Language Skills of Children Adopted from China: School-age Follow-up

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Short Header: Language Skills of School-Age CAC

ABSTRACT

Children adopted from China (CAC) learn a new language while at the same time lose their birth language, a process which has been described in the literature as "second first language acquisition." In order to investigate how the unique language issues facing CAC affect school achievement, information packets were collected from 70 parents of school-age children adopted from China as infants/toddlers who had participated in an earlier longitudinal study of speech and language development. Parent data from the earlier study were compared with the data from a parent-report measured called the Children's Communication Checklist – 2nd Edition (CCC-2). As a group, CAC's performance on the CCC-2 did not differ significantly from the normative sample, and the majority of children had scores at or above age/grade level. However, approximately 14% of children had CCC-2 profiles suggestive of communication delays/disorders, and 27% had received speech-language services. Performance was significantly negatively correlated with age at adoption (i.e., the younger at adoption, the higher the scores). Furthermore, vocabulary size and utterance length measures at 24 months post-adoption were also significantly correlated with school-age language skills, but similar measures at 12 months post-adoption were not.

INTRODUCTION

Every year many families in North America choose to adopt children internationally, with China being the number one country of choice. From the years 1993 to 2007, 10,593 children in Canada were adopted from mainland China (Adoption Council of Canada, 2007; Family Helper, 2009). In the year 2007, children adopted from China (CAC) consisted of

approximately 40% of the adoptions in Canada (658 out of 1713 adoptions). In the United States, 30,805 children were adopted from China between the years 2004 to 2008 alone (US Department of State, 2009). Up until the year 2007, China was also the number one choice for families in the United State until 2008 in which adoptions from Guatemala surpassed those from China.

Nonetheless, CAC represent the largest group of internationally adopted children, and they have been of great interest to researchers as CAC face a challenging task (Pollock, 2005; Roberts et al., 2005). They learn a new language while at the same time lose their birth language, a process which has been described in the literature as "second first language acquisition" (Pollock, 2005) to differentiate it from other types of bilingual or second language acquisition. Given different preadoption experiences, variable orphanage conditions and resultant physical and developmental delays, researchers have been interested in whether these children experience difficulties learning English, or exhibit specific types of speech or language delays/disorders. However, it has been difficult assessing speech and language in this population as children will have limited proficiency in both the birth and adopted languages, and they cannot be compared to monolingual standards of assessment (Glennen, 2002). Thus, this difficulty in assessment has made it difficult for speech-language pathologists to determine who needs intervention, who needs monitoring, and who is developing normally given the circumstances (Glennen, 2002). Normative data on English language development in CAC have begun to emerge and are necessary to determine whether a child's language skills are within normal limits or significantly delayed relative to his or her peers who are other children adopted from China.

Pollock (2005) completed a longitudinal study examining the early language growth of CAC and collecting preliminary normative data. Information on English language development was collected from 141 children between 9 and 42 months of age who had been in their permanent homes for less than 12 months. Surveys were completed by the parents every 3 months until the child reached either 3 years of age or 600 words produced on the MacArthur Communicative Development Inventories (MCDI). Her results provide a basic sketch of what to expect during the first 2 years post-adoption. In general, the majority of children exhibited rapid vocabulary growth. Children adopted at older ages used more words and produced longer sentences at each 3-month interval post-adoption, but had further to go to "catch up" to norms for non-adopted monolingual English-speaking peers of the same age. These results serve as a base, aiding us in our ability to predict which children are likely to acquire English simply given sufficient exposure, and which may be at risk for longer-term problems and might benefit from speech-language intervention.

The prevalence of language delays in children two or more years post-adoption is estimated to be low. In a study of 55 preschool children adopted from China as infants(Roberts, Pollock, Krakow, Price, Fulmer, & Wang, 2005), only 5.5% scored below normal limits on two or more measures from a battery of standardized speech-language tests. In addition, 27% scored above average on two or more measures, reflecting excellent language skills. They attributed these positive outcomes to robustness of the language system and the enriching environments of the children's adoptive homes.

Several recent and ongoing studies have shifted attention to the language and academic skills of school-age children who were adopted as infants from Eastern Europe (e.g., Glennen &

Bright, 2005) or China (e.g., Urichuk, 2007). The focus of these studies has been on the acquisition of more complex language skills and early literacy. Urichuk obtained parent and teacher report data from 73 children adopted from China, and found that on average the children scored within normal limits for their age and grade. However, a subset of children (13%, or 10 of 73) experienced delays in language or academic skills, suggesting that some CAC have longer-term difficulties. Performance was correlated with retrospective parent report of preschool language difficulties.

