Oral language milestone acquisition in children adopted from China

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ORAL LANGUAGE MILESTONE ACQUISITION IN CHILDREN ADOPTED FROM CHINA

BY

HANNAH HARWOOD
Bachelor of Science, University of New Hampshire, 2008

THESIS

Submitted to the University of New Hampshire in Partial Fulfillment of the Requirements for the Degree of

Master of Science

In

Communication Sciences and Disorders

September 2010
This thesis has been examined and approved.

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May 24, 2010
Date
DEDICATION

For Alan- your unconditional love and support gave me the strength to complete this research.

For my parents- I have been lucky enough to feel your love and pride in all my accomplishments, thank you.
ACKNOWLEDGEMENTS

I would like to thank those webmasters willing to post and forward my research as well as the parents who took the time to respond to my questionnaire. Additional recognition must to be extended to Jeanne O’Sullivan, Steve Bornstein, and particularly to Penny Webster, for their time, support, knowledge, and welcomed feedback throughout the course of this research project. Thank you!
# TABLE OF CONTENTS

DEDICATION ....................................................................................................................... iv

ACKNOWLEDGEMENTS ....................................................................................................... v

LIST OF FIGURES .............................................................................................................. viii

LIST OF TABLES ................................................................................................................ ix

ABSTRACT ........................................................................................................................... x

CHAPTER  PAGE

I. LITERATURE REVIEW ................................................................................................. 1

Introduction ....................................................................................................................... 1
Orphanage Risk Factors ................................................................................................. 2
Importance of Language Input in Early Life ................................................................. 3
Efficacy of Early Intervention ....................................................................................... 12

II. METHOD AND PROCEDURE .................................................................................... 18

Method ............................................................................................................................. 18
Participants and Recruitment ......................................................................................... 18
Materials .......................................................................................................................... 24
Procedure ......................................................................................................................... 25

III. RESULTS ................................................................................................................... 28

Results ............................................................................................................................... 28
Language Comprehension Milestones ......................................................................... 28
Oral Language Milestones .............................................................................................. 31

IV. DISCUSSION .............................................................................................................. 34

Discussion ......................................................................................................................... 34
Age Expectation of Adoptees ......................................................................................... 35
Receptive Language ......................................................................................................... 35
Expressive Language ....................................................................................................... 36
Manner of Acquisition ..................................................................................................... 38
Early Intervention Implications ..................................................................................... 39
Theoretical Findings ......................................................................................................... 41
Limitations ........................................................................................................................ 42

LIST OF REFERENCES ..................................................................................................... 44
<table>
<thead>
<tr>
<th>Appendix</th>
<th>Title</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Institutional Review Board Approval Letter</td>
<td>49</td>
</tr>
<tr>
<td>B</td>
<td>Invitation for Participation (email)</td>
<td>50</td>
</tr>
<tr>
<td>C</td>
<td>Informed Consent Document</td>
<td>51</td>
</tr>
<tr>
<td>D</td>
<td>Online Questionnaire Posting</td>
<td>52</td>
</tr>
<tr>
<td>E</td>
<td>Request to forward Questionnaire</td>
<td>53</td>
</tr>
<tr>
<td>F</td>
<td>Questionnaire</td>
<td>54</td>
</tr>
</tbody>
</table>
LIST OF FIGURES

<table>
<thead>
<tr>
<th>FIGURE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Figure 1: Pre-Adoption Care</td>
<td>20</td>
</tr>
<tr>
<td>Figure 2: Health Concerns</td>
<td>21</td>
</tr>
<tr>
<td>Figure 3: Care Prior to School</td>
<td>22</td>
</tr>
<tr>
<td>Figure 4: Education of Adoptive Mother</td>
<td>22</td>
</tr>
<tr>
<td>Figure 5: Siblings in Adoptive Home</td>
<td>23</td>
</tr>
<tr>
<td>Figure 6: Region of Residence</td>
<td>23</td>
</tr>
<tr>
<td>Figure 7: Language Comprehension Milestones</td>
<td>28</td>
</tr>
<tr>
<td>Figure 8: Oral Language Milestones</td>
<td>31</td>
</tr>
</tbody>
</table>
# LIST OF TABLES

<table>
<thead>
<tr>
<th>TABLE</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Table 1: Milestone Ages</td>
<td>29</td>
</tr>
</tbody>
</table>

---

ix
ABSTRACT

ORAL LANGUAGE MILESTONE ACQUISITION IN CHILDREN ADOPTED FROM CHINA

by

Hannah Harwood

University of New Hampshire, September 2010

This study contains language milestone acquisition information for 14 children adopted from China between 8 and 12 months of age. A retrospective questionnaire was utilized to gain information regarding the specific ages at which these adoptees demonstrated an understanding of English along with the ages where they demonstrated proficient usage of English. Parent responses indicated that these adoptees developed English language milestones comparable to their monolingual peers, for both age of acquisition and order of acquisition. This research adds to the literature on what may be expected regarding language development in children adopted from China prior to one year of age. Results are discussed in terms of their theoretical and clinical implications.
CHAPTER I

LITERATURE REVIEW

Introduction

International adoption has always been practiced in the United States. China has recently become the country from which most children are internationally adopted into the US. Since 1990, there have been over 42,000 children from China adopted due in part to the population control policies put forth by the Chinese government (Roberts, Pollock, & Krakow, 2005).

Additionally, 88 percent of children adopted internationally await adoption in an institutional orphanage environment (Glennen, 2002). Orphanage care has been identified as a risk factor for not only the physical health of children, but their speech and language development as well (Mason & Narad, 2005). This population of children needs closer examination to provide beneficial intervention services.

With the documented increase of children being adopted into the United States from China, further research is necessary to identify what is expected linguistically of these children. Due to the unique nature of their language exposure, these children’s native language suffers almost immediately from attrition because of its abrupt halt once adopted. These children cannot be considered bilingual learners, and are more aptly labeled by Glennen (2002) as “subtractive bilingual” learners because they gain a second language while losing
the first. Through this process, these children are not adept enough at their adopted language for valid language testing to be administered. They are losing their initial language at a rate where testing of their native language would only be accurate immediately following adoption (Glennen, Rosinsky-Grunhut, & Tracy, 2005). Research providing language acquisition norms following adoption would be beneficial for both parents and speech language pathologists to distinguish between children following the expected transitional processes and children following an aberrant one. Once aberrance is detected, these children can be placed in early intervention programs that target these language irregularities.

