

Language Skills of CAC & Non-Adopted Peers

Language Skills of Children Adopted from China and Their Non-Adopted Peers

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ABSTRACT

Children adopted from China (CAC) have a unique path of language development, as they are cast abruptly into a new ambient language, typically with limited or no ongoing exposure to their birth language. They often face additional risks of speech and language delays due to a history of institutionalization. Despite these risk factors, previous studies have found that overall, CAC had language skills that were average to high when compared to test norms. One possible explanation for this finding is that the relatively older age and higher education levels of adoptive parents may create a particularly language rich environment that compensates for disruptions in early language learning. While a range of parent ages and education levels are represented in the general population (on which the tests were originally normed), this is not true of the CAC population. Thus, while these results are compelling, their interpretation is limited by the lack of a control group matched for parental age and education.

The present study sought to enrich the findings of previous research by recruiting a control group of non-adopted children that match the age, parental age, and parental education profiles of a subset of CAC who had participated in earlier studies. Parents of 20 new control participants completed the *Children's Communication Checklist – 2* and the parent report form of the *Social Skills Improvement System*, and their results were compared to those of the matched group of CAC.

When matched to their non-adopted peers for parent age and education, the CAC group did not differ from the control group on the General Communication

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Composite of the CCC-2 or any of the subscales for vocabulary and structural aspects of language. Ultimately, CAC performed comparably to other children with highly educated parents on the structural aspects of language. However, group differences were found on subscales of Nonverbal Communication and Social Relations. While no significant group differences were found on the SSiS composite scores for Social Skills or Problem Behaviours, the subscale for Autism Spectrum Disorder approached significance.

Though overall the CAC performed comparably to non-adopted peers with highly educated parents, some exhibited difficulties in social communication and behaviour. Some CAC participants had histories of attachment disorders, which may have resulted from a lack of stimulation and reduced caregiver bonding prior to adoption. The relationship between attachment disorders and social communication and behavior warrants further investigation..

INTRODUCTION

In North America, an increasing number of families are choosing to adopt children internationally. According to Statistics Canada (2010), nearly 21,000 children were internationally adopted (IA) between 1999 and 2009, and China was the primary source country. In 2009, China accounted for approximately 22% of all overseas adoptions to Canada (*STATS Canada*, 2010). In the United States, China is also the most popular source country, accounting for 32% of total international adoptions in 2014 (*Fiscal Year Annual Report on Intercountry Adoption*, 2015). As more and more IA children find homes in North America, the issue of how to best support their success in

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academic, linguistic, and social domains has grown more pressing, particularly as the combination of adverse conditions often facing children adopted from China are usually unknown. Multiple risk factors must be considered throughout early assessment to ensure a maximally supportive post-adoption environment. Variables specifically affecting language acquisition are considered to be age of adoption, length of exposure to English, experiences prior to adoption, and experiences post-adoption (Miller & Hendrie, 2000).

Worldwide, children raised in orphanages or similar institutions are at risk for cognitive, physical, language, and social-emotional delays as early experiences are likely to have been characterized by malnutrition, low (or variable) amounts of stimulation, and decreased interaction with the surrounding environment. (Gunnar, Bruce, & Grotevant, 2000). It is important to not only consider how the pre-adoptive environment may have supported or delayed motor, cognitive, language, and social development (Scott et al., 2008), but to also understand that emotional attachment bonds with caregivers can either positively or negatively influence the quality of early learning experiences. In early months of development, attachment bonds are formed as a child demonstrates a signaling behaviour (e.g. crying, cooing, gazing), which causes the caregiver to respond. These interactions are critical in the development of the child's later regulatory functioning social-emotional development (Greenspan, 2008), and disruptions to this cycle in which a child and caregiver are attuned to each other can affect the child's overall social and emotional development (Wilson, 2009).

Previous studies

Some previous studies have found that the language skills of internationally adopted children tend to be lower than those of control groups matched for parental age, education, and family income. Gauthier and Genesee (2011) found that the expressive language delay identified in 24 IA children aged 50 months persisted in a follow-up assessment conducted 16 months later, and that receptive language skills of IA children were significantly weaker than their non-adopted counterparts. In a follow-up study, Delcenserie, Gauthier and Genesee (2011) investigated the language, cognitive, and socioemotional abilities of 27 children (with an average age of 7) adopted from China by French-speaking parents as compared with non-adopted (control) French children. Controls were matched with respect to age, gender, and socio-economic status. Results indicated no significant differences between the groups with respect to socioemotional and cognitive development. However, the adopted group scored significantly lower than the control group on measures of expressive vocabulary, receptive grammar, word definitions, and sentence recall. Both of these findings are consistent with Glennen's (2007) study of 18-month children adopted from Eastern Europe, where after 2-3 months post-adoption, most participants scored in the low-average to mildly delayed range on the Behavior Sample of the Communication and Symbolic Behavior Scales Developmental Profile (CSBS-DP) (Wetherby & Prizant, 2002).

