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**Speech and language development for children adopted internationally
after age 3: two clinical case studies**

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Speech and language development for children adopted internationally

after age 3: two clinical case studies

by

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Dedication

This work is dedicated to the families of children adopted internationally. The commitment you have to bettering the lives of the children you adopt is an incredible sacrifice and gift to the world. I hope this report is a start to answering the many lingering questions you may have about your child's development.

I would like to give special thanks to my wonderful husband, Matt, who endured our first year of marriage alongside this report, and saved me hours of proofreading with minimal complaining.

Finally, to my mother, who inspired me throughout her dissertation writing process that you can get a graduate degree while still being a nice human.

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Abstract

Speech and language development for children adopted internationally

after age 3: two clinical case studies

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Of the available research on speech and language acquisition for children adopted internationally, a disproportionate amount is dedicated to children adopted after the age of three. These case studies examined the speech and language outcomes for two children adopted from Russia at ages 3 and 7. At the time of assessment, the children were 12 and 10, respectively. Both children were administered a full battery of standardized and informal tests. The first participant demonstrated speech and language outcomes that were at age expectations, despite early concerns that she would have long-term delays due to a diagnosis of fetal alcohol syndrome (FAS). Interestingly, her phonological processing was delayed, consistent with previous research. The second participant experienced significant speech and language delays, although her L1 baseline was impaired prior to adoption.

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Chapter 1

Introduction

According to the U.S. Department of State (2013), around 10,000 children are internationally adopted every year. Since 1999, over 250,000 children have been adopted into the U.S., primarily from China and Russia. Children adopted internationally go through a unique type of bilingual experience. They experience a radical shift in environment in which they no longer have input in their home language and this input is replaced with input in a new language. Depending on their age of adoption, their L1 proficiency and use can vary widely due to the conditions in which they live (Krakow et al., 2005). The majority of children adopted internationally come to the US before the age of two, while they are still considered within the sensitive period of language acquisition and have not fully developed a birth language (Roberts et al., 2005). Children adopted internationally undergo what has been described as “second first language acquisition”, characterized by the attrition of birth language and simultaneous acquisition of the new adoptive language (Tan et al., 2011). Many factors can contribute to language learning in this population such as linguistic, environmental, and medical issues prior to adoption (Glennen, 2002).

Children adopted internationally have an increased likelihood of experiencing speech and language difficulties due to socio-emotional factors related to institutionalization combined with the abrupt termination of their L1 input and immediate, likely total, exposure to a new adoptive language (Glennen, 2002). In 2011, the U.S. Department of Education announced amendments to Part C of the Individuals with Disabilities Education Act (IDEA), which ensures that at-risk children receive early intervention as young as possible. Children who are identified early in

life and who receive intervention demonstrate gains in speech and language development (Blackman, 2002). However, internationally adopted children are often unable to receive services during this sensitive period of language acquisition. In addition, many children are born into institutionalized settings, and spend their first years of development in deprived circumstances. Johnson (2000) proposed that institutionalized children experience 1 month of growth delay for every 5 months that they are institutionalized. This proposition indicates a potential correlation between age of adoption and developmental delay, and predicts that the older a child is adopted internationally, the higher the likelihood that they would experience residual deficits in speech and language acquisition of the second first language.

The World Health Organization (WHO; Geneva, 2002) created a structured framework as a means of systematically organizing descriptions of health and health-related states. The *International Classification of Functioning, Disability, and Health* (ICF) established constructs by which human functioning can be classified: body structure and function, activities and participation, and environmental factors (p. 13). Disability involves dysfunction at one or more of these levels. Since this framework was intended for matters of international classification, it can be useful for describing the nature and growth of internationally adopted children. This framework will be used throughout to discuss the level at which children adopted internationally may experience differences or disabilities as a result of their experience.

Most research for children adopted internationally is weighted towards children adopted before two years of age. This is unsurprising, as approximately 75% of the children adopted between 1999-2013 were adopted young (U. S. Dept. of State, 2013). However, the remaining 25% of children adopted at age three or older remains largely unstudied. Scott, Roberts, and

Glennen (2011) conducted a meta-analysis of 22 studies intended to examine all of the literature pertaining to language outcomes in internationally adopted children. Results indicated a trend in language outcomes favoring children adopted before 12 months. Based on the literature reviewed, the authors proposed that internationally adopted children performed comparably to their same age peers at younger ages. However, the studies evaluated found that when children were reassessed during school age years they were less likely to be comparable to their school age peers. The authors reported a “gaping hole” (p. 1166) in our understanding of language development for older children who are adopted internationally.

The following reviews studies of children adopted internationally, selected specifically for relevancy to the topics of long term outcomes, chronological age of adoption, and underlying differences for second first language acquisition. It is organized based on chronological age of adoption.

Children Adopted Before Age Three:

A review of the literature on children adopted internationally indicates a trend heavily favoring children adopted before age three. This is likely due to the high incidence of children adopted in this age range. It has been estimated that more than 75% of the children adopted internationally are adopted before age three (U.S. Dept. of State, 2013). There are many studies of internationally adopted children specifically studying the speech and language acquisition patterns, 7 of which were deemed relevant to this study based on generalizable findings and long term implications. These studies are summarized below (Table 1).

Glennen and Masters (2002) proposed that children adopted internationally undergo a rapid

but predictable acquisition of language within the same trajectory as typically developing, monolingual children (see Table 1). They used adapted versions of multiple existing surveys (Rosetti, 1990; Rescorla, 1989; Fenson et al., 1993; Clauss & Baxter, 1998) mean length utterance, and assessment of grammatical morphemes to assess 130 infants and toddlers adopted from Eastern Europe before 12 months. The children examined reached English language developmental norms within 2 years of adoption; however, children adopted at later ages lagged their acquisition of developmental norms as compared to their younger adopted peers. They also reported that although most of the children were adopted with medical and developmental risk factors, such as fetal alcohol syndrome (FAS) or cleft palate, within 1-2 years of adoption 64% were no longer in any risk factor categories. After follow up surveys, they concluded that 13% (14 out of 106 children) of the sample had long term, significant concerns.

Snedeker et al. (2007) studied 27 preschoolers at three-month intervals up to 18 months. The children were adopted between the ages of 2 years 7 months and 5 years 6 months. Using the MacArthur Bates Communicative Development Inventory-2nd Edition (Fenson et al., 1993) and a spontaneous language sample, the authors examined each child's vocabulary size in relation to length of time in the United States as compared to a monolingual infant control group. Results showed that the children were matched for vocabulary size and type as monolingual peers, meaning that their speech was initially shorter, less grammatically complex, and dominated by use of nouns early on. The study also demonstrated that while the adopted children acquired English on the same trajectory as their monolingual peers, they went through the stages much more rapidly than the infant control group. These results are displayed in Table 1.

Some researchers have claimed that children adopted at older ages have positive outcomes

for language development. Roberts et al.'s 2005 study (Table 1) examined variables linked to second first language outcomes. The study included 55 preschoolers who were 2 years postadoption who were assessed using the Clinical Evaluation of Language Fundamentals-Preschool (CELF-Preschool; Wiig, Secord, & Semel, 1992), Expressive One-Word Picture Vocabulary Test-Revised (EOWPVT-R; Gardner; 1990), Goldman-Fristoe Test of Articulation-Second Edition (GFTA-2; Goldman & Fristoe, 2000), Peabody Picture Vocabulary Test- Third Edition (PPVT-III; Dunn & Dunn, 1997). Results indicated that the overwhelming majority (94.5%) of the sample was within or above age expectations regardless of age of adoption. The authors conclude, "the language system is sufficiently robust to withstand early potential risk factors that might delay its development" (pp. 103). They claimed that although the outcomes were positive, they were unable to identify whether the low scorers on their measures were indicative of true language impairment or were demonstrating lagging model of typical growth. They proposed that further research was warranted to establish the difference between impairment and growth lag.

Tan et al. (2011) found that children adopted older tended to have smaller vocabularies at the time of assessment on the Language Development Survey (Achenbach & Rescorla, 2000). Data was collected on 318 girls adopted from China between the ages of 18-35 months. The authors looked at language outcomes relative to age of adoption, chronological age, length of exposure to English, and developmental risk status. Developmental risk status was assessed by a parent checklist consisting of two areas of concern: "Signs and Symptoms" (observable concerns, such as a rash) and "Developmental Delay" in specific areas of development (such as gross motor and cognitive). The authors found that age of adoption was negatively correlated

with vocabulary and mean length utterance (MLU), but positively correlated with chronological age and length of exposure to English. Between 16-17% of their study population met the criteria for language delays, although between 25-33.3% of the children were receiving speech/language intervention services. This finding confirms a proposal being tested by the author's of over identification of speech-language impairment in the internationally adopted population. It also indicates that the percentage of adopted children with actual speech-language impairment is relatively consistent with the broader population of non-adopted children (See Table 1).

A few studies have attempted to capture the difference between groups of older and younger children adopted internationally. Krakow et al. (2005) examined two groups of six children adopted from the same orphanage in China at one-year post adoption and again when each child was age 2 ½ (See Table 1 below). The measures used to track growth included the MacArthur Bates Communicative Development Inventory- Words and Sentences (Fenson et al., 1993) and the Language Development Survey (Achenbach & Rescorla, 2000). The first group was adopted as infants (7;22-9;5 months), the second as toddlers (24;11-32;6 months). Study results indicated that the toddler group initially had an advantage in rapid second language acquisition, in that they were older and were able to quickly acquire a larger vocabulary, number of irregular forms, and complex grammatical forms. However, when each child was reassessed at age 2 ½, the group adopted as infants significantly outperformed their peers adopted as toddlers. Although the toddlers were considered delayed compared to their same age peers, the authors noted that “most of the adopted toddlers in this study appeared to be either caught up by the time they were here for a year or close to catching up by that time” (pg. 42). This finding indicates that once the children were matched for length of exposure to English and not age of adoption,

they performed similarly. This type of finding furthers the need for examination between the three key variables in this study: age of adoption, chronological age, and length of exposure to English.

Pollack, Price, and Fulmer (2003) followed two toddlers adopted from China for several months up to two years post adoption (displayed in Table 1). One child was adopted at 13 ½ months, the other at 20 months. Each child was given a battery of speech-language assessments that included: the MacArthur Communicative Development Inventory (CDI; Fenson et al., 1993), Clinical Evaluation of Language Fundamentals—Preschool (CELF-P; Wiig, Secord, & Semel, 1992), Peabody Picture Vocabulary Test III (PPVT-III; Dunn & Dunn, 1997), the Expressive One Word Picture Vocabulary Test—Revised (EOWPVT-R; Gardner, 1990), the Goldman Fristoe Test of Articulation—2 (GTFA-2; Goldman & Fristoe, 2000), and a spontaneous language sample. The authors found that at two years postadoption, the child adopted at a younger chronological age performed higher across all measures, although the younger child scored within normal limits on all measures except expressive vocabulary. They propose possible factors contributing to differences were age at time of adoption, quality and quantity of prelinguistic vocalizations, and general cognitive abilities (pp. 184).