**Orphanage Risk Factors**

Internationally adopted children are often considered an at risk population due to orphanage conditions in foreign countries. Orphanages are often understaffed and unable to provide the children in their care with the optimal amount of attention. A number of studies assessing the effects of orphanage care on children who have been internationally adopted have identified health risks associated with these conditions. Mason and Narad (2005) reviewed the literature and found that children adopted from China had high incidents of elevated lead levels, 14%, anemia, 35%, abnormal thyroid levels, 10%, and positive hepatitis B exposure, 22%. These risks appear to be directly correlated to the length of time infants are exposed to the poor living conditions of their orphanages.
In general, studies show that children adopted internationally exhibit stunted growth in height, weight, and head circumference. An average growth loss of one month per every three months spent in an orphanage has been acknowledged. A further study identified that 94% of internationally adopted children have developmental delays in such areas as language, 30%, fine motor skills, 28%, and social skills, 25%. Children adopted from China in particular showed delay in at least one of these areas 75% of the time and within that percentage, language delays 43% of the time. A possible link between abnormal development and the orphanage conditions has been connected to the hypothalamic-pituitary-adrenal (HPA) stress axis. The HPA is significantly connected to the body's growth response, and cognitive development. It is hypothesized that in these children the early isolation imposed by the orphanage conditions causes abnormal levels of stress hormones along this axis (Mason & Narad, 2005).

**Importance of Language Input in Early Life**

Hoff-Ginsberg and Shatz (1982) conducted an extensive review of the literature on the relationship between linguistic input and acquisition of language. Many of the studies they reviewed looked into the effects of "motherese" in a variety of linguistic input contexts. "Motherese" is a term used to describe the way adults commonly modify their language while interacting with infants e.g., slow rate, exaggerated stress, repetition and use of single words. While most of the findings suggest this input is important, the extent of its value, as noted by
Hoff-Ginsberg and Shatz (1982) were, however, able to identify one cross-sectional study conducted by Newport, Gleitman and Gleitman (1977) in which the results highlight the importance of such input on the development of the auxiliary verb system. This developmental connection was noted to be resultant of the frequency of yes/no questions presented in maternal speech which often contain auxiliaries, i.e. “Do you want a cookie?”. These results led the authors to conclude that the high number of do/does/did questions commonly presented in maternal speech aid in the development of these English language auxiliary verbs.

Glennen (2003), identified the contrast of input typically experienced by internationally adopted children while in orphanage care. Children who receive orphanage care exhibit both health and developmental delays. However language development is the primary area of delay for children who are adopted internationally. Glennen (2003) reported that orphanages have a 1:5 or higher ratio of staff to children creating an inopportune amount of 1:1 contact. This 1:1 contact is what makes “motherese” so efficient. Additionally, children are grouped with children their own age, effectively limiting the amount of higher quality input the children receive. This leaves them with language experiences which are not as rich as those of their monolingual peers who receive higher quality language input.
There is additional evidence in the importance of language input provided by Read, Schreiber and Walia (1979) who found that school age children rely on prosodic clues of language to decipher aspects of sentences. The review by Hoff-Ginsberg and Shatz (1982) notes that the language learning environment plays a heavy role in acquisition of language, however certain conditions need to be met for language to grow to its full potential. It seems apparent to these researchers that a communicative partner is necessary for ideal acquisition and that overhearing speech or a television will not provide the input and modifications children need to establish language on par with their capabilities. While these authors have only established this connection for English speaking children, it is logical to assume this finding can be generalized to children speaking other languages.

Bavin (1995) identified how linguistic input may reflect directly on children’s productive vocabularies. In reviewing the literature on the first few expressive words produced by children from various cultures, he noticed differences in the types of words seen. English speaking children had a high number of nouns in their early lexicons while Korean and Japanese children had heavy verb usage in their early lexicons. Further research identified this was due to the style of language input received by these children. English stylistic speakers use high levels of naming and labeling while speaking with children. This highlights nouns, making nouns more salient to the child. Conversely, Korean and Japanese morphostyntactict languages allow for subject and object
nominals to be omitted highlighting the saliency of verbs to those children. Also, the verb appears at the end of the sentence in these languages.

Input language affects children’s language production not only by shaping which types of words appear first but additionally the age at which children begin using language. Language input must not only be present for the acquisition, but the quality of input must reach a level in which the child can ascertain appropriate usage, i.e. presented in a manner which denotes saliency for that child. Mothers of K’iche’ Maya cultures apply little linguistic significance to the sounds made by their children before they achieve intelligible speech and consequently ignore these sounds. Until their children reach toddler age they are not considered to be conversational partners. As a result, children of this culture are not expected to speak until two or three years of age. Children of English and Chinese speaking parents typically begin receiving child-directed speech soon after birth. Parents in these cultures use what is known as “baby talk” which is described as modifications of prosody as well as vocabulary. In these situations children typically begin to speak at twelve months (Bavin, 1995).

Even before first words, there is evidence for the continuity of speech acquisition through the first year. The continuity hypothesis states that children begin acquiring language at birth through environmental input. Children sort through the language around them and use their input to provide guidelines. Difficulty in identifying the appropriate language patterns of children receiving differing language input needs careful consideration when looking into language acquisition of internationally adopted children. Vouloumanos and Werker (2007)
contributed important information in support of the continuity hypothesis of language acquisition. These individuals designed a study stating that neonates and infants were able to distinguish speech sounds from non-speech sounds based on their sucking patterns. Additional studies' findings have found that neonates are able to perceive differences in speech presented forward and backwards, and differences between languages possibly through their rhythmic patterns. Interestingly these same studies found that neonates were not able to identify the previously perceived differences in languages when those languages were played backwards.

Intrigued by these findings, but noticing flaws in the designs, Vouloumanos and Werker (2007) set out to restudy neonate's perceptions of speech with improved methods and procedures. Original studies failed to represent the non-speech sounds as having the same frequency patterns as their speech counterparts providing the child with a linguistic cue to distinguish. The 2007 study matched as closely as possible the frequency patterns of the non-speech and speech units presented limiting the margin for error. The infants were presented with the speech and non-speech stimuli in alternating minute intervals for a total of eight minutes. The results were broken into two time blocks, four minutes apiece. While the first block did not produce significantly different results, the second block's results showed differences, with infants sucking significantly more when listening to speech than non-speech sounds, even when underlying sound patterns are the same.
Vouloumanos and Werker (2007) cited an interesting notion reported from a previous study conducted by Klin (1991), individuals diagnosed with autism spectrum disorders do not show a preference for speech sounds. In fact, these individuals actually showed a preference for non-speech sounds. While the results cannot be correlated with absolution, they do bring up an important area that needs further research suggesting that a bias for speech preference may be an important factor in the development of typical speech.

