison to a similar participant acquiring the attrited language (Kuhberg, 1992). Even within the L1 acquisition literature, there are differing opinions as to the effect that multilinguality has on language acquisition (Francis, 2005). One of the inherent difficulties in applying the Regression Hypothesis to bilingual children is in not knowing their precise development of acquisition. Only Cohen (1975) and Hansen (1980, as cited in Hansen & Chen, 2001) tracked both the acquisition and attrition of the same participants, but with very limited focus. Reetz-Kurashige's (1999) study provides a detailed time-line of bilingual attrition in Japanese participants, especially in terms of verb morphology; however, without similar studies in bilingual acquisition, we may never know if the Regression Hypothesis is completely valid.

Speed of Attrition

The process of forgetting has often been described as a curve. In the classic Ebbinghaus curve (Ebbinghaus, 1913; "Forgetting Curve," 2007), newly-acquired knowledge will be lost exponentially over time until it becomes completely inaccessible or forgotten. Attrition research has shown that language, however, doesn't follow the traditional Ebbinghaus curve. In his study on long-term loss in Spanish L2 learners, Bahrck (1984) was the first to describe the "initial decline then plateau" of language loss where speakers lose the bulk of their ability within the first few years after the onset of attrition and then reach a plateau that may continue indefinitely. In other words, language ability is retained in a "permastore" but never truly lost. In response to Bahrck, Neisser (1984) argued that instead of being retained in "permastore", certain aspects of language develop an immunity to loss after reaching a certain "critical threshold." Whether individual aspects reached this threshold depended on how extensively they were "tied into a redundant cognitive structure" (p. 34). Although based on personal interpretations of Bahrck's (1984) study, Neisser's hypothesis has generally been accepted as valid in studies on adult L2 learners (Godsall-Meyers, 1981, as cited in Yukawa, 1997a; Weltens,

Van Els, & Schils, 1989; and Weltens, 1989, as cited in Yukawa, 1997a). Regardless of whether language is placed in “permastore” or reaches a “critical threshold”, Bahrlick’s study did much to support Berko-Gleason’s (1982) claim that language loss does exhibit gradualness and directionality, but that continuity may in fact be halted.

One of the current debates in child LA research is the speed and manner of the plateaus and declines experienced during attrition. Instead of the “initial-decline-then-plateau” phenomenon of the L2 adult studies mentioned above, studies into child attrition have shown the process follows much more varied courses. Kuhberg (1992) describes the loss in his two participants as following a three-stage process: an initial plateau of six months where fluency was maintained, followed by a two-month period with initial signs of attrition, followed by a period of drastic deterioration of all language skills. Kaufman and Aronoff (1991) showed a similar pattern, except the initial period of fluency lasted until the eighth month.

Studies with Japanese participants, however, have shown mixed results. Yukawa (1997a, 1997b) describes the younger Haruki’s (5;5) and Shoko’s (3;10) loss as quick and drastic, with almost no initial period of fluency. The older Haruki (7;0), as well as the participants in Tomiyama (1999) and Yoshitomi (1999), showed little attrition over the period of attrition (16 months, 19 months, and 12 months, respectively). Among the eighteen participants in Reetz-Kurashige’s (1999) study, the level of attrition was mixed. Decreasing Targetlike Usage (TLU) scores reflected a gradual weakening of language skills over time; however, this decline was dependant on pre-attrition proficiency and the length of residence overseas. Highly proficient participants showed little change in the TLU scores while those of low proficiency had yet to reach the critical threshold prior to attrition and, therefore, suffered the most dramatic loss.

Age and Proficiency

In child attrition, the age of the participant and his or her proficiency level at the onset of attrition are often considered two of the most important predictors of language loss. Early studies on siblings (Cohen, 1989; Hansen-Strain, 1990; and Yukawa, 1997a) concluded that the older children get, the more resistant to attrition they become. Kuhberg (1992) is the only study reported where an older sibling experienced more severe attrition than a younger. Recently, however, more emphasis has been placed on the participant’s level of pre-attrition proficiency in determining the amount of loss that will be experienced. Tomiyama (1999), Reetz-Kurashige (1999), Yoshitomi (1999), and Yukawa (1997a) included participants who could be considered advanced or even native-like and all seemed to be resistant to attrition, regardless of age. In Reetz-Kurashige’s (1999) study, where literacy was a requirement for inclusion in the study, pre-attrition proficiency was seen as the single best predictor of language retention. Specifically, only those participants who were over eight years of age and had attended school abroad for more than two years (a strong indicator of proficiency) were able to maintain high TLU scores for more than 12 months.

Although not the focus of any studies to date, educational experience before and after the onset of attrition is also an important factor in the retention of language skills. Except for very young participants (*e.g.* Kaufman and Aronoff, 1991; and Yukawa, 1997a), participants in child attrition studies have been described as attending school prior to moving to the new language environment. However, as Reetz-Kurashige (1999, p. 40) explains, the quality of that education can differ drastically “from excellent schools and close rapport with teachers to never getting out of an ESL class where English input was primarily from non-native speakers.” Unfortunately, no studies in bilingual child attrition could be found that address the quality of pre-attrition education issue. Although attrition studies (*e.g.* Hansen, 2001; Reetz-Kurashige, 1999; and Yoshitomi, 1999) often conclude with a section on the “pedagogical implications” of their research to give educators suggestions on how to improve language maintenance, studies actually putting these suggestions into effect are lacking. Finally, no studies could be found on attrition in bilingual children that have not experienced this explicit language education and have both acquired and lost a language in a purely naturalistic way—without the benefit of language education prior to attrition or maintenance classes after changing language environments.

