LANGUAGE OUTCOMES IN SCHOOL-AGED CHILDREN ADOPTED FROM EASTERN EUROPEAN ORPHANAGES

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Developmental studies by pediatricians and surveys of adoptive parents of children that have been adopted to the United States from foreign countries indicate that many of these children are experiencing substantial difficulties with the acquisition of their new language. Language difficulties may compromise the adopted child's abilities to understand, negotiate, and adjust to a new family and environment (Jenista, 1993). Reports range from 100% of the children having difficulties (Willig, 1995) to 34% (Groza,1995), with the majority of researchers reporting incidences in the 30-50% range (Johnson et al. 1996; Hough, 1996). These figures are in-line with research from countries such as Norway (Dalen, 2001a; Saetersdal & Dalen, 1987), Denmark (Rorbech, 1997) and Holland (Hoksbergen, 1997). To date, no studies directly assessing the language skills, long-term outcomes, or the types of language difficulties experienced by these children after experiencing an abrupt language switch have been completed. This study evaluated the language skills of a group of 44 school-aged, post-institutionalized Eastern European adoptees (EEA-PI) to determine the extent, and the types, of problems present in the areas of semantics, morphology, syntax, pragmatics, and reading, and explored the factors of institutionalization that might predict language development. Results showed that as a group, EEA-PI children, in comparison to the normative data on the standardized and spontaneous speech measures, performed lower than age expectations on all of the measures, with the exception of measures of listening (receptive language). The disparity within the group's performance was notable. Though institutional factors of time in institution,

age of adoption, and time in U.S. did not correlate with measures of receptive and expressive language, they were significant for reading and nonword repetition scores. This research furthers our professional knowledge regarding long-term language outcomes and the selection of appropriate diagnostic measures for these children and other children experiencing early neglect in our country.

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PREFACE

I am very grateful to many individuals who supported this research project. My dissertation chair and advisor Dr. Louise Kaczmarek provided tremendous guidance and support throughout my doctoral studies. Dr. Heidi Feldman, who served as my UCLID mentor also provided invaluable assistance and encouragement throughout my course of studies.

Special thanks go to Thais Tepper, founder of the Parent Network for Post Institutionalized chidlren for her unwavering help, research articles and insight. I have gained the utmost respect for the parents of the children who participated. I am also sincerely appreciative of the contributions of the adoption agencies, physician offices and graduate students, who made this research possible.

Lastly, I would like to thank my family and friends who have encouraged me throughout this effort. Their unfailing belief in me and in my ability allowed me to reach this goal.

1. INTRODUCTION

Over 175,000 children have been adopted to the United States from foreign countries in the past ten years (U.S. Dept. of Immigration, 2002). Developmental studies by pediatricians and surveys of adoptive parents indicate that many of these children are experiencing substantial difficulties with the acquisition of their new language. Reports range from 100% of the children having difficulties (Willig, 1995) to 34% (Groza, 1995), with the majority of researchers reporting incidences in the 30-50% range (Johnson et al. 1996; Hough, 1996). These figures are in line with research from countries such as Norway (Dalen, 2001a; Saetersdal & Dalen, 1987), Denmark (Rorbech, 1997) and Holland (Hoksbergen, 1997). To date, no studies directly assessing the language skills, long-term outcomes, or the patterns of language difficulties experienced by these children have been completed.

Over the years, sharply divergent opinions have emerged about the long-term impact of environmental stimulation on child development in the early years of life. Some authors view those early years as critical, with a lasting effect that is difficult to alter (Fox, Calkins & Bell, 1994; Gunnar, Porter, Wolf & Rigutuso, 1995; Hotz, 1997), while others question the long-term effects of environmental stimulation because of the young infant's limited abilities to process experiences cognitively (Kagan, Kearsley & Zelazo, 1977). Research to determine the specific effects of early learning experiences on later development has been difficult because of the strong interrelationship between the two in most ordinary situations (Rutter et al., 1998). Information has been deduced from those rare cases of individual children being rescued after being reared in extremely abnormal circumstances (e.g. Genie and the Wild Boy of Aveyron)(Karen, 1990), studies of children in abusive and neglectful domestic environments, and follow-up studies of children adopted after early deprivation in orphanages

These studies have provided rare insight into the impact of severe deprivation, and have given rise to the idea that recovery occurs rapidly following "rescue" and the provision of a normal rearing environment (Skuse, 1984). However, this belief is called into question when one examines the outcome data from U.S. children who have been exposed to abuse, neglect, and stress. These children have more birth defects, chronic medical conditions, educational, and emotional disorders than other young children (Blatt & Simms, 1997). In light of recent charges of fraud and misrepresentation leveled against adoption agencies by parents of children adopted recently from foreign orphanages (Graber, 1998; Ohlson, 1998), the belief in rapid and sustained recovery cited by adoption agency personnel may be misleading.

Upon closer examination of the literature, however, the conclusion of rapid and sustained improvement following deprivation is difficult to ascertain because of the scarcity of reliable information. Few studies are available and many that are, report inconclusive findings. Many studies are beset with methodological weaknesses such as extremely small samples, measured improvements in outcomes based solely on physical health standards (height and weight gains) rather than on growth in developmental domains, culturally insensitive assessment instruments, and the absence of long-term follow-up. The use of standardized assessment measures has been sparse when reporting the effects of institutionalization.

Institutionalization has been correlated with a wide spectrum of physical and intellectual problems. There is an urgent need for research related to educational issues facing families who have children adopted from institutions. In this decade, research on international adoption has focused primarily on the medical challenges. Equal efforts need to be devoted to researching assessment and treatment in the areas of communication, cognition, and social development. This study reviews the development of children adopted from orphanages in Eastern Europe, with special emphasis on the development of language skills. The studies reported document the

severe deprivation in child care and environmental conditions in the orphanages, and attempt to identify the extent and nature of the children's medical, behavioral, cognitive, and language difficulties.[1] A research study is then detailed that investigated the long-term language status of children adopted from Eastern European institutions. The study also was designed to advance understanding of the impact of institutionalization factors on the future development of language skills.

1.1. Description of Eastern European Orphanages

Thousands of children are adopted every year into the United States from foreign countries. (See Table 1) Since 2002 alone, over 175,000 children have been adopted into America, primarily from the Eastern European countries of Russia and Ukraine, and in the past five years from China (Siemers, 2000; U.S. State Dept., 2002). This trend is predicted to continue for several reasons.

Despite great progress in the medical treatment of infertility, approximately one million American couples are unable to bear children. The number of international adoptions in the United States has increased by 10% each year since 1992 and has doubled in just ten years. The reasons for this include: a shortage of adoption-aged children in the U.S.; the real or perceived uncertainties inherent in domestic adoptions; the shortage of desired characteristics (race and age) in the children available for U.S. adoption; and the restrictive criteria set by adoption agencies for domestic adoptions (i.e., parent age less than 40 yrs., married couple) (Johnson & Groza, 1994). Today, more than three-quarters of internationally adopted children come from institutional care settings in countries where the per capita income is very low, and levels of health care and nutrition are, at best, minimal (Judge, 1999). Infants, less than one year

[1] For the purposes of this paper a search of the literature included ERIC, Medline, and Psychlit databases from 1980-to-date.

Table 1 Statistics 1998, 2001 & 2002 (Immigration and Naturalization Services)

Number of children adopted to U.S. in 1998 from:

Russia	3816
Former USSR	387
Romania	621
Total	4824

IMMIGRANT VISAS ISSUED TO ORPHANS COMING TO THE U.S.

TOP COUNTRIES OF ORIGIN

	FY 2002	FY 2001
1	5,053.....CHINA (mainland)	4,681.....CHINA (mainland)
2	4,939.....RUSSIA	4,279.....RUSSIA
3	2,219.....GUATEMALA	1,870.....S. KOREA
4	1,779.....S. KOREA	1,609.....GUATEMALA
5	1,106.....UKRAINE	1,246.....UKRAINE
6	819.....KAZAKHSTAN	782.....ROMANIA
7	766.....VIETNAM	737.....VIETNAM
8	466.....INDIA	672.....KAZAKHSTAN
9	334.....COLOMBIA	543.....INDIA
10	260.....BULGARIA	407.....COLOMBIA
11	254.....CAMBODIA	297.....BULGARIA
12	221.....PHILIPPINES	266.....CAMBODIA
13	187.....HAITI	219.....PHILIPPINES
14	169.....BELARUS	192.....HAITI
15	168.....ROMANIA	158.....ETHIOPIA
16	105.....ETHIOPIA	129.....BELARUS
17	101.....POLAND	86.....POLAND
18	67.....THAILAND	74.....THAILAND
19	65.....PERU	73.....MEXICO
20	61.....MEXICO	51.....JAMAICA & LIBERIA

Sources: United States Immigration and Naturalization Services, 2003

(54%) and young children (1-4 years of age, 35%) constitute the majority of internationally adopted children (Judge, 1999).

An increasing number of these children have entered American health care and educational systems with a wide spectrum of physical and intellectual problems. Of note is the number of Eastern European adopted children receiving speech and language services. For example, Huang, Hopkins, and Nippold (1997) noted that 205 speech pathologists in Oregon recently reported caseloads that contained children who were foreign-speaking. The research showed that 7% of the therapists (15/205) reported treating children whose first language was Russian and 3% of the therapists reported treating children (6/205) whose first language was Romanian. In Schell-Frank's 2000 survey of 150 E.E. children between the ages of 1 month and 14 years, 59% had received or were receiving speech/language services. As this population of adopted children with special needs continues to grow and develop, it is critical to identify the extent and nature of their medical, behavioral, cognitive, and language difficulties, so that professionals and parents can anticipate their medical and educational needs more accurately.

1.2. Description of Children in Eastern European Orphanages

In order to understand the reasons for concern regarding the outcomes for children adopted internationally, it is necessary to understand the environment from which these children are emerging. A Los Angeles Times report in February, 1998 stated that "over 533,000 children, under age 18, are housed in Russian orphanages today. An additional 100,000 are abandoned, orphaned or taken from abusive parents each year" (Williams, 1998, p.1). Orphanage care varies broadly across Eastern Europe, making it difficult to draw conclusions about countries, cities, regions, or even classes of institutions (Hunt, 1998). Orphanage directors enjoy considerable discretion over their domains, yielding a hybrid of the former centralized organization and low-

grade anarchy. Though findings can not be applied to every orphanage in Eastern Europe, there is a general pattern to this system (Hunt, 1998).

Orphanages tend to be overcrowded, understaffed, and have limited resources (Groza & Ileana, 1996). Media coverage since 1990 has graphically revealed the deprived conditions endured by many of the children in Eastern European orphanages. Profound medical, nutritional, and often physical neglect has been well documented at many sites (Silver & Friedman, 1992). Many of the children (reports range from 68% to 44%) at adoption were below the tenth percentile for weight and height (Albers, Johnson, Hostetter, Iverson & Miller, 1997; Johnson & Groza, 1994), indicating that the children did not have enough to eat or drink. Federici (1997) reported observing children in Romanian orphanages lying passively still, whereas others were seen frequently rocking back and forth, scratching, or staring at their fingers. Cermak (1995) reported that the Romanian baby orphanages that she observed were eerily quiet. The children did not talk to each other and there was little interaction between them.