While there are numerous accounts of the lingering deficits in the development of IA children, there is a contrasting body of work demonstrating the resilience of children who find new homes, parents, and languages early in life. Scott (2009)

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acknowledges that while IA children are at risk due to the likely sensory, linguistic, and emotional deprivation in their early experiences, they typically reach (or come close to reaching) the language development level of their non-adopted peers by 2 years post-adoption. China has been particularly noted for the positive outcomes achieved by its IA children (Gauthier & Genesee, 2011). For example, several studies indicate that children adopted from China rapidly acquire their second first language (Krakow & Roberts, 2003; Pollock, 2005) and suggest that CAC appear to follow the same language acquisition trajectory of monolingual children (e.g., Snedeker, Geren, & Shafto, 2007). Roberts, Pollock, Krakow, Price, Fulmer, and Wang (2005) found that children adopted from China performed within normal limits on a variety of standardized language measures after 2 years post-adoption. Of 55 preschool-aged (3-6 years old) children who had been adopted from China 2 or more years earlier, only 5% scored below average (more than 1.25 SD below the mean) relative to test norms, and 25% scored above average (more than 1.25 SD above the mean). More recently, Clover, Goerz, and Pollock (2014) examined the linguistic, academic, and social level of 36 school-age CAC via standardized tests. Overall, as a group the CAC performed as well as (or better than) expected relative to the test norms, with only 14% falling more than 1.25 SD below the mean. Taken together, results from these studies point to robustness in the language and academic development of children adopted from China.

One possible explanation for the rapid language development seen in these children is the parent profile associated with international adoption; parents who choose to pursue IA are typically older, more educated, and as a result, more financially

solvent than the general parent population (Pollock, 2005). All of these factors combine to create a stable environment where language input is likely to be high-quality. Previous research has supported the connection between parent education and language development. Dolloghan, Campbell, Paradise, Feldman, Janosky, Pitcairn & Kurs-Lasky (1999) studied 240 three-year old children to see how their speech and language skills varied on both informal and informal tests based on their mothers' levels of education: less than high school graduate, high school graduate, and college graduate. Analyses showed a statistically significant upward linear trend as education increased. Based on these results and the characteristics of parents who adopt internationally, it is reasonable to expect that parental factors may be mitigating the potential early deficits and risk factors associated with children adopted internationally.

Current Study

This study established a control group that closely matched a subgroup of children adopted from China who participated in previous longitudinal studies by Pollock and colleagues (Pollock, 2005; Pollock & Yan, 2011; Clover, Goerz, & Pollock, 2014). Pollock (2005) tracked the early linguistic development of 150 girls adopted from China as infants/toddlers, while Pollock and Yan (2011) and Clover, Goerz, and Pollock (2014), examined the academic, social, and language development of some of these same children during the early (K to Grade 3, n = 70) and later (Grades 5 to 9, n = 36) school years. The development of these CAC was determined relative to the normative samples of the assessments used. Such comparisons are appropriate for making decisions about clinical concerns, but do not allow for further exploration of the role of

the parental and home environment of CAC. In the Pollock (2005) study, the average age of parents (or one parent, if a single-parent family) at the time their children were adopted was 41.7 years old. Parental education was also atypical, as the majority of parents had graduate or professional degrees. The present research therefore focused on creating a control group of non-adopted children matched to a subset of CAC on parental age and education in order to determine whether parental factors may be a mitigating factor in the adopted group's long-term academic and social success.

Research Question:

Do CAC obtain similar scores to non-adopted age-matched peers on tests of social and language development when the variables of parental age and education are controlled for?

METHODS

This study was approved by the University of Alberta Research Ethics Board. Participants were largely recruited via online outreach. Potential participants were contacted through social media networks and online support groups targeting older parents and by word of mouth. Flyers were created (see Appendix) and posted on Facebook, and a call for participants was sent out to faculty members across several Canadian universities in an effort to target parents with higher levels of education. Researchers outlined the following inclusion criteria for control group participants:

- Non-adopted female child in K-Grade 9
- English primary language spoken in the home

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- Parent(s) 30-60 years old
- Parent(s) have a graduate (e.g. Master's, PhD) or professional (e.g. nursing, engineering, law, medicine, etc.) degree.