Lexical Attrition

The loss of lexicon is one of the most studied aspects of child attrition research. In order to gauge changes in both the amount of lexis lost and the change in lexical diversity, several studies have used the analysis of type-to-token ratios (TTR) which assesses the ratio of the number of word categories (types) to the number of individual words (tokens) and how that changes over time. The results of the TTR analyses, however, have been mixed. Cohen's (1989) younger participant (age 9;7) showed a dramatic drop in both types and tokens and an increase in the TTR—showing less variety in his lexical choices. His older sister (age 13;9) showed similar results but the change was much less severe. In contrast, Reetz-Kurashige (1999) found only a slight decrease in the average TTR between the groups with the shortest time period of attrition versus the group with longest. In a similar finding, Yoshitomi (1999) reports that the ratio of open-class to closed-class words showed no clear evidence of attrition in her four participants.

Although there are discrepancies regarding how attrition affects the number and variety of lexical items, most researchers agree that once words have been committed to memory, very few will truly be lost. Instead, attrition mostly affects the ease with which lexical items are accessed. Those suffering attrition have often been described as suffering “retrieval failure” where information is not lost but has become increasingly more inaccessible. Productive lexis, in particular, is shown to be more affected by attrition than receptive lexis. Most studies in child attrition (*e.g.* Cohen, 1989; Barzilay & Olshtain, 1991; Kuhberg, 1991; Olshtain, 1986; Turian & Altenberg, 1991; Tomiyama, 1999; Yoshitomi, 1999; and Yukawa, 199b) include descriptions on how their participants have overcome this lexical retrieval failure by resorting to a variety of compensatory strategies. The quality and quantity of these compensatory strategies are quite often seen as an indicator of loss, with more strategies being used as language skills deteriorate. As a result, however, little is known about the actual amount of lexical loss which may occur. In cases where storytelling has been used to gather language samples (*e.g.* Cohen, 1989; Olshtain, 1989; Reetz-Kurashige, 1999; and Tomiyama, 1999), for example, the language samples show what the participants chose to share at that particular moment and not necessarily what they have lost. This is important, but it does not provide a description of what specific vocabulary is lost and at what stage in the attrition process.

In order to address this issue, research on adult L2 learners in the Netherlands has been conducted which focuses on the process of lexical attrition and relearning. A good example of this research was the study by de Groot and Keijzer (2000), which looked into how word concreteness, cognate status, and word frequency affect learning, forgetting, and relearning in both productive and receptive testing. They found that, for adult L2 learners, words that are concrete (as opposed to abstract words) and share cognate status (words that share some orthographical or phonological forms with words in the L2, *i.e.*, English - *dish* / German - *Tisch*) are much more easily learned and remembered over time. They also found that receptive testing (*i.e.*, L1 Dutch translations of L2 English words) was much easier than productive testing (L2 English to L1 Dutch) and that the frequency of words had little effect on either learning or remembering. In a related article cited by de Groot and Keijzer, Atkinson (1972) points out that learnability and retainability might also be affected by the post-training “state” of the vocabulary. According to Atkinson, vocabulary can exist in three states after a training session: Permanent (P), Temporary (T), and Unknown (U). In subsequent testing sessions, only State P items will consistently be remembered correctly. Forgetting will only occur in words previously defined as State T and State U. The conclusion that can be drawn from these two articles is that concrete words that share cognate status and that have been identified as those permanently fixed in the memory should be the most resistant to the affects of attrition—a conclusion that has yet to be investigated in child attrition research.

Research Questions

The primary purpose of the present study is to add to the growing body of research on child bilingual attrition. As a bilingual child of a cross-language marriage, the participant, Keisuke, has in effect grown up with two L1s—a stronger, dominant Japanese and less fluent, minority English. These language skills have been acquired in a

truly natural environment without the benefit of any explicit language education. The attrition that he suffered was a result of the absence of his minority language (ml) parent, the main source of ml input and output, and not as a result of moving to a different language environment. These attributes set him apart from most of the case studies reviewed above and all of the studies on Japanese participants. In addition to providing an overall look at a situation not yet covered by current research, this study will also try to address certain discrepancies that have been found in previous studies: firstly, the level of change in lexical diversity as seen in the calculations of types and tokens, and secondly, the speed at which attrition occurs and what factors might mitigate that speed.

The study also aims to map the loss of specific lexis over time in order to ascertain whether vocabulary follows the same “last-learned, first-loss” process described by the Regression Hypothesis. In the task designed to test this hypothesis, only concrete nouns were used because words related to tangible objects have been found to be the most resistant to loss and any loss in this class of words would be the most significant (Groot & Keijzer, 2000). Nouns were selected because of their high “imageability”, a quality de Groot and Keijzer deemed necessary for concrete words. Atkinson’s hypothesis (1972, as cited in de Groot and Keijzer, 2000) that only “permanent” words are immune to attrition was also tested by identifying which “permanent” words were in Keisuke’s lexicon prior to attrition.