Caregivers, struggling with large numbers of children, had little time for individual attention or interacting. The number of children per careworker in Eastern European orphanages in recent studies ranged from 1:8 to 1:35, with the average being 1:15 (Groza & Ileana, 1996; Marcovich, Cessaroni, Roberts, & Swanson, 1995). Cermak reported that the adults did not talk very much with the children, and the children rarely cried. Most of an infant's time was spent alone in a crib without the benefit of toys or caregivers (Cermak, 1995). Staff training in childcare was minimal, and work hours were very long. Sloutsky reported in his 1997 study of Moscow orphanages that personal relationships of staff with the children were discouraged. His study revealed, for example, that "staff members were required not to communicate with children outside of the orphanage, take them to their homes or give them personal presents" (p. 137). Groark et al. (2000) reported on the number of caregivers that provided for children in

orphanages in St. Petersburg, Russia. On average children between the ages of 4 and 25 months have 60-80 different caregivers, and those caregivers are not scheduled to work two days in a row. Children move by age to new units every few years, and a new set of caregivers take over (McKelvey, 1994; Sweeney & Bascom, 1995). UNICEF researchers (1997) in Russia found a higher than normal death rate in the psychoneurological internats (i.e. state orphanages). Across Russia approximately 30% of the severely disabled children in special homes die before age eighteen. Upon leaving the orphanages, children were reported to have on-going medical problems, developmental delays, and behavioral problems (Marcovich et al., 1995) that continued to affect them in their post-adoption placements.

2. REVIEW OF THE LITERATURE

2.1. Definitions of Terms

A number of specific terms and definitions are used within this paper. The term *Eastern European* is used to include the countries of Romania, Bulgaria, Poland, and former U.S.S.R. countries including Russia, Latvia, Lithuania, Estonia, Uzbekistan, Ukraine, and Belaruss.

Additionally, the following definitions are adapted from the Human Rights' Watch publication *Abandoned to the State: Cruelty and Neglect in Russian Orphanages* (Hunt, 1998):

Orphan refers to a child without living parents; "orphan and "social orphan" are currently used broadly in adoption literature to also include those abandoned children with one or both parents living, which is the case for roughly 95% of the children in Russian state institutions" (p. xii).

Eastern European Institutions encompasses the many types of children's residential institutions that exist in Eastern European countries, including homes for abandoned and orphaned children, boarding schools for delinquents, chronic care hospitals for infants, and homes for children with mental and physical handicaps. The term would include the **Rod dom**, a maternity ward in a general hospital in larger towns in which many Russian orphans are abandoned (p. xii); the **Dom rebyonka,** an orphanage for infants 0-4 years old (called the **leagane** in Romania); and the **dyetskii dom**, the children's home for "normal" children ages 5-18 years. **Dyetskii dom** is often used interchangeably with **internat** to refer to state orphanages in general (p. xi), and the **psychoneurological internat** (in Romania, the **nerecuperabili)** to refer to boarding institutions for children ages 5 to 18 deemed mentally retarded. Rutter et al. (1998) states "Some of the residential institutions were officially labeled 'hospital' and some 'orphanages,' but in practice,

there were few major differences between them in that both provided long-term care for children whose parents had given up looking after them for one reason or another" (p. 467).

Post-institutionalized refers to those children now residing in adoptive homes who spent an extended amount of time (i.e., no more than 2 weeks absence from their placement) in an institution (Rutter et al., 1998). In this paper, the criterion for the term 'post-institutionalized' is that the child spent more than 50% of their pre-adoptive life in an institution. EEA-PI is the abbreviation used for Eastern European Adoptees-Post-institutional.

The following definitions are derived from the report of the United Nation's Convention on the Rights of the Child (1989).

Physical abuse is defined as, (a) shaking, or beating, or burning that results in bodily injury or death, (b) physical acts that result in lasting or permanent neurological damage.

Physical neglect is defined as (a) abandonment with no arrangement made for care; (b) inadequate provision for long periods or disregard for potential hazards in the home; (c) failure to provide adequate nutrition, clothing, personal hygiene; (d) failure to secure needed or recommended medical care.

Emotional neglect includes (a) failure to provide warmth, attention, affection, normal living experiences; (b) refusal of treatment services recommended by social or educational personnel.

Maltreatment encompasses children who are either abused and/or neglected (Sparks, 1989). When studies specifically investigate neglected children vs. abused children different patterns emerge. Abuse and neglect may occur together, but they are not interchangeable. Neglect indicates that the adult passively fails to provide necessities for children's growth and development. Abuse indicates acts in which adults actively and

intentionally harm children (Sparks, 1989). Garbarino and Crouter (1978) estimated that there is a 50% coincidence of neglect and abuse.

For this study, the term *language delayed* is used initially. Language delayed is presented as a neutral label that simply indicates that the child presented with language abilities below the level expected for his or her age (Klee et al., 1998). In contrast, *language disorder and specific language impairment (SLI),* are used as terms that imply that there is a deficit in language production.

2.2. Effects of Institutionalization on Child Development

2.2.1. Medical conditions and physical development

Several studies have addressed the medical condition of Eastern European orphans (Albers et al., 1997; Hersh et al., 1991; Jenista, 1993; Johnson et al., 1992; Paquet, Babes, Drucker, Sensmaud, & Dobrescu, 1993). Johnson et al. (1992), Paquet et al. (1993) and Albers et al. (1997), upon review of medical records and medical testing of recently adopted Eastern European orphans, reported medical factors that included prematurity, as well as poor prenatal, natal, and postnatal care. Medical studies show that children lose one month of linear growth (weight and height) for every three to five months spent in an orphanage (Johnson et al., 1992; Albers et al., 1997). About half of the Russian and Eastern European orphans referred for adoption were low birth weight babies (Jenista, 1997). Known medical risks associated with living in orphanages include: scabies, rickets, chronic ear infections, lice, intestinal parasites, tuberculosis, dental caries, cytomegalovirus, HIV, and hepatitis. Deficient immunizations, malnutrition, and undetected vision and hearing problems are common and are associated with developmental delays (Adoption/Medical News, 1996). Chronic otitis media (COM) when associated with hearing loss has been shown to affect the language development of children, specifically, delayed language acquisition and deficits in auditory processing (Friel-Patti & Finitzo, 1990;

Roberts, Burchinal, Koch, Footo & Henderson, 1988; Wallace, Gravel, McCarlton & Ruben, 1988). Infants who feed themselves bottles, as has been reported of children in the orphanages (Tepper, 1996), have been shown to have a higher percentage of otitis media (American Academy of Pediatrics, 1987).

Infantile malnutrition may result from lack of adequate calories, a poor caloric intake, or may result from chronic gastrointestinal illness, such as parasitic infestation from which many of the Eastern European orphans suffer (Johnson et al., 1996), particularly helicopyloric bacteria infestations. Groza and Ileana (1996) reported that the children in Romanian orphanages were deprived of proper nutrition; over half of the infants were under normal weight levels for their ages. UNICEF researchers (1997) also reported that the incidence of malnutrition disorders, rickets and anemia increased in Russian baby homes by 20%, 13% and 75% respectively between 1989-1994.

According to Heckhausen and Krappman (1996) there is substantial evidence from many studies that suggest a causal relation between undernutrition and problems of development in children. For example, Galler and Ross (1989) reported in a landmark longitudinal study of 185 U.S. infants that 60% of the children who experienced only one severe incident of malnutrition exhibited attention deficits, poor memory, distractibility, and poor school performance on follow-up testing at age 9-10 years.

Additional environmental concerns impacting on medical health specific to the Eastern European orphans include lead exposure and fetal alcohol exposure. Eastern Europe strongly supported the expansion of chemical and metallurgical industries in the past decade without consideration of the environmental impact and with virtually no environmental regulations. About 10% of all Russian children are born with birth defects or deformities (Kramer, 1996). The Russian Environmental Commission now estimates that 20% of birth defects are caused by

pollution. Before and after birth, EE infants will be exposed to chemical pollutants. These pollutants are in the water they drink, in the air they breath and in the food they eat (Fitzgerald et al., 2001; Gabby, 1998). Paint containing lead is used everywhere including the rusted cribs and peeling painted walls of the EE orphanages (Tepper, 1996). Unfortunately, children are most susceptible to the poisonous effects of lead. They are growing fast, and lead goes selectively to those places that are growing the most rapidly and have the most fatty components, such as the brain (Palfrey, 1999). Given the oral habits of infants and toddlers, it can be predicted that many of these children will have the potential for exposure to lead poisoning at a young age. Exposure to only small amounts of lead can result in inattentive behaviors, hyperactivity, and irritability. Children exposed to greater levels of lead often have problems with language, learning, reading, and hearing (Needleman, 1982).

The East European countries are number one in the world for consumption of hard liquor and third for wine. The average Russian adult drinks 38 litres/year, which is twice the amount consumed in the U.S. (Johnson, 1997). In 1993, the number of alcoholics in Russia rose by 40.8%. Eighty to 94% of girls between 15 and 17 drank sometimes and 17% drank often (Aronson, 1998). After reviewing 302 pre-adoptive records, Albers et al. (1997) reported that 19% of the records noted maternal alcohol use during pregnancy. The rate of Fetal Alcohol Syndrome (FAS) in Russia is estimated to be eight times greater than the worldwide incidence (Aronson, 1998). At a 2000 ISBRA workshop in Yokohania, Japan, Drs. Marinichova and Robinson described a FAS project undertaken in Moscow, Russia that evaluated 184 children ages 8-5 to 17 years who resided in institutions--orphanage children and boarding school children. The study found that Fetal Alcohol Syndrome was diagnosed in 14.1% of the children in the orphanage (Warren, Calhoun, May, Viijoen, Li, Tanaka,, Marinicheva, Robinson & Mundie, 2001). The incidence was almost three times higher than that found in the children in

the Russian boarding school. Unfortunately, a complete medical history of a child adopted internationally is rarely available. Only educated guesses regarding whether a child has or does not have FAS can be made based on facial characteristics and behaviors. Fetal Alcohol Syndrome is associated with the diagnosis of learning disabilities including language problems, memory, attentional deficits, and mental health problems (Streissguth et al., 1994; Streissguth & Kanter, 1997).

Fortunately, preliminary studies of physical and nutritional growth show that most children make tremendous gains in physical growth during the first two years with their adoptive parents (Johnson, 1997). Some exceptions do exist for children with true neurological impairments. Gross motor and fine motor coordination, as well as strength, respond favorably to improved nutrition and a stimulating environment (Johnson, 1997). However, many children, especially those who spent extended time within institutional settings, continue to show cognitive, motor, and behavioral delays.