Children with academic or language difficulties were not excluded from participation.

Participants

Control group. Individuals who were interested in participating and believed that they fit the criteria were required to fill out a pre-screen form via Google Documents. This form gathered contact information and automatically entered the parents' age, education, and the child's gender, age, grade, and medical history into an online spreadsheet. Participants who met criteria were contacted via email to inform them that a package would be mailed to the address they had provided on the pre-screen form.

Parents of 43 prospective participants filled out the prescreen form, and 42 were selected to receive packages and take part in the study. One parent filled out the form for a male child and thus did not qualify. Packages were mailed out between April and October of 2014. Of those 42 packages, 21 were mailed back completed to the University of Alberta by January 2015 when analysis began. Twenty control participants were ultimately included in the study: 9 were in Grades K-3, and 11 were in Grades 5-9.

CAC group. Data from the CAC group had already been collected through previous studies, as described above. To form the control group, participants aged 5-9 and 11-13 with older and highly educated parents were recruited, in keeping with the characteristics of the CAC group. Then, adopted children from the previous studies were

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matched with the newly collected controls. Matches for the younger group were drawn from Pollock and Yan (2011) while matches for the older group were taken from Clover, Goerz, and Pollock (2014). Twenty CAC children and their parents were selected based on the best match for participant age, parental age, and parental level of education. Of the total subject pool from the original studies, 9/70 (from the K-3 follow-up) and 11/36 (from the Grades 5-9 follow-up) were included in this sample.

Mean parental age and education were calculated for each group. Levels of education were assigned numerical values of 1-4 (1=high school, 2=some college/university, 3=college/university, 4=graduate/professional). For children with a single parent, only one value for age and education was used. There were three single parents in the CAC group, and none in the control group.

Table 1.2. Mean Child and Parental Age and Parent Education Level in CAC and Non-adopted Control Groups

Group	n	Mean child age (in years)	Mean parent age (in years)	Mean parent education
CAC group	20	10.2	42.5	3.7
Control group	20	9.8	44.4	3.6

Materials - Packages

A cover letter containing information about the forms in the package and specific instructions on how to fill them out was included. A stamped return envelope was also provided in the package to encourage participants to mail their forms back to the university (whether or not they had been completed). The following forms were included in the package: the *Children's Communication Checklist - 2* (CCC-2; Bishop,

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2003), the *Academic Competence Evaluation Scales* (ACES; DiPerna & Elliott, 2000), the *Social Skills Improvement System Rating Scales* (SSiS; Gresham & Elliott, 2008), in addition to parent and teacher questionnaires designed by the researchers. *Table 1.0* summarizes all of the forms included in participant packages.

Table 1.0. Summary of Parent Questionnaire and Standardized Forms

Test	Description	Forms given to:
Parent Questionnaire	Researcher-designed questionnaire aimed at gathering information about parent demographics, family profile, language development, medical history, and behaviour.	All participants
<i>Children's Communication Checklist - 2</i>	Standardized parent questionnaire that rates aspects of communication such as speech, vocabulary, sentence structure, and language skills; screens for verbal and non-verbal language impairments, characteristics of Autism Spectrum Disorder (ASD), and determines whether a child may benefit from further assessment.	All participants
<i>Social Skills Improvement Rating Scales</i>	Standardized scales that evaluate social skills, problem behaviours, and academic competence via a triad of parent, teacher, and student reports. Distinct student forms for age groups 8-12, and 13-18.	Parent and teacher forms for all participants. Student self-report forms for children age 8 and older
<i>Academic Competence Evaluation Scales</i>	Standardized instrument that determines student functioning in the classroom; screens for learning disorders, and prioritizes skills requiring intervention; contains both teacher and student forms.	Teacher forms given to all participants Student self-report forms for children in Grades 6 and higher
Teacher Questionnaire	Researcher-designed questionnaire aimed at gathering information about the child's grade and level of familiarity to the teacher (e.g., how long the teacher has known the child and how many subjects has she/he taught her).	All participants

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Of particular interest for this study were the forms completed by the parents, namely the CCC-2 and the SSiS parent form.

The CCC-2

The *Children's Communication Checklist (CCC-2)* is a standardized parent checklist that screens children for communication and pragmatic language disorders. In particular, it examines areas of speech, syntax, semantics, pragmatics, and other communication behaviours. It also serves to identify children who may benefit from assessment for Autism Spectrum Disorder. There are ten subscales in this checklist, 8 of which contribute to a General Communication Composite (GCC). The GCC can identify communication deficits that are clinically significant.