It is of great interest to determine the language outcomes of school-aged CAC and how the unique language issues facing CAC will affect school achievement. Children who had adequate English conversational skills during the preschool years may still be at risk for language-learning problems in the elementary school years and beyond as more complex language skills are required. Thus, it is important to follow up on the children who participated in Pollock's earlier longitudinal study (2005) as many of the original participants are now school-aged. School-age measures of language and academic skills can be compared to their early language skills from their toddler and preschool years. This will help us further understand the typical course of language development of CAC as well as the long-term effects of second first language acquisition.

Purpose and Research Questions

The primary purpose of this study is to obtain information on language and academic skills of school aged children who were adopted from China prior to two years of age. Specific research questions to be addressed include:

1. How do children adopted from China as infants perform on measures of language compared to norms available for their grade level?
2. What early language skills (e.g., vocabulary size or utterance length at 12 or 24 months post-adoption) are correlated with measures of school-age language?
3. What other child factors (e.g., age at adoption, health status, time in foster care, whether intervention was received), if any, are correlated with measures of school-age language?

METHOD

Participants

The participants were 70 female CAC who had all previously participated in Pollock's (2005) longitudinal study. They ranged in age from 5;10 to 10;5 at the time of the study (M = 7;2) and their ages at adoption ranged from 6 to 44 months (M = 14 mos). The participants were enrolled from Kindergarten to Grade 4. Table 1 shows the distribution of participants by grade.

[Insert Table 1 about here]

The participants were recruited through e-mails sent to all of the original participants. Those who wished to participate responded and survey packets were subsequently sent to their home addresses. Some were ineligible because of the age of their child (usually not in Kindergarten yet) and others chose not to participate. When contact could not be made through e-mail, letters were sent to their home addresses on file. Families were sent notifications by e-mail when the package was mailed to the participants, as well as when the

packages were returned to the researchers usually several weeks later. Follow-up messages were sent when the survey packets were not returned by two months. In total, 85 survey packets were sent out and 66 were returned. Four of the original participants had participated in Urichuk's (2007) study, so the components of their survey packets were added to the database. In total, there was 1 participant from the United Kingdom, 2 from Canada, and 67 from the United States.

Materials

Following the procedures used by Urichuk (2007), survey packets consisted of a measure called the *Children's Communication Checklist – 2nd Edition* (Bishop, 2003), a standardized teacher rating of indicators of student academic competence called the *Academic Competence Evaluation Scales (ACES) Teacher Form* (DiPerna & Elliott, 2000), a parent questionnaire, and a teacher questionnaire. This project examined only the results collected from the CCC-2 and the parent questionnaire.

Children's Communication Checklist – 2nd Edition (CCC-2). The CCC-2 is a standardized parent checklist that screens for language impairments in children ages 4 to 16. It is designed to "identify children whose scores fall outside the normal range for their age," or in other words to differentiate between children with communication impairment and those with typically developing language (Bishop, 2003). The CCC-2 is not a diagnostic test, but it provides information that helps to identify children who may benefit from a more detailed evaluation. The CCC-2 has been more extensively used in the United Kingdom, but it has been shown to be appropriate for Canadian children (Quiring & Tovillo, 2003), and was used by Glennen and

Bright (2005) in their follow-up study of Eastern European children adopted in North America and by Urichuk (2007) in her study of school-aged CAC.

The CCC-2 divides communicative behavior into 10 scales which can be grouped into different aspects of speech and language. Aspects of language structure, vocabulary and discourse are assessed by the scales *Speech, Syntax, Semantics,* and *Coherence* while pragmatic aspects are assessed by the scales *Inappropriate Initiation, Stereotyped Language, Use of Context, and Nonverbal Communication*. The last two scales, *Social Relations* and *Interests*, assess behaviors usually impaired in children with Autism Spectrum Disorders. The scores from the first 8 subtests are combined to produce a General Communication Composite (GCC) which can be used to identify children who may have clinically significant communication problems (Bishop, 2003). In addition to the GCC, a Social Interaction Deviance Composite (SIDC) score is calculated and used to identify discrepancies between the sums of the scales for vocabulary and structural aspects (*Speech, Syntax, Semantics* and *Coherence*) and the sums of the scales for some of the pragmatic aspects (*Inappropriate Initiation, Nonverbal Communication)* and the scales for *Social Relations*, and *Interests.* The SICD, in combination with the GCC, can be used to identify children with communicative profiles characteristic of children with specific language impairment, autism, and Asperger's syndrome.

Parent Questionnaire. Parents were asked to complete a brief questionnaire regarding their child's current school setting and any support services that they were currently receiving or had received in the past. They also were provided with a summary of the medical and developmental information that had been reported at the time of their participation in the earlier project, and asked to update the information.