The research questions for the study are as follows:

1. How are the language skills of a primary bilingual, bicultural child affected when his main source of input/output is absent over an 11-month period?
2. If attrition occurs, what are the characteristics of that attrition in terms of lexical loss, as seen in changes in word types and tokens on a storytelling task?
3. Does the Regression Hypothesis hold true in terms of newly-acquired lexis?

Method

Participant

The participant in this case study, Keisuke, is the son of an American father and a Japanese mother. He has lived his entire life in Japan but has spent time in the U.S. on several family vacations (3 months total). His primary language is Japanese and he is at peer level in all four language skills in that language. He has attended Japanese schools since he was 18 months old. Until he was 5;8, his home environment was almost exclusively English, with English being the vehicle for family communication. Prior to this study, he had never had any formal instruction in English; however, he did have access to English videos, books, and computer programs, which he was encouraged but not required to use.

When he was 5;8 years old, his father left the home to attend graduate school in the U.S. Data collection took place when Keisuke was between the ages of 6;8 and 8;0 (see Table 3). The period of attrition in this study follows a month-long stay with his grandparents in the U.S. where only English was used.¹

Keisuke’s mother reports that the language of family communication shifted to Japanese within a month of the father’s departure, due to the dramatic change within the home environment, the increased stress of being a single working mother, and the greater influence of Keisuke’s extended Japanese family. During the following ten months, the only English input Keisuke received was through his own use of available English-language videos and computer games, and during a two-week visit from his father when he was 6;12 years old. His mother reports that throughout the period of attrition he averaged one to two hours of video viewing per week and very sporadic use (once or twice a month) of the English computer games. Although limited, Keisuke’s exposure to English during these months was almost entirely receptive.

Data Collection

The data collected in this study came from two tasks (see Table 3 for schedule). A total of three data collection sessions were conducted over two periods of attrition lasting a total of almost eleven months. All of the data collection sessions were videotaped in order to capture both oral samples and paralinguistic features.

Task 1 was designed to provide the language samples used in the type-token analysis. Similar to previous studies on child attrition (*e.g.* Cohen, 1989; Olshtain, 1989; Retz-

Kurashige, 1999; Tomiyama, 1999; and Yoshitomi, 1999), Keisuke was asked to tell three stories based on three picture books. In order to reduce stress and anxiety, Keisuke was allowed to choose two of the three stories from his own library of picture books—one in English and one in Japanese. The English story he chose was the picture book version of Disney's *Lion King* (1994). The Japanese story was the Japanese folk-tale *Momotaro, the Peach Boy* (Nishimoto, 1993). The final story, *Frog, Where are You?* (Meyer, 1969), was completely new to Keisuke. This is the same story used by the authors mentioned above and is particularly suited to storytelling sessions because of its lack of text and the variety of settings presented. In order to eliminate cues that might be given in the text of the Japanese story, all words were covered, and outside of the data collection sessions Keisuke was not allowed to look at any of these books. Overall, these stories proved to be a good combination in that there were few lexical overlaps resulting in only a few words per session being repeated in the individual stories.

At each session, Keisuke was asked to tell the story as best he could. The length and detail of the stories depended entirely on him, and the researcher did not provide any unsolicited help or encouragement. At times, Keisuke did ask for and receive aid in identifying unknown words or phrases; however, in each instance the author attempted to provide as little assistance as possible without causing anxiety in the participant.

Task 2 was a productive vocabulary recognition test in which lexical items on a series of four, topically-organized picture cards were identified by Keisuke. Each card contained twenty-six pictures of numbered items. During the task, the author would call out a number and then Keisuke would search the card for the item with that number and identify it in English. As with the storytelling sessions, Keisuke was only allowed to see the picture cards during the data collection sessions.

Table 3 Schedule and Description of Data Collection

Period	Age	Description
Treatment	age 6;8 to 6;9	<ul style="list-style-type: none"> ◆ Given diagnostic vocabulary recognition test ◆ Identification of “Known”, “Unknown” and “Hesitant” lexical items on vocabulary recognition cards (Task 2) ◆ Training in Unknown items until able to identify all without hesitancy.
Data Collection 1 (DC1)	age 6;9	◆ Baseline data collected (Task 1 and Task 2)
Period of Attrition 1	age 6;9 to 6;12	<ul style="list-style-type: none"> ◆ First period of attrition ◆ L1 English-speaking father leaves home ◆ Japanese takes over as language of home environment ◆ Input includes one or two hours of English videos and/or computer games per week ◆ Input entirely self-selected as to content and quantity ◆ No output
Data Collection 2 (DC2)	age 6;12	◆ Results collected (Task 1 and Task 2)
Period of Attrition 2	age 7;0 to 7;7	◆ Same as for Period of Attrition 1
Data Collection 3 (DC3)	age 7;7	<ul style="list-style-type: none"> ◆ Results collected (Task 1 and Task 2) ◆ End of period of attrition

Data Analysis

For the story-telling sessions in Task 1, the video was transcribed and lexical items were calculated for total words per story (tokens) and divided into categories of word types (types): verbs, nouns, adjectives, adverbs, prepositions, pronouns, conjunctions, auxiliaries, and code switches. Following suggestions made by Richards (1987), a sample of 480 tokens per session (160 from each story) was used for analysis. This included all words regardless of repetition.² This sampling was used in order to standardize the storytelling sessions and help overcome such variables as participant mood or maturation

over the period of the study. In calculating types, only single samples of each type were counted. In certain situations the same word might be used as two different types. In these cases, the word would be calculated as an example of both. The Total number of tokens for each type category in each story was also calculated. A Type/Token Ratio (TTR) was then determined for each of the data collection sessions.