SSiS Parent Form

The Social Skills Improvement System Rating Scales (SSiS) is a standardized rating scale evaluating two areas: social skills and problem behaviours. Standard scores are reported for these two composite skill areas. Note that there is no academic competence section on the SSiS Parent form. Scores for particular questions of the rating scale are sorted into the sub-areas as shown in *Table 1.1*.

Table 1.1. Summary of SSiS Subscale Components

Composites	Subscales
Social Skills	Communication, cooperation, assertion, responsibility, empathy, engagement, self-control
Problem Behaviours	Externalizing, bullying, hyperactivity/Inattention, internalizing, Autism Spectrum

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Though the subtests of the SSiS Parent form and the CCC-2 are different, both encapsulate communication and social skills. As such, examining both will provide an enriched perspective on differences that may exist between adopted and non-adopted children aged 5-13. This also serves as a measure of concurrent validity and reliability: if deficits in the same or similar areas arise on both tests, it supports parents' accuracy in judging their children's abilities and b) the likelihood that those deficits are robust.

Data and Scoring

The CCC-2 and SSiS forms were scored by two master's students studying speech-language pathology, under the supervision of a certified speech-language pathologist. Raw and standard scores derived from each form in the participant's package were checked twice: once upon initial scoring, and again upon entry into the Statistical Package for the Social Sciences (SPSS). Each score was totaled and entered by a different SLP student (e.g., if student A scored the SSiS parent forms, then student B checked the scores upon entering them).

ANALYSIS

Assessments

Of the 20 control participants included in the study, all parent forms (the parent questionnaire, CCC-2, and SSiS Parent form) were universally completed, while the majority of the student and teacher forms were returned blank or incomplete. Overall, too few of the student and teacher forms were completed to yield meaningful results (fewer than 6 of each form were returned completed). Furthermore, many teachers

noted they did not teach the student or academic subject being addressed. For these reasons, all student and teacher forms were excluded from analysis in the present study. For the purposes of this paper, data were examined from the CCC-2 and SSiS Parent forms, consistent with this study's focus on the parental influences exerted on children's academic and social development.

Initial comparison of the CCC-2 scores of the younger and older groups revealed no statistical differences in any of the subscale or composite measures. As a result, the K-3 and Grade 5-9 groups were combined for analysis in order to increase the sample size and lend more power to results. The SSiS was only used with CAC children in the Grades 5 to 9 follow-up. Therefore comparisons between CAC and control groups on the SSiS could only be made for the older children.

Statistical Testing

Prior to statistical investigation, a Shapiro-Wilk test of normality was conducted on the data within each subscale and composite measure to ensure assumptions were met for parametric testing. No significant outliers were found. Some expected skewness was observed on certain test measures (e.g., *bullying* and *speech*). Scores on subtests measuring quality of speech were universally high, creating a negatively skewed curve. Similarly, scores measuring characteristics of bullying were uniformly low, resulting in a positive skew. Non-normally distributed data were found on 4 subtests: Speech, Syntax, and Semantics (from the CCC-2), and Bullying (from the SSiS). Group comparisons for these subtests were analyzed using the Mann-Whitney U Test, a measure that compares

differences between two independent groups when data present with a positive or negative skew. All other comparisons were analyzed using the Student's t test.

Independent t-tests were used to compare each group's scores on the SSiS Parent form as well as on the CCC-2 form. From these analyses, significance levels and effect sizes (p-values < 0.01 and Cohen's d) were considered to determine whether the CAC group performed significantly differently than the control group on any of the standardized tests' subsections.

RESULTS

Parent Questionnaire

Control Group. All but 3 parents spoke English as a first language. Two parents (same family) reported Chinese as their first language, but they were completely fluent in English. The third parent reported being bilingual in Korean and Chinese from early childhood. All parents reported that their children had age-appropriate or advanced language use. There were no current concerns reported about development or behaviour, but one participant had a history of sleeping concerns, and another had a history of gross motor, fine motor, and social concerns.

CAC Group. All but one parent reported English as their first language; one reported French as their first language and English as a second language. Three children reportedly received speech-language services in preschool, but none were currently receiving services. The CAC group had some early developmental deficits in motor, vision, and hearing development (most of which were remedied with treatment by the

Kindergarten years). Notably, one child had been diagnosed with Tourette's syndrome (TS), one with Attention Deficit Hyperactivity Disorder (ADHD), and a further 4 CAC presented with attachment concerns (e.g., Reactive Attachment Disorder, insecure attachment, Post-Traumatic Stress Disorder).