Eigsti et al. (2011) suggested that there may be underlying neural differences that occur due to the impact of chronic stress early in a child's life (Table 1). The authors examined the relationship between language skills and core cognitive processes related to length of institutionalization. They evaluated 46 children adopted internationally between the ages of 2-84 months. They administered the Disturbance of Attachment Inventory (Smyke, LoScertales, & Guaza, 2002), the Clinical Evaluation of Language Fundamentals (CELF; Wiig, Secord, and

Semel, 1992) and the California Verbal Learning Test- Children's Version (CVLT; Delis, Kramer, Kaplan, & Over, 1994). Children adopted internationally showed differences in language skills as a function of length of time in the US compared to their non-adopted peers. The authors speculated there were neural circulatory alterations due to chronic stress and experience of non-contingent, un-individualized caregiving, although they did not gather direct data on neural structure or function. Rather, they indirectly tested data of behavioral correlates of language. These changes may have long-term consequences that emerge in later developmental periods as children increasingly use their newer language for academic activities.

Based on the findings of the following studies, there is great variability among the young adoptee population. Most authors conclude that children adopted internationally should receive support services immediately following adoption to encourage a seamless transition into their adoptive culture. In addition, however, many authors concluded that internationally adopted children acquired English at a developmentally similar trajectory as their non-adopted peers, and that only about one third of the researched population had long term developmental delays, also consistent with the general population of children their chronological age range.

Table 1.

Summary of findings: Children Adopted Before Age 3, Assessed Before Age 3

Authors	Participants	Age of Adoption	Age of Assessment	Assessments Used	Findings
Glennen & Masters (2002)	130 infants	<12 months		Rosetti, MLU, grammatical morphemes	Developed language on similar trajectory to peers
Snedeker et al. (2007)	27 preschoolers	2;7-5;6	3 mo intervals	MCDI-2, Sample, Vocabulary	English developed in same patterns as monolingual peers
Roberts et al. (2005)	55 preschoolers		2 yrs post adoption		95% of sample at or above age level
Tan et al. (2011)	318 toddlers	18-35 mos		LDS	1/3 of sample had delays
Krakov et al. (2005)	6 infants 6 toddlers	<36 months	1 yr post adoption, 2 1/2 yrs CA	MCDI- Words and Sentences	Early testing, toddlers had advantage. At 2.5 years CA, infants had advantage
Pollack, Price, Fulmer (2003)	2 toddlers	13.5 mos, 20 mos	3 mos-2 years post adoption	MCDI, CELF-P, PPVT-III, EOWPVT-R, GFTA-2, Sample	2 years post, the children adopted younger had advantage, although all performed within age expectations
Eigsti et al. (2011)	46 children	2-84 months		DAI, CELF, CVLT	Indirect results showed potential alterations in neural circuitry

Children Adopted Before Age 3, Assessed After Age 3

Recently, some research has shifted to focus on the performance of preschool or school age children adopted internationally at earlier chronological age to consider longer term outcomes (see Table 2 below).

Gauthier & Genesee (2011) studied a study of 24 children from China who were adopted between the ages of 7-24 months and tested between 19-46 months post adoption. They proposed that internationally adopted children demonstrate verbal memory and phonological memory differences. The children were assessed using a variety of tests: an adapted Developmental Questionnaire, a French adaptation of the Preschool Language Scale- Third Edition (PLS-III; Zimmerman, Steiner, & Pond, 1992), a French adaptation of the Expressive One-Word Picture Vocabulary Test- Third Edition (EOWPVT; Brownell, 2000), the Echelle de vocabulaire en images Peabody (EVIP; Dunn, Theriault-Whalen, & Dunn, 1993), and Brief IQ Screener of the Leiter International Performance Scale- Revised (Roid & Miller, 1997) and the Vineland Social-Emotional Early Childhood Scales (SEEC; Sparrow, Balla, & Cicchetti, 1998). The children were tested 15.6 months apart, and had an average of 4 years exposure to French by the second assessment. Mean length of exposure before first words in their second language was 2.9 months, although there was considerable variance ranging from a few days to 12 months. The authors found that on the initial assessment, children adopted internationally at younger chronological ages scored significantly lower than control peers on tests of expressive language skills, but there was no significant difference with respect to receptive language, intellectual ability, or socio-emotional adjustment (Table 2). However, in the follow up assessment, participants demonstrated increasingly significant lags in both expressive and

receptive language. There was a significant negative correlation between the age of children who produced their first words in the second language and language outcomes, and the authors conclude that children who produce their first words relatively soon after adoption are more likely to make better progress later, at least within the first 3-5 years, than children who produce their first words relatively late.

Jacobs, Miller, and Tirella (2009) assessed 37 internationally adopted children adopted between the ages of 8-16 months at current ages of 4-5 years to examine the relationship between pre-adoptive risk and protective factors to outcomes. These were measured using the Mullen Scales of Early Learning (Mullen, 1995), the Preschool Language Scales-4 (PLS-4; Zimmerman, Steiner, & Pond, 2002), the Connors' Parent Rating Scale (Connors, 1997), the Behavior Rating Inventory of Executive Function-Preschool Version (BRIEF-P; Gioia, Epsy, Isquith, 2002), Short Sensory Profile (Dunn, 1992), and a parent interview. The children were assessed at arrival (mean age 6.8-20.2 months) and follow up (51-57 months). During the initial assessment, 51% of the sample was considered "very below average", while expressive language scores varied from "average" to "very below average". However, at follow up, the mean scores were 1 standard deviation greater than the typical US population, with scores in the 73rd percentile for the total language score (see Table 2). However, there were significant concerns about other domains of development, including attention, executive function, and sensory processing. Although other studies have shown similar patterns of rapid language acquisition, no other authors have reported such positive outcomes for the entire sample of children assessed.

Loman et al. (2009) studied three groups of children from various regions: children

adopted at 8 months or younger (n = 109), children adopted at 12 months or older (n = 91), and a control group of children (n = 69) raised in their biological homes setting. The authors aimed to look at broader areas of development including growth, cognition, and language outcomes five to eleven years after adoption. To assess language growth, children were assessed using the Comprehensive Assessment of Spoken Language (CASL; Carrow-Woolfolk, 1999), and subtests of the Clinical Evaluation of Language Fundamentals, Fourth Edition (CELF-4; Semel, Wiig, & Secord, 2003). Cognition was assessed using the Wechsler Intelligence Scale for Children-Third Edition (WISC-III; Wechsler, 1998). Results showed that children adopted internationally scored lower than the control group on both assessments, and that there were no differences across regions of origin. However, there were differences associated with duration of institutionalization (Table 2).

Scott et al. (2013) found that children adopted internationally were more likely to be at risk for language impairment when assessed at school age. Their study included 45 children adopted from China between the ages of 6-25 months. At time of the assessment, the children were between the chronological ages of 6;8 and 9;3. Using two subtests from the CELF-4 (Semel, Wiig, & Secord, 2003), the Comprehensive Test of Phonological Processing (CTOPP; Wagner et al., 1999), the Passage Comprehension subtest of the Woodcock Diagnostic Reading Battery (WDRB; Woodcock, 1997). Results showed that the majority of children scored at or above average ranges for their chronological age in the area of phonological processing (see Table 2). Reading scores were moderately to highly correlated with phonological processing. This finding indicated that age of adoption may be correlated with some, but not all, language outcomes. However, children participants were all adopted at younger chronological ages. The

authors note that spoken language measure were found to be correlated with age at adoption, and children who had been adopted at less than 6 months if age had more positive outcomes than children who had been adopted after 24 months of age.

Hough and Kaczmarek (2011) assessed 44 children adopted from Russia between the ages of 7-81 months. The children were between the ages of 5;10- 11;8 at the time of assessment. The authors aimed to examine the specific types of language difficulties, reading difficulties, and what factors are associated with these difficulties. They used a full battery of speech and language assessments including the Leiter International Performance Scale-Revised (Roid & Miller, 1997), the Test of Language Development- Third Edition (TOLD-P:3; Newcomer & Hammill, 1997), the Pragmatic Judgment subtest of the Comprehensive Assessment of Spoken Language (CASL; Carrow-Woolfolk, 1999), the Children's Communication Checklist (CCC; Bishop, 1998), the Woodcock Reading Mastery Tests-Revise (WRMT-R; Woodcock, 1998), and language samples. Results showed that 15 of the 44 children (33.2%) scored at or below 1.25 standard deviations for the overall spoken language composite on the TOLD-P:3. Between 29-36% of the sample scored consistently below average on all of the remaining domains. Results of the correlations for various factors showed that only "reception of speech therapy services at the time of the study" correlated with the language tests (Table 2). However, age of adoption and time in institution correlated negatively for reading, whereas time in the United States correlated positively. The authors observe that comprehensive guidelines have been developed for use with newly adopted children between 11-24 months; however, no such guidelines exist for children adopted at ages greater than 24 months. They propose regular screenings during the initial 2-year transition period, and

provide detailed recommendations for therapy with this population.

These studies provide insight into long-term outcomes for children adopted at chronologically young ages and assessed at a later age. Unlike the previous section, authors observed more difference between children adopted internationally and their non-adopted peers. While some studies were consistent with previous findings showing 1/3 of the population having difficulties (Hough & Kaczmarek, 2011), others proposed a correlation between length of institutionalization and speech and language outcomes (Loman et al., 2009; Gauthier & Genesee, 2011; Jacobs, Miller, & Tirella, 2009; Scott et al., 2013).

Table 2.