In Task 2, a diagnostic recognition test was carried out prior to the first data collection session (DC1), and each item was identified as being “known” or “unknown.” Following this test and immediately before the beginning of the first period of attrition, Keisuke was given daily training (a total of six training sessions) for the unknown items until he could identify all of the items without hesitancy. In the later data collection sessions (DC2, DC3), responses to each lexical item were labeled “Known”, “Unknown”, or “Hesitant”, and totals for each data collection session were calculated. Items were labeled hesitant if pauses of more than 3 seconds occurred. During the entire period of attrition, no additional instruction or practice was given.

Results

Diagnostic Pre-test and Training

Prior to the first set of data collection, Keisuke underwent a vocabulary recognition pre-test to determine which of the items on Task 2 were known to him. Table 4 shows the results of this initial diagnostic test and the subsequent data collection sessions (DC1-DC3). A full list of all items is available in the Appendix. It is interesting to note that although many of the items were determined to be Unknown, Keisuke did have answers. Although not entirely incorrect, many of his answers were approximations, circumlocutions, or transfers from his L1 Japanese and were, therefore, labeled “Unknown”. For the 71 items that were unknown to him, he was given daily training on the appropriate responses until he could recite each of the items without hesitation.

Table 4 Results of Vocabulary Recognition Tests

Label	Diagnostic Test	DC1	DC2	DC3
Known	33	104	63	54
Hesitant	0	0	25	29
Unknown	71	0	16	21

Data Collection One (DC1)

Keisuke’s first storytelling session (Task 1) showed a variety of lexical items, but very little concern as to whether his sentences were grammatically correct, or if his interlocutor, the author, understood his stories. That is not to say that there was no grammaticality in what he produced. On certain occasions his stories were carefully constructed, but on others he seemed to take greater risks which led to almost incomprehensible sentences. He seemed to rely on his own intuitive sense of grammar and never resorted to self-repair. His set of personal grammar rules relied heavily on simplification. Present tense was most often expressed by the contracted be-verb (*e.g. Simba’s old enough. Dog’s biding in the rock.*) and the plural form of all transitive verbs (*e.g. The squirrel come out. Big peach come.*) The past tense was formed by adding -ed to almost every verb except the be-verb. The past tense be-verb was almost entirely singular, irrespective of the subject.

Throughout the sessions, he tended to seesaw back and forth between the use of the present and past tense. However, on closer inspection, it seems that he was simply alternating between (a) the telling of the story and (b) an explanation of what he was seeing in the pictures. For the storytelling, he used mainly past tense, but with the descriptions he used the present, especially the present continuous. Although Keisuke’s use of grammar was not the focus of this study, it is important to note that he was capable of producing error-free sentences; however, at that point in his language development, issues of proper grammar were of little concern to him.

The only instances of Keisuke trying to edit his stories were situations in which he did not know or was not sure of ways to express specific phrases or lexical items. In this session more than any other, Keisuke was acutely concerned with using appropriate English vocabulary. In three particular cases (with the words *wildebeest* and *rice cakes*, and

in describing a scene where a boy and dog get thrown into a stream), he resorted to appeals for assistance. Curiously lacking in all the stories in this session were code-switches. The only case of switching was quickly followed by an appeal for the correct word. For Keisuke, the embarrassment of an appeal for assistance was less significant than the embarrassment of resorting to a change in language. He seemed to take great pride in being able to speak English, especially with his father—even though his father does speak Japanese as an L2.

The calculations of Total Types and Total Tokens for all data collections sessions can be seen in Tables 5, 6, and 7. Table 5 contains the analyses of the word types (Types) for each session and includes the total for the different type categories, the total of all Types, the Type/Token Ratio (TTR) for each session, and the ratio of the individual type categories to the total number of types. Table 6 shows the analyses for all the word tokens (Tokens) for each session and includes the tally of tokens by word type and the ratio of these individual categories to the total number of tokens. Table 7 shows how the results from each session compared with those of the previous sessions, including tallies for both the individual type categories and the total number of types.

Although it relied heavily on the use of verbs and nouns, the number of individual Types showed the ability of this task to elicit a wide variety of lexical items. These three stories were also efficient in that few lexical items (aside from function words such as prepositions, conjunctions, and articles) were carried over from one story to the next. In the two largest Types, verbs and nouns, only 9 and 16, respectively, out of 117 items were repeated in more than one story and many of these were different verb forms of high frequency verbs such as *go* and *be*. The results of this session will form the baseline to which other sessions will be compared. The pre-study training in Task 2 proved effective and Keisuke identified all 104 items of the vocabulary recognition cards without hesitancy.

Data Collection Two (DC2)

Taking place four months after DC1, Task1 in DC2 revealed both increases and declines in the categories of Types and Tokens. The most evident drop was in the number of nouns in both Types (-10) and overall Tokens (-30). The most significant increase was in adjectives, which rose in both Types (+5) and Tokens (+12). Verb Types lost only one type but the number of verb Tokens actually increased from 96 to 109. Although small in relation to the other categories, the increase in code-switches (+3) showed a lessening in Keisuke's insistence on using only English. All other categories had either little or no change from DC1 to DC2. The TTR for these two sessions remained unchanged (0.35).