CCC-2

All 40 participants (20 CAC, 20 Control) completed the CCC-2. Group means are shown in *Table 1.3*. The General Communication Composite (GCC) is a standard score with a mean of 80. A GCC score below 55 indicates a possible clinical concern. One CAC child had a GCC score <55, and no children in the control group had a score <55. Subscale scores are based on a mean of 10. Scores below 5 are a possible cause for concern. Six out of twenty participants in the CAC group had scores of <5 on one or more subscales, whereas only 1 member of the control group scored <5 on one subscale. Notably, one member of the CAC group scored <5 on 7/10 subscales; (this same participant scored <55 on the GCC). These results suggest that parents of the CAC group recognized more signs of concern in their social and language development than the control group.

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Table 1.3. Summary of CCC-2 Results

CCC-2 Composite or Subscale	CAC Group Mean (SD)	Control Group Mean (SD)	p-value	Effect Size	Effect Size Description
GCC	80.80 (20.25)	90.55 (8.88)	0.059	0.773	Medium-large
Speech	10.40 (2.50)	11.00 (1.49)	0.718**	0.063**	Medium**
Syntax	11.10 (2.53)	11.16 (1.95)	0.718**	0.063**	Medium**
Semantics	10.16 (3.66)	12.21 (3.01)	0.072**	0.288**	Small**
Coherence	10.30 (3.51)	11.15 (2.39)	0.376	0.290	Small
Inappropriate Initiation	10.60 (3.50)	11.70 (2.08)	0.236	0.435	Small-medium
Stereotyped behavior	10.10 (3.02)	11.00 (2.10)	0.282	0.376	Small
Use of Context	9.45 (3.75)	10.95 (2.14)	0.131	0.566	Medium
Nonverbal Communication	8.70 (3.15)	11.20 (1.54)	0.004*	1.214	Very large*
Social Relations	8.90 (3.29)	11.35 (1.81)	0.007*	1.073	Very large*
Interests	9.55 (3.02)	9.85 (2.89)	0.750	0.104	Very small

Note: *p<.01 (alpha adjusted for multiple comparisons)

**non-parametric

Independent samples t-tests were used to calculate significant differences between the non-adopted control group and CAC. The alpha level was adjusted to

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reduce the likelihood of error due to multiple comparisons. When comparing the GCC of the non-adopted control group to the CAC, no significant differences were found ($t(20)=-1.972$, $p=0.059$). No significant differences were found in subtests for speech ($U=186.0$, $p=0.718$), syntax ($U=214.0$, $p=0.718$), semantics ($U=133.5$, $p=0.072$), coherence ($t(20)=-0.895$, $p=0.376$), inappropriate initiation ($t(20)=-1.208$, $p=.236$), stereotyped behaviour ($t(20)=-1.093$, $p=0.0.281$), use of context ($t(2)=-1.554$, $p=0.131$), and interests ($t(20)=-0.321$, $p=0.750$). Significant differences were found in nonverbal communication ($t(20)=-3.190$, $p=0.004$) and social relations ($t(20)=-2.915$, $p=0.007$).

SSiS Parent

The 22 participants in Grades 5 to 9 (11 CAC, 11 Control) completed the SSiS-Parent form. Composite scores for Social Skills and Problem Behaviors are standard scores with a mean a 100 and standard deviation of 15. Standard scores of <81 (1.25 SD below the mean) on Social Skills are considered to be below the average range for a child's age. On Problem Behaviors, a score of >118 (1.25 SD above the mean) indicates above average problem behaviours for a child's age, (indicating more problems). One CAC had a social skills composite standard score that was below average; this same participant also had an above average composite problem behavior score. In the control group, no children had scores below the average range. (Note that the Problem Behavior composite works in reverse, such that high scores indicate more concern and low scores indicate less concern). *Table 1.4* shows the mean standard scores for the two composite measures and raw scores for each of the subtests of the SSiS –Parent results for each group.