Summary of findings: Children Adopted Before Age 3, Assessed After Age 3

Authors	Participants	Age of Adoption	Age of Assessment	Assessments Used	Findings
Gauthier & Genesee (2011)	24 children	7-24 months	19-46 months post adoption	Questionnaire, French PLS-III, EOWPVT-III, PPVT, Leiter International Performance Scale, Vineland	Initial testing favored older, but in follow up, increase in lags for language
Jacobs, Miller, & Tirella (2009)	37 children	8-16 months	4-5 years	PLS-4, Connors, BRIEF-P, Mullen	51% below average at initial, 100% were above average at follow up
Loman et al. (2009)	269 children	8-12+ months	8-11 years old	CASL, CELF-4, WISC-III	Differences in performance correlating with length of institutionalization
Scott et al. (2013)	45 children	6-25 months	6;8-9;3	CELF-4, WDRB, CTOPP	Reading scores correlated with phonological processing; better language for children adopted <6 mos
Hough & Kaczmarek (2011)	44 children	7-81 months	5;10-11;8	TOLD-P:3, Leiter, CASL, CCC, WRMT-R, samples	Between 29-36% of the sample had low standard scores across all domains

Children Adopted After Age 3, Assessed After Age 3

The observational research on children adopted at older chronological ages and assessed at older ages is limited to three studies (see Table 3). Within these three studies, 68 children are included but only eight were adopted before age 3. Two are longitudinal studies of children adopted at various ages.

Glennen (2009) focused specifically on children adopted at older ages in order to provide useful guidelines for treatment. Their study included fifteen children adopted from Russia and Kazakhstan. Seven of the children were adopted after age 2, and 8 children were adopted between ages 3-4. The study excluded children with previously known etiological diagnoses, including cleft palate or hearing loss. The children were first seen at 3-4 months post adoption, followed by two more assessments in 6-month intervals following the initial evaluation. The author assessed vocabulary and language using the MacArthur Communication Development Inventory (MCDI; Fenson et al., 1993), the Peabody Picture Vocabulary Test-IV (PPVT-IV; Dunn & Dunn, 2007), the Preschool Language Scale-IV (PLS-IV; Zimmerman, Steiner, & Evatt-Pond, 2002), the Clinical Evaluation of Language Fundamentals-Preschool 2 (CELF-P2; Wiig, Secord, & Semel, 2004), the Goldman Fristoe Test of Articulation-2 (GFTA-2; Goldman & Fristoe, 2000), and language samples analyzed using the *Systematic Analysis of Language Transcripts* (SALT; Miller & Chapman, 1999). Results showed that at the three-month mark, 80% of children adopted between ages 3-4 had acquired more than 100 English words, with an average of 175 words. The older adoptees far outpaced their younger counterparts, who had an average of 59 words at three months. As for vocabulary comprehension, only two of the fifteen had PPVT-IV standard scores below 85 within 14 months of adoption. However, when

looking at receptive and expressive language scores, the children adopted at age 2 reached age expectations before the children adopted between ages 3-4. At fourteen months postadoption, only 2 of 15 (13%) of children had receptive language standard scores below 85 on the PLS-IV, although 6 of 15 (40%) of children had expressive language standard scores below 85 on the CELF-P2 (see Table 3). Further examination of the language samples showed that “children adopted at older ages show evidence that remnants of their birth language may impact learning their new adopted language” (pp. 60).

Greenfield (2011) looked at the English language development of a preschool child adopted at age 3 year 7 months assessed at age 4 years 11 months. Using the Peabody Picture Vocabulary Test- 3rd Edition (PPVT-III; Dunn & Dunn, 1997), three language samples, caregiver interviews, and a storytelling experience, the author aimed to evaluate vocabulary development. She proposed there is a unique criterion for the profile of a “second first language” learner, and this child fit the description. Unique aspects of the child’s speech-language errors included articulation errors consistent with phonemes often found in her first language (Mandarin), incorrect word order, omission of “to be” verb, and misuse of articles. Her strengths related to chronological age expectations included MLU, one-word receptive vocabulary, and pragmatic language abilities (Table 3). The author added recommendations for supporting children during second first language acquisition, and included acknowledging the child’s unique rate of development, sensitivity to the language or the larger environment, and encouraging the use child’s heritage language.

In a longitudinal study of 52 children adopted between the ages of 12 months to 4 years, 11 months, Glennen (2014) measured the correlation between age of adoption and early and later

speech and language outcomes. The assessment procedures varied based on age of adoption, based on each child's current level of speech and language development. Children ages 3 years-5 years, 11 months were administered the CELF-P2 (Semel, Wiig, & Secord, 2004) and the Goldman-Fristoe Test of Articulation- 2nd Edition (GFTA-2; Goldman & Fristoe, 2000). For children ages 6 years and older, they were administered the CELF-4 (Semel, Wiig, & Secord, 2003), the GFTA-2, and a language sample from a spontaneous narrative for the book *Frog Goes to Dinner* (Mayer, 1974). Results for these two chronologically older categories were similar to one another, but varied significantly from the younger children. For children adopted after age 3, scores on receptive and expressive language tests at 2.5 months post adoption were considered very low as compared to younger children. However, when the children were reassessed at age 3 years, 4 months postadoption, all standard scores for expressive and receptive tests were right at or above 100, with the range decreasing from youngest to oldest adoptees (see Table 3). Interestingly, when each group of children were divided by subcategory to determine what percent were above or below average scores, only two children had delays in 2 or more areas: one adopted in the 12-17 month range, and one adopted in the 3 years-3 years, 11 months range. This finding would indicate that although the children's performance was below the younger adoptees, only one child in the older adoptee category experienced long term, significant delays. Age of adoption also did not show any significant impact on articulation or MLU. Glennen concluded that "it is not clear how, nor when, children adopted at older ages move through the transition period and reach age-level competence in their new language" (pp. 187). She also proposed that children adopted at older chronological ages may have increased cognitive capacity and prior experiences with language that may negate differences in language growth,

giving them an advantage in second first language acquisition.

Review of the literature for children adopted at older ages shows great variability among this population. Some children were observed to catch up to their same chronological age peers, while others lagged behind in specific areas such as phonological processing. Greenfield (2011) proposed that there is a unique profile specifically for “second first language learners”, although there is a great need for further investigation of this assertion.

Table 3.

Summary of findings: Children Adopted After Age 3, Assessed After Age 3

Authors	Participants	Age of Adoption	Age of Assessment	Assessments Used	Findings
Glennen (2009)	15 children	2-4 years	3, 9, 14 months post	CELF-P2, PLS-IV, GFTA-2, MCDI, SALT	Older children had advantage for vocabulary, younger children advantage for language
Greenfield (2011)	1 child	3;7	4;11	PPVT-III, Samples, Interviews, Narrative	Unique profile for "second first language" learner
Glennen (2014)	52 children	12 mos-4 years, 11 mos	5x across 3 years	Varied based on age	Older children eventually caught up, but were significantly behind in first months

Study Goals and Rationale:

There remains a need for further research as to why some studies demonstrate an increased

likelihood of speech and language impairments in children adopted at older ages, while others claim that the number of children with actual impairments is actually more likely consistent with the general population. There is no conclusive evidence to indicate whether or not children adopted at older ages are at a higher likelihood of experiencing speech or language delay or disorder. However, there is enough evidence to support the use of traditional developmental norms to help guide clinicians in assessment and treatment of this population.

Chapter 2

Methods

This clinical case study aims to further develop a speech and language acquisition profile in children adopted internationally at older chronological ages. It will discuss the most prevalently used standardized measures used for children within the framework provided by the World Health Organization. These measures will be used to describe a full speech-language assessment for two children. Finally, the results of these assessments will be discussed with recommendations for each child as well as potential implications that should be tested in the older adoptee population at large. These case studies will also enable a look at individual differences, a topic not addressed in the present literature where group data is most often presented.

Participant Characteristics

Two children adopted from Russia participated. They were recruited as personal acquaintances of the researcher. They were adopted into the same home in the United States, which includes an additional seven Russian adoptees and three biological children. Participant 1 is currently 12 years old, and was adopted at age 3;5 along with her two biological siblings. Participant 2 is 10 years old, and was adopted at age 7 as a trio of non-biological siblings. Very little information was obtained about the biological parents of either child, although some key details about the health of both birth mothers was provided. Both children resided in orphanages in Russia prior to adoption, and received full medical evaluations upon their adoptions.

Data Collection and Analyses

The participants were given a full battery of speech and language assessments. Each assessment

was given in the children's home. Assessment took place over one 3-hour session with each participant. Breaks were incorporated as needed.

Both participants were assessed using formal and informal measures in the three areas noted by the WHO framework (discussed below). Formal measures are standardized tests, where there is a formal administration and scoring processes, and test data gathered is normed on a population of children consistent with the general U.S. population. These measures provide a standard score, which indicates how the participant performed on the test compared to a typically developing child of her same chronological age and gender, as well as percentile scores and age equivalents. Standard scores for children who are adopted internationally should be interpreted with caution due to the discrepancy between their chronological age and their amount of exposure to the English language as well as cultural experiences with testing. For example, in this case study, the participants are 10 and 12 years old chronologically, however their exposure to English is 3 ½ years and 8 years, respectively. The standardized measures are unable to account for these differences. As a result, informal measures were included as well.

Informal measures include tests that are nonstandardized, and involve clinical observations by the clinician. These include speech and language samples, which are written and analyzed from an informal conversation, or a case history questionnaire, which is informally provided by the parents. Information yielded from these measures will not provide standard scores to compare with other children of the same chronological age and gender, but does help complete a broader profile for the each participant's current level of proficiency.

Standardized measures are often divided into subtests, and performance on each is measured with a raw score. For most standardized measures, this number indicates the total

number of test responses where the examinee scored correctly. Raw scores are converted to other scores that correspond to the average scores of the normative sample. These scores are referred to as standard, composite, or scaled scores. Most tests report a standard score that ranges from around 40-160. For these measures, the average score is 100, and the examinee's performance is assessed relative to a score of 100. Each standardized measure describes its scoring process at length, and typically provides a percentile and age equivalent for each subtest. The percentile rank will demonstrate how the examinee performed out of a sample of one hundred children of his or her chronological age. The age equivalent describes at what age the examinees performance is typically achieved.

World Health Organization Framework

Assessment methods were selected based on frequency of use in relevant literature, reliability, norm-referenced scoring, and age range. Although standardized measures are helpful in comparing participants to same age to their monolingual peers, it is important to consider that the standardized tests were not intended to be sensitive to special populations that may undergo vastly different patterns of language acquisition, such as international adoptees. The evaluation was organized based on the WHO (2002) framework previously discussed. It included informal and formal measures for each of the three categories of disability as follows:

Body Function and Structure:

Body functions are described as physiological functions of body systems, while body structures are anatomical parts of the body such as organs, limbs and their components. Impairments are problems in body function or structure such as a significant deviation or loss. This construct was

measured through an oral motor exam.