2.2.2. Motor and sensory development.

Several researchers have been interested in the effects of institutionalization on motor and sensory development. Sweeney and Bascom (1995) tested the motor skills of more than 200 institutionalized children in Romanian orphanages, and found them all to be severely delayed. Haradon, Bascom, Dragomir, and Scripcaru (1994) examined the sensory processing of post-institutional Romanian infants, ages 4 to 9 months, and found them to be significantly different from their control group of American infants. They reported abnormal hypo- and hyper-responsive behaviors in the Romanian infants. Hypo-responsive behaviors included high tolerance to pain or lack of arousal. Hyper-responsive behaviors included tactile defensiveness and hyper-auditory sensitivity. Cermak and Daunhauer (1997) studied 73 children, ages 3 to 6, that were adopted to the U.S. from Romanian orphanages. They examined whether the adoptees

had more difficulty with sensory processing and related behaviors than a typically developing control group of 72 children, living in New England, and selected to approximate the number, age, and gender of the study children. The orphan adoptees had significantly greater problems in five of the six areas of sensory processing that were tested, and had significantly greater problems in four of five behavioral domains.

2.2.3. Cognitive development.

One study focused on the impact of institutionalization on the overall cognitive development of the EEA-PI child. Kaler and Freeman (1994) assessed the cognitive and social development of 25 orphans, aged 23-50 months, from Romania, in comparison to a control group of 11 Romanian children, ages 21-63 months, who were living with their families. A variety of traditional and nontraditional measures were used to assess visual self-recognition, level of play, level of interaction, and social referencing. Results indicated that all of the children from the orphanages were delayed on all measures of cognitive and social development. The range varied from mild to severe delays, but the majority of orphanage children were severely delayed in comparison to the Romanian family-reared group.

However, Kaler and Freeman's results also raised a number of questions. Unlike other reported studies, the deficits noted were unrelated to the length of time the children spent in the orphanages, their age at entrance into the orphanages or the children's birth weights. Further, the children from orphanages were noted to have strengths in the area of peer interaction.

Ames and her colleagues have conducted a number of studies on children in British Columbia, Canada who were adopted from Romania (Ames, 1990; Ames, 1997; Ames et al., 1992; Ames, Fisher, & Savoie, 1994; Chisholm, Carter, Ames, Morison,1995; Chisholm & Ames 1995; Le Mare, Vaughan, Warford, & Fernyhough, 2001; McMullen & Fisher, 1992). Due to the structure of the Canadian healthcare system, Ames had access to virtually all of the

children adopted to this province. Ames et al.(1994) assessed the IQ status of 131 Romanian orphans adopted to British Columbia. The average IQ for those children adopted under age 4 1/2 years was 90 (range 65-127), and for children who were older than 4 1/2 years, the IQ score average was 69 (range 52-98). LeMare et al. (2001) reassessed the status of 34 of these same children ten years post adoption. The researchers reported that the scores of the Romanian orphans on the *Stanford-Binet* scales were significantly lower that those of their Canadian-born matches.

Rutter et al. (1998) studied the cognitive status of 111 children adopted from Romanian orphanages to England. Assessment measures included the *Denver Developmental Screening Test* (Frankenburg, Dodds, & Tantal, 1970) and *The McCarthy Scales of Children's Abilities* (McCarthy, 1972). The mean *McCarthy* General Cognitive score was 92 (low normal) for the adopted children, as compared to a score of 109 for the within-U.K. adoptions. The strongest predictor of level of cognitive functioning was the child's age at adoption (and by association, the length of time in the orphanage). Rutter and colleagues concluded that the cognitive deficit was likely a consequence of the early deprivation, with the psychological deprivation being more important than the nutritional deprivation.

2.2.4. Psycho-social development.

Research also has examined the emotional and behavioral functions of the children adopted from Eastern Europe and the former USSR. Ames et al. (1994) compared three groups of children: 46 Romanian orphans who had spent at least eight months in a Romanian orphanage, 31 Romanian children who had spent less than four months in the orphanage, and a control sample of 46 Canadian children who had never been institutionalized. The *Child Behavior Checklist* (Achenbach,1991) was used to assess behavior problems reported by adoptive parents after the children had been in Canada more than one year. Results showed that

the children with more than eight months of institutionalization exhibited significantly more rocking behaviors and spent more time "watching their hands" than the control sample. Eating problems, such as not chewing solid foods, not eating solid foods, and an inability to regulate amounts of food eaten were present. There were no differences between the children who had been institutionalized less than four months and those who had never been institutionalized.

Chisholm, Carter, Ames, and Morison (1995) assessed attachment security of these same children. Attachment refers to the bond established between an infant and the caregiver (Karen, 1990). Children who had lived more than eight months in the orphanages scored significantly lower on security of attachment, and displayed more indiscriminately friendly behaviors than children with less than four months of orphanage living. Attachment and its relation to language development is discussed in a later section.

A recent Canadian study by LeMare, Warford and Feryhough (2001) reported the follow-up data from 34 of these same Romanian orphans on measures of peer relationships. The researchers reported that the data indicated a mixed picture of social functioning. On the positive side the children appeared to be as well accepted by their peers as their Canadian-born counterparts and their self-concepts were equally positive. However, despite their acceptance by peers there was evidence that the Romanian orphans were continuing to have difficulties with their sense of group belonging and their parents reported that they engaged in significantly less peer activities than the Canadian-born matches.

Other Canadian researchers have also reported behavior problems. Marcovich et al. (1995) surveyed 105 parents of 130 Canadian adoptees from Romania who were between the ages 5 days and 9 years. Seventy-one of the children had been living in an institution and 59 had been living with their biological parents at the time of adoption. Parents reported significantly more delays, including developmental and behavioral difficulties, for the children adopted

directly from the orphanage. They reported behavioral problems of (1) eating difficulites; (2) stereotypical behaviors, such as rocking, hand flapping, and head banging; (3) sleeping difficulties; (4) attachment difficulties; (5) tantrums; and (6) difficulties interacting with peers.

Groza and Ileana (1996) surveyed adoptive parents and reported outcomes for 462 Romanian children adopted to the U.S. The majority of the children (72%) had been with their adoptive families for more than 3 years. Comparable to Marcovich et al. (1995), the majority of parents reported behavioral difficulties. Forty-six percent of the adoptive parents reported that their children had no behavior problems. For the remaining 54%, the most frequent behavior problems reported were: (a) very high activity levels (21%); (b) bed wetting (19%); (c) rocking self (16%); (d) over-sensitivity to sights, touch, or sound (18%); and (e) under-reaction to pain or stimulation (11%).

Federici, in 1997, defined a psychological profile that he labeled "Institutional autism." Based on his personal observations formed over many years of visiting Eastern European orphanages, and evaluating hundreds of orphanage children, he proposed the concept of institutional autism, which he defined as:

> ...a complete regression to self-stimulating behaviors as a way to fill in the gaps regarding loneliness, deprivation and despair. It is very common for children in institutions, who have been sensory deprived, and socially neglected for years, to find some degree of pleasure in self-stimulating rocking and movement behaviors, hyperactivity, and uncontrollable rage, in addition to, self-mutilation behaviors. Over the course of time, these cognitive and physical stimulation behaviors develop into a repetitive pattern of movements, mannerisms and speech. (p.1)

Recently completed studies by Rutter et al. (1999) and McGuinness (1999) also note difficulties with social competence in Eastern European adoptees. Rutter in his cohort of 165 Romania children adopted into English families reported findings on a subgroup of 11 children that met the criteria of possible autistic features. In order to assess social deficits, communication abnormalities, and stereotyped behavior patterns, a questionnaire was given to each of the 11 adoptive parents. Concerns were expressed about difficulties in forming selective friendships, in social reciprocity, in empathy for other people and in the use of eye gaze and gestures in social approaches. Similarly attention was drawn to impaired language development, and to a lack of reciprocal conversation and social chat. Rutter et al. continued to note that "the first question is whether the pattern in these children constitutes childhood autism or rather a different clinical disorder that happens to mimic it. The communicative abnormalities- the amount of reciprocal interchange and lack of conversation- for example, stand out." (p. 9). Rutter and colleagues concluded, "This high percentage (6%) is far too high to be dismissed as coincidence" (p. 8).

McGuinness' 1998 doctoral dissertation examined, among other issues, the academic and social competence of 105 six to nine year old children adopted from Russian orphanages. She used *The Vineland Adaptive Behavior Scales (VABS)* (Sparrow, Balla, & Cicchetti, 1984), and asked parents to rate their adoptive children in an effort to characterize their current social, school, and conduct competencies. Peer social success was the main factor in rating social competence. The average score on the *VABS* was 87, considerably below the average of 100 for U.S. born, non-institutionalized children. However, 25% scored above 100 and 35% scored below 85. McGuinness (1999) stated "these children are a diverse group with much variation ... There will be areas that need remediation...one major concern is that many experienced language delays" (p. 25).

2.3. Effects of Length of Institutionalization

Once children are placed in an orphanage it is extremely rare for them to return to their homes. Few reassessments of placement occur, partly because institutions receive government funding based on the number of children in their care, and partly because there are no social workers trained to work with the families of institutionalized children (Johnson, Edwards, & Puwak, 1993). Typically, children simply age into subsequent levels of institutional care. At age four, in Russia and Romania, all children are given cognitive testing to determine their future placements. Normal scores will earn the child placement into the dyetskii dom or training school where an education is provided. Low scores result in placement in the psychoneurological internat, or as it is commonly known, the home for imbeciles (Hunt, 1998). Information regarding the cumulative effects of orphanage stay are limited, particularly for long-term outcomes and age-related factors.

Macovei (1986) reported on a series of studies comparing a random sample of 200 Romanian rural, urban, and orphanage children at age three. She reported global delays among the institutionalized children including lags in intellectual functioning, language comprehension, physical delays, and decreased motor skills. Length of time in the institution was directly related to the level of severity of the delay.

Additional studies have continued to support the relationship between length of orphanage stay and developmental delays. Ames (1997) reported significant developmental and behavioral delays, particularly for children institutionalized for longer periods of time. In Ames et al.'s (1992) initial study, at 13 months post-adoption, the parents of 131 children reported that 46% of the adopted children had delays in 3 or 4 areas on the *Denver Developmental Screening Test* (Frankenburg et al., 1970), 36% had 1 or 2 areas of delay, and 19% were no longer delayed in any area. Further analysis of the data showed significant differences between the children

adopted before two years of age and those children adopted after age two. Ames et al. (1992) concluded:

> Previous studies of institutionalized children have all reported developmental delays. Most children adopted before the age of two years eventually attain normal development. There is controversy concerning the eventual level that can be attained by children adopted at older ages whose cumulative deficits are greater. We do not yet have enough information to answer this important question. (p. 22)

In a previously cited study, Groza and Ileana (1996) reported that Romanian children with significant behavioral and social problems were also significantly more likely to have been adopted from institutions rather than from Romanian homes. Additionally, there was a direct relationship between the length of time in an orphanage, and the months of delay in social and language skills.