Data Analysis

The CCC-2 was scored using the computerized analysis program, the CCC-2 Scoring Summary Program. Raw responses on the CCC-2 checklists were entered into the CCC-2-Scorer. This electronic score sheet generated raw scores, scaled scores, and percentiles, as well as the two composites of GCC and SIDC on a summary sheet for each individual.

RESULTS

CCC-2 Results

The CCC-2 Scoring program completes an internal consistency check to determine if the parent responses are consistent. No forms were excluded as test score analysis showed that all responses to questions were consistent. The distribution of GCC scores for the participants is illustrated in Figure 1. The mean (78.70) and median (78) GCC scores were very similar.

[Insert Figure 1 about here]

Table 2 shows the mean and standard deviation of all subscale scores and the GCC scores for the entire sample. A one sample t-test showed that there was no significant difference between the mean of the GCC scores of the CAC and the norming sample mean of 80; $t(69) = -0.57$, $p = 0.57$. In addition, one sample t-test comparisons between the group mean and the sample mean for the 10 individual subscales indicated no differences on any of the subtests using a corrected probability level of 0.005 (0.05 divided by 10 tests).

[Insert Table 2 about here]

A Closer Examination of Individual Scores

The CCC-2 was designed to identify children with pragmatic language deficits, but can also reportedly be used to screen for general communication disorders. Although the group mean did not differ from the sample mean, 11 out of 70 (or 16%) children had CCC-2 scores indicative of a language delay/disorder. Out of these 11 children, five had profiles indicative of Specific Language Impairment (SLI) with a GCC below 55 and SIDC above 9. Four children had profiles suggestive of an Autistic Spectrum Disorder (ASD) with a GCC below 55 and an SIDC less than 0. One child had a profile suggestive of Asperger's Syndrome with a GCC above 55 and SIDC below -15, and one child's profile did not fit any of the three possible diagnostic categories (GCC = 45 , SICD = 7).

It should also be noted that an additional 5 children had profiles that met the stated criterion for possible Asperger's diagnosis (i.e., GCC >55, SIDC <-15). However, in all five cases, none of them had three or more scale scores below the 10th percentile, which is the criterion used to determine whether a child warrants further investigation or not. In addition, in all 5 cases the GCC scores were near or above average (77-90), with individual scores on vocabulary and structure subscales ranging from 8 to 16, and the other subscale scores were within the acceptable range. The large negative SIDC scores thus resulted from the high structural scores, not because of any deficiencies in the other scores, and thus are not considered clinically significant (D.Bishop, Personal Communication, June 7, 2007).

Correlations between GCC and Early Communication and Child Factors

Pearson Product Moment correlations were used to determine the relationship between the GCC and early communication measures such as vocabulary size and mean length

of three longest utterances (ML3) of both 12 and 24 months post-adoption (PA), as measured by Pollock's longitudinal study, as well as child factors (such as height, weight and age at adoption), whether any time was spent in foster care, and whether speech and language intervention was received. Prior to conducting correlation analyses, the early communication measures (vocabulary size and ML3) were converted into developmental quotient scores by dividing their age equivalent scores by their chronological age and then multiplying by 100 (following Glennen, 2007). For example, a child who was 35 months old but producing words equivalent to a 27 month old would have a DQ of 77.14 (27/35 x 100). Height and weight measurements at the time of adoption were reported by parents during the earlier longitudinal study, and were used as a general index of physical health at the time of adoption. All measures were converted to z-scores using the standardized height and weight calculator available at https://web.emmes.com/study/ped/resources/htwtcalc.htm. Because children entered and exited the earlier longitudinal study at different times, not all children had vocabulary or ML3 measures available at both 12 and 24 months of age. The number of children with scores available ranged from 40 to 58 (out of the 70 total participants). Likewise, not all parents provided height and weight measurements from the time of adoption. In the parent survey, parents reported whether their child was ever in foster care, and this was coded with a binary system, as either yes (1) or no (0). Also, parents reported whether intervention, or speech language therapy, was received before preschool, during preschool, or during school age. Children who received intervention at any point in time were coded as 1, while those who never received intervention were coded as 0. Table 3 shows the correlation of GCC with factors thought to affect language development. Point biserial correlation coefficients were calculated

in the case of dichotomous variables, such as whether the children were in foster care and whether they received any intervention. A detailed correlation matrix illustrating how each factor is correlated with each other is in Appendix J.