Oral Motor Exam

The oral motor exam consists of various exercises targeted at measuring how the structures of the mouth and face are coordinating on command. It involves movement of the lips, tongue, and jaw structures, observation of the palatal structures, and diadochokinetic (DDK) rates of speech, measured by repetition of the sounds “puh”, “tuh”, “kuh”, and “puh-tuh-kuh” over the span of three seconds. Norms are provided for each age group (Cohen, Waters, Hewlett, 1998).

Activities and Participation:

The WHO (2002) defines activity as the execution of a task or action by an individual.

Participation is involvement in life situations. Restrictions in either of these areas would consist of problems an individual may experience in involvement in life situations or executing a task or action within their life context. To measure activities and participation, formal and informal measures were used to assess language and speech skills. The formal language measure used was the Clinical Evaluation of Language Fundamentals- Fourth Edition (CELF-4; Semel, Wiig, & Secord, 2003), and formal speech measures used were the Comprehensive Test of Phonological Processing (CTOPP; Wagner et al., 1999) and the Goldman Fristoe Test of Articulation- Second Edition (GFTA-2; Goldman & Fristoe, 2000). The informal measures included a spontaneous speech and language sample to understand both children’s use of speech and language in a functional daily setting.

Language Measures

Standardized Measure:

1. Receptive and Expressive Language: The Clinical Evaluation of Language Fundamentals-Fourth Edition (CELF-4; Semel, Wiig, & Secord, 2003) was administered with both participants. Six subscales on this normed test are used to determine receptive and expressive language composite scores. Expressive language is a measure of the communication output produced by an individual, and receptive language reflects an individual's ability to understand oral, written, and non-verbal language. This measure is included because it assesses whether language is a hindrance to message comprehension and expression. It refers more specifically to how communication is processed and produced, rather than how it is physically articulated.

Informal Measure:

Language Sample

A 67 utterance spontaneous language sample was collected during a play-based conversation with each participant using age appropriate materials. This measure was deemed appropriate to measure 'activities and participation' because it provides information regarding how the participant interacts with unfamiliar people in her home environment. The spontaneous-language samples were analyzed using the *Systematic Analysis of Language Transcription* (SALT; Miller & Chapman, 1999) to analyze language variables such as mean length utterance (MLU), type token ratio (TTR), as well as disfluencies such as filled pauses and mazes (defined below).

To provide a quantitative assessment of how well the child expresses herself and interacts with others related to aspects of language structure and function, the following analyses were implemented using the spontaneous language sample data:

Mean length utterance (MLU): MLU is a measure of utterance length relative to expectation for

the child's chronological age. It is analyzed by counting number of morphemes per utterance in a conversational sample. Morphemes are defined as the smallest grammatical units, where each part represents a word or part of a word that cannot be omitted or reduced. To determine MLU, the number of utterances in the sample is divided by the total number of morphemes per utterance. For example, in the two sentences "My dog is running. Her name is Sally," the MLU is 4.5. The first sentence contains 5 morphemes (4 words, 1 -ing), and the second sentence contains 4. The mean of these two is 4.5

Type Token Ratio (TTR): TTR is a measure of lexical diversity. It is calculated by looking at the total number of words produced in a conversational sample, and dividing that number by the number of different words produced by the child. A high TTR indicates a high level of lexical diversity, whereas a low TTR is considered indicative of a restricted vocabulary. For example, a TTR of .50 indicates that 50% of words in a given sample were repeated, while 50% of words in the sample were only used once.

Mazes: Mazes are a series of words, initial parts of words, or unattached fragments, which do not contribute meaning to the ongoing flow of language (Loban, 1976). Mazes can include filled pauses ("um, uh I saw it"), repetitions ("The girl, the girl went over there"), or revisions ("The girl, I mean, the lady left"). Loban (1976) stated that average words per maze and maze words as a percentage of total words yields a measure of the subject's linguistic uncertainty, characterized by how familiar an individual is with a language.

Filled pauses: Filled pauses are non-stuttering like disfluencies present in all conversations. They include interjections such as "ah, eh, er, hm, uh, and um". Similar to mazes, the number of filled pauses can be an indicator of the child's unfamiliarity with a language, and is often used to

fill pauses between utterances while word choices are being processed (Thordardottir & Weismer, 2001).

Speech Measures

Standardized Measures:

1. Articulation

To assess speech sound development, the *Goldman Fristoe Test of Articulation-Second Edition* (GFTA-2; Goldman & Fristoe, 2000) was administered. This normed test is used widely to assess speech sound production at the single word level. The test may be adapted to account for variances in response. For example, if the examiner cannot elicit the targeted word, it may be provided as an immediate model for the child to repeat. It is scored using data from initial, medial, and final positioning of specific English consonant sounds.

2. Phonological Processing

Phonological processes are predictable pronunciation errors that children make as they are acquiring language. These phonological processes have been categorized and can be a predictor of subtle language differences in the area of speech production. The Comprehensive Test of Phonological Processing (CTOPP; Wagner et al., 1999) assesses phonological processing skills using six subtests: Elision, Blending Words, Sound Matching, Phoneme Isolation, Blending Nonwords, and Segmenting Nonwords. These six tests yield three composite scores: Phonological Awareness, Phonological Memory, and Rapid Naming. This measure was included to further examine Scott et al.'s (2013) findings that children adopted internationally show differences in Phonological Processing skills, and that scores are correlated with reading

comprehension.

Informal Measure:

Speech Sample

Speech output relates to the use of the speech sounds in English for producing words and utterances. Speech variables were analyzed using the spontaneous speech and language sample with the analyses described below:

Percent consonant correct (PCC): PCC is measured by the number of consonants correct in a sample divided by the number of consonants targeted (Shriberg, Austin, Lewis, & McSweeney, 1997). For example, if a child says, “dis” instead of “this”, their PCC is 50%, because they correctly articulated 1/2 consonants in the word. Children are expected to be 98% accurate in PCC by age 9-11.

Percent vowel correct (PVC): Similar to PCC, PVC is measured by the number of vowels correct divided by the number of vowels targeted (Shriberg, Austin, Lewis, & McSweeney, 1997).

Distortions are minor differences in production, and are considered correct when calculating PCC and PVC scores (Velleman, 2009). The number of vowels and consonants produced accurately relative to word targets are correlated with assessments of severity of speech delay or disorder relative to chronological age expectations.

Consonant, vowel and syllable shape inventory: The consonant, vowel, and syllable inventory is measured by recording the frequency and type of words produced within the sample. It is measured by coding each word in a sample as “C” for consonants and “V” for vowels. Informal developmental norms have been compiled for the approximate expected age children should

produce different syllable shapes (Velleman, 2003). For example, the word “go” is a CV word, while “paint” is a CVCC. Children 48 months and older are expected to produce complex syllable shapes such as CCVCC (“thank”) and CCCVC (“throw”).

Consonant, vowel and syllable shape accuracy: Similar to above, consonant, vowel, and syllable shape accuracy is measured by examining the inventory of the speech sample, and comparing it to the intended frequency and types of words attempted in the sample. The difference is considered the accuracy of how each individual word was produced. Accuracy is expected to increase with age, as children will consistently develop new sounds to increase the accuracy of their speech.

Environmental Factors:

Environmental Factors make up the physical, social and attitudinal environment in which people live and conduct their lives. WHO (2002) describes these as mostly external factors that are not within the person’s control, such as family, work, law, or cultural beliefs. Though these factors may not be directly related to a health condition itself, they may have an impact on a person’s ability to function in daily activities.

Formal Measure:

Vineland Adaptive Behavior Scales- Second Edition

To formally measure environmental factors, both participants’ parents completed the Vineland Adaptive Behavior Scales-Second Edition (Vineland-II; Sparrow et al. 2005). The Vineland-II is a norm-referenced questionnaire that assesses the social-adaptive abilities of an individual, with items investigating issues such as the child’s ability to cope with environmental changes, learn

new everyday skills, and demonstrate chronological age appropriate levels of independence. It is used to measure how well children are adjusting and participating in life situations relative to chronological age expectations.

Informal Measures:

Case History

An informal survey was created based on an adaptation of the University of Texas Speech and Hearing Center (UTSHC) Case History survey (See **Appendix**). This case history consists of comprehensive background information regarding an individual's educational, social, and medical and language status. The period of interest in this adaptation was prior to and immediately following each child's adoption.

Summary

This clinical case study is intended to provide an in depth look at the level of functioning of children who are adopted internationally at older ages when they are in later stages of development, relative to the structure for evaluating potential disability created by the WHO's ICF (2002) framework. This type of information is not evaluated in depth related to individual child profiles the present research literature. Although information from this case study cannot be generalized to the population at large, it can contribute to establishing a template for future research in this population. Additionally, the outcomes of this study are a collation of information important to clinical practice with international adoptees.

Chapter 3

Results

Participant 1: H.R.

Case History

History and Developmental Background

H.R. was born on 4/21/02 and was 12 years, 8 months at the time of this assessment. Her adoptive parents first met her at the age of 26 months in the orphanage. They reported H.R. was “very docile” in their initial interactions and was observed to have a very low birth weight. They reported that this orphanage, unlike others they had visited, was very unwelcoming and they were not allowed to see any other children or rooms other than the one H.R. was in. She was adopted from Russia to America at age 37 months. She and her two biological sisters were adopted to a family with eight other Russian adoptees and three biological children, residing in the rural Midwest.

Medical History

H.R. was born 4 weeks prematurely at a birth weight of 4lbs. At 37 months, she weighed 19 lbs and was very delayed in muscle development. The only information provided on her biological parents was that her mother consumed alcohol while H.R. was in utero, and therefore H.R. was likely to show symptoms of Fetal Alcohol Syndrome (FAS). Upon H.R.’s arrival in the U.S., her primary physician reported concerns with her skull being flat and the potential prognosis for FAS. However, after undergoing thorough evaluations she demonstrated excellent attention, appropriate responses to questions, and increase in muscle development, which resulted in her

physician stating that FAS might only mildly affect her moving forward.

Speech and Language Development

At 37 months, H.R.'s parents reported her as having 10-20 single words in Russian, although they were poorly articulated. Within three weeks of her adoption, she understood simple 1-2 word commands in English (“sit”, “stand”, “lay down”, “get diaper”). Her expressive language developed in a ‘first language loss’ manner due to significant reduction in L1 productive use and input (Anderson, 1999). By 6 months post adoption, she did not speak any Russian, and she had developed around 15 expressive words in English. She began putting 2-3 word utterances together around 12 months postadoption, and her parents reported she was saying 3-4 word sentences by age 5;4. Presently, she has an excellent vocabulary, no difficulties in conversation, and has mild articulation errors with /r/ and /tʃ/.