In a study reported earlier by Rutter et al. (1998), of 111 children adopted in England from Romanian orphanages, researchers attempted to assess the children's degree of recovery, and the relationship of the recovery to the length of deprivation (stay in an orphanage). The extent of developmental deficit and catch-up following adoption was examined in children age 4 years who were between 0 and 23 months of age at the time of adoption, and compared to a sample of English children adopted before the age of six months. Catch-up for orphans who spent less than six months in an orphanage was nearly complete by age four years. For those children who spent 6 to 23 months in an orphanage, the catch-up was substantial, but it did not reach the same level as that of the children without, or with less than six months, of orphanage experience. Rutter also noted a connection between duration of deprivation (time in the

institution) and the cognitive score at age four. More specifically, children exposed to longer periods of deprivation exhibited increasingly lower cognitive scores.

O'Conner et al. (1998) reported a follow-up study of these same 111 children at age six years. Results indicated that there was considerable catch-up for the later adopted Romanian children (adopted after 24 months in an institution) compared to levels upon entry into the UK, but as a group, they exhibited lower cognitive scores and general developmental delays compared with earlier adopted children (adopted before six months). In addition, the resilience suggested at the four-year-old testing was maintained longitudinally, but there was no further evidence of catch-up.

Benoit, Moddemann, Jocelyn, and Embree (1996) described another study that investigated the relationship between length of stay and extent of the deficit. These authors reported on the developmental, behavioral, and medical characteristics of a group of Romanian orphans adopted by families in Manitoba, Canada. Their participants were 22 children adopted at a young age (15.5 months +/-13 months). At the time of adoption, 6 children were less than 6 months of age, 5 were between 6 and 12 months, 8 were between 13 and 24 months and the remaining 3 were older. Fifty-four percent of the children were adopted from institutions, and 45% were adopted from Romanian homes. Testing for cognitive and language functioning was based on the *Gesell Developmental Scales* (Gesell & Amatruda 1947), which was administered by one of five pediatricians on two different occasions; the first administration was at a median time of 3 months post-adoption, and the second at a median time of 12 months after adoption (range of 4-26 months). Following the initial assessment, eight (36%) of the children were recommended for early intervention services. Results of the follow-up assessments showed significant improvement for the group as a whole, in all domains. Those children who were adopted before the age of 6 months showed normal growth, behavior, and development at the

time of follow-up. Children adopted at older ages were more likely to demonstrate continuing developmental deficits (Benoit et al., 1996). These results are consistent with Rutter et al.'s (1998) conclusions that Romanian children who were younger than 12 months, and who therefore experienced little or no institutionalization, upon adoption to a nurturing environment demonstrated cognitive (language) skills that, upon evaluation, were within normal limits within one year after adoption. These results appear to discount the effects of genetic factors as the causal agent for the language delays observed in children who spent 12 or more months in institutions.

Staff at Rainbow House International, an adoption agency that has placed children from Russia for over five years, distributed a questionnaire to 215 of their adoptive parents to assess attachment and developmental delays in children adopted to the United States (Clauss & Baxter, 1998). Results from 206 returns showed the following:

-average age of adoption was 37 months.

-average number of months the children had resided in their adoptive home was 23 months.

-average number of months the children remained in institutions prior to adoption was 30 months.

-34% of the parents reported undiagnosed problems at the time of adoption.

-on arrival to U.S., 73% were developmentally delayed (by parent report, not by formal testing)

-after an average of 23 months in their new placement, 39% of parents reported ongoing developmental delays; 61% parents reported no delays

-the most common delay parents reported was in speech and language -32%

-91% of the children had fewer than four positive indicators for attachment problems.

In light of the above research, the Kaler and Freeman study (1994) cited earlier in this paper, which assessed the cognitive and social development of 25 orphans from Romania, aged 23-50 months, reported surprising results. Whereas Kaler and Freeman agreed with the findings of many researchers (Ames et al., 1994; Benoit et al., 1996; Macovei, 1986; Rutter et al., 1998) that the children from the orphanage were often delayed, unlike the other studies, they found that the deficits were unrelated to the child's length of time in the orphanage or their age at entrance into the orphanage. No explanation was given for these results.

2.4. Speech/Language Development and Institutionalization

It is important to understand the impact a speech and language problem can have on a child. Language difficulties may compromise the adopted child's abilities to understand, negotiate, and adjust to a new family and environment. Speech and language disorders are often long lasting and directly affect the child's academic functioning (Gindis, 1997). For children newly adopted to the U.S., it may be difficult to determine when a language delay becomes a language deficit. Behavior problems and frustration often occur as communicative partners fail to understand each other (Prizant et al., 1990; Rice, Sell, & Hadley, 1991). Adoptive parents and professionals working with these children need to be aware of the indicators of a speech or language problem so that appropriate interventions may be initiated as early as necessary.

2.4.1. Early learning periods for language.

The debate over the amount of language residing in a child at birth is far from settled, but recent research (Gopnik, Meltzoff, & Kuhl, 1999; Kuhl, et al., 1997; Lust, 1998; Werker, 1994) is transforming traditional views of how language develops. Over forty years ago, Noam Chomsky first put forth his theory that nature, at birth, wires children's brains with the ability to acquire

their parents' native language by fitting what they hear into a preexisting language template that he named a language acquisition device (LAD) (Chomsky, 1955). This LAD, Chomsky postulated, endows children from birth with a set of "universal grammar rules" common to all languages that they can immediately begin to use (Chomsky, 1965). This linguistic module is analytical in development and computational in practice. It locates recurring elements in the child's stored utterances and extracts the rules by which those utterances are combined by adults.

One of the most convincing supports for the idea that a language acquisition device is at work was the report by Marcus, Pinker, Ullman, Hollander, Rosen and Xu (1992) at MIT that between 20 and 36 months, children suddenly begin to make grammatical mistakes. The researchers interpreted this behavior to signal that the children, instead of merely reproducing what they have heard, were now generating their own words from previously heard utterances and using "rule " governed speech. Rules, in turn, impose an organization on incoming information expediting the learning of new word meanings (Marcus et al., 1992).

Over thirty years ago, Eric Lenneberg, at MIT, in his book *Biological Foundations of Language* (1967), attempted to demonstrate that there was a special one-time-only period in a child's life when the brain systems that learn and use language can be turned on. Lenneberg's 'critical' period for language seems to have important implications for institutionalized children who received little early social and linguistic stimulation. He believed this period lasted till about puberty. Using a variety of noninvasive brain imaging techniques including fMRIs, ERPs and PET scans, scientists study language development in the brain. They find that there are shifts during development in how the brain's language is configured which do not stabilize into mature organization until children are 15 years of age (Neville & Bruner, 2001). However, some aspects of brain development depend on input at one time, while other aspects depend on input at other times.

Language development is marked by different critical periods for different components. Results from many different studies reviewed by Bortfield and Whitehurst (2001) indicated different developmental time courses for grammatical and semantic processing. Processing grammatical information appears to rely on different neural mechanisms than those relied on for processing semantic information. The semantic knowledge base continues to expand throughout life, while conversely, grammatical processing shows gradually differentiated localized responses. For semantic development, scientists studied vocabulary development. Semantic language processing appeared to be invulnerable to delays in exposure to a second language. Unusual early language experience did not have large effects on how semantic processing was organized in the brain. However, grammatical processing was affected. Bortfield and Whitehurst (2001) cited as an example, their study of Chinese children. Those who learned English early, between 1 and 3 years of age, developed left hemisphere activation patterns just like those of native English speakers. However, children delaying second language learning until 4-6 years of age resulted in a more bilateral pattern of brain activation. The authors concluded that within the language processing systems, the semantic and grammatical processing subsystems are affected differently by delays in language experience. The grammatical subsystem was more sensitive to early experience than the semantic system (Bortfield & Whitehurst, 2001).

According to Cho (1993) the critical period hypothesis when applied to second language learning is a very complex phenomenon that interweaves age of exposure to language, interaction between age of exposure, the length of stay, different language structures, and performance on different tasks. There has been a considerable amount of research on the issue of the critical period and the age factor in general. Following her extensive review of the literature, Cho concludes, “even though the existence of the critical period has been widely supported, recent evidence suggests that lateralization of language function is established before the age of

five. One can state that the younger the learner the better the ultimate attainment" (Cho, 1993, p. 4).

While adults often have difficulty perceiving nonnative phonetic contrasts, young infants can discriminate nonnative contrasts with ease (Werker, 1994). In Werker's research studies children ages 12, 8, and even 4 years perform as poorly as English-speaking adults in determining nonnative sound contrasts. Yet this ability is evident well before age 4 years. Tests show that the change in discrimination abilities begins around one year of age. Infants aged 6-8 months can discriminate both English and non-English phonemes, but among infants ages 10-12 months, only two out of ten infants could make the same discriminations. Best, McRoberts, and Sithole (1988) also studied infants' abilities to discriminate Zulu click contrasts from English. They found that infants 6-8 months of age clearly performed better than infants at 10-12 months of age. Kuhl et al. (1997) have produced research at the University of Washington that shows that eight-month-old babies can distinguish Russian, English, and Swedish phonemes. By ten months of age, babies can recognize the phoneme boundaries for only their own language (Jusczyk, 1989). Fernand (1987), a psycholinguist, has shown, using PET scans, that when a baby is around nine months old, the part of the brain that stores and indexes many kinds of memory becomes fully functional. Fernand believes that it is no coincidence that this is the time that many babies begin to attach meanings to words.

The contribution of early linguistic input to a child's language acquisition has continued to be a source of controversy (Culp, Lawrence, Lette, Kelly & Rice, 1991). Werker (1994) contends that language experience is necessary to maintain the ability to discriminate nonnative phoneme contrasts, and that without such experience the ability to do so is lost.

Additional evidence for the existence of an early critical period for learning language has been found in Johnson and Newport's 1989 study of first language acquisition of American Sign

Language (ASL). The participants of this study were 30 pre-linguistically deaf adults who used ASL as their primary language. Johnson and Newport divided the group into three subcategories: native learners exposed to ASL from birth, early learners first exposed to ASL by deaf peers at age twelve, and late learners first exposed to ASL after age twelve. Results showed that for basic ASL word order there was no significant effect for the age of exposure. In sharp contrast, the scores on tests of morphology all showed significant differences, with native learners outscoring early learners, who outscored late learners. Although the early and late signers did at times use many of the same forms as the native signers, they also used forms that were considered ungrammatical. The researchers concluded that their study supports the hypothesis that there is a critical period for first language acquisition.