Swingley and Aslin (2002) reported experimental results relating to a study by Werker and Tees (1984) as the catalyst for further research. The 1984 study determined that by 12 months of age children are able to identify phonologically relevant distinctions within their native language. Swingley and Aslin (2002) stated these findings as the basis for their continued research in the area of phonological distinction in children. This implies that the first year of life is a critical time in children’s ability to learn and sort through the rules of their input language to facilitate later production. Researchers looked at 50 infants at approximately 15 months of age. The sample was divided into two groups. The infants were given a set of two pictures hanging horizontally. The speech stimulus, naming of the object, was stated and infants reactions were measured using eye gaze technology to identify where they looked and for how long. One group was given the correct pronunciation of the word and a distant mispronunciation (dog to mog), while the second group was given the correct pronunciation and a close mispronunciation (dog to tog). The results showed that these infants found the mispronunciations more difficult to recognize.
regardless of whether they received the close or distant mispronunciations. This study provides strong evidence that infants do indeed encode words with high levels of phonetic detail, making the first year of life essential in the buildup of lexical banks of language learners.

Further support for the continuity hypothesis is the notion of a universal grammar in children (Crain, Goro, & Thornton, 2006). These researchers found that children speaking English often made grammatical mistakes that are appropriate in the grammar of different languages. Children use input to identify what features of language are salient in their language, but are still working through fine tuning of the grammar. Until these children have enough input to deduce the correct rules of that grammar, they pull from a universal grammar. Crain et al. (2006), moreover, suggested that initially the child has the “most restrictive” hypothesis concerning grammar and that language specific broadening follows. This restriction is the result of adopting only the limited language parameters of the Universal Language. However once a native language is assumed, grammatical rule broadening follows.

Though less is known about language acquisition of internationally adopted children, Snedeker, Geren and Shafto (2007), studied English language development in 27 preschool children adopted from China. Participants ranged in age from 2 years 7 months to 5 years 6 months. Their language development was monitored for the first 18 months of residence in the United States. Parents completed the MacArthur-Bates Communication Development Inventory 2, CDI-2, every three months. For additional comparison, an initial language sample
was taken via an hour-long recording of the parent and child playing with a toy. Participating children were matched up to monolingual infants with the same vocabulary size for comparison.

Snedeker et al. (2007) found that after 3 months in the United States, adopted preschoolers had a vocabulary size on par with a typical monolingual 24 month old, giving adoptees an initial acquisition rate of four times monolingual infants. Of further interest were the words in which the adopted preschoolers acquired. They showed the same shift in word acquisition as the infants; nouns dominating early acquisition with the proportion of verbs increasing as the nouns decreased. This study lends credence to the notion that having knowledge of language structure, even a different language, provides a foundation upon which another language can be acquired at a quicker rate.

A second finding of Snedeker et al. (2007) identified that preschoolers who are adopted from foreign countries acquire language in the same sequences as monolingual babies (i.e. single words which progress to word combinations). They believe this to be a result of language itself and not the maturity of the brain learning the language which lays out how it is acquired. Furthermore, children who are adopted at a later age grasp temporal concepts quicker than infants who do not have the cognitive maturity to understand those concepts.

A second study which compared language acquisition of children adopted from China to age matched English speaking peers from Canada was conducted by Cohen, Lojkasek, Zadeh, Pugliese, and Kiefer (2008). These researchers compared seventy children adopted from China (mean age 13 months) to age
matched peers from Canada using the Preschool Language Scale-3, PLS-3. The PLS-3 was used to measure receptive and expressive language skills every three months. Results showed that by the six month follow-up, adopted children had matched their monolingual peers in receptive language skills, but lagged slightly in skill on expressive language. It was noted that expressive language development typically lags behind receptive language development, and that while the adopted children were behind their peers at the six month mark, they were still within the average range. Furthermore, by two years post adoption, expressive language skills had reached that of their monolingual peers.

Children who are internationally adopted receive input from two different languages. These children are required to relearn grammatical and lexical regularities in their adopted language. Additionally, it can be inferred based on the aforementioned research that children begin to delineate what is typical in their language from birth. Once this process has been initiated, it is still unclear how abrupt discontinuance of the native input and introduction of a new language system is interpreted by children. It seems reasonable to assume that the similarities between the two languages play an important role with the second language acquisition. Children who learn Chinese have a similar acquisition as those who learn English. For example, nouns dominate their vocabulary initially and verbs are introduced as the rate of new nouns drops. This similarity may help to create the rule foundation in which the new language can be applied as hypothesized by Snedeker et al. (2007). However, those who have been
internationally adopted face a language input alteration which requires them to adapt to new linguistic input.

**Efficacy of Early Intervention**

Children adopted internationally cannot be expected to follow the same language acquisition process as their non adopted peers. With accurate identification of English language acquisition norms for individuals adopted from China, the ability to identify and isolate those with possible aberrant acquisition becomes more successful. It would then be possible to target those following an irregular acquisition path for early intervention services, i.e. intervention prior to the start of first grade. While studies on the efficacy of early intervention in Chinese adoptees is another area that needs to be studied more closely, studies showing the improvement of non-adopted individuals who are considered at risk for various language difficulties and their results with intervention can be reviewed. Researchers have focused on specific populations in the hopes of isolating intervention techniques that can be used beneficially to target commonly associated difficulties.

Gillon (2000), for example, looked at individuals with specific language impairment, SLI, and identified them, based on the literature, as at risk for progressive reading difficulties in conjunction with their current reading delays. The study included 91 children, 61 with SLI and 30 normally developing peers. The children with SLI were broken down into three different groups, group 1- experimental intervention, group 2- traditional intervention, group 3- minimal
intervention, a fourth group contained children who were not identified as having any reading delays or difficulties. Groups 1 and 2 received two 1 hour sessions of therapy a week for a total of 20 hours. Group 1 was in phonological awareness therapy containing rhyming, phonemic manipulation, phoneme identification, and linking speech to print activities carried out by a qualified speech language pathologist, SLP, who was trained by the researcher or carried out by the researcher themselves. Group 2 was seen for traditional therapy by a SLP, group 3 was unable to meet the required 20 hours and received minimal therapy from a SLP, and group 4 received no therapy. The results indicate that group 1 showed significantly more improvement than both group 2 and 3 in their ability to read and comprehend the presented connected speech correctly.