Behavioral, Social, and Educational Background

H.R.'s parents reported no difficulty with her behavior and attachment relationships at the time of adoption. Currently, H.R. is very social and outgoing with her siblings, peers, and adults at church. Her parents reported concerns that occasionally they fear she is overly naïve and friendly with people she does not know well, and that they will continue to monitor her development of appropriate relationships in the future.

Socially H.R.'s parents report that she tends to connect with children that are chronologically younger, likely due to her small stature and social development. They also observed that H.R. is very good at initiating conversation and play with her peers, although occasionally she does not pick up on social cues for separation.

H.R. is homeschooled using an adapted curriculum. Her mother, who serves as her primary teacher, reported a drastic change in her schooling in the past year. H.R. demonstrated difficulty picking up on the basics of reading, and she showed a strong preference toward auditory learning. Recently she has begun reading chapter books and currently completes school at age appropriate, or just below, levels. Her mother reported that H.R. has some difficulties with math and quantitative concepts, but overall is an excellent student who enjoys learning.

Oral Motor Exam:

H.R. was administered an informal oral motor exam to observe the structure and function of her muscles and articulators. During this task, she was asked to demonstrate adequate tongue strength, coordinating various movements, and measure DDK rates. This is measured by recording the amount of time in which a certain number of syllables are produced in a certain word, in this case “buttercup” was used in addition to repetition of the monosyllable [pa], [ta], [ka], and the polysyllabic sequences [pataka] (Kent, Kent, & Rosenbek, 1987). On this task, H.R. produced the sequences within expected limits for children her chronological age with an average of 3.7 syllables per second for the monosyllabic sequences and 1.7 syllables per second for the polysyllabic sequence (Fletcher, 1972).

Language Measures

Standardized Measure:

Receptive and Expressive Language: CELF-4. H.R. performed at or above age expectations for all subtests given on the CELF-4. Her Core Language score demonstrated that she showed

strengths for her chronological age in *Concepts* and *Following Directions, Formulated Sentences*, and *Understanding Spoken Paragraphs*. H.R. was able to begin at her chronological age, and she completed all of these three subtests scoring in the 75th, 91st, and 84th percentiles, respectively. Subtests that were more challenging were *Recalling Sentences*, *Word Classes*, and *Word Definitions*. This pattern of responses to the areas of the CELF-4 highlights her ability to receptively understand spoken language and express herself in open-ended responses (such as formulating a sentence with a given word), while also demonstrates that closed, specific tasks are more challenging (such as describing the relationship between two words).

Informal Measure:

Language Sample

A 67-utterance language sample was collected during a conversation with materials familiar to the child. The language sample was later coded for MLU, TTR, filled pauses (FP) and mazes using the *Systematic Analysis of Language Transcription*. Analysis of her language transcription shows that she is at or above age expectations for her MLU, as her average throughout the sample was 7.71. However, her TTR of 0.39 was considered low for her age by less than one standard deviation from the expected mean for her chronological age. As mentioned above, a low TTR may indicate a restricted vocabulary, although TTR is often skewed during play based samples due to the concentrated amount of discussion based on the toy of focus. For example, during the conversation she was reading a book and said the name of the main character 13 times in 67 utterances. The clinician observed no difficulties in H.R.'s vocabulary or word choice selection. H.R. produced mazes, abandoned utterances, and filled pauses one time each throughout the sample, which was considered very low for her age, indicating verbal fluency as a

strength of hers.

Table 4: Language Measures for Participant 1

Language Measures	Percentile	Age Equivalent	Description
Formal: CELF-4			
Core Language	55th	12;11	Average
Receptive	47th	10;8	Average
Expressive	53rd	12;7	Average
Informal:			
Language Sample			
MLU	7.71		Above Average
TTR	0.39		Average
Mazes	1/67		Below Average*
Abandoned Utterances	1/67		Below Average*
Filled Pauses	1/67		Below Average*

*Low numbers in these measures indicate more fluent speech, whereas higher numbers indicate more disfluent speech. A score of “Below Average” is desired for these measures.

Comparing H.R.’s performance on formal and informal language measures indicates that her receptive and expressive language development is at chronological age expectations. Her scores on the CELF-4 demonstrated that she is proficient in both her understanding and production of complex language, and the data collected from her language sample shows that she is capable of using language fluently in conversation, as observed by her low use of mazes, abandoned utterances, and filled pauses. These findings show that H.R. readily understands and expresses language skills in a proficient manner.

Speech Measures:

Standardized measures:

GFTA: H.R. made no errors during the administration of the GFTA. She had slight distortions of

the /r/ sound unaccounted for by the GFTA scoring system, although these errors did not affect her intelligibility.

CTOPP: H.R.'s scores on the CTOPP demonstrate Phonological Processing as an area of relative weakness. On the C-TOPP, six subtests are administered to yield scores in three areas: Phonological Awareness, Memory, and Naming. H.R. was able to complete portions of all six subtests, which included Elision, Blending Words, Memory for Digits, Rapid Digit Naming, Nonword Repetition, and Rapid Letter Naming.

Her scores in Elision and Blending determine Phonological Awareness, and she performed below chronological age expectations in this area. The tasks on both of these subtests require her to retain auditory information, then retrieve and manipulate it in some way. For example, on the Elision subtest she is asked to repeat a word (tan), then instructed to “say tan without saying /t/”, to which she should respond “an”. She was able to complete three CVC to CV words (tan → an, mike → my, and time → tie), however she did not complete any CVCCC to CVCC (powder → power). When Blending words, she is asked to listen to two sounds, then produce the word that results in combining the two sounds, such as hearing “i-t” and responding “it”. She completed all CV items, but was unable to continue to CVC words (such as m-oo-n, “moon”). Her standard score of 76 put her in the 5th percentile for Phonological Awareness.

Her Phonological Memory score is a combination of her scores in Memory for Digits and Nonword Repetition, both of which require her to listen and repeat what she hears. She was able to correctly repeat up to a 5 digit number for the first subtest, and correctly repeated seven nonwords on the second. For these two subtests she scored a standard score of 79, which placed her in the 8th percentile. Her standard scores

H.R. did very well with Rapid Digit and Letter Naming, and received a standard score of 106, placing her in the 65th percentile for these subtests. These subtests require that she look at a page of digits or letters and say them verbally as quickly as she can. Her scores in these areas may indicate a slight trend favoring her visual input system over auditory, since the subtests that were most challenging for her required complete auditory input.

Informal Measure:

Speech Sample

Using the same 50-utterance play sample from above, H.R.'s speech was coded for PCC, PVC, and syllable shape inventory and accuracy (see Table 5 and 6). This analysis demonstrated that H.R.'s speech in conversation is grammatical, easily understood, and high in both accuracy and inventory of word shapes. Her PCC and PVC were both 100%, indicating that she made no errors in articulation during the sample. Slight distortions of /r/ were heard, but not at a level that affect her intelligibility.

Table 6 shows that H.R. uses a variety of word shapes with high accuracy. During the sample, she used 26 combinations of 1, 2, and 3 syllable words. Although she 1 and 2 syllable words accounted for the majority of the sample (97% of words), her use of 3 syllable words was 100% accurate, indicating that she is capable of using sounds accurately in more complex word forms.

Table 5: Speech Measures for Participant 1

Speech Measures	Percentile	Age Equivalent	Description
Formal:			
CTOPP			
Phonological Awareness	5th	7;4	Below Average
Phonological Memory	8th	7;3	Below Average
Rapid Naming	65th	9;6	Average
GFTA-2	>29th	7;8*	Above Average
Informal:			
Speech Sample			
PCC			100% accuracy
PVC			100% accuracy

*Normative data only provided up to age 7 years, 8 months for this test.

Table 6: Word Shape Inventory and Accuracy for Participant 1

Word Shape	Inventory	Accuracy
1 Syllable	353/440=80%	352/353=100%
2 Syllable	72/440= 16.4%	72/72=100%
3 Syllable	16/440= 3.2%	16/16=100%

Analysis of H.R.'s speech measures indicates strengths in the areas of articulation, consonant and vowel accuracy, and inventory/accuracy of word shapes. H.R. is performing at or above age expectations in these areas. Her one area of weakness was Phonological Awareness and Memory, as evidenced by her scores on the CTOPP (Wagner, Torgensen, & Rashotte, 1999). She demonstrated a decreased ability to perceive differences and manipulate word shapes when presented with auditory stimuli relative to age expectations.

Standardized Measure:

Vineland Adaptive Behavior Scales- II

The Vineland parent questionnaire was administered to determine how well H.R. is adapting to her environment in the areas of communication, daily living skills, socialization, and maladaptive behavior (see Table 7). H.R.'s parent's report on these issues indicated that she is adjusting very well in all areas. She is able to communicate her wants in needs in everyday situations, understands directions, transitions from one setting to another, cares for herself and others appropriately, is responsible for her chores at home, initiates interaction with her peers, and understands abstract concepts such as time and money management. She is slightly below age expectations in *Written Communication* and *Coping Skills* based on the Vineland results, likely due to her delayed acquisition of literacy and habitual behaviors such as rocking. H.R.'s parents reported no challenging behaviors observed at home.

Table 7: Vineland-II Scores for Participant 1

Vineland-II	Age Equivalent	Description
<i>Communication:</i>		
Receptive	18;0	Moderately High
Expressive	12;3	Adequate
Written	10;10	Moderately Low
<i>Daily Living Skills:</i>		
Personal	12;6	Adequate
Domestic	22;0	High
Community	15;6	Moderately High
<i>Socialization</i>		
Interpersonal Relationships	12;9	Adequate
Play and Leisure Time	9;6	Moderately Low
Coping Skills	22;0	High

Summary:

H.R.'s original prognosis at adoption was that she would experience significant global delay in all areas as a result of FAS. Her current level of functioning indicates that she performs at or above age expectations for all formal and informal measures in all domains, with the exception of phonological processing. Her language scores demonstrate that she understands and expresses herself appropriately, while her speech measures showed that her ability to articulate and produce speech is very good. Her speech is completely intelligible. HR's gross and fine motor development has been unremarkable. Overall, she has adapted to her environment both socially and educationally.

Participant 2: E.R.

Case History

History and Developmental Background

E.R. was born on 4/28/04 in Russia. She was placed in an orphanage before the age of one when her biological mother was institutionalized. Her adoptive parents reported that she lived in two different orphanages, but the one she lived in starting at age 4 ½ was one of the best orphanages in Russia, and the ratio of children to caregivers was approximately 1:8. Her adoptive parents first met her at age 5 ½, and she was adopted from Russia to America at age 6 ½. She was adopted along with two other unrelated children to a family with eight other Russian adoptees and three biological children.