The change in productive skills during this period can be described as a process of simplification and generalization. The small decrease in verb Types and increase in verb Tokens seems contradictory, except when considering that Keisuke used more of the same verbs to complete the task. A good example of this was the increase in the use of the verbs *got* (+12 tokens) and *was* (+3 tokens) as a generic means of indicating past tense. As for nouns, the use of the pronoun *he* (+13 tokens) showed generalization as it was used to take the place of many nouns describing the characters in the stories.

Although the number of Tokens remained consistent, this figure is somewhat misleading due to the fact that many of the items found in DC1 were not found in DC2, and vice versa. A tally of DC1 items that were not found in DC2 or DC3 was taken in order to determine which items were most likely "lost" over the entire period of attrition. This tally showed a total of 71 items found in DC1 were lost for the entire period of attrition. A further tally determined that 56 items not found on DC1 were found in DC2. The term "lost", therefore, has only relative value. The results from this and the following sessions might not show which lexical items were actually lost, but rather the words which Keisuke chose to use or not use in these particular sessions.

The results of Task 2 may in fact provide a better indication of what was actually lost from one period to the next (see Table 3 above and Appendix). Of the 104 items on the vocabulary cards, in this session 63 were labeled as Known, 16 as Unknown, and 25 as Hesitant. Of the 16 Unknown items, all were from those also labeled Unknown in the diagnostic pre-test. Of those answered with hesitancy, only three were not from the original list of Unknown items. After only 4 months, the items that were learned

Table 5 Type Analyses and Type/Token Ratios: 480-token Sample

Session	Verbs	Nouns	Adj	Adv	Prep	Conj	Pron	Art	Aux	C-S	TOTAL TYPES	TOTAL TOKENS	TTR
DC1	51	66	11	11	8	5	9	2	5	0	168	480	0.35
Ind. Types: Total Types	0.30	0.39	0.07	0.07	0.05	0.03	0.05	0.01	0.03	0.00			
DC2	50	56	16	12	9	5	11	2	5	3	169	480	0.35
Ind. Types: Total Types	0.30	0.33	0.09	0.07	0.05	0.03	0.07	0.01	0.03	0.02			
DC3	41	44	11	8	8	4	6	2	5	4	133	480	0.28
Ind. Types: Total Types	0.31	0.33	0.08	0.06	0.06	0.03	0.05	0.02	0.04	0.03			

Table 6 Token Analyses: 480-token Sample

Session	Verbs	Nouns	Adj	Adv	Prep	Conj	Pron	Art	Aux	C-S	TOTAL TOKENS
DC1	96	144	13	21	27	43	50	71	15	0	480
Ind. Tokens: Total Tokens	0.20	0.30	0.03	0.04	0.06	0.09	0.10	0.15	0.03	0.00	
DC2	109	114	25	16	26	63	57	49	18	3	480
Ind. Tokens: Total Tokens	0.23	0.24	0.05	0.03	0.05	0.13	0.12	0.10	0.04	0.01	
DC3	108	148	44	16	30	41	27	47	14	4	480
Ind. Tokens: Total Tokens	0.23	0.31	0.09	0.03	0.06	0.09	0.06	0.10	0.03	0.01	

Table 7 Comparison of Data Collection Sessions: 480-token Sample

Session	Verbs	Nouns	Adj	Adv	Prep	Conj	Pron	Art	Aux	C-S	TOTAL TYPES
DC1	51	66	11	11	8	5	9	2	5	0	168
DC2	50	56	16	12	9	5	11	2	5	3	169
DC2:DC1	0.98	0.85	1.45	1.09	1.13	1.00	1.22	1.00	1.00	3.00	1.01
DC3	41	44	11	8	8	4	6	2	5	4	133
DC3:DC2	0.82	0.79	0.69	0.67	0.89	0.80	0.55	1.00	1.00	1.33	0.79
DC3:DC1	0.80	0.67	1.00	0.73	1.00	0.80	0.67	1.00	1.00	4.00	0.79

immediately preceding the period of attrition had already suffered a 22% rate of attrition with another 31% showing signs of future loss.

Data Collection Three (DC3)

The collection of the third set of data saw the end of the almost 11-month period of attrition and, as expected, this period saw the greatest decreases in all categories in Task 1. The Total Types dropped from 168 in DC1 to 133 in DC3. The TTR showed a dramatic decrease to 0.28—a seven percent drop from DC1. Considering that the TTRs for all other sessions were at or near the 0.35 level, this drop represents a drastic weakening in Keisuke's lexical diversity during this period.