A second study looking at early intervention for at risk individuals was conducted by Justice, Chow, Capellini, Flanigan, & Colton (2003). In this study, the at risk population was 18 children with a mean age of 53 months and participating in a Head Start program in Virginia. At risk status was identified in these children as low SES, below poverty limit, which is a requirement for the head start program, and co-existing oral language impairment, LI. These children participated in a 12 week program that was divided into two 6 week courses. The first was the experimental explicit intervention program further subdivided into name writing, alphabet recitation, and phonological awareness games. The second program was a comparison intervention. Here the activities included adult-child shared storybook reading and a story retelling activity. Results showed that significant gains were made in each of the five measures
underscoring the idea that early intervention creates gains for the child in areas that are weak based on their risk factors, oral language impairment and/or poverty.

Wilson (2004) also looked at an at-risk population based on their placement in a head start program. This researcher looked at 54 participants from a Head Start program in Tennessee. These children were then divided into 3 distinct groups. One group received in-class and at-home intervention. At-home intervention was administered via parents following handout guidelines while in-class intervention was provided by the researcher. A second group received only in-class intervention and the last group was a control receiving no intervention. Wilson structured the intervention with a test-teach-retest approach. Each child was tested pre and post intervention using the Bracken Basic Concept Scale-Revised, BBCS-R, which assesses concept acquisition and receptive language skills.

Following review of pre-intervention results, based on findings from the BBCS-R, an instruction program was designed for each child following the Bracken Concept Development Program, BCDP. This program aims to fill any voids identified in a child's conceptual knowledge. Children were required to show mastery, i.e. 80% correct, of a concept before another one was introduced. The intervention was implemented twice a week for 45 minutes for 10 weeks. Post-intervention testing results showed that groups who received intervention had higher gain scores post-intervention, however there were no differences noted between the two groups receiving intervention. This suggests that the at-
home intervention component made no difference. It is important to remember that the at-home intervention in this case was not controlled. There was no follow up to ensure that the parents were actually implementing the researchers' suggestions. Still, this study again highlights that the success of early intervention can provide children with marked gains when compared to the same at risk population without intervention (Wilson, 2004).

A fourth study identifying the importance and effectiveness of early intervention was conducted by Fey, Warren, Brady, Finestack, Bredin-Oja, et al. (2006). This study included 51 participants with developmental disabilities and co-occurring mild to moderate mental retardation. The goal of this study was to identify whether a responsivity education/prelinguisitic mileu teaching, RE/PMT approach to intervention would increase a child's communicative acts i.e. gestures, vocalizations, eye gaze or a combination which shift from a referent of interest to a communication partner. The participants were randomly assigned to a RE/PMT therapy intervention group and a no-treatment group. Treatment lasted 6 months during which parents of children in the experimental group received eight one hour long sessions of RE in hopes of heightening their awareness to all of their children's communicative attempts in order to respond appropriately to those attempts. The PMT component was interwoven into routines where efforts at nonverbal communication as well as vocalizations were highlighted and encouraged during games and routines. The results of this study showed that children in the RE/PMT intervention group used significantly more communicative acts than their no-treatment peers.
The studies identified so far have all lent support to the idea of early intervention and its effectiveness with monolingual children. A review conducted by Scruggs, Mastropieri, Forness & Kavale (1988) in which the researchers looked at 20 studies with a total of 44 participants, whose independent results were examined, provides yet more support for the efficacy of early intervention services. Through individual analysis of the participants, none of whom are identified as internationally adopted; Scruggs et al. (1988) were able to identify important variables in the efficacy of early intervention. The researchers' unique perspectives studying 20 independently conducted studies allowed them to make cross-study generalities on varying results of early intervention with various populations. They noted that there was no significant difference within the studies in the variables participant age, severity of disability, gender, intervention model implemented, or instructor on the effectiveness of early intervention. It was successful for all. Additionally, from the compiled information, these researchers noted that the outcomes that were associated with spontaneous language use were generally lower than those pertaining to general language skill acquisition.

The studies presented lend credence to the notion that early education is worthwhile and should be practiced in as many situations as appropriate. Further identified by these studies including the review by Scruggs et al. (1988) is the idea that intervention specific programs show an even higher rate of improvement, such as phonological awareness intervention for reading comprehension, when compared to general intervention techniques. Given the
evidence that early intervention is successful with monolingual children with speech and language delays, it is reasonable to assume that this intervention approach will be successful with children who are internationally adopted. While many studies show that individuals adopted from China around 12 months of age do indeed catch up to age matched peers in an average of two years post adoption (Roberts, Pollock, Krakow, Price, & Wang, 2005), identifying those individuals who are at risk for further delay will help to eliminate the compiling problems associated with late identification. Therefore the purpose of this study was to identify language acquisition milestones in children adopted from China.
METHOD AND PROCEDURES

Method

Participants and Recruitment

Participants of this survey were parents of children adopted from China. Participants were recruited through contact with numerous websites which are of interest to the target population, individuals who have adopted children from China. Several different websites and engagement methods were utilized to identify participants for this study. Direct contact was established via email correspondence with 19 families who willingly posted contact emails on the Children’s Hope International website (http://www.childrenshopeint.org/chinaref.html). These families received an email (see Appendix B) from the researcher which requested participation in an online questionnaire. An attachment, the informed consent document (see Appendix C), was enclosed within the email. A link to the questionnaire was found at the end of the informed consent document. A second email, a replica of the first, was sent to all 19 families as a follow-up request for participation.

A second website utilized for recruitment was Families with Children from China (www.fwcc.org). Contact was established via email with the webmaster,
and a link was posted on the homepage (see Appendix D). The link brought participants to the same informed consent document as those who had been directly emailed. Additional contact was made through email with the webmasters of multiple websites (http://www.attach-china.org/, http://www.adoptivefamilies.com/china_adoption.php, http://www.chineseadoptionstories.com/, and http://www.adopting.com/mailing.html) with a brief explanation of the purpose of the research, a copy of the informed consent/questionnaire link along with a request to forward the questionnaire to followers of their websites who might be interested in participating (see Appendix E). Because of the confidentiality involved and the anonymity of the questionnaire, it was not possible to identify the website portal used for the participants to gain access to the study. All participants who gained access to the questionnaire had access to the informed consent document regardless of their place of recruitment. Participants were informed that at any time they could discontinue participation by exiting the questionnaire, or leave blank any questions to which they felt uncomfortable responding.