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Table 1.4. Summary of SSiS Results

SSiS Parent Composite or Subtest	CAC Mean (SD)	Control Mean (SD)	p-value	Effect Size	Effect Size Description
Social Skills Composite	100.55 (14.24)	107.45 (9.29)	0.193	0.452	Small-medium
Communication	17.18 (2.86)	19.18 (1.40)	0.055	0.939	Large
Cooperation	14.45 (2.73)	15.36 (2.62)	0.435	0.340	Small
Assertion	13.91 (3.62)	16.09 (1.22)	0.082	0.902	Large
Responsibility	14.82 (2.40)	14.36 (2.80)	0.687	0.175	Very small
Empathy	13.00 (3.82)	15.55 (1.63)	0.062	0.933	Large
Engagement	13.64 (4.13)	16.09 (2.26)	0.099	0.769	Medium-large
Self-control	14.55 (2.42)	14.27 (3.07)	0.819	0.0993	Very small
Problem Behaviours Composite	100.82 (16.47)	95.18 (8.39)	0.324	0.453	Small-medium
Externalizing	4.00 (3.97)	4.36 (2.98)	0.811	0.105	Very small
Bullying	0.82 (1.83)	0.36 (0.67)	0.898**	0.036**	Very small**
Hyperactivity/inattention	3.91 (3.65)	3.09 (2.34)	0.538	0.273	Small
Internalizing	100.55 (14.24)	107.45 (9.29)	0.329	0.437	Small-medium
Autism Spectrum Disorder	7.55 (5.45)	3.18 (1.78)	0.026	1.208	Very large

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Independent samples t-tests (parametric or non-parametric, depending on normality of distribution) were used to identify significant differences between the non-adopted control group and CAC. Using an adjusted alpha of .01, no significant differences were found in any of the composite measures (Social Skills ($t=1.348$, $p=0.193$), Problem Behaviours ($t=-1.011$, $p=0.324$)) or subtests (Communication ($t(20)=-2.084$, $p=0.013$), Cooperation ($t(20)=-0.797$, $p=0.435$), Assertion ($t(20)=-1.895$, $p=0.082$), Responsibility ($t(20)=-0.409$, $p=.687$), Empathy ($t(20)=2.031$, $p=0.062$), Engagement ($t(20)=-1.730$, $p=0.099$), Self-Control ($t(20)=-0.231$, $p=0.819$), Externalizing ($t(20)=0.243$, $p=0.811$), Bullying ($U=62.50$, $p=0.898$), Hyperactivity ($t(20)=-0.626$, $p=0.538$), Internalizing ($t(20)=-1.001$, $p=0.329$), and Autism Spectrum ($t(20)=-2.526$, $p=.026$)). However, the difference between groups on the Autism Spectrum Disorder subscale approached significance ($p = 0.026$) and the effect size was very large.

Subtest raw scores were used for statistical analyses, but are uninterpretable given the wide age range of the participants. Although scaled or standard scores are not available, raw scores are classified into 3 categories by the SSiS using ranges of scores that differ based on the norms for the child's age: Average (A), Below Average (BA), and Above Average (AA). On subtests of the Social Skills Composite, 3 CAC scored in the BA category for two or more subtests, whereas no members of the control group scored in the BA range on more than one subtest. Three CAC children scored BA on Empathy and Engagement and 4 scored BA on Assertion. On subtests comprising the Problem Behaviours Composite, 3 CAC scored in the AA range on two or more subtests, while no

control group member scored AA on more than one subtest. Four CAC children scored AA on the Internalizing subtest.

DISCUSSION

Based on two standardized parent report tools (the CCC-2 and the SSiS), children in the CAC group and the control group matched for parent age and education were not significantly different on most measures of communication (speech, syntax, semantics, and various other measures listed previously). However, particular areas of communication discussed below were found to be significantly weaker in the CAC compared to their matched non-adopted peers. The following discussion highlights some of these areas and their effect on communication.

Non-verbal Language

The adopted and non-adopted groups scored significantly differently ($p= 0.004$) on the nonverbal language subtest: specifically, the CAC group scored lower than their non-adopted peers. Nonverbal language items on the CCC-2 included statements such as *“does not look at the person he/she is talking to”* and *“ignores conversational overtures from others.”* These results indicate that the types and instances of negative nonverbal communication behaviours were higher among the adopted children. In child language development, nonverbal communication (or pragmatic language) can stem from cues given to infants in their early experiences with language, such as eye contact, joint attention, and body language (Wilson, 2009). These skills provide important foundations for the emergence of language and its development in future years. Varying

conditions prior to adoption may have included isolation, and maternal deprivation. Reduced contact and bonding with caregivers may have also affected their development of nonverbal skills.