All but three categories of Types showed decreases in comparison to both the previous session (DC2) and from the onset of attrition (DC1). From DC2 to DC3, the three categories which showed no change or slight increases were articles (no change), auxiliaries (no change), and code-switches (+1). When comparing the rate of fall for Types in the first period of attrition (DC2:DC1) to the second period of attrition (DC3:DC2), the results show a greater rate of decline for the second period in all categories except articles and auxiliaries which stayed the same and code-switches which increased by one. As time progressed, therefore, Keisuke's English attrited to a greater degree in verbs, nouns, adverbs, conjunctions, and pronouns. Adjectives, prepositions, articles, pronouns, and auxiliaries first increased in DC2 and then fell back in DC3 to the same level recorded at DC1. Code-switches, on the other hand, increased from 0 to 4 in the period from DC1 to DC3. With only four Japanese insertions out of a total of 480 tokens, however, code-switching for this participant was still quite low. Throughout the period of attrition, the variety of lexis which Keisuke used deteriorated dramatically with 20% to 33% drops in five of the Type categories and a 21% drop in Total Types.

For individual tokens, there were 72 words not repeated from DC2, 12 words that were in DC1 and reappeared in DC3, and surprisingly, there appeared 24 entirely new tokens that could not be found in either of the previous two sessions. In particular, the use of the pronoun *he* fell dramatically from 26 to four, verb declension decreased, and Keisuke almost entirely eliminated the use of names for the characters in his stories. As a replacement, he relied on *lion* (+21 tokens from DC1) to describe all but one of the lion characters in *The Lion King*. He increased the use of *thing(s)* (+9 tokens from DC1) and he started to use the Japanese name *Momotaro* (+5 tokens from DC1) for the main character of the Japanese story. In addition to this use of a Japanese name, DC3 saw the highest use of code-switching for certain specific words in the Japanese story: *oni* (devil or demon), *Onigashima* (Devil Island), *onitaiji* (capture the devil), and *takaramono* (treasure). As mentioned above, a total of four switched phrases is in itself relatively small in consideration of the total number of tokens; However, the gradual increase of code-switching from DC1 to DC3 showed Keisuke's growing comfort in using this strategy to overcome gaps in his lexicon without resorting to appeals for assistance—which had completely disappeared by DC3.

As shown in Table 7, the results from Task 2 demonstrate a continued but less dramatic decline from the previous session. The total number of Known words fell to 54, the Unknown words rose to 21, and the words answered with hesitancy increased to 29. Twelve words were labeled Unknown for the first time in DC3 and all but one (*hip*) were also Unknown in the diagnostic pre-test. As with some of the tokens on Task 1, five of the words labeled Unknown in DC2 reappeared as Hesitant on DC3. Of the 54 Unknown words in DC3, all but one were also labeled Unknown in the pre-test. Thirty-two of the 33 pre-test Known words resisted attrition for this 11-month period.

Discussion

One of the primary goals of this study was to describe the process of attrition in a young bilingual child over an 11-month period. As evident in the baseline data collection (DC1), Keisuke's minority English was far from fluent and he often left it up to his interlocutor to figure out what he was trying to say. However, even at this less-than-proficient stage, Keisuke was an active participant who always tried his best to complete the tasks asked of him. Unfortunately, his willingness to communicate could not overcome the effects of attrition and he suffered noticeable declines in his productive skills as evidenced by reduced lexical diversity and a loss of pre-learned vocabulary. In

comparison with other studies on bilingual children, Keisuke's experience both compares and differs in several significant ways.

Speed of Language Loss

Over the 11-month period, Keisuke's minority language attrited in what could be described as a "plateau then decline". In the first four months, Keisuke did not demonstrate much change in types, tokens, and the TTR, but in the following seven months more severe declines occurred in all areas. This is very similar to Cohen's (1989) younger participant, Daniel, who decreased in both types and tokens more in the first three months than in the last three. Daniel's older sister, Judy, followed the same pattern but to a lesser degree. Similarly, Kuhberg's two participants (Kuhberg, 1991) experienced a six-month initial plateau followed by two-stages of declines. In stark contrast, the participants in studies by Reetz-Kurashige (1999), Yoshitomi (1999), and Yukawa (1999) experienced little change in type/token analyses. Further, although a type/token analysis was not included in her study, Tomiyama (1999) describes her participant as having shown little loss in the first seven months and only some difficulty in lexical retrieval and decreased fluency until the nineteenth month. These contrasting findings in the starting point and length of the initial plateau and subsequent decline might, in some ways, be explained by individual differences in the participants' age and proficiency; however, problems in the analyses of the language samples might be more at fault with those studies using type/token analyses.

In his 1987 article, Richards argues convincingly that the TTR should be calculated from samples that are standardized according to the number of tokens and not on the number of utterances or recording time. By relying on the number of utterances or recording time, the number of tokens may swing drastically from sample to sample, seriously affecting the reliability of the TTR. In addition, Richards argues that in order to obtain reliable TTRs, the sample size must be roughly 400-500 tokens. Smaller sample sizes also tend to give uniformly high TTRs regardless of the proficiency of the participant. Among the studies mentioned above that used TTRs as part of their data analysis, only Yukawa (1997) took these important arguments into consideration. As a result, the findings in Cohen (1989), Reetz-Kurashige (1999), and Yoshitomi (1999) that suggest changes in the TTR showed evidence of attrition must be taken with some skepticism. In the current study, both protocols were met in that samples were obtained based on a standardized number of 480 tokens per sample—well within the 400-500 range suggested by Richards.