In order for participants to be included in the final results of the study, their children must have been adopted between 8 and 12 months of age. Adoptees could not have been diagnosed by a speech-language pathologist as having any kind of language development anomaly. Additionally, adoptive homes needed to have English as the only language of input. Out of the 44 individuals who responded to the survey, 14 fit the above criteria resulting in a response usage of
32%. The 14 adopted children included in this study, 13 female and 1 male, have a mean adoptive age of 10.2 months. The children differed on a number of variables including care prior to adoption, health at time of adoption, care prior to school, adoptive mother’s education, siblings in the home, and location of residence in the United States. Figures 1-6 illustrate these factors.

![Pre-Adoption Care](image)

**Figure 1**: Place the adopted children received care prior to adoption into the United States

As figure 1 shows, the majority of children, 11, received care solely in an orphanage prior to being adopted. An additional 2 children had some orphanage care, and only 1 child was cared for in a foster home before adoption.
Figure 2: Health of the adopted children once they were brought home, into United States

Figure 2 reveals any reported health concerns of those children whose data was included in the study. For the most part, children who were adopted had no health concerns, 64% of those who were included in the study. An additional 29%, that is 4 out of the 14, had only one concern upon arrival home and 1 child had multiple concerns including three ear infections prior to six weeks post-adoption and pressure equalization tubes at three months post-adoption. In the case of the one child who had ear infections, problems were resolved by two years of age.
Figure 3: Place of care and subsequent language input prior to start of school

As figure 3 illustrates, half of the children spent at least part of their time prior to enrollment in school, preschool or kindergarten, cared for in daycares. The remaining half were cared for in their adopted homes until they began either preschool or kindergarten, with one child not yet in school.

Figure 4: Highest level of education achieved by the adoptive mother

As shown in figure 4, adoptive mothers predominately have achieved more than 16 years of education. The remaining 50% have at least 12 years.
education, the equivalent of a high school diploma. This information speaks to the quality of input within the adoptive home.

**Figure 5: Siblings present in the home of the adoptees from China**

The participants indicated that 35% of the children included in this survey were only children. The remaining 65% had at least one sibling. Figure 5 presents these data.

**Figure 6: Geographical location of residence within the United States of the participants**
As evident in figure 6, participants ranged from all over the United States. This indicates that the results of the study are not biased based on location of residence or a dialectal difference in input.

Materials

An online questionnaire was created using Surveycat, an online survey system. Surveycat is an online service provided to faculty and staff of the University of New Hampshire. It allows for creation of anonymous questionnaires. These questionnaires are then provided an associating link. This link can be distributed and results of each questionnaire are anonymous. The results can only be viewed through a password protected sign-in. This system was chosen because it is not limited to location or the need for personal access to or contact with participants.

The researcher created a forty-one question survey utilizing the Surveycat program (see Appendix F) for distribution as previously described. The questionnaire was broken into two parts, as follows:

- Part 1: Qualifying information, general background information, and demographic information (questions 1-28).
- Part 2: Language milestone achievement information (questions 29-41).

Part one of the questionnaire was designed to gain information regarding language input, age of adoption, and whether or not a diagnosis had been made regarding atypical language development by a speech-language pathologist.
This information was taken to determine eligibility for inclusion in the study and to control for factors which could alter language milestone outcomes according to the guidelines of this study. The additional information gathered in part one provided insight surrounding the home environment and subsequent language input of the adopted child.

Part two of the questionnaire was developed to gain knowledge regarding at what age specified language milestones were achieved in these children who had been adopted into the United States from China. This section was developed based on the work of Masters (2000) as cited in Glennen (2009), regarding silent periods often exhibited immediately upon arrival home (questions 28, 29). Receptive language questions were asked to identify if these children experienced language development in the same manner as monolingual peers (i.e. demonstration of understanding the language prior to using it; questions 29-32). These were included based on the research conducted by Owens (2004). Questions regarding oral language milestones (33, 35-40) were developed based on the work of Owens (2004).

Procedure

The questionnaire was developed to identify at what age children who were adopted from China achieved specified language milestones. The questionnaire was created as previously described, in two parts. After development, approval for this study was obtained from The University of New
Once approval was obtained, the questionnaire was made obtainable to prospective participants through Surveycat. This created a link to the questionnaire. Participants were recruited through various websites, where contact information had been willingly posted, and kept anonymous. No information apart from what was provided in the questionnaire was attached to each response. Additionally, all participants were informed that they were free to discontinue participation at any time or leave questions blank. Participants were told that they would be asked questions regarding the age at which their child achieved certain language milestones and general background information.

Prior to beginning the questionnaire, participants were made aware that all information obtained from the questionnaire would go towards creation of a retrospective timeline aimed at identifying the language development of children adopted from China. Once responses were submitted, they were examined for possible inclusion in the study results. Those which did not fall within the parameters of the study (i.e. adopted after 12 months of age, diagnosed by a Speech-Language Pathologist, etc) were destroyed to ensure continued protection of anonymity.

Those which were included in the study were analyzed for various qualitative and quantitative data (see Figures 1-8 and Table 1). Following initial breakdown into qualitative and quantitative, results were further analyzed using creation of means for specified oral language milestones. The results of this
study were then compared to expected norms of the mean ages at which the same milestones were achieved in monolingual English speaking peers. Questions 29-33, 35-40 were then analyzed in comparison to work done by Owens (2004).
CHAPTER III

RESULTS

Results

Language Comprehension Milestones

Figure 7: Parentheses contain the number of the corresponding question. See Appendix F.

Language Comprehension Milestones

Data on language comprehension for children adopted from China are presented in Figure 7 along with comparative data from Owens (2004). For each average age of achievement presented for children adopted from China, a corresponding age expectation is presented for monolingual peers. Typically-developing
<table>
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<tr>
<th>Age at Time of Adoption</th>
<th>1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 Average</th>
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</table>

**Table 1: Milestone Ages**
children demonstrate an understanding of language prior to using it. To help validate the results obtained in the Oral Language Milestone section, the same procedures were used to analyze adoptees’ acquisition and demonstration of their language comprehension. Data obtained from questions 29-32 of the questionnaire are laid out in Table 1. These results were compiled to create average ages at which children adopted from China exhibited these language comprehension milestones. All responses were added together and then divided by the number of responses obtained for that question. This resulting average was then displayed in the last column of Table 1. On average, monolingual peers achieved comprehension milestones 2.15 months prior to their adopted peers. In comparing children adopted between 8-10 months with children adopted at 10.5-12, the data indicated that children adopted in the younger age bracket were only approximately a month, 0.95, behind their monolingual peers with respect to language comprehension development. Conversely, children adopted at 10.5-12 months fell 3 months behind their monolingual peers in acquisition of these milestones.
Oral Language Milestones