Age at adoption was significantly negatively correlated with the GCC scores (meaning that the younger the child was at adoption, the higher the GCC). Furthermore, vocabulary size and utterance length measures at 24 months post-adoption (but not at 12 months post-adoption) were both significantly positively correlated with the GCC. No other factors were significantly correlated with GCC scores.

Once the factors that were significantly correlated with GCC scores were discovered, they were entered into a regression model to see which factors or combination of factors gave the best prediction of GCC scores. Using the enter method, a significant model emerged: $F(3,37) = 5.247$, $p<0.05$. The model explains 29.8% of the variance (Adjusted $R^2 = .242$). Table 4 gives information for the predictor variables entered into the model. ML3 at 24 months was a significant predictor, but the other two variables were not.

DISCUSSION

Performance of CAC Compared to Norms

The participants in this study did not differ statistically as a group from the norming sample on the CCC-2. Overall, 48 of the 70 children (69%) had GCC scores on the CCC-2 that were higher than the expected mean of 80, and 61 out of 70 (87%) had GCC scores above the 10th percentile, the cutoff for suggested clinical concern. Seventeen out of 70 CAC (24%) had a score of 103 or better (90th percentile for the GCC), demonstrating their very high resilience and

remarkable progress with language. Eleven of the children (16%) had scores that were below 55 (the 10th percentile) and/or indicative of a communication disorder. Hence, a slightly higher portion of the CAC seemed likely to have problems compared to their English born peers, given that speech-language disorders are estimated to occur in approximately 5 - 10% of school-age children (CASLPA, 2005). Similar to the findings of Roberts et al. (2005) for preschool CAC, the majority of school-age CAC had language skills that were age appropriate, and a higher than expected number had language skills that were above average for their age. However, the percentage of school-age children with below-average skills (16%) was higher than expected relative to non-adopted peers and higher than the 5.5% of preschool CAC with below-average language skills reported by Roberts et al. (2005). Differences in methodology (parent report vs. direct assessment) between the studies make direct comparisons impossible, but these results do raise the possibility that CAC experience greater difficulty with the more complex language skills expected during the school-age years.

Diagnostic Profiles

As indicated in the results, a higher than expected number of CAC (11 or 16%) were revealed to have atypical profiles due to their GCC and SIDC scores. Five showed a profile of SLI, four showed a profile of ASD, one showed a profile of Asperger's Syndrome, and one's profile did not fit any of these three diagnostic categories. The high proportion of CAC with profiles characteristic of ASD (4/70 or 5.7%) is an unexpected finding as the prevalence of ASD in the North American population is 1 in about 150 (Centers for Disease Control and Prevention, 2007). However, Urichuk (2007) reported very similar findings, pointing to a need for more research in this area. Both Urichuk's sample and the present sample differ from the norming

samples for the CCC-2 in a number of ways. For example, the CAC parents were older and more highly educated, which might influence either their children's language abilities or the way the parents responded to the items on the CCC-2. The above-average scores on vocabulary and structural aspects in combination with more average scores in pragmatic or behavioral aspects represent a profile not yet considered in interpreting the CCC-2, but which may be typical of gifted or precocious children or children whose parents have higher than average levels of education.

Relationship between Performance and Early Communication and Child Factors

The correlational analysis results show that the earlier the CAC were adopted, the higher their GCC scores. Also, performance at 12 months post-adoption was not significantly correlated to longer-term outcomes as performance at this time is still highly variable. However, by two years post-adoption, measures of vocabulary and utterance length were correlated with later performance. The mean length of the three longest utterances at 24 months was the best predictor for later performance. Thus, delays that persist at two years post-adoption are a cause for concern and may warrant direct intervention. No typical profile of delay or disorder for CAC was identified, although some unusual individual profiles were revealed.

Future Directions

This study utilized indirect assessment tools as parents completed checklists in survey packets. In would be beneficial to use direct assessment measures to determine language and academic skills to follow the language development and academic progress of a group of children from adoption through school ages and onto high school. Furthermore, the

disproportionate percentage of CAC (16%) having profiles suggestive of communication delays and disorders needs to be investigated. The results of the CCC-2 further indicated that 5 out of 70 (7%) were likely to have social communication or pragmatic impairments, and could have Asperger's Syndrome or Autism Spectrum Disorder. This unusual finding of pragmatic weakness in the CCC-2 of CAC could have arisen from limitations in the CCC-2 or its norming sample, or could result from actual attachment issues of CAC due to early traumatic experiences. The loss of birth mothers, physical abandonment and multiple caretakers might make it difficult for children to form secure attachments as CAC might suffer from deprivation or neglect. This in turn could lead to social communication or pragmatic language difficulties, impairing how CAC relate and interact with communicative partners. Further research is needed to investigate this area through assessment of the pragmatic language abilities of CAC.