Evidence that language structures cross language boundaries continues to accumulate. Lust (1998) reports in recent studies at Cornell University that both American and Taiwanese children, as young as three years of age, already possess a remarkable knowledge of language structure and syntax. She states, “In both languages, the individual child was capable of creating the formal, and highly complex grammatical system they hear around them, structures that linguists have pondered for years, and the children do it in just three years” (Lust, 1998 p. 4). She cites previous studies on the acquisition of more than 14 different languages. By age three, 90% of the utterances spoken by the average child are grammatically correct (Brownlee, 1998). Brownlee reported that Miles and Nelville (1998), using electrodes on toddlers’ heads, found that grammatical processing shifts from both sides of the brain to the left side around the end of three years of age--even when language is signed, not spoken (Brownlee, 1998). The Cornell studies also offered evidence that language disorders occurred in past tense verb use and diminutives across four different languages- even though the way these structures were formed varied widely from one language to the next.

Cho's 1993 study of six Korean children and their acquisition of English grammatical structures revealed several interesting conclusions. Age of exposure and length of exposure to the language were significant for the participants studied, with younger children outperforming the older learners after four years, but not at two years of exposure. In her study she suggested that the older participants learned the language in a surface manner, while younger participants internalized the rules at a deeper cognitive level. It appeared that the learning mechanism or processing mechanism differed between those who were exposed to English from the ages of two-to-four, and those who started to learn English from the ages of six-to-twelve years. Many factors may cause this differential performance, but one possible explanation, based on the findings of her study, was interference from the child's more fully developed first language system. She concluded that the finding of the greatest difference between the performance of the children exposed to English since they were age two, versus children exposed beginning at age four, requires further research.

The Kuhl et al. (1997), Johnson and Newport (1989), Werker, (1994), and Cornell studies (Lust, 1998) all lend support to Chomsky's theory of a universal innate language acquisition faculty (Gopnik et al., 1999). However, while infants may enter the world prepared to understand and use language, the environment quickly begins to play an influential role.

2.4.2. Role of the environment in early language development.

Environment and stimulation are regarded as essential elements in the normal development of language skills (Gindis, 1997; Locke, 1993; Whitehurst, 1997). The depressed environmental stimulation and language input that children reportedly experience in orphanages can often result in limited language development (Brodbeck & Irwin, 1946; Dubrovina, 1991; Helm & Frank, 1997; Provence & Lipton, 1963; Sloutsky, 1997).

Research evidence now suggests that what a child knows now, and in the future, depends in substantial measure on how her or his parents/caregivers talk to them during the first three years of life (Thompson, 1995). In a landmark study, Hart and Risley (1995) studied 40 families for 2 /1/2 years including the time before, during, and after the child learned to talk. The data, painstakingly recorded over the 2 1/2 years in the homes of 1- and 2-year old children, showed that between professional and welfare parents, there was a difference of almost 1,500 words spoken per hour. Extrapolating this verbal interaction to a year, a child in a professional family would hear 11 million words while a child in a welfare family would hear just 3 million. Hart and Risley further concluded that this study provided strong evidence that the amount of parent speech was directly related to children's vocabulary growth, and that this large disparity in language experience was tightly linked to differences in child outcomes. With few exceptions, the more parents talked to their children, the faster the children's vocabularies grew, and the higher the children's IQ test scores were at age 3 and later.

Scarr and Weinberg (1983) proposed that a child's genetic make-up shapes what they experience even though opportunities provided by different environments may be similar. When a baby is born its cerebral cortex is an associative tabula rasa. Most synapses between adjacent neurons develop as a consequence of experience over the first several years of life (Huttenlocher et al., 1998). Lab animal studies indicate that the amount of early experience translates directly into the amount of brain weight, glial cell to nerve cell ratio, amount of dendritic branching and level of synaptogensis (Neville & Bruner, 2001).

Once the hard-wiring is in place, however, the affluent child's brain circuitry is poised to learn while the child growing up in a poor family may end up with 50-70% fewer synaptic connections (Thompson, 1995). The rate of synaptogenesis drops off sharply after 4 or 5 years of age, which means that trying to play linguistic catch-up in later years would not work well

(Thompson, 1995). The 45 million words the affluent child hears on average before age 4 must produce a greater impact than the 13 million words the average child in welfare home experiences. Once the child establishes that words relate to things and have power, -once they begin to use language their social environment changes in response to that skill. For most children the greatest gains in language functioning are attained early in life, with the magnitude of change decreasing chronologically (Thompson, 1995).

Children raised in East European orphanages generally experience limited opportunities to use or hear language (Ames, 1997; Cermak, 1995; Federici, 1997). They are given few opportunities to make choices. Clothes and food are chosen for them by their caregivers (Hunt, 1998). Language stimulation is further reduced by high caregiver-to-child ratios, the absence of formal schooling, and the low education levels of the staff (Groza & Ileana, 1996; McKelvey, 1994; Sloutsky, 1997; Williams, 1998). Cermak, an occupational therapist from the United States, in 1995 described her experiences, in what was considered one of Romania's best orphanages. She writes:

> The children had no idea what toys were. They did not automatically play with toys or even reach out to touch them. When given a toy they would pull their hands back. The children were observed generally passively lying still or frequently seen rocking back and forth. The children did not "jabber" to each other and there was little interaction between them. (p. 502)

Hunt (1998) also reported similar experiences at the Moscow orphanage she observed. She writes, “Another notable feature of the baby house that confirmed patterns described by regular visitors was the extraordinary silence...even as a group of preschoolers was piling on their snow suits... there was barely a sound, either among the children or between them and the staff” (p. 65).

Dubrovina (1991) reported results of his Russian study that examined the language development of two-and-a-half year old children in a Russian orphanage. Results indicated that 60% of the children in the Dom rebyonka (Babies' Home, an orphanage for preschoolers) had no expressive language at all. Re-testing in the orphanages, one year later, showed that only 14% of these children used two-word sentences.

This lack of stimulation has been proposed to explain changes in the brain structures of several orphans adopted from Eastern European orphanages (Gauger, Lombardino & Leonard, 1997). Chugani, Behen, Nagy, Muzik, and Chugani (1998) used PET scans to examine the brains of eight children adopted from Romanian orphanages. All demonstrated abnormal findings in the anterosuperior temporal gyrus. Gauger et al. (1997), using MRI on eleven Eastern European adoptees with specific language impairment, found that all had smaller right hemispheres, smaller pars triangularis on the left, and a trend towards smaller plana on both sides. These areas all correspond to language centers in the brain. They proposed this explanation for the reduced size:

> If a child suffers from genetic and neurodevelopmental errors and comes from an environment that does not provide adequate linguistic enrichment, the risk of language disorder will be increased, because excess environmental stimulation will not be provided to encourage the developing fibers to find their proper synaptic targets. Fibers that fail to make appropriate connections during the critical period for language development would then die back, leaving the language structure decreased in size (p. 1281).

Studies of the cortical correlates of specific language impairment are in the early stages, and very little is known about the brains of children who display language impairments (Rice, 1997). Plante (1996) used MRI scans to examine perisylvan structures for asymmetries. The

research found in six of eight boys, ages 4 to 9 years with known language impairments, that unlike normal children (that typically show left larger than right structures), these children showed average-sized left perisylvan areas paired with atypically large right structures.

Predicting the effects of environment on the speech and language development of the internationally adopted children is complex. Language rich environments have been shown to positively influence language development. At 20 months, toddlers who had mothers rated as "talkative" produced over 100 more words in their vocabularies, and at two years of age, the gap widened to about 300 more words (Huttenlocher, Drummer & Wiley, 1998). Conversely, if language rich environments increase vocabulary development, then the question is: What is the impact on an infant's language development when experiencing a very restricted language environment due to caregiver neglect? Unfortunately, few controlled language research studies that utilize appropriately selected and tested children post-institutionally, have been completed. Even if there are critical periods of language learning for the child, they play out against a backdrop of individual differences in biological and environmental factors that must necessarily blur the effects of critical periods on individual children. It takes pronounced genetic or environmental deprivation for normal firing patterns to go off track (Bortfield & Whitehurst, 2001).

2.4.3. Communication problems in neglected children.

While information regarding the presence of physical abuse may be missing or inaccurate in the medical histories of those children adopted from Eastern European orphanages, there is evidence to suggest that most of the children suffered some degree of neglect during their time in the orphanage or children's hospital. Dr. Christian Tabacaru, Secretary of State of the Romanian Department of Child Protection, then head of the Romanian governmental department that oversees the Romanian orphanages, acknowledged the problem at a conference in Washington

DC entitled “Risk Factors for Children Adopted from Eastern Europe”, at Children’s Medical Hospital (1998). He cited recent Romanian studies that indicated that, on average, the Romanian child caregivers were able to spend less than 30 minutes per day with each individual child in the orphanage (Tabacaru, 1999). Research during the past two decades has provided increasing evidence of the negative effects of a maltreating environment on children’s language and communication development (Allen & Oliver, 1982; Bobkoff- Katz, 1992; Coster & Cicchetti, 1993; Culp et al., 1991; Hotz, 1997). Studies of the language development of children in the U.S. support the concept that caregiver neglect, comparable to that found in Eastern European orphanages, results in significant language delays in young children.

Research in this area often includes several forms of neglect and abuse including physical neglect, physical abuse, sexual abuse, emotional abuse, and/or combinations of the aforementioned. Given the population under consideration, this review will concentrate on those studies that investigate the effects of neglect on communication development.

In an attempt to delineate the specific roles played by neglect vs. abuse, a research design was proposed by Allen and Oliver (1982) to specifically investigate whether abuse, neglect, or their interaction, could predict the child’s performance on a standardized language test. Allen and Oliver examined the verbal and comprehension abilities of a group of preschool children who had been abused and/or neglected. Results indicated that child neglect significantly predicted poorer language abilities, whereas child abuse did not correlate. They postulated that the association between child neglect and language delays could be attributed to a general lack of stimulation.

Bousha and Twentyman (1984) compared 36 families divided into abusive, neglectful, and control families, looking at family interaction patterns. Results showed that mothers and children in the neglectful group interacted less frequently, and produced the least number of

maternal initiations. The authors concluded that the picture for the neglected child is one of a social environment with depressed amounts of verbal and nonverbal instructions, and fewer social interactions or initiations.

Building on Bousha and Twentyman's research, Crittenden (1988) described a series of studies comparing the mother/child interaction patterns in a group of neglecting, abusing, and adequate mothers. They found that abusing mothers were the most controlling of infant behavior, and neglecting mothers, the most unresponsive to their infants' signals. Neither abusive nor neglectful mothers' interaction patterns, although different, provided the support for building effective social or communicative skills. Neglecting mothers, in this sample, used fewer grammatical utterances and a higher proportion of directives. Similar interaction patterns were reportedly used by staff in Eastern European orphanages (Ames 1997; Groza, Ileana & Irwin,1997; Hunt, 1998; Sloutsky, 1997).