Medical History

E.R.'s adoptive parents reported some inconsistencies in the information they received about her health at birth. They were told there were no medical issues at present or birth, but that E.R. had been placed in an orphanage for children with intellectual disabilities. They were also told she had global developmental delays, but the nature and magnitude of the delays were not reported. E.R.'s biological mother was institutionalized for schizophrenia. Upon adoption her adoptive parents were told she had a 10% chance of developing schizophrenia by age 20. Her parents report no concerns with her psychological health at present.

Speech and Language Development

E.R.'s adoptive parents were told via translator that she was placed into an orphanage for

children who were “mentally retarded”, and that she had been diagnosed with “global developmental delays and a speech impediment”. However, it is important to note that Russian orphanages receive more funding if the children there are considered delayed, so the majority of children are labeled as such without any proper assessment. Despite the informal diagnosis, the children receive no specialized services, and the parents reported “It was unclear which children were more or less severe, since we were told every child was special needs”.

When E.R.’s adoptive parents first met her at age 5 ½, they observed that other children and caregivers in the orphanage had difficulty understanding E.R.’s speech. When she was formally adopted a year later, her Russian speech and language skills had not progressed. Her siblings reported that E.R.’s speech was not simply underdeveloped Russian, but that it was characteristically different and they had difficulty understanding her speech even as native Russian speakers. Her parents reported that for the first 2-3 months, she would use two phrases, both of which were 3 word utterances in Russian: “I want to go back to the children’s home”, and “I need to use the toilet”, and that her English understanding and speaking capacities developed remarkably slower than her siblings, who were also adopted at that time.

In the twelve months following her adoption, E.R. did not produce any English words. Her parents reported that she would use 1-word utterances in Russian to communicate, although the words were often unintelligible. Her parents reported that the past year she has started to combine 2-3 word utterances, but she often tries to say longer utterances that are unintelligible. They also reported that E.R. did not experience the same type of subtractive bilingualism that her adoptive siblings did. All eight of her other adoptive siblings experienced a loss of Russian as they acquired English. Since E.R. did not have fully developed Russian to begin with, her

parents reported that she lost some of her Russian and began mixing it with English words, but it presented like an early sequential bilingualism, where a potential language impairment leads to a loss of L1 when there is a reduction of input and use, and a difficulty of L2 acquisition because of the variation in the language-learning system (Kohnert, Windsor, & Ebert, 2009). According to her parents, she often shuts down if someone is unable to understand her, and she will resort to “Never mind” in lieu of repeating herself. She has also begun to recognize and ask questions regarding time concepts, such as “When is _____ coming over”.

Behavioral, Social, and Educational Background

E.R.’s parents noted that, unlike any of her other siblings, E.R. demonstrated violent behaviors in response to her parents for approximately three years. They reported that she had difficulty with adjusting to authority from her oldest siblings and parents, and it was unclear initially whether it was a difficulty in receptive language and understanding the new permanence of her adoptive situation. However, they have not seen any violent behaviors in the past 2 ½ years, and report that she has adjusted to her surroundings very well and has grown into having secure and appropriate attachments and relationships with her siblings and parents. They reported that occasionally she will exhibit anxious behaviors related to uncertain events, such as if her parents are leaving town and she is uncertain when they may return.

Socially E.R. has been observed by her parents to be very isolated by friends at their church. They reported that she is starting to become aware that she cannot communicate as effectively with her friends as she would like, and that others are shying away from her. They reported that she is very imaginative and playful, but she often resorts to playing with much younger children because of the reduced demands on her conversational skills.

E.R. is currently homeschooled using an adapted curriculum. Presently, her mother reported that she is engaged and active in her schooling, but she is completing work at a Preschool-Kindergarten level. She is able to count and is developing some use of sight words, however she has observed difficulties with letter identification and confusion between developing English and remnant Russian phonemes.

Oral Motor Exam

E.R. was administered an informal oral motor exam to observe the structure and function of her muscles and articulators. During this task, she was asked to demonstrate adequate tongue strength, coordinating various movements, and measure DDK rates. DDK rates are measured by recording the amount of time in which a certain number of syllables are produced in a given word. In this case “buttercup” was used in addition to repetition of the monosyllable [pa], [ta], [ka], and the polysyllabic sequences [pataka] (Kent, Kent, & Rosenbek, 1987). On the DDK task, E.R. produced the sequences within expected limits for children her chronological age with an average of 4.5 syllables per second for the monosyllabic sequences, although her production of the polysyllabic sequence was slightly delayed at 2.3 syllables per second (Fletcher, 1972). She was also observed to have decreased range of motion in her tongue protrusion.

Language Measures

Standardized Measure:

Expressive and Receptive Language: CELF-4: Due to her chronological age, E.R. was initially tested using the “9-21” Record Form 2. After she was unable to complete the demonstration items for the 9-12 age group for the first subtest (*Concepts and Following*

Directions), the examiner used the 5-8 criteria as a starting point for the remainder of the testing. E.R. completed portions of the following subtests from the CELF-4: *Concepts and Following Directions*, *Recalling Sentences*, *Formulated Sentences*, *Word Classes Receptive and Expressive*, *Word Definitions*, and *Understanding Spoken Paragraphs*.

E.R. demonstrated some difficulties in understanding the directions for each subtest. For example, the *Word Classes* subtest requires that the child listen to four words, then pick two that are associated, and verbalize why they are associated. During this task, E.R. was unable to retain the list long enough to recall which two were associated, and would say a word not listed. For this subtest, she was unable to complete the demo questions for the age 9-21 record form. However, when the four words were presented visually, as in the age 5-8 record form, she completed this task with a raw score of 11 for receptive and 6 for expressive, which is indicative of a performance for a child aged 4 years, 8 months. This subtest was her greatest strength, followed by *Understanding Spoken Paragraphs* and *Recalling Sentences*.

Understanding Spoken Paragraphs consisted of reading a short paragraph once and answering five questions following for three separate paragraphs increasing in difficulty. On this task, E.R. was assessed using the ages 9-10 paragraphs, and correctly answering 2/5 questions on the first paragraph before receiving no correct answers on the second paragraphs. While her performance indicates a low score for her chronological age, it highlights her strengths in receptive understanding of auditory input, which is also consistent with her performance on the *Recalling Sentences* subtest. This subtest required her to listen to a sentence and immediately repeat it. On this test, she was able to retain sentences up to six words in length before demonstrating difficulties in immediate recall.

The most challenging subtests were those that required E.R. to verbally produce specific responses following stimuli. For example, she completed thirteen items on *Formulated Sentences*, which requires her to produce a sentence given one word. However, because the scoring criteria have specific guidelines as to acceptable responses, her sentences were often ungrammatical and lead to her receiving scores of zero on all but two items. Similarly, *Word Definitions* required her to define words, and the list of acceptable responses is provided. It was evident that E.R. comprehended some of the concepts she was asked to define, but did not have the expressive output to further describe her responses. For example, she responded “hot dog” to mustard, but was unable to produce the desired description, such as “a yellow sauce that you put on hot dogs or pretzels”.

E.R. had a ‘Core Language’ standard score of 40, which puts her in the <.1 percentile for her age. Her age equivalents for the Core Language subtests were all 4;0, indicating that her performance was consistent with a child whose chronological age is 4 years. E.R.’s performance on the CELF-4 indicated that she performed better on the items intended for children ages 5-8. If she were reassessed using only this criteria, she may have more success, and therefore more confidence, in her performance. Although E.R.’s chronological age is 10 year, 8 months, her length of exposure to English is only 3 years. This makes her performance on standardized measures difficult to assess, because the normative sample provided for her chronological age does not encompass the intricacies involved in second first language acquisition.

Informal Measure:

Language Sample

A 67-utterance language sample was collected during a natural play interaction. The

language sample was later coded for MLU, MTL, TTR, filled pauses (FP) and mazes using the *Systematic Analysis of Language Transcription*. Analysis of the language sample showed that E.R.'s MLU was 4.29, which was one standard deviation below the mean. This was consistent with her expressive output measures seen in the CELF-4, which demonstrated her performance consistent with a child of 4½ years old. During the sample, she had 11 mazes and 15 abandoned utterances, which is significant because it demonstrates the lack of fluency of her expressive language. Her mazes often consisted of repetitions of words she had previously said (“and we go and we go to the store”). Her abandoned utterances often appeared to be due to a lack of appropriate word choice available for her initial thoughts. For example, E.R. would start a sentence, pause to find a word, then abandon the utterance if it did not come immediately. During the sample, E.R. also demonstrated difficulties with topic maintenance and thought organization. She would change subjects with no logical flow, and interrupt one thought for another.

Table 8: Language Measures for Participant 2

Language Measures	Percentile	Age Equivalent	Description
Formal: CELF-4			
Core Language	0.1	4;0	Below Average
Receptive	0.1	4;0	Below Average
Expressive	0.1	4;0	Below Average
Informal:			
Language Sample			
MLU	4.29		Below Average
TTR	0.46		Average
Mazes	14/67		Above Average*
Abandoned Utterances	15/67		Above Average*
Filled Pauses	16/67		Above Average*

*Low numbers in these measures indicate more fluent speech, whereas higher numbers indicate

more disfluent speech. A score of “Below Average” is desired for these.

E.R.’s performance on these measures indicate that her current receptive and expressive language skills are consistent with her length of exposure to English (4 years), but severely delayed for her chronological age of 10;8. Her current strengths include receptive vocabulary and understanding spoken language. Areas of challenge related to her level of language functioning include following complex directions, expressive vocabulary, and executive functioning skills such as thought organization and topic maintenance.

Speech Measures:

Standardized Measures

GFTA: The Goldman-Fristoe Test of Articulation is a single word articulation test, intended to measure how words are produced in isolation. E.R. achieved a raw score of 35 and standard score of <40, placing her in the <1 percentile with an chronological age equivalent of 2;5. She correctly produced the following sounds across all word positions: /p/, /n/, /k/, /d/, /l/, /v/, /s/. She did not produce the following sounds in any position: /w/, /j/, /z/, and /t-sh/. E.R.’s speech in conversation will be further discussed below.