Oral Language Milestones were determined using the same procedures as language comprehension milestones. Results are presented in Figure 8 in conjunction with expected ages of achievement for the same milestones in monolingual peers as reported by Owens (2004). Data for the analysis of oral language milestone achievements of children adopted from China were obtained via question 33 and questions 35-40 of the questionnaire and are available to view in Table 1. Individual results were compiled and then divided by the number of responses to create an average age of achievement for that milestone and displayed in the final column of Table 1. On average, adoptees achieved
oral language milestones within a month of their monolingual peers. This data indicates that, in some cases, adoptees even demonstrated certain milestones prior to their peers. Results of question 40 indicate that adopted children exhibited clear speech 10 months prior to their non-adopted peers. However, results of this question may be invalid due to the ambiguity of the question. The researcher simply asked when the child no longer needed to have his/her speech interpreted to unfamiliar listeners. The question should have been more specific regarding the accuracy of the speech as well (i.e. the child no longer exhibits any phonological processes, or other misarticulations). Informal analysis of the results regarding children adopted younger, (ages 8 to 10 months) and children adopted slightly later (10.5 to 12 months) revealed a wider variety of achievement. These results indicated age of adoption has a less predictable outcome on demonstration of oral language milestones than language comprehension milestones.

A second observation which can be made by examining the data collected is the anticipated noun/verb ratio present in adoptees vocabularies. These results suggest that internationally adopted children experience a similar shift from a noun heavy vocabulary to a vocabulary containing a higher percentage of verbs. This information is taken from the results of questions 37-39. While it is not possible to state with certainty this shift has occurred due to a lack of information regarding which word classes the children actually produced, it is logical to assume that these 2 or 3 word combinations and questions contain a variety nouns, verbs, and modifiers. These findings will be further examined in
the discussion. However, overall, adoptees' acquisition was similar to the expected age of acquisition of their monolingual peers regarding oral language milestones.
Discussion

The language development of 14 children adopted from China before one year of age was studied using a retrospective questionnaire. This study was designed to examine the age at which children who have been adopted from China achieve oral language milestones. The children studied in this project were adopted from China into the United States between the ages of 8 and 12 months. Though there was some variation in age of acquisition, adoptees in general followed the same milestone acquisition path as their non-adopted peers.

Specific research questions were as follows (a) What is the expected age of acquisition for specified language milestones in children adopted from China and how does that compare to non-adopted peers? (b) How does language milestone acquisition in Chinese adoptees compare to non-adopted peers regarding order and manner of acquisition? (c) What are developmental expectations for Chinese adoptees and when is early intervention appropriate? The following sections discuss the findings for each of the previously posed questions as well as additional theoretical points.
Age Expectations of Adoptees

One of the purposes of this research was to determine if age at time of adoption can successfully predict what can be expected for the language development of children adopted from China. The children chosen for this study were adopted prior to one year of age, in order to precede advanced oral language development in the initial language. Adoption prior to the development of an oral language base in language one, defined as an understanding salient enough to lead to developmentally appropriate expressive language, appears to allow for an immediate shift into language output in English. Previous research on children who have been adopted from China has been conducted using children who have been adopted within a wider age range, but is consistent with the present study. The studies below illustrate current research in the areas of receptive and expressive language acquisition in children who have been adopted from China and Eastern Europe.

Receptive Language

Cohen et al. (2008) studied both receptive and expressive language acquisition milestones of children adopted from China into Canada. The study included seventy adoptees with a mean age of 13 months. In contrast to the current study, Cohen et al. (2008) employed a larger sample with a higher adoption mean age, and did not control for whether or not adoptees received services from a speech language pathologist. Despite these methodological differences, results of these two studies compliment each other. Cohen et al.
(2008) found that adoptees from China into Canada lagged approximately 2 months behind their monolingual peers regarding demonstration of specified receptive language skills. They determined that by six months post adoption, however, receptive language of adoptees was on par with monolingual peers. It is important to note that the intrapersonal data on these adoptees does vary; a number of participants responded to English immediately while others required a lengthier time of exposure for those skills to manifest.

Snedeker et al. (2007) found that internationally adopted preschoolers acquire their new language at a quick rate and out-develop monolingual infants regarding their rate of acquisition. These older adoptees were found to grasp higher level concepts, such as temporal concepts, prior to monolingual infants’ ability to understand the same concepts. While these preschoolers do not catch up as quickly as children adopted prior to one year of age, their acquisition rate is accelerated when compared to monolingual infants. This research lends credence to the work by Cohen et al. (2008) as well as the present study, the findings of which indicate that children adopted from China will catch up to their monolingual peers receptively. Cohen et al. (2008) found that when children are adopted by one year of age, receptive language should be comparable to peers within a couple of months.

**Expressive Language**

Rate of expressive new language in children who have been internationally adopted has been examined by a number of researchers.
Snedeker et al. (2007) examined the language acquisition of twenty-seven preschoolers adopted from China into the United States. Participants were much older than the children in the current study, ranging in age from 2.7-5.6 years. Snedeker et al.'s children had an expressive vocabulary size comparable to a 24 month old after only 3 months in the United States. Likewise, Cohen et al. (2008) found that their adoptees had caught up to their monolingual peers by two years post adoption not only regarding vocabulary skills but other developmental language skills as well.

The findings of the two above studies lend support to the credibility of the findings in the current study, which employed stricter inclusionary criteria as well as an overall smaller age range of examination. Results indicate that it is reasonable to expect children who have been adopted from China before age one to acquire oral language milestones along with their peers. Given that most monolingual children do not begin to demonstrate expressive language prior to one year of age, it can be assumed that adoptees do not exhibit much acquisition lag because they do not have any ground to 'make up'. When children are adopted at an age where their peers are already displaying oral language skills, adoptees are able to acquire language at an accelerated rate which allows for catch up, according to previous research, no later than two years post adoption. The above two studies support a language catch up in children adopted from China, while Glennen and Masters (2002) identified a similar two year catch up in children adopted from Eastern Europe. The current study, along with those cited above, only looked at language development in adoptees prior to their entrance
into first grade. Therefore no comments can be made regarding the language proficiency of these participants in academic situations.

Manner of Acquisition

Another purpose of this study was to determine how the language acquisition of children adopted from China's compares to their non-adopted peers concerning the order with which specified language milestones are achieved. Findings are consistent with previous investigating research which identified that internationally adopted children can be expected to have a receptive understanding of language prior to using it expressively. Based on the information presented by Owens (2004), it can be expected that typically developing monolingual non-adopted children will demonstrate receptive understanding of language an average of two months prior to any demonstration of expressive language. Results of this study indicate that adoptees follow the same two month lag in expressive language when compared to their acquisition of receptive language. That is, the comprehension/production relationship is comparable.