In addition to the types of language interaction patterns, research has attempted to describe the type and amount of language delay. A study by Fox, Long, and Langlois (1988) investigated the language comprehension abilities in a group of preschoolers who were labeled as: "abused, generally neglected, or severely neglected", versus a control group of non-maltreated preschoolers. The severely neglected group performed the poorest on measures of vocabulary and language comprehension. A consistent negative trend in performance was noted across the three experimental groups. The authors speculated that parental neglect leads to disruption of the interactive nature of parent-child relations. Receptive language skills were adversely affected by this lack of interaction. A more recent study by Culp et al. (1991) also produced findings that indicated that both the receptive and expressive language skills of neglected preschoolers were generally six to nine months delayed.

Coster, Gersten, Beeghly, and Cicchetti (1989) studied the language and discourse skills of 20 mothers and their maltreated toddlers (average age 31 months) in comparison to a matched control group of typical toddlers. Although the maltreated children were not sub-divided in the data analysis, the authors note that 75% had experienced neglect. Data from a semi-structured activity and a free play session with the mother and child were analyzed for language structure, intention, and discourse characteristics. The maltreated children were found to have lower Mean Length of Utterances (MLUs), less diversity of vocabulary, more repetitive and fewer informational utterances. These children used more fillers, talked less about their activities and internal states, talked more about the "here and now", and had difficulty sustaining discourse. Unlike the Fox et al. (1988) study, scores on vocabulary testing did not differentiate the two groups. Of note also, was the authors' conclusion that neglected children as young as 30 months demonstrated significant differences in language use in comparison to the control group (Coster et al., 1989).

In summary, these studies, highlighting the detrimental effects of neglect on children's language development, suggest that the differences in interaction and the social context in which early language development occurs do have consequences for subsequent communication development. These consequences appear to extend to all aspects of communicative development, at least during the early years. As reported earlier, researchers have found that neglected children present with a shorter MLU, a more limited vocabulary, fewer exchanges about feelings or their own activities, and shorter discourse sequences. Whether these patterns of language seen in infants and toddlers are maintained in older maltreated children or simply reflect a unique vulnerability during the early language development years is not known. Such longitudinal research studies are not yet available (Coster & Cicchetti, 1993).

Bobkoff-Katz (1992) concluded in her review of the literature on the relation between maltreatment and communication problems that "the results of selected studies suggest the presence of language problems, particularly the possibility of language difficulties in neglected children" (p.1). Coster and Cicchetti (1993) stated that while both abused and neglected children display language difficulties, their findings also reveal that, when abused and neglected children are compared, the neglected children display a more severe deficit.

Both Coster and Cicchetti (1993) and Bobkoff-Katz (1992) were quick to point out the limitations in the present body of research, affecting interpretation of the results. They suggested that the designs of many of these studies do not permit clear conclusions due to confusions about the source of the deficits, inconsistencies in the definitions, the unknown cumulative effect of continued rearing in non-optimal environments, and the uncertainty about whether the language difficulties reported were greater than might be expected given the children's general cognitive levels. There is currently no evidence within the child abuse literature to determine precisely what kind of abnormal language development these children exhibit, and if the language patterns are distinct from general performance deficits. Eastern European orphanage children who also experience periods of caregiver neglect and lack of stimulation, similar to the neglected children in the U.S. studies, might be predicted to show delays in language development.

2.4.4. Attachment and speech/language development.

Opportunities to study the role of extreme deprivations on the development of children have been exceedingly rare in the last three decades. One must look back as far as 1945 to find the first reports of what today has been defined in the DSM-IV (American Psychological Association,1994) as reactive attachment disorders. John Bowlby (1952), expanding upon earlier research, and influenced by his perceptions of the children in England during World War II bombings, continued to study the phenomena and coined the word 'attachment' to describe the

developing relationship between an infant and the person with whom he/she most frequently interacts.

Between six and nine months, infants begin to form selective attachments to consistent caregivers. These selective attachments affect the infant's emotional, behavioral, and cognitive processes. Children learn through these attachments about security, safety, and themselves. Once a child has established a secure place or base, he/she can begin to venture out in exploratory behaviors, returning to caregivers whenever feeling insecure (Doolittle, 1995).

Studies of normal child language suggest that a secure attachment with a consistent, warm, sensitive, and contingent parent-child interaction style is optimal for early child communication development (Clarke-Stewart, 1988). During such interactions, even before the onset of spoken language, the infant learns important cause-effect relationships between vocal signals and caregiver responses, as well as rudimentary pragmatic skills such as joint attention, turn-taking, and the exchange of different functional messages (Bates, Bretherton, Beeghey-Smith & McNew, 1982). The development of a secure attachment relationship with the caregiver is considered to be a central developmental issue in children between the ages of six and twelve months.

In 1946, Brodbeck and Irwin studied the speech behavior of 94 infants aged 0 to 6 months who were reared in a U.S. orphanage. Excellent medical attention was provided but there was "little personal attention in the way of being held, played with or spoken to" (p. 147). Their results showed the infants' speech development was significantly below that of a control group of noninstitutionalized infants, at all age levels, in both frequency and types of sounds (consonants and vowels) produced (Brodbeck & Irwin, 1946). Earlier attachment studies published by Rene Spitz (1945) and William Goldfarb (1943) also described the diminishing speech behaviors of children in foundling homes and orphanages.

In 1963, Provence and Lipton at the Yale Child Research Center wrote an early definitive work on institutionalization. In *Infants and Institutions*, they noted that institutionally raised infants had depressed language behaviors by the second month. The early signs of disturbance were diminished output, and lack of musical cooing or vocalizations.

Attachment theorists continue to draw their critics. One of the most well-known is Harvard psychologist Jerome Kagan. He criticized the idea that early experiences form any lasting psychological structure (Kagan et al., 1977) and cited several of his daycare studies of child development to prove this. In summary, although a secure attachment has been viewed as facilitative of optimal language development, the research findings on this question have been inconsistent (Bates et al., 1982; Coster & Cicchetti, 1993).

2.4.5. English as a Second Language (ESL).

As described earlier, children adopted from Eastern European countries reportedly have been exposed to significant malnutrition, neglect, abuse, lack of medical care, and limited sensory experiences in understaffed and underfunded orphanages. Any one of these factors would place them at high-risk, even for first language learning. Despite this, a surprising number of children according to parent surveys or developmental screenings acquire functional English speaking skills within six to twelve months in their new homes (Ames, 1997; Jenista, 1993; Pearson, 1997). A percentage of children, however, are also reported to have significant difficulties in their acquisition of the new language (Ames, 1997; Clauss & Baxter, 1998; Hough, 1999; Johnson, 1997). In 1985, Bohman and Sigvardsson in Sweden reported a detailed follow-up of 70 internationally adopted children, aged 18 to 27 years at the time of the study. About half of these individuals, now adults, felt that the schools had a false impression of their true language abilities because they had no accent, and used the body language and idioms of their adoptive families. They also reported significant difficulties in reading and writing in later life.

It has been widely observed that young children from immigrant families, unlike their parents, eventually speak the language of their new community with native-like fluency (Lightbown & Spada, 1993). One explanation for this difference is that as in first language acquisition, there is a critical learning period. According to this view, language learning that occurs after the critical period may not be based on the innate structures of the brain but rather on more general learning skills-- those skills used to learn other kinds of information. Researchers argue that these general learning abilities are not as successful in language learning as the more specific innate structures.

Cummins (1996) stated that proficiency in the first language is the best predictor of proficiency in the second language. Conclusions based on the research of Patkowski (1980) and Johnson and Newport (1989) indicated that it is clearly better to begin second language learning before puberty. Johnson and Newport studied 46 Chinese and Korean speakers who had learned English at different ages. All had been in the United States for at least three years. When they compared those speakers who had begun their intensive exposure in English between 3 to 15 years, against those beginning between ages 16-39 years, they found that before age fifteen and especially before age ten there were few individual differences in second language abilities. After age 16 substantial variations in speakers' abilities were noted. Mayberry (1994) cited in her review of the ESL literature that a number of research findings suggested that language acquisition in early life has very specific effects on language processing, effects that are readily apparent in later adulthood. Her research on deaf children learning a first or second language at a later than normal date found a robust predictive relationship between age of onset of language acquisition and its long range outcome.

Children adopted internationally present unique language learning experiences (Hene, 1987). Hene (1987) illustrates the differences between the language development of children

adopted internationally and native speaking children in first language acquisition as in Figure 1. Two key differences between children from international adoptions and other children in English as a Second Language (ESL) situations are that the adopted children are adopted at an early age (average age is now approximately 26 months) with limited exposure to their first language and rudimentary language skills, and secondly, that they are suddenly cut off from input in their native language and must restart their language learning. Rarely does the new family speak the child's native language (Jenista, 1993). The children enter a second language situation where they must learn a new language, usually without support in their native language. An immigrant child who arrives in the U.S. at an older age may only need to acquire a new word label in the second language (L2) for an already existing concept, while a child who does not yet understand the meaning of the concept in the first language (L1) has a very different and more difficult task to acquire the concept in L2 (Cummins, 1984).

Though there is presently no research data on the rate of loss of first language in an

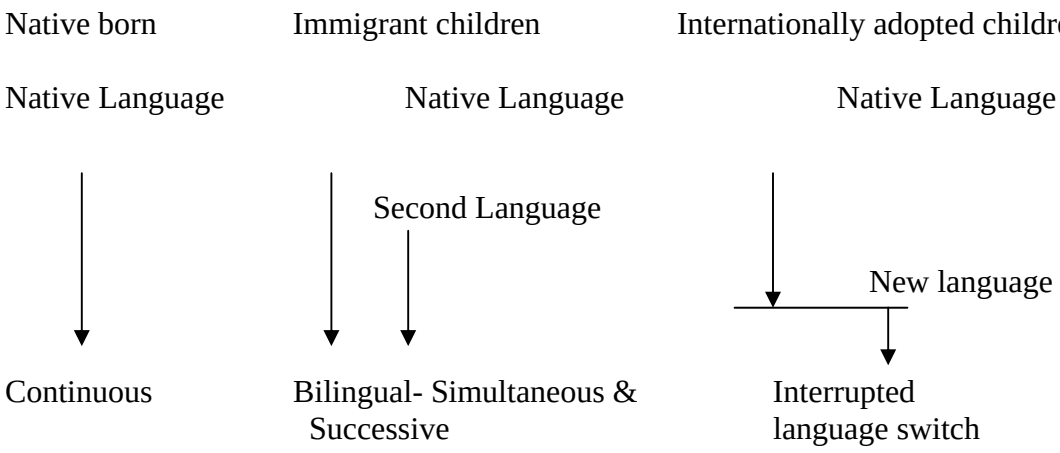

Figure 1 Differences between the language development of children adopted internationally and native-speaking children in first language acquisition

Note. Adapted from: Language development of Swedish-born, immigrant, and IA children by B. Hene, 1987, in De *utlandska adoptivbarnen och deras sprakutvechling.* Projektpresentation. SPRINS-rapport nr 41. Goteborg: Department of Swedish

internationally adopted child (Gindis, 2000b), clinical observations and anecdotal reports have indicated that for most internationally adopted children, the use of the first language seems to stop within the first three months (Gindis, 2000b; Masters, 1998). As the children seem to realize that the first language no longer serves any useful communicative function, it is extinguished rapidly, and English begins to replace it (LeChevalier, 1994). Gindis (2000b) concluded, "Among the factors that encourage rapid native language loss by children post-institutionally are: low level of language skills in the native language, no motivation to continue to use native language, no opportunity to practice native language, negative feelings about native language, and no practical support in the family or community environments" (p. 4). In Glennen and Master's 1999 survey data, only 2 of 127 internationally adopted children retained their native language three months after adoption. They also reported that according to parent report most children spoke more English than their native language within six months of adoption.