CONCLUSION

The majority of CAC appear to be doing extremely well in the school setting as there are no significant differences showing that as a group CAC are doing less well than their English born peers, and almost a quarter of CAC scored above the 90th percentile. Likely a combination of environmental and personal factors contribute to the remarkable adjustment made by CAC.

The unique contribution of this study was that information about early language skills in the toddler and preschool years could be compared to CAC's current performance on school-age measures of language and academic skills. Age at adoption and vocabulary and utterance length at 24 months post-adoption were significantly correlated with school-age language abilities. These results help us further understand the typical course of language development

of CAC, and provide further information on the long-term effects of second first language acquisition, an area of great concern of many parents, families, and speech-language pathologists.

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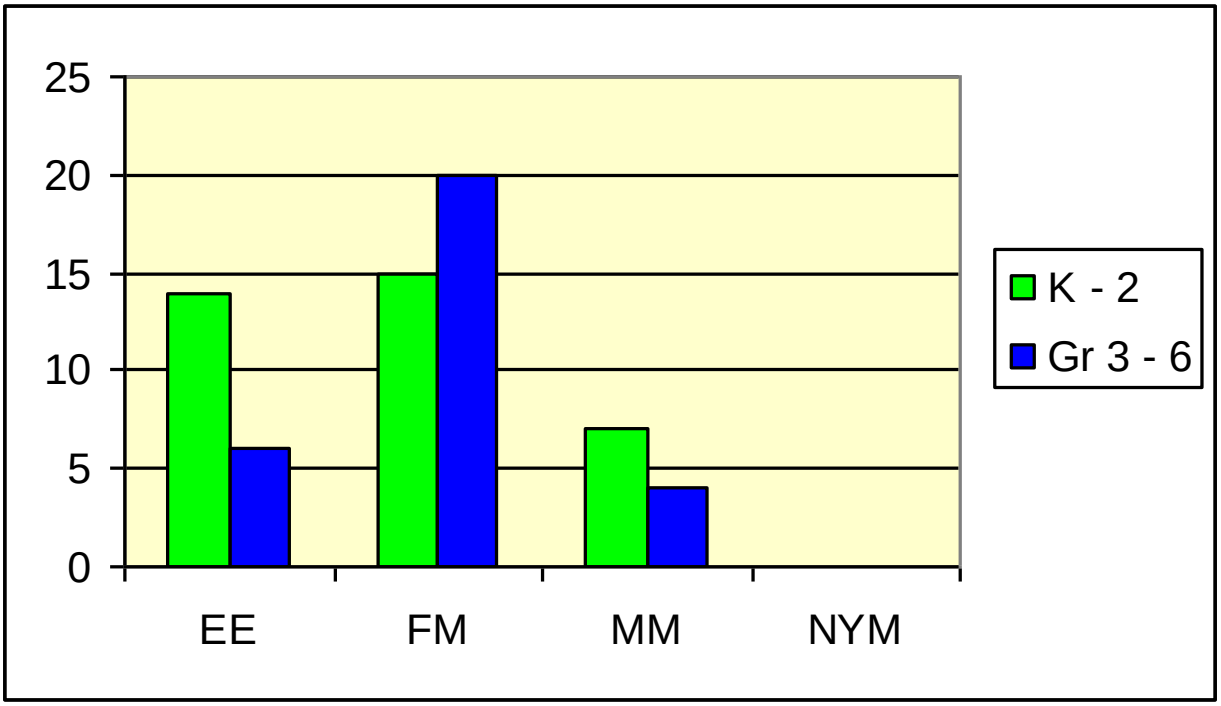
Table 1

Number of participants by Grade level

Grade	Number of participants
Kindergarten	27
Grade 1	20
Grade 2	18
Grade 3	3
Grade 4	2
Total	**70**

Figure 1

Distribution of Scores



Note: N = 70; Mean = 78.70*, SD =19.02

Table 2

Group CCC-2 Composite and Subscale scores

Communication Aspect		
Subscale	Mean	SD
Vocabulary and structure aspects		
Speech	9.10	3.63
Syntax	10.50	2.96
Semantics	9.90	3.44
Coherence	9.97	3.27
Pragmatic aspects		
Inappropriate initiation	9.89	2.95
Stereotyped language	10.43	2.79
Use of context	9.59	3.57
Nonverbal communication	9.33	3.09
Behavioral aspects		
Social relations	9.70	3.59
Interests	9.81	2.6
General Communication Composite (GCC)	78.70	19.02

Note: Normative sample mean is 10.00 for each subscale and 80.00 for the composite GCC.