CTOPP: E.R. was unable to complete any items from the first two subtests, demonstrating difficulties with *Elision* and *Blending Words*. She recalled three two-digit combinations from *Memory for Digits* and repeated one non-word from *Nonword Repetition*. Her rapid naming skills were stronger for numbers than letters, although both were significantly delayed for her chronological age. Her rapid naming for letters demonstrated some confusion and blending of Cyrillic and Roman letters. For example, she read the the Roman letter “C” as the Cyrillic “S”

four times in 2 minutes. E.R.'s scores placed her in the <1 percentile for all subtests except for Nonword Repetition, which placed her in the 2nd percentile. The CTOPP is not normed on children younger than 5 years, so her age equivalent is considered "<5" for all subtests. Her performance on the subtests yielded the following composite scores: *Phonological Awareness*, 46; *Rapid Naming*, 49; and *Phonological Memory*, 55 (Scores ranged from 55-150, with 100 indicating the average).

Informal Measure

Speech Sample:

Using the same 50-utterance play sample from above, H.R.'s speech was coded for PCC, PVC, and syllable shape inventory and accuracy (Tables 9 and 10). The sample demonstrated that E.R.'s conversational speech consists of mostly 1-syllable words, and that as she increased word length and complexity, her accuracy decreased significantly. Within 1-syllable words, she was highly accurate (94-100%) in productions of V, CV, and VC words. The majority of her errors were made on CVCC words, showing that words with two consonants placed together were more challenging. Her 2-syllable word errors were made on words with CVCV and CVCVC combinations (44% and 50% respectively). She attempted to use three 3-syllable words, with errors on multiple consonants on all three attempts.

Within the speech sample, she was 100% accurate in her use of vowels and 91% accurate for consonants. Her consonant errors consisted of errors in manner and placement of her articulators such as "ve" for "we", "Faif" for "Faith", and "laller" for "ladder". These numbers are high compared to her performance on speech standardized measures, which seems like a discrepancy. However, it is important to remember that during the speech sample, E.R. had free

range of topic choice and word selection, and she appears to frequently use words in conversation where she has high accuracy of use. This would be considered a familiar set of topics for her, although with an unfamiliar conversational partner. Words that were unfamiliar to her were less accurately produced (such as butterfly, pronounced “buherfy”), and she experienced lower percent consonants correct (PCC) on those words (Table 10).

Table 9: Speech Measures for Participant 2

Speech Measures	Percentile	Age Equivalent	Description
Formal:			
CTOPP*			
Phonological Awareness	<1st	<5	Below Average
Phonological Memory	<1st	<5	Below Average
Rapid Naming	<1st	<5	Below Average
GFTA-2	<1st	2;8	Below Average
Informal:			
Speech Sample			
PCC			91%
PVC			100%

Table 10: Word Shape Inventory and Accuracy for Participant 2

Word Shape	Inventory	Accuracy
1 Syllable	224/357=87%	200/224=89%
2 Syllable	32/257=12.5%	24/32=75%
3 Syllable	3/257=1%	0/3=0%

E.R.’s performance on speech measures shows difficulties with articulation and phonological processing, as well as low accuracy when she attempts complex word shapes. E.R. had a high PCC and PVC during her conversational sample, demonstrating that she has is

comfortable using shorter, simple words and more intelligible when she is selecting words and sentences on topics that are familiar to her.

Standardized Measure

Vineland Adaptive Behavior Scales-II

The Vineland parent questionnaire was administered to assess how E.R. is adapting to her environment in the areas of communication, daily living skills, socialization, and maladaptive behaviors (see Table 11). E.R.'s parents indicated that she has significant difficulties in communication in areas of expressive and receptive language. She is able to understand simple directions, listen to stories, and verbally respond to basic information about herself. However, she cannot complete tasks with complex instructions, clearly articulate words, use prepositions when describing items, tell about her experiences in depth, or consistently identify letters in writing. She cares for herself and completes her responsibilities at home independently. She is able to complete items that are considered more complex for her age, such as preparing meals and using kitchen appliances. She has difficulty with abstract items such as time and money management, and with initiation of interactions from her peers in a social situation. Her parents reported in their Case History for E.R. that she initially demonstrated violent behaviors when she was adopted. However, in the Vineland format they did not report any problem behaviors being a concern at this time.

Table 11: Vineland-II Scores for Participant 2

Vineland-II	Age Equivalent	Description
Communication:		
Receptive	8;6	Adequate
Expressive	3;7	Low
Written	5;1	Low
Daily Living Skills:		
Personal	11;6	Adequate
Domestic	14;0	Moderately High
Community	6;10	Low
Socialization		
Interpersonal Relationships	3;8	Low
Play and Leisure Time	3;5	Low
Coping Skills	11;3	Adequate

Summary:

E.R.'s status at the time of adoption indicated that she would likely have speech and language differences post-adoption. Her current level of functioning indicates that she has challenges related to age appropriate functioning in the areas of speech articulation and expressive and receptive language, consistent with reports from her case history that are available. Her speech articulation for consonants, vowels, and word shape complexity was characterized by severely decreased intelligibility, although she performed well at one-word articulation of words on the GFTA-2. In the GFTA-2 context, she was naming familiar pictures. Her language scores performance placed her at the approximate age of a child of 4;6 in terms of length and complexity of utterances, which is consistent with her mother's report regarding her academic performance. Informal measures showed that she is able and willing to attend to academic tasks, but may 'shut down' if she is unable to communicate adequately. She is experiencing no difficulties in gross or fine motor coordination, and has fully adapted to her environment in the

areas of personal care for herself and others.

Summary of Results

Analysis of Participant 1 and 2's developmental profiles show two very different current levels of functioning in the areas of communication and language. In terms of motor development and personal care for self and others, both children have grown and fully adapted to their post-adoption environments. Their educational setting allows for flexibility in the rate in which they progress, which has been observed to be beneficial for Participant 1 to allow her to progress academically at her own pace. Participant 2 demonstrates more difficulties with academic progress, likely related to abilities in communication and language.

Participant 1 has fully acquired English and has no notable differences in her conversational speech or language capabilities relative to chronological age expectations. Participant 2 shows major challenges in the areas of speech and language development, consistent with those described in available records for the period prior to her adoption. Both children demonstrated lower performances on phonological processing tasks, specifically in the areas of phonological awareness and memory.

Chapter 4

Discussion

The goal of these two clinical case studies was to determine the effects of speech and language acquisition of an adoptive language in the period after the initial period of language learning. Most studies of this group of children have centered on children adopted early, in the period that language learning occurs in children developing typically (Glennen & Masters, 2002; Snedeker et al., 2007; Roberts et al., 2005; Tan et al., 2011). However, there are few studies of children adopted at older chronological ages, past the age of language acquisition for early milestones in typically developing children (Glennen 2009; Greenfield, 2011; Glennen 2014). Understanding of children in this population of older adoptees is important due to the disproportionately small amount of research investigating outcomes for children adopted at older ages. The small body of research available indicates that there is considerable variability among the speech and language development of children adopted at older ages (Glennen, 2014), and it is valuable to observe the various levels of functioning between these two children who were adopted at different chronological ages but having all other controls consistent in regards to their post-adoption environment.

To examine more closely the nature of language acquisition in children adopted at older chronological ages, past the period of early language acquisition, two children adopted at ages 7 and 3 were given a full speech and language evaluation in their homes. All domains of development were assessed including the children's speech, language, social-adaptive behaviors, and oral motor function. Several findings emerged indicating similarities and differences in the development of English for the two participants.

Participant 1: H.R.

The findings of these evaluations demonstrated that Participant 1, who was adopted at age three and assessed at age twelve, showed significant gains in her speech and language development compared to what was originally predicted given her health status and diagnosis of FAS at adoption. She is currently performing at chronological age expectations in all areas except phonological processing, which is consistent with Roberts et al.'s (2005) finding that demonstrated that 95% of preschoolers adopted internationally were performing at chronological age expectations. Her profile indicates a child who has experienced subtractive bilingualism and has been able to achieve age appropriate expectations for spoken language in her second language.

H.R.'s FAS diagnosis at adoption predicted that she was at high risk for long-term challenges in development for all areas. FAS is typically associated with neurodevelopmental disorders that result in physical, socioemotional, and educational challenges for children due to prenatal alcohol exposure. This environmental risk factor is associated with many children adopted internationally, specifically Eastern Europe and Russia (Landgren et al., 2010). In the case of Participant 1, her medical assessment at the time of adoption indicated significant risk factors for differences in physical and neurodevelopmental growth. However, at the time of this evaluation all features of FAS appeared to have resolved.

Many factors may have contributed to Participant 1's outgrowing of FAS features. Her earlier age of adoption may have played a critical role, as she was in an enriched and supportive language and social-developmental environment at a younger age, closer to the age of language

acquisition in typically developing children. Since H.R. was adopted with two older biological siblings, her adoptive parents were able to support patterns of challenges in to aid H.R. in her developmental growth. H.R.'s resolution of FAS symptoms is a significant finding in support of the claim that healthy, nurturing adoptive environments may ameliorate the effects of neurodevelopmental and environmental risk factors. This finding should be explored in research with larger cohorts of international adoptees to understand whether it represents a general aspect of adoption in children with significant risk factors. While available research has noted the presence of children with risk factors within certain cohorts, this issue has not been specifically explored in groups of children who face coherent risk factors such as FAS.

Participant 2: E.R.

The second participant, who was adopted at age seven and assessed at age ten, is currently experiencing significant difficulties in her English speech and language acquisition. Her level of functioning is approximately equivalent to a child of age 4 years, indicating that there may be cognitive level differences that have not been resolved despite a healthy post-adoptive environment.

Participant 2 demonstrated a unique profile in bilingualism, as she did not demonstrate subtractive bilingualism in her acquisition of English. This outcome may have been influenced by her lack of fully developing L1 prior to adoption based on available reports from Russia. Her parents and siblings report that even prior to adoption, her speech intelligibility in Russian was very low. Post-adoption she was described as using a blending of Russian-English vocabulary words. Although she did not attempt to use any Russian words during the present evaluation, she

confused Cyrillic and Roman letters during the *Rapid Letter Naming* subtest of the CTOPP (Wagner, Torgensen, & Rashotte, 1999). This pattern of response may indicate that her speech and language deficits are further exacerbated by an underdeveloped speech sound system in either language.

In considering Participant 2's development in broader context of her nine siblings, her difficulty in developing English is consistent with the incidence of the general population experiencing speech and language delays or differences. The incidence of monolingual children with speech and language delays or differences is estimated to be between 6-25% (Shriberg, Tomblin, & McSweeney, 1999). In this regard, the findings for this child are similar to Tan et al.'s (2011) study, which claimed that only 16-17% of a sample of 318 children adopted internationally actually experienced speech or language delays, although more than one third were receiving speech therapy services.