McLaughlin, Gesi, and Osani (1995) found in a review of the ESL research literature that success in learning a second language is defined by the degree of performance in the native language; that children transfer to the second language, the system of meaning and use that they already know from their first native language. For children adopted internationally with weak first language skills, as often displayed by many Eastern European orphanage children (Dubrovina, 1991; Sloutsky, 1997), language acquisition is more typically based on a subtractive model. The first language, or in this case, the lack of a first language, interferes with the ability to acquire the new language. As a result, when first language skills are delayed, one would predict language delays in both the native and second language use to occur.

Conversely, with no contact with their first language since their arrival, and immediate immersion in an entirely new language environment, one might predict an accelerated acquisition rate for adopted children. As noted earlier, it is not uncommon for adopted children

to lose completely all first language skills within the first few months in the new setting. A differential language assessment at this point becomes extremely difficult. Schiff-Myers (1992) discussed the "normal" second language phenomenon of *language loss*. She noted that loss of the first language can cause children to appear delayed on initial language tests when, in reality, the children have experienced a predictable language loss as a direct result of decreased exposure to their first language when they began attending school or arrived in their new homes. Unfortunately, the tempo of losing and replacing language often does not coincide. Losing language generally occurs much faster than mastering a new one (Gindis, 1997).

Because many limited English proficiency students with disabilities are being placed in bilingual education as an alternative to special education (Baca & Cervantes, 1991), the appropriate placement in the educational system has become an issue for internationally adopted children (Gindis, 2000a; Masters, 1998). Accurate assessment of cognitive and language skills may be difficult. Standardized tests often are inappropriate to use with multicultural children because these tools are culturally normed and biased, do not consider dialectal differences or idiomatic differences, and often result in the misdiagnosis of a learning disability (McLaughlin et al., 1995; Shoemaker, 1997). Therefore, if the child has a genuine language disorder rather than a lag in acquiring the new language, assessment may fail to correctly identify a 'disorder' rather than a 'delay' (Schiff-Myers, 1992).

One of the most hotly debated topics in psycholinguistics in the past decade has revolved around the issue of how language proficiency is related to academic achievement (Cummins, 1984). Considerable evidence has been assembled to show that cognitive and academic variables are strongly related to some measures of general language skills. It is generally believed that immigrating students over the age of six years, acquire proficiency in English within two years of arrival in their host country (Lightbown & Spada, 1993; Snow & Hoefnagel-Hohle, 1978).

Small scale studies of Russian immigrant students by Carlson in 1981 showed that these students required only about two years to achieve age-appropriate levels of English skills (cited in Wong-Fillmore, 1991). Cummins (1984) noted, however, that while conversational skills approach age norms, immigrant students over the age of six require at least five years to approach grade norms in their second language in cognitive/academic skills. Conceptual knowledge deficits may underlie the difficulties. Delays in the acquisition of reading skills, learning problems related to lack of instruction, and confusions due to a lack of appropriate translations from the native language are reported (Rosenberry-McKibben & Eicholtz, 1994; Schiff-Myers, 1992). Behavior problems associated with experiences of failure and cultural identity problems have also been noted (LeChevalier, 1994; Schiff-Myers, 1992).

Of critical importance then in assessing these children is the determination of the presence of a language/learning delay versus a true language disorder. It requires training and knowledge to distinguish a true language/ learning disability from the differences that are characteristic of a particular culture and language background, and from the fact that children from a foreign country would not to be expected to be proficient in a new language for some time, but will "catch-up" given more time.

In conclusion, Masters (1998) raised the question "Just how DO these post-institutionalized children learn English and when should they receive more than ESL services?" Information on the typical language acquisition pattern for these children does not exist (Masters, 1998). Jenista (1993) agreed. She stated, "Unfortunately, there is no research on how internationally adopted children develop language. And no one has studied the best way to approach language acquisition in that peculiar circumstance" (p. 34). The limited research that does exist focuses primarily on the product and not the process of language development.

2.5. Research on the Speech and Language Skills of Eastern European Adoptees

Scientific reports of the language skills of children adopted from Eastern Europe have been very sparse. Those few studies available have indicated significant delays in language acquisition. Willig (1995) described eight children, ages 4 months to eight years, adopted to the U.S. from Eastern European countries, who were given speech and language evaluations. The children had resided in the U.S. anywhere from two weeks to one year. Assessment tools varied widely, and none were standardized in either Russian or Romanian. Results of testing revealed that all eight children exhibited language delays. The follow-up evaluations of several of the children one to two years later, showed significant gains in their language skills, but continued wide discrepancies in their language abilities (more specific information was not provided). Willig also cautioned, "These children are too new to our American system for reliable studies of long term language effects to be available" (p. 4).

Two adoption clinics pooled their recent clinical findings of 120 orphans adopted to the U.S. from Eastern Europe (Johnson, 1997). Screening results indicated that 59% of the children demonstrated language delays. Like Willig, the author cautioned, "One can not assert, with any certainty, what percentage of these children have normal or abnormal language skills, and whether these capabilities will change over time" (p. 3).

Groza and Ileana (1996) reported data from a survey of parents of 475 children adopted from Romania to the United States between 1990 and 1993. The survey instrument probed the adopted child's history, development, family activities, social, and medical needs. The majority of the children (81%) were institutionalized prior to adoption, while 19% were adopted from families. Thirty percent of the parents reported delayed language skills. Factor analysis of the data supported the conclusion that children with delayed language skills, along with other developmental delays, were significantly more likely to come from institutions. The study did

not report the percentage of children adopted from orphanages alone that exhibited language problems. Groza also noted that the children were quite young at the time of the study. Over one-fourth were not yet school age, and 81% of the children who were school age were in special education classes. Speech and language difficulties may become more evident as the children get older.

McMullen and Fisher (1992) reported on the language development of 131 children adopted to British Columbia from Romania. They surveyed adoptive parents using a questionnaire based on the *Denver Developmental Screening Test* (Frankenburg et al., 1970). Although the data reported on the children's language status upon arrival to their new families were retrospective, it was notable that 100% of the parents reported language delays at the time of adoption, a finding that was predictable. However, although follow-up rescreening, by both parent report and professional testing, at a mean of 13 months post-adoption, showed significant speech and language progress, only 50% of the children adopted before age two were found to have age appropriate language skills, and <u>all</u> of the older children (those children adopted after age two years) were still language delayed. (Future studies are planned to determine if these trends continue.)

Glennen and Masters (2002) summarized data from parent surveys on 130 children adopted from Eastern Europe. Surveys were collected at 3-6 month intervals from the time of adoption until the child reached age 36-40 months. Surveys collected data on expressive vocabulary growth, mean length of the three longest utterances, and development of four bound morphemes. Results showed no significant correlation between pre-adoptive medical or developmental risk factors and later language development. Children adopted at younger ages (less than 12 months) had fully caught up to English norms by age 36-40 months. The authors stated that this indicated that children adopted before 12 months of age reached average English

standards within 2 years of adoption. Children adopted at later ages lagged behind, with the length of the delay related to the age at adoption. Though the majority of children are doing well, it should be noted that 36% were still considered delayed and at risk, while 13 % of the 36% elicited "significant" concerns.

2.5.1. Social competence and communication

The acquisition of communication skills is intricately intertwined with both social-emotional and cognitive development (Prizant et al., 1990; Rice, 1993; Rice et al., 1991). Language development is predicated on interaction with adults and peers (social bases of language), experiences with the objects and events in the environment (cognitive bases of language) and experiences with mature language learners (linguistic bases of language) (Lahey, 1992; Rees, 1979). Because language is the primary medium for social exchange, as well as one of the primary means through which schooling is accomplished, language difficulties have the potential to affect a wide range of developmental tasks, from establishing satisfactory peer relationships to acquiring basic literacy skills (Rice, 1993).

A number of researchers have reported that children post-institutionally have behavior difficulties that interfere with their social relationships (Ames et al., 1994; Federici, 1997; Marcovich et al., 1995; McGuinness, 1998; Rutter et al., 1999). The influence of pragmatic language difficulties is suggested as an underlying problem. Pragmatics refers to the social use of language and communication. Pragmatics has been defined as the "rules governing the uses of language in context" (Bates, 1976; Rees, 1979). Pragmatics encompasses an awareness of appropriate language in a situational context, and the ability to modify this language as necessary (Pena, 2000). Children with pragmatic difficulties have deficits in how they express intentions and often use unconventional means of communication. Rutter and his colleagues (1999) noted the use of unusual patterns of communications in a subgroup of their study of 165 Romanian

orphans. They described 11 of the children as having difficulties in friendship formation, social reciprocity, empathy for other people, and the use of eye gaze and gestures. In these same children, they also noted impaired language development and a lack of reciprocal conversation or "social chat".

Language is considered to be a primary mediator of social interaction and an inherent aspect of social development (Goldstein & Kaczmarek, 1992). Children with pragmatic difficulties may use aggression, tantrums, and even self-injury to demonstrate their desire to communicate (Donnellan, Mirenda, Mesaros & Fassbender, 1984). These same behaviors have been reported in adopted children post-institutionally (Federici, 1997; Groza & Ileana, 1996). Language is a shared social system with rules for correct use in given contexts. The knowledge of these rules and the ability to apply them are what Hymes (1971) referred to as "communicative competence."

2.6. Early pragmatic skill development.

Pragmatics is believed to be one of the first organizing principles for the development of language (Roth & Spekman, 1984). Social interactions and communication involve developmental pragmatic skills that typically emerge during infancy (Prizant et al., 1990). Some researchers believe that pragmatic functioning follows a developmental progression (Bates, 1976; Denckla, 1996) that begins right from birth. The continuing maturation of pragmatic social skills has been viewed as related to myelination of the frontal cortex, as well as with changes in behaviors.

Long before an infant utters his or her first words, communicative language has begun to be used. Bates (1976) suggested a progression of language function in the development of the intent to communicate. The first stage, which was named the perlocutionary stage, begins at

birth, and lasts until approximately eight months of age. In this stage, the infants' sounds are primarily reflexive, with the caregivers reacting to and interpreting the infants' utterances as having particular meanings. Around nine or ten months of age the baby begins to consistently use a number of nonverbal behaviors that carry a deliberate intent to communicate. Bates (1976) labeled this emerging period as the illocutionary stage. Now the baby uses nonverbal behaviors such as smiling, pointing, or crying to direct the adult to do something (proto-imperative) or attend to something (proto-declarative).