Loss of Lexicon

The first and most significant evidence of Keisuke's lexical loss was in the results of the vocabulary recognition task (Task 2). To my knowledge, this has been the only study with young participants to track loss of particular lexical items over the entire period of attrition. The first important finding was that the Regression Model seems to hold true for lexical items. Of the 21 items lost over the 11-month period, only one came from the list of pre-training Known words. This provides strong evidence that lexical items learned immediately prior to the period of attrition were the most susceptible to loss, i.e., last learned-first lost.

Another finding was that Atkinson's hypothesis (Atkinson, 1975, cited in de Groot and Keijzer, 2000) that attrition will occur only in items marked Temporary (T) or Unknown (U) and not Permanent (P) also seems to hold true, but not absolutely. In this study, P items were considered those items which had resisted attrition through DC2 (n=75). Of those 75 items, only four would eventually be marked as Unknown in DC3. These four items were also originally labeled Unknown in the pre-study vocabulary recognition test, which casts doubt on the level of permanence these items had achieved as a result of the training sessions. Of the P items, however, 16 were marked as Hesitant in the final data collection, which implies these items might be candidates for future loss. This suggests that Atkinson's hypothesis might not hold true over longer periods of time.

Finally, the labeling of items as known or Unknown, Permanent or Temporary, should be done with some skepticism. As demonstrated in the vocabulary recognition test results, retrieval of lexical knowledge is at times fickle. On six occasions, items marked completely Unknown in DC2 came back in DC3 as Hesitant. On eleven other occasions, items labeled Hesitant came back as Known. Only seven items can be

described as following a classic Ebbinghaus curve where Known was followed by Hesitant followed by Unknown.

The capriciousness of lexical retrieval is also important to remember when considering language samples elicited from storytelling sessions. In this study, the storytelling language samples were quite effective in generating samples large enough and diverse enough to be used in a type/token analysis; however, those samples would have been inappropriate for gauging loss of specific lexical items or as an evaluation of overall lexical attrition as seen in studies by Cohen (1989), Olshtain and Barzilay (1989), Tomiyama (1999), and Reetz-Kurashige (1999). As with the vocabulary recognition tests, lexical items would appear and reappear throughout the three data collection sessions. In Keisuke's final storytelling session, for example, 72 items that had been used in DC2 were not used in DC3 and 24 completely new items suddenly appeared. Does that mean he "forgot" 72 words and "learned" 24 words between DC2 and DC3? Maybe, but we cannot know for sure.

Educational Effect

Growing up in rural Japan, Keisuke had few opportunities to use his minority English outside of the home. In comparison to most of the other participants in child attrition studies, he was at a distinct linguistic disadvantage. In the studies reported by Tomiyama (1999), Reetz-Kurashige (1999) and Yoshitomi (1999), the participants had all acquired their L2 English "naturally", that is to say, while living in the L2 environment surrounded by English-speaking friends and going to American schools where they most likely had language arts classes. Although both the quality of education and length of stay affected proficiency and, in turn, future language loss (Reetz-Kurashige, 1999), this environment obviously had a direct effect on their levels of proficiency and may in many ways explain the comparatively lower attrition levels experienced by some of these children upon their return to Japan. Due to the benefits of their acquisition environment, they had reached critical threshold. This is something which Keisuke, enjoying none of these benefits, never did. Starting at a low baseline proficiency level comparable to the younger participants (age 5-8) in Olshtain (1986), Cohen's (1989) younger sibling Daniel, and the "low retention" participants in Reetz-Kurashige (1999), Keisuke experienced a more dramatic rate of loss. Since birth, Keisuke had grown up in a home environment conducive to natural bilingual acquisition, but he lacked the quality language education and literacy skills which seem to be strong precursors for post-attrition retention of language skills.

Conclusion

As Keisuke's father, I have attempted in this study to describe the loss of language precipitated by my absence from the home. Being a parent of bicultural children presents some unique and difficult challenges. One of these is the necessity to nurture language skills that will satisfy the communicative needs of both the parents and the children. The desired result is a child that can communicate across both languages and cultures—in essence, to raise a truly bilingual child. Before embarking on this study, I thought I had helped nurture such a child. However, as the results clearly show, I was extremely naive in thinking that by simply providing an all-English home environment in the first crucial years of his life, this would immunize my son against the onslaught of attrition once I was out of the home. By not attending more carefully to Keisuke's linguistic development in order to help him reach his critical threshold, I was severely handicapping his potential—either to continue acquiring language proficiency, or as in this case, to resist attrition.

There is a lesson that I think all parents and educators can take from this study: we must be much more pro-active in the language development of our children. The ability to communicate does not equate with proficiency. Prior to the study, Keisuke was a very communicative child who was able to meet his home needs in his minority English, and even today he remains a highly social person. Perhaps this gregariousness gave me a false sense of his abilities, because it was not until I started analyzing his language samples that I began to see his weaknesses. Comparing Keisuke's language samples to those of the other children, I realized how truly negligent I had been.

So, what would have I done differently? Or better, what would I have done considering the constraints of living in rural Japan? The most important thing would have been to be much more adamant about teaching Keisuke literacy skills. The main difference between Keisuke and participants in other studies who seemed to weather attrition better was that Keisuke lacked literacy skills. Reetz-Kurashige's (1999) important conclusion that the children with the highest language retention were those with at least two years of overseas schooling and literacy skills was confirmed in the current study. Once children are literate, they can provide themselves with crucial input. If parents also become involved by reading to their children, the reading experience can be both productive and receptive.