Based on Participant 2's case history, her speech and language development difficulties may be the result of a congenital disorder being exacerbated by spending her first seven years in an orphanage, as opposed to a direct effect of institutionalization. With reference to her development in other domains, she has had no lasting problems with motor or adaptive behavioral development, and her social challenges appear to be a result of her communication skills, not otherwise due to additional difficulties. In this sense, she too has experienced resiliency in development and adaptation to her adoptive environment in only three years.

Participant 2's parents observed that as early as 5 years old, she was showing speech and language differences in development from her sibling peers, and that her speech intelligibility has always been very low. However, her current level of functioning strongly indicates a need

for clinical intervention. Should Participant 2 begin therapy soon, it is predicted she will be able to make gains in speech intelligibility and language. Based on results of the assessment, she has a foundational understanding of English words and concepts, but lacks the ability to connect speech in a fluid and organized manner. She also is more accurate at the single word level in naming pictures on the GFTA-2 (Goldman & Fristoe, 2000) where the language level is within her capacities and she is responding to a stimulus rather than needing to formulate her own utterance. The ability to achieve speech accuracy at the lower language level of picture naming indicates a positive prognosis that she can make progress in developing speech intelligibility with organized intervention. A focus on core language capacities to boost confidence and increase functionality is recommended to begin, while increasing intelligibility should be considered as a longer term speech outcome.

Intervention is now important for Participant 2 due to her current level of speech and language functioning after several years of exposure to English. Should intervention be pursued, her speech intelligibility should be targeted in addition to receptive and expressive language skills.

Similarities and Differences

Some similarities and differences between the outcomes for each participant were observed. Relative to available research, Scott et al.'s (2013) review of studies based on children adopted internationally showed difficulties in the areas of phonological processing for school aged children. The results of these two individual assessments confirmed that both participants experienced difficulties in phonological awareness and phonological memory. Although

unsurprising for Participant 2, as she experiences global delays, Participant 1 consistently scored at or above age expectations in all domains except for phonological processing. This pattern of response may indicate that although Participant 1 is able to organize and perform academic tasks with ease, her underlying sound systems may be unorganized and underdeveloped for more complex academic tasks. The need for further research in this area is evident through examination of a larger group of children representative of the older adoptee population to determine whether this finding is generally characteristic of children adopted at older ages.

The family's background is unique and may contribute to the generally positive outcomes these children have achieved. The participants' parents have adopted nine children from Russia, at ages varying from 3-16. They reported that all of their previous children experienced subtractive bilingualism (Roberts et al., 2005), characterized by the loss of L1 (Russian) as they acquired L2 (English). Gindis (2005) reports the most significant attrition of birth language occurs in the first 4-8 months post adoption. This pattern was observed for all of the siblings and Participant 1 demonstrated no lingering remnants of Russian phonemes in her articulation. Her slight distortions of /r/ appeared developmental in nature, and she was able to self-cue herself if prompted to better articulate the sound. Much of the research emphasizes a rapid and successful acquisition of English and attrition of Russian post-adoption (Snedeker et al., 2007; Roberts et al., 2005). Participant 2, however, showed a very unique profile of language acquisition, potentially as a result of cognitive differences at the time of adoption. Since her age of adoption was seven, it is expected that her acquisition of English would be slower and there would be more remnants of Russian compared to her sister. Her current level of functioning fits the profile of a sequential bilingual child with impaired speech production capacities. She is attempting to

acquire a second language after a first (Menyuk & Brisk, 2005), and neither language has been proficiently acquired.

Although Participant 2 had some similarities, neither child was fully consistent with the profile outlined by Greenfield's (2011) case study of second first language learners, which demonstrated an adopted preschooler acquiring English in a sequential manner, with an observed effort to maintain L1 after arrival. This confirms the amount of variability seen in the internationally adopted population, and how there is much room for further investigation to determine if there are any observable patterns.

A remarkable finding in both participants was the level of resiliency in development that occurred post adoption. Participant 1's prognosis upon adoption was a global delay severely affecting her level of functioning. Her progress in all areas including motor, speech and language, social, and reduction of negative behaviors is within normal limits for her chronological age. This achievement is consistent with the research that predicted that children adopted internationally initially experience difficulties in catching up to their same aged peers, but the vast majority end up performing at or above academic expectations (Glennen, 2014).

Limitations

Although many helpful findings related to these two children individually were established as a result of these clinical case studies, the scope of this study has some inherent limitations. As with any case study, the findings are limited to these participants, and may not be generalized to the older adoptee population at large. The two participants were adopted into the same home, which is a strength. This similarity enables some insight about post-adoption factors in two different

children adopted from the same country who have had generally the same language exposure, as well as educational and social environment. However, the children were also different in important respects; age of adoption and pre-adoptive status may have made some important contributions to the outcomes observed at this time.

Another study limitation is the inability to assess the participants' progress longitudinally, especially to examine how Participant 2 might benefit from speech/language therapy in the future. Tracking her progress throughout treatment would provide further insight into an unavailable aspect of the research. All available research has assessed and observed at the current level of functioning, but to date, no studies have attempted to track intervention progress for children adopted at older ages.

Future Directions

Many interesting findings emerged from these clinical case studies, which would be areas of interest for future research. The environmental risk factors that exacerbate or ameliorate FAS after adoption is an area lacking in the research. There are observational studies of children adopted internationally who experience long term effects of FAS (Landgren et al., 2010), however, no available studies examine the factors related to resolution of FAS post-adoption in a group of children selected for that pre-adoption risk factor. A further examination of amount of alcohol exposure, age of adoption, home environment post-adoption, developmental status at the time of adoption, and education outcomes are all factors that should be considered.

These case studies enable insight into longer-term outcomes for children adopted at older ages, although it would be stronger as a longitudinal study. These two participants demonstrated

that very different outcomes may be observed despite generally similar pre and post adoptive environmental backgrounds. Although some research has attempted to capture long-term effects for children (Glennen, 2014), no studies have included children adopted at school age who have an established L1. Additional longitudinal studies would help in further developing a bilingualism profile for these children.

Finally, more research is warranted in the area of cognitive differences and the efficacy of intervention for children adopted at older ages. The adoptive context negates the opportunity for early intervention, although both children would have qualified due to their medical concerns at birth (Participant 1) and developmental concerns as a toddler (Participant 2).

Future studies should focus on treatment techniques that target a firm establishment of the English phoneme system, as both children demonstrated challenges in phonological processing and insufficient phoneme representation. Phonological processing plays a key role in analyzing and manipulating sound structures, and an impairment in this area could lead to challenges in literacy and information processing (Gathercole et al., 1992).

Conclusion

The purpose of these clinical case studies was to examine the effects of English acquisition for children adopted at older chronological ages. The two participants were both adopted from Russia to the same household in the Midwestern United States. Despite similar environmental backgrounds, the participants demonstrated very different speech and language outcomes.

Participant 1 was adopted at age three and currently performs at chronological age expectations in all areas except for phonological processing. Participant 2 was adopted at age

seven and is currently experiencing significant challenges in her speech and language skills. Both children had environmental risk factors that were anticipated to significantly impede their developmental outcomes: Participant 1 with Fetal Alcohol Syndrome and Participant 2 with cognitive-communication differences prior to adoption. Both have maximized their potential without intervention in regards to physical, socioemotional, and medical growth.

Their post-adoptive household includes seven additional children adopted from Russia between the ages of 3-16. Eight of the nine children, including Participant 1, have demonstrated subtractive bilingualism, characterized by rapid attrition of Russian and acquisition of English in the first months of adoption. Participant 2, however, has demonstrated a different profile of bilingualism inconsistent with her siblings. She initially appeared to lose use of Russian after adoption, however, some Russian phonemes are confused in her phonological representation system, and she has not developed English in the same fluent, rapid process that her siblings have. At present, she may need intervention for intelligibility and language skills to observe the positive effects of intervention.

It is worth noting that the WHO (2002) framework was especially beneficial for establishing a framework for referencing international developmental standards. Dividing level of functioning into practical domains helped demonstrate the level of impact that both participants will experience as a result of speech and language development. This framework, which was established to provide consistency across culture and languages, will continue to become increasingly important due to the changing multicultural societies that are being established worldwide in many countries.

Despite some challenges in speech and language outcomes for one participant, both children demonstrated resiliency in their physical and socio-emotional growth within their adoptive context. These effects indicate the potential support provided by a nurturing adoptive environment, but also demonstrate that environment alone may not resolve all differences present for internationally adopted children. These case studies outline different patterns for language acquisition in children adopted at older ages based on individual factors. However, similarities contribute to our understanding of language development for this population.

Appendix A: Case History Questionnaire
Adapted from University of Texas Speech and Hearing Center's
"Case History"

History/ Developmental Background:

1. How old was your child when you first met him/her? When you completed the adoption process?
2. Can you verify your child's birthdate and age?
3. Describe the conditions of the orphanage (if you observed them)
4. From what you observed, what was the ratio of children to caregivers in the orphanage?
5. Describe your interaction with your child prior to adoption? What, if any, behaviors did you observe from your interactions? Did she make eye contact, speak, interact with you?
6. What, if any, details do you have about your child's early development before adoption? Were you given any information regarding the following:
 - biological parents
 - birth history/medical conditions
 - developmental milestones
 - other issues
7. Has your child previously received any evaluations? What were dates of the evaluations? Why did you choose to pursue this additional information about your child?
8. Would you be willing to share the results of the evaluation?
9. What support services, if any, is your child receiving? None currently.
10. What kinds of activities interest your child?

Language Development

11. What was your child's birth language when she first arrived in the US? Did she speak often in her birth language? Did you use her birth language to speak to her in your home?
12. Describe your child's acquisition of English. Do you recall the first words she spoke in English? Approximately how long did it take her to begin putting 2-3 word sentences together?
13. Have you noticed a change in your child's personality since first arriving in the US? What about since she has acquired English?
14. Describe your child's speech and language.
15. Do you have any concerns about your child's speech or language?
16. Approximately how much of your child's speech do you understand?
17. How do you usually communicate with your child? How does the child respond best?
18. How well does your child handle separation from you?

19. What language(s) are used in your home? When? Where? By whom?

Medical:

- 20. Has your child had any medical procedures?
- 21. Is your child on any medications now? Has she previously been on medication?
- 22. Has a physician ever had concerns about your child's development?
- 23. Do you have any concerns about her health and/or development?

Educational:

- 24. Describe how your child interacts with her peers and/or siblings.
- 25. Prior to adoption, what kind of education was your child receiving?
- 26. How does your child perform with academic tasks in her school setting?
- 27. Have you seen a change in her academic performance?
- 28. What are some of her strengths and weaknesses in school?

Thank you for taking the time to complete this questionnaire. Your input is greatly appreciated!

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