Social Relations

The CCC-2 also identified significant differences ($p = 0.007$) in the social relationships of CAC versus their non-adopted peers. The social relations scores included items such as *“with familiar adults, seems inattentive, distant, or preoccupied.”* The mean score for social relationships in the CAC was lower than those of their non-adopted peers. This makes sense in light of the lower scores on nonverbal language: as many social skills rely on accurately transmitted and interpreted nonverbal behaviours (e.g., messages or meanings conveyed through facial expression), a deficit in nonverbal language should also manifest as a deficit in social interactions.

Autism Spectrum Disorder (ASD)

Analyses of the SSIS revealed a higher mean score for ASD for the CAC when compared to controls, although the difference was not statistically significant. Similarly, the CCC-2 identified 3 of the 20 CAC children as having profiles of scores consistent with ASD (i.e. a discrepancy between structural language subscale scores and certain pragmatic and behavioural subscales). Lower scores in social communication and components such as empathy in older school-age children are often associated with ASD. On the other hand, these characteristics may also reflect difficulties with attachment to others. Therefore, the possible confound between behaviours associated with attachment disorders and measures of ASD warrants further investigation.

Attachment Disorders

A review of parent questionnaire responses revealed 4 CAC who were seeing professionals for difficulties with attachment to caregivers. CAC9's parents remarked in the questionnaire that she was diagnosed with Reactive Attachment Disorder at age 4 and had received years of counseling. CAC5's parents described her as having "mild attachment issues". Both of these children had CCC-2 profiles suggestive of ASD. (Note that they were in the younger group, so did not complete the SSiS.) In addition, CAC4, who had been counselled by an attachment specialist, had average CCC-2 scores but scored more than 1.25 SD below average on the SSiS Social Skills composite and more than 1.25 SD above average on the SSiS Problem Behaviours composite. He also scored Above Average on the ASD subscale of the SSiS. Finally, CAC1, whose parents noted on her first assessment (in Kindergarten) that she had post-traumatic stress disorder and had received attachment therapy, scored in the Below Average range for Empathy and Assertion in the follow-up assessment (Grade 6), but her SSiS composite scores and CCC-2 scores were all within normal limits. Importantly, none of the parents reported diagnosis of, or concerns about ASD, suggesting that the CCC-2 and SSiS results indicating possible ASD might actually be measures of social communication and behavior issues related to attachment.

It is therefore possible that ASD and attachment disorders share characteristics to which the SSiS and CCC-2 are sensitive. It should be noted that although ASD scores were higher in the CAC compared to their matched non-adopted peers, this does not mean that they have a probable diagnosis of ASD, nor is it meant to insinuate that there

is a causal or correlational relationship between pre-adoptive experiences and ASD. Rather, it highlights that some characteristics related to the social development of some CAC overlap with some characteristics of ASD. In light of the environmental and caregiver inconsistency often experienced by children raised in orphanages or foster homes, it is more likely that the underlying cause of these ASD-like characteristics is in fact an attachment (or attention) disorder.

These results allow for exploration of the research question posed earlier:

1. Do CAC obtain similar scores to non-adopted age-matched peers on tests of social and language development when the variables of parental age and education are controlled for?

In answer to this question, the CAC obtained similar scores to their non-adopted counterparts on all composite measures of communication, social skills, and problem behaviours. This was true even when variables of parental age and education were controlled. However, 2-3 subtests indicated lower performance in the CAC group. These 3 measures of notable difference relate to social pragmatics more than language structure. The CAC group did not have indications of difficulties syntax or speech, but *did* as a group score lower in skill areas reliant on indirect or implied information. Taking significant and non-significant results together, the findings of the present study partially support the conclusions of both strains of previous research on children adopted internationally: namely, those who discover a generally rapid catch-up with non-adopted peers as measured by norm-referenced tools (Roberts et al., 2005; Scott, 2009; Clover, Goerz, & Pollock, 2014), and those who have identified enduring deficits in

IA children as compared with controls (Delcenserie, Gauthier & Genesee, 2011; Gauthier & Genesee, 2011; Glennen, 2007).

While numerous and larger scale investigations have been conducted on the topic of CAC, this study is among the first to have incorporated a significant age range (5-13 yrs). Though differences in nonverbal language skills, social relations, and ASD characteristics were significant between the CAC and their non-adopted peers from Kindergarten to Grade 9, as a group the CAC did not score outside of the normal range on the standardized measures used. This reinforces the findings of previous studies, which have highlighted rapid language acquisition and a development trajectory similar to monolinguals (Krakow & Roberts, 2003; Pollock, 2005; Snedeker, Geren, & Shafto, 2007). While we cannot conclude that deficits exist in this CAC group, we can see that when parental variables are held constant, social aspects of language emerge as weaker when compared to a non-adopted control group.