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Notes

¹ The periods of attrition came a year after the father had initially left the participant's home environment. In hindsight, the author realizes the importance of having ascertained the participant's level of English acquisition at the time the father left the home. This would have made for a stronger description of the actual effect that such a shift in language environment might have had on the participant. It must be pointed out, however, that many of the studies into child language attrition to date have also failed to provide an original baseline by which to judge attrition in all or some of their participants (e.g. Cohen, 1989; Kuhberg, 1988, 1992; Olshtain, 1989; Reetz-Kurashige, 1999; and Yoshitomi, 1999). These studies have assumed pre-existing language skill or have utilized a cross-sectional research design as a means of comparing loss over time. In order to overcome this deficiency in the present study, the initial data collection came immediately after a month-long vacation in the U.S. where only English was used and where most of the previously attrited language was assumed to have been reacquired. In addition to this, a task (Task 2) was developed to test specific lexical items that had been acquired during this stay in the U.S. The study described above, therefore, is a slice of time taken from the entire continuum of language development in this participant and looks at a specific period of time where the participant went from a level of language acquisition determined at the first data collection through a period of attrition.

² The data analysis also took into consideration the following tendencies shown by the participant. On certain occasions Keisuke would attempt to self-repair his dialog or would repeat the same word over and over while gathering his thoughts. In these instances, only the final product was calculated. The participant also had the tendency to use the conjunction *and* as a way of connecting different parts of his stories which gave the word little or no grammatical function. In these situations, *and* was not included in the calculation of Total Tokens. He also used the word *when* in a similar fashion, but in these cases it carried the grammatical function of a conjunction and was an integral component of the story and, therefore, was included in the tally of tokens. In cases where the participant asked for help, the word or phrase given by the researcher was not included in the tally of either Type or Token.

Appendix

Results of Vocabulary Recognition Test (Task 2)

Card One						Card Two					Card Three					Card Four				
No	Item	Pre	DC1	DC2	DC3	Item	Pre	DC1	DC2	DC3	Item	Pre	DC1	DC2	DC3	Item	Pre	DC1	DC2	DC3
1	hen	U	K	K	H	sidewalk	U	K	H	H	rhino	U	K	K	K	toe	U	K	U	U
2	barrel	U	K	K	H	baby carriage	U	K	U	U	camel	U	K	H	K	finger	K	K	H	K
3	horse	K	K	H	H	antenna	K	K	K	K	seal	U	K	H	K	knee	K	K	K	K
4	cow	U	K	K	H	motorcycle	U	K	K	K	elephant	K	K	K	K	ankle	U	K	U	U
5	fence	U	K	K	H	porch	U	K	H	U	feather	U	K	H	U	wrist	U	K	U	U
6	bee	K	K	K	K	mailbox	U	K	K	H	tiger	K	K	K	K	elbow	U	K	U	U
7	dog	K	K	K	K	cable	U	K	H	K	rocks	K	K	K	K	chest	U	K	H	U
8	pond	U	K	U	U	newspaper	U	K	K	H	tail	K	K	H	K	nose	K	K	K	K
9	barn	U	K	U	H	bicycle	K	K	K	H	train	K	K	K	K	back	K	K	K	K
10	sheep	K	K	K	K	squirrel	U	K	K	K	gorilla	K	K	K	K	chin	U	K	U	H
11	lamb	U	K	U	U	street light	U	K	K	H	giraffe	U	K	K	K	ear	K	K	K	K
12	chick	U	K	K	H	telephone pole	U	K	H	H	peacock	U	K	K	H	waist	U	K	U	U
13	pig	U	K	K	K	mailman	U	K	K	K	ostrich	U	K	H	H	shoulder	U	K	H	U
14	stream	U	K	U	U	bench	U	K	K	K	hippo	U	K	K	K	mouth	U	K	H	K
15	boot	U	K	K	H	veranda	U	K	H	K	zebra	K	K	K	H	eyebrow	U	K	K	U
16	tractor	U	K	K	K	wagon	U	K	H	K	kangaroo	K	K	K	K	hair	K	K	K	K
17	field	U	K	K	H	bus stop	U	K	K	K	alligator	K	K	K	K	leg	U	K	U	H
18	bull	U	K	K	K	house	K	K	K	K	monkey	K	K	K	K	hip	K	K	H	U
19	duck	K	K	K	H	park	U	K	H	H	exit	U	K	K	K	head	K	K	K	K
20	silo	U	K	U	H	fence	U	K	K	K	entrance	U	K	K	K	eye	K	K	K	K

21	rooster	U	K	H	H	tree house	U	K	K	U	lion	K	K	K	K	neck	K	K	K	K
22	goat	U	K	H	K	apartment building	U	K	H	K	bear	K	K	K	K	cheek	U	K	U	U
23	scarecrow	U	K	U	H	garden	U	K	K	U	cage	U	K	H	H	foot	K	K	K	H
24	goose	U	K	K	K	chimney	U	K	K	U	ticket	K	K	H	K	arm	U	K	H	U
25	hay	U	K	K	K	garbage collector	U	K	H	U	penguin	U	K	K	K	heel	U	K	U	H
26	pitchfork	U	K	K	H	truck	U	K	K	K	shop	U	K	K	K	hand	K	K	K	K

Key: Known (K), Unknown (U), or Hesitant (H)