Also related to manner, previous research on children who have been adopted from China has looked not only at the age at which milestones were achieved but also the vocabulary composition of the children. Snedeker et al. (2007) assessed the vocabulary development of preschoolers adopted from China. These researchers noted that preschool age adoptees demonstrated the same shift in vocabulary development as monolingual peers. This was evident
by analyzing the proportion of nouns and verbs present in their speech. It is reasonable to assume that participants in the current study exhibited the same shift in vocabulary as expected by their peers because adoptees in this study demonstrated usage of noun/verb combinations and generation of questions comparable to typical developmental research conducted by Owens (2004). Based on order of acquisition of these skills, this study’s findings regarding the vocabulary shift and make up follow what has been identified in previous studies.

Additional findings regarding the development pattern of children who are internationally adopted was addressed by Snedeker et al. (2007). These researchers found that both infant and preschool adoptees shift from using single words to express their messages to using two word utterances to three word utterances to express their messages. Data from this study follows the same conclusions. Children here have been specifically adopted from China prior to the age of one year old. Findings from this study both support and add to the current literature regarding the order and manner with which language milestones are achieved.

**Early Intervention Implications**

As previously discussed, findings from this study indicate that children who are adopted from China between the ages of 8 to 12 months develop receptive and expressive language skills at ages consistent with their monolingual peers. Without any form of language intervention, it can be assumed that these children developed language in a typical fashion. Glennen
and Masters (2002) studied children who have been adopted internationally from Eastern Europe and found that children adopted between 0-12 months caught up to peers by one year post adoption, a finding that is slightly different than one of this study. However, the methodological differences (i.e. these children were not screened for having any language development anomalies) could help to explain the differences in findings. Additionally, Glennen and Masters (2002) found that children adopted at an older age, 13-18 months, developed language development to average limits by 36 months. Cohen et al. (2008) studied 70 infants adopted from China between the ages of 8 to 21 months, mean of 13 months, and found that by 24 months post adoption adoptees had caught up to their monolingual peers. The findings of previous research have been conducted on a broader adoption age range, yet still provide support for the findings of this study. The current study indicates that children adopted from China between 8 to 12 months of age develop receptive and expressive language skills on par with their peers.

The results indicate that Chinese adoptees prior to 12 months of life should not be considered for early intervention services any differently than their monolingual peers. However, adoptees who fall into ‘at risk’ populations as defined by Justice et al. (2003) should be screened for language development anomalies. Additionally, parents of children adopted prior to one year old should be aware of age expectations for monolingual peers and should seek services from a speech language pathologist if they are concerned about language developmental discrepancies. For speech-language clinicians, the current study
provides information regarding what to expect developmentally for children within the 8 to 12 month age range who have been adopted from China. Screening and evaluation may take the same form as that of monolingual children.

**Theoretical Findings**

The findings of this study offer extensive food for thought regarding the effects of early language input. Despite the fact that the study children received their language input prior to 8 to 12 months in a different language than English, it did not significantly affect their acquisition of English. They did not appear to need a certain length of exposure to the new language prior to acting on it. While other studies such as Masters (2000) as cited in Glennen (2009) have reported that some international adoptees, often preschool age adoptees, experience a silent period upon arrival home, presumed to be a time where the new language is auditorily examined, only one child whose results were included in this study experienced this. The remaining 13 children did not alter their prelinguistic behavior, including cooing and babbling, as a result of the new language input. The current study appears to lend credence to the philosophy that infants develop a universal grammar. While infants are still developing an understanding of the grammar system of their native language, they rely on a universal grammar. Universal grammar is a general set of innate rules that infants rely on.

Crain (2006) for example, studied language development in infants and found support for a universal grammar in English speaking infants. These infants
received input from one language, yet still made grammatical errors which would be appropriate in other languages. Crain (2006) believed that children initially rely on a universal grammar until the rules of their input language become salient. Based on the findings of the current study and those of Crain (2006), it appears that children adopted from China prior to one year of age are pulling from a universal grammar which allows them to demonstrate skills in English while still figuring out the salient rules of English. The universal grammar appears to provide a foundation with some rules of language from which these adoptees can pull from while developing their new first language. Additionally, Snedeker, Geren and Shafto (2007) found that preschoolers adopted from China acquire vocabulary four times faster than monolingual infants. This suggests that prior exposure to any language accelerates language and vocabulary development in the second language of exposure.

Limitations

This study’s results are restricted by several limitations. First, the project was retrospective, dependent on parents’ recollection regarding the age at which their children achieved language milestones. Prospective analysis of language development would have afforded greater reliability of the findings. Second, parents were asked in the questionnaire to respond to language based milestones. It is not known how much knowledge in the area of language development they brought to bear on the task. Respondents had to identify ages
and levels on the basis of only one or two examples. This narrow frame of reference for each milestone leaves a large margin of error for accurate judgment. A third limitation on the findings of this study is the small sample size. To achieve confidence in the results, a much larger sample size would be necessary. Given the limited number of participants, results must be viewed with caution. It is not possible to know with certainty whether these results truly represent the target population. Suggestions for future research are to investigate language acquisition milestones in children who have been internationally adopted prior to age one from countries outside of China. Additionally, more research is needed regarding the effect of older age adoption in children from China on the acquisition of English.
LIST OF REFERENCES


APPENDICES
20-May-2010

Hannah Bass Harwood
Communication Sci. & Dis., Hewitt Hall
4 Library Way
Durham, NH 03824

IRB #: 4612
Study: Developmental Milestones of Oral Language in Children Adopted from China
Approval Date: 10-Aug-2009

The Institutional Review Board for the Protection of Human Subjects in Research (IRB) has reviewed and approved the protocol for your study as Exempt as described in Title 45, Code of Federal Regulations (CFR), Part 46, Subsection 101(b). Approval is granted to conduct your study as described in your protocol.

Researchers who conduct studies involving human subjects have responsibilities as outlined in the attached document, Responsibilities of Directors of Research Studies Involving Human Subjects. (This document is also available at http://www.unh.edu/osr/compliance/irb.html.) Please read this document carefully before commencing your work involving human subjects.

Upon completion of your study, please complete the enclosed Exempt Study Final Report form and return it to this office along with a report of your findings.