CONCLUSION

Based on parent report, the CAC group scored lower on 2-3 measures of social development than a non-adopted control group matched for child age, parental age, and parental education. Earlier Studies by Pollock and Yan (2011) and Clover, Goerz, and Pollock (2014) found that as a group, CAC did not perform significantly differently on a battery of standardized parent questionnaires when compared to the normative standards of those questionnaires. Nonetheless, a number of individual children exhibited weakness in language, academic, and social skills. These previous findings did

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not however take into account the unique characteristics of the CAC group, which includes older parents with higher levels of educations than are accounted for in normative samples. In this study, each CAC participant was matched with a non-adopted peer, and significant differences were found between the two groups. Particularly, CAC received lower ratings for items pertaining to their social development. Social skills were not only rated as low when the children were younger (Grades K-3), but also in older, school-age (Grades 5-9) children.

It should be noted that although some group differences existed between the CAC and the control group, group means for CAC were still well within normal range, and only a few children had scores that could be considered of clinical concern. Only one member of the CAC group scored within the range of clinical concern on composite scores for each of the CCC-2 and SSiS parent. This indicates that although there were few significant differences between the groups, a lag in some aspects of the CAC's performance was found when compared to that of non-adopted children in similar, language rich environments. Overall, the present study supports findings from previous research that the language and academic performance of CAC is comparable to their non-adopted peers, while adding an important nuance: by holding parent age and education levels constant, this study has demonstrated that CAC may score lower on some measures of pragmatic language. This serves to highlight the value of early support for social development in the adopted population.

As China continues to be a primary country of origin for international adoption in North America, understanding the impact of early experiences and their subsequent

impact of emotional and social well-being is a growing concern. The varying conditions these children may have experienced prior to being adopted, (particularly deprivation of an enriching environment, social contact, and bonding with caregivers), can exert lasting effects on their social development in their early and later school years.

Clinically, it is important to be aware of the experiences that these children may have lacked pre-adoption, as they may need more exposure to them in their early years. Precursors for the emergence of language, and social skills, such as joint attention, imitation, play skills, and caregiver bonding may need to be more highly stressed in a child's early years, in order to make up for what they may have missed pre-adoption. That is, CAC may have fallen behind in these areas, and it is important for parents to provide the enriching stimulation needed in order to continue to provide their children with the best tools necessary for healthy communication development. In addition, due to the difficulties with communication the CAC or IA children face early in their development, Speech-Language Pathologists may be the first professionals they encounter who are able to assess their development, and determine if further referral to professionals (e.g. mental health, attachment therapists) who can provide support around the adjustment of the child into their new environment.

LIMITATIONS AND FUTURE RESEARCH

This preliminary study aimed to identify differences between CAC and their non-adopted peers based on parent report measures. In future, recruiting a larger control group to compare with adopted participants from the previous studies would give a

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more definitive picture of how CAC performance may differ, if at all, from their non-adopted peers. As mentioned before, only 9/70 (from the K-3 follow-up) and 11/36 (from the Grades 5-9 follow-up) were included in this study. Recruiting matches for all the CAC participants would allow greater power, as well as provide the opportunity to examine potential differences in the participants' performances when they are elementary school age versus when they reach junior high.

Additionally, further follow-up on how these children are functioning academically would shed light on how their early experiences translate into their academic performance, and whether these ratings remain consistent with parent reports. Student self-reports, via SSIS-S and ACES-S would also provide further information on academic development. Unfortunately, the time of the year in which packages were mailed out, namely, the busy end of the school-year, may have been a barrier to teachers completing the study forms. In the future, we recommend mailing out packages in the middle of the school calendar. It is also important to note that while Pollock and Yan (2011) gathered information on the age of adoption of CAC from orphanages, information was not available about the conditions of those orphanages. Many of the assumptions in this paper have to do with previous research reporting the depriving conditions of institutions. However, we do not have thorough knowledge of the conditions that CAC came from, and to what extent these children may have, or may have not had early experiences lacking stimulation that affected their long-term language outcomes.

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Finally, it is important to note that all measures used in this study were based on parent-reports. It is possible that different parents may provide their ratings differently. For example, adoptive parents are required to complete specific parenting courses prior to bringing their child home. These courses often highlight some of the concerns that are commonly observed in children adopted internationally. As a result, adoptive parents may recognize more signs of concerns from their children than their children are demonstrating, or vice-versa. Therefore, they may provide varied ratings, and results should be interpreted with caution.

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