If you have questions or concerns about your study or this approval, please feel free to contact me at 603-862-2003 or Julie.simpson@unh.edu. Please refer to the IRB # above in all correspondence related to this study. The IRB wishes you success with your research.

For the IRB,

[Signature]

Julie F. Simpson
Manager

cc: File
Invitation for Participation (email)

To Whom It May Concern,

My name is Hannah Bass and I am a graduate student at the University of New Hampshire. I am conducting a Master's Thesis on the Developmental Milestones of Oral Language in Children Adopted from China.

I have developed an online questionnaire aimed at determining the average age at which children who have been adopted from China achieve specified language milestones. I would like to invite you to participate in this survey and have included a cover letter with an attached link. This survey does not request information regarding your name and responses will be kept anonymous. The information gathered will be used only to create a timeline for the indicated oral language milestones. If you do agree to participate, you are free to withdraw participation at any time during the survey or leave questions blank.

Thank you for your time,

Hannah Bass
Informed Consent Document

Informed Consent

Purpose: The purpose of this study is to identify a timeline for oral language milestones of children adopted from China.

1. I understand that this study has been approved by The University of New Hampshire Institutional Review Board for the Protection of Human Subjects in Research.
2. I understand that this study involves research.
3. I understand that this study contains approximately 45 questions.
4. I understand that I will be asked questions regarding the language development of my child.
5. I understand that I will be asked background information on my child to identify any factors that may have affected language development.
6. I understand that I will be asked demographic questions.
7. I understand that my responses along with those of the other participants will be averaged to create an oral language acquisition timeline.
8. I understand that others may benefit from this research by early identification of atypical language development in children adopted from China.
9. I understand that I will not be compensated for my participation in this study.
10. I understand that my identity will remain anonymous and only my responses will be seen by the researcher.
11. I understand that I may leave blank any questions I do not feel comfortable answering.
12. I understand that I can exit out of the questionnaire at any time and my answers will be erased.
13. I understand that my participation in this study is voluntary and should I feel that I want to discontinue there will be no penalty.

If you have any questions pertaining to the research you may contact (Hannah Bass, 603-793-6303 or hat2@unh.edu) to discuss them.

If you have any questions about your rights as a research subject you may contact Julie Simpson in the UNH office of Sponsored Research, 603-862-2003 or Julie.simpson@unh.edu to discuss them.

If you agree to participate in this survey please click the link.
http://survey.unh.edu/surveycat/surveys/survey736_Thesis.htm
If you choose not to participate please just ignore this email.
Online Questionnaire Posting

A study to identify a timeline for oral language milestones in children who have been adopted from China

My name is Hannah Bass and I am conducting a master's thesis at the University of New Hampshire. This study has been approved by the university's IRB. I am looking to identify a timeline for oral language milestones in children who have been adopted from China. I have created an online questionnaire of approximately 45 questions surrounding specified milestones. I am looking for participants for this study. If you would be interested in participating, download the informed consent pdf. If would like more information, please contact me at hat2@unh.edu and I will gladly respond. Thank you.
**Request to forward Questionnaire**

Hi [name],

My name is Hannah Bass, I am doing a Master’s Thesis at the University of New Hampshire regarding children who have been adopted from China into the United States. I am hoping to develop a oral language milestone timeline with my data. My study has already been approved through the University’s IRB and participants are kept anonymous. I was hoping it would be possible for you to post by survey or forward it to parents who might be willing to participate. The survey only takes ten or fifteen minutes and any help would be appreciated.

Thank you
Hannah

p.s. I have attached a copy of my informed consent document and the survey.
**Questionnaire**

1. At what age, in months, was your child adopted from China?
2. What is your child's gender?
3. What is your child's date of birth?
4. Was your child in orphanage care prior to adoption?
5. If no, where was your child cared for (i.e. birth home, foster care, etc)?
6. What language was spoken to your child prior to adoption?
7. What language(s) is(are) spoken in your home?
8. Did your child exhibit any health concerns once home (i.e. small head circumference, stunted height, stunted weight, anemia, etc)?
9. If yes, what?
10. Is there a history of ear infections or hearing loss?  
11. If yes, please explain.
12. What percentage of time did/does your child spend in daycare?
13. If at home fulltime, until what age (i.e. until preschool, until kindergarten, until 24 months, etc)?
14. How many other children attended this daycare?
15. How many adults were present?
16. Any siblings present in your home?
17. If yes, are they also adopted?
18. If adopted, at what age(s), in months, and from where?
19. How old are the siblings today?
20. Was your adoptee from China, ever diagnosed as having a speech and language disorder?
21. If yes, what was the diagnosis?
22. Was he or she ever seen by a speech-language pathologist?
23. If yes, for how long (age in months to age in months)?
24. In what geographical region do you live?
25. What is the highest level of education achieved by adopted mother?
26. How confident are you with your answers to the previous questions (please remember that if you are unsure of ANY of the answers they may be left blank)?
27. Did your child experience a silent period
<table>
<thead>
<tr>
<th>Question</th>
<th>Answer</th>
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<tbody>
<tr>
<td>immediately after arrival home (not using any kinds of words or vocalizations)?</td>
<td></td>
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<tr>
<td>28. If yes, for how long (in months or weeks)?</td>
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<td>29. At what age did your child respond to his/her name?</td>
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<td>30. At what age could he or she respond to simple English words (i.e. doggy, kitty, juice, etc)?</td>
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<td>31. At what age could he or she follow simple commands (i.e. come here, let's go, stop that)?</td>
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<td>32. At what age did he or she show recognition of familiar routines (i.e. bedtime, snack time, bath time by following the sequence of commands associated with the specified routine)?</td>
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<td>33. At what age did your child say his or her first words other than Momma and Dadda?</td>
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<td>34. What was it?</td>
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<td>35. At what age did your child have a vocabulary of approximately 50 words?</td>
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<td>36. At what age did he or she refer to self by name?</td>
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<td>37. At what age did your child say his or her first two-word combination (i.e. eat cookie, throw ball, milk gone, mommy go, etc)?</td>
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<tr>
<td>38. At what age did he or she combine more than two words for the first time (i.e. Daddy kick ball, Kitty chase mouse, Car go fast, etc)?</td>
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<tr>
<td>39. At what age did he or she begin a sentence with a question word (i.e. who, when, what)?</td>
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<td>40. At what age was your child able to get their message across through speech with no difficulties (you no longer needed to translate what he or she was trying to say to anyone)?</td>
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<tr>
<td>41. How confident are you with your answers to the previous questions (please remember that if you are unsure of ANY of the answers they may be left blank)?</td>
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