Between 11 and 13 months the next stage emerges with the use of recognizable single words to communicate those intentions previously expressed nonverbally. Many different researchers have ascribed a variety of interpretations to this beginning linguistic stage. Bates (1976) names it the "locutionary stage," Dore (1974) applies a "speech-acts" framework, and Greenfield and Smith (1976) use the term "performatives" to refer to the abilities of the child to use language to express a variety of meanings. Regardless of the terminology used, the social or pragmatic aspect of communication deals with the intentions of the speaker, the relation of utterances to contexts, and conversational skills.

Halliday (1975) also described pragmatic "functions" that emerge at an early age. Phase I functions begin to emerge from 10 months to about 18 months. Examples of these functions include:

- *instrumental* -(I want) used to satisfy the child's needs,
- *regulatory*- (do as I say) used to control the behavior of others,
- *personal*-(here I come) used to express personal opinions or feelings, and
- *heuristic*- (tell me- to obtain information).

Halliday reported that most of these functions are fully developed by age 2 years. Given the above information, one can conclude that the development and the structure of pragmatic language abilities are intimately involved with early developmental history.

2.6.1. Later developing pragmatic skills.

For the older child, pragmatics involves the child's abilities to initiate and maintain conversations, to take conversational turns, to produce messages that can be understood, to move from one topic to another in conversation, and to adjust one's speech to the listener (often referred to as discourse skills). By age four, children demonstrate abilities to stay on topic (Shatz, 1978) and use "contingent queries" to keep the conversation going (Garvey, 1975). Numerous researchers have studied the young preschool child's abilities to adapt to the needs of their listeners (Garvey, 1975; Rollins, 1999; Roth 1984; Shatz, 1978). Shatz (1978) reported that children at age four spoke in shorter, simplified patterns to two-year-olds, and used longer, more conversational patterns with adults. Ervin-Tripp's (1977) discussion points out that indirect comments are particularly susceptible to social factors. Often the choice of appropriate words and interpretation by the listener follow unconscious and automatic social or cultural rules. For example, the English sentences, "Do you have the time?" or "Why don't you sit down?" follow the unspoken rules that it is impolite to use direct imperatives with a stranger and that their noncompliance is acceptable. Children often acquire routinized indirectives early on as automatic polite forms, while broad hints like "Is your arm broken?" to the child whose parent is carrying in groceries or "Are you deaf?" as the telephone rings are often misunderstood.

After the age of five years, pragmatic functioning also encompasses a construct called executive functioning. There is a set of activities that most researchers refer to under the term of executive function. The set may be narrowly or broadly defined but does have recognizable outlines (Eslinger, 1996; Hayes, Gifford, & Ruckstuhl, 1996). It includes "self -regulation," "set-

maintenance," "selective inhibition of verbal and nonverbal responses," "cognitive flexibility," "planning," "setting priorities," and "organization." Problem solving and abstract reasoning are often referred to as aspects of executive function (Fletcher et al., 1996; Levin et al., 1996). For language development, intact executive function is thought to be necessary to develop linguistic competence. A tacit knowledge of language as a moderator, an understanding of the rules of grammar, and the comparing of previous information with stored information to ascertain its veracity is necessary. The ability to modify an utterance according to the perceived needs of the listener, often called code switching, is an important aspect of this type of pragmatic functioning (Beukelman & Mirenda, 1992; Barkley, 1996). The relationship between language, and the ability to utilize cognitive controls for problem solving and coping with frustrations, warrants careful investigation.

2.6.2. Impact of institutionalization on pragmatic skills

For infants reared in orphanages with high caregiver rates and strict schedules, it can be predicted that the development of these pragmatic behaviors may not follow the typical progression. Feedings are not given on demand, a baby's cries may be responded to at later times, and choices are often not available. Because children learn the language of their community in a social context, it seems obvious that their early utterances will somehow be constrained or shaped by that context (Rees, 1979; Rollins, 1999). This may be one explanation of the reports of "eerily" quiet orphanages (Cermak, 1995; Hunt, 1998). Bruner's (1977) deixis model also supports this reasoning. He states that the infants' early involvement with the caregiver in joint action and attention activities provides the framework for the development of a conceptual structure for language. Especially critical are shared experiences in which the child acts as a participant rather than as an observer.

Children learn language in context and a crucial component of that learning experience is dialogue. Slobin (1973) stated:

> Communicative interaction is considered not only as the context of language learning but as the very source of language learning. It has been recorded that children learn only the language that is spoken to them, even when they have regular opportunities to hear adults converse together in another language. Apparently a language system will not be attended to unless it plays a role in meaningful interaction in the child's life. (p. 145)

Early nonverbal interchanges between a child and the caregiver form the foundation for later conversational abilities (Linder, 1993). Pragmatics includes recognizing that an utterance has been directed to one's self, and that the communication can be maintained by responding to it. The ability to exchange comments reciprocally usually begins within the second year of the infant's life. This may be difficult to accomplish in E.E. orphanages in light of the recent Romanian studies that indicated that, on average, the Romanian child caregivers were able to spend less than 30 minutes per day with each individual child in the orphanage (Tabacaru, 1999).

Assessment of these pragmatic skills utilizes tasks that determine the extent to which children possess the range of communication functions within the various earlier cited taxonomies (Craig & Washington, 1993), and that assess the child's ability to select an appropriate language form. Existing knowledge or previous experiences are believed to play an integral role in the child's selection of language forms used to accomplish particular functions. Rees (1979) concluded that a "child's early experiences in child-adult interactions not only provide for the development of the communicative habit and the establishment of social roles, but also actually supply the ingredients for the development of semantic-syntactic relations as these are realized in the language of the child's community" (p.238). Further studies of

institutionalized children are needed to better understand the nature, source, and consequences of the pragmatic communication difficulties that are reported in the literature.

2.6.3. Reading; Oral Language and its Relation to Reading Difficulties

Recent research has addressed the co-occurrence of language and reading problems in children. McArthur, Hogben, Edwards, Heath, and Mengler (2000) found that 55% of 110 children classified as reading impaired also had an oral language problem, while 51% of 102 children classified as having Specific Language Impairment (SLI) had a reading disability. Using a twin study design, Bishop, North, and Donlan (1995) reported on the language and literacy skills of a group of twins with Specific Language Impairment. The twins with Specific Language Impairment had significantly lower literacy scores than controls. These studies raise the possibility that language impairment and reading impairment may not actually be separate disorders, but rather both disorders may share some common core elements that influence their co-occurrence in many individuals. Several longitudinal studies demonstrate that many individuals whose early oral language difficulties appear to resolve remain at risk for later language-based deficits in phonological processing, and literacy, (Lomardino, Riccio, Hynd, & Pinheiro,1997; Scarborough & Dobrich, 1990; Snowling, Bishop, & Stothard, 2000). Stothard, Snowling, Bishop, Chipchase, and Kaplan (1998) found that children whose oral language problems had been resolved by age five continued to perform well as adolescents in the area of language comprehension, however, they evidenced problems in phonological processing and literacy skills. Those children who continued to have significant language problems at age five continued to have both oral and written language problems as adolescents. Lomardino, Riccio, Hynd and Pinheiro (1997) suggest that phonological processing is the core deficit in children with developmental reading disorders.

A number of studies also have documented that young children with language impairments are at increased risk of demonstrating later reading disabilities (Aram & Hall, 1989; Catts, 1993; Catts, Fey, Tomblin, & Zhang, 2002; Paul, Murray, Clancy, & Andrews, 1997). Aram and Hall (1989) reported, after an extensive review of studies published between 1965 and 1987 that approximately 40% to 100% of preschool children with speech and language problems, continued to have oral language problems during the school-age years, and that 50% to 75% were reported having reading and other academic difficulties. Scarborough (1990) reported that children who demonstrated poor syntactic skills and phonological production at 30 months of age were later identified as poor readers. In a large prospective longitudinal study, Tallal, Allard, Miller, and Curtiss (1997) annually assessed the language and emerging academic skills of 100 language impaired children and their age-matched controls from age four to age nine. The language impaired children showed marked deficits in spelling, decoding, reading vocabulary, and reading comprehension as compared to the controls, with the gap between groups widening over time.

2.7. Long-Term Effects of Institutionalization on Language Development

Early scientific reports in the 1940's and 1950's of infants and young children reared in orphanages clearly described the progressive developmental deterioration associated with institutional placement (Brodbeck & Irwin, 1946; Frank, Klass, Earls, & Eisenburg, 1996; Goldfarb, 1943; Provence & Lipton, 1963; Spitz, 1945). Few recent studies have investigated the long-term effects of institutionalization on child language development. Tizard (1991) summarized her work in this area, in London, throughout the 1960's and 1970's. Variables in language development among children raised in 22 different nurseries were dependent on the staff-to-child ratios, and the quality of the staff's verbal response to individual children. Two-

year-old children in well-staffed English institutions were found to be delayed, with particular deficits in language, compared with low-income, home-reared children (Tizard & Joseph, 1970). In those institutions where the staff was occupied by housekeeping and interactions with the children were minimized, the most significant delays were found. Deficits in verbal skills and associated academic delays in reading seemed to persist into school age and adolescence (Frank et al., 1996; Tizard, Cooperman, Joseph & Tizard, 1972).

Kim, Hong, and Kim (1979) conducted a study of 21 Korean children adopted to the United States after the age of three years. They reported that behavior problems were present in 16 of the children, and learning difficulties in 17 of the 21. Their results indicated a different pattern than Kim (1977) found in an earlier study of 406 Korean adoptees between the ages of 12 and 17 years, who had lived in the United States for at least one year. For those Korean children adopted after age six, general academic performance was rated by their parents as "at least average," even though the children were about one and a half grades behind for their chronological age (a fact that Kim attributed to problems with the English language). Those Korean children adopted before age one were rated as "better than average."

Unlike the Korean children who were adopted primarily from foster care settings (Jenista, 1999) in the 1970's, the recent data shows that internationally adopted children are coming from orphanages in developing nations (Frank et al., 1996). According to the U.S. National Adoption Information Clearinghouse, since 1997, over 70% of the internationally adopted children have come from four countries: Russia, China, Ukraine, and Korea.

A long-term outcome study in 2002, by British Columbia researchers LeMare and colleagues, studied two groups of children adopted from the Romanian orphanages as compared to a Canadian-born group matched for sex, age and demographics. Group 1 was comprised of early-adopted children who spent less than 4 months in the institutions (N=29). Group 2 was

comprised of children adopted between 8 and 68 months who had spent at least 8 months in an institution (N=46). Children were evaluated at 11 months post- adoption, at 4 yrs, 5 mths. of age (N=43) and at 10 yrs,.5 mths. of age (N=42). Findings showed that at 4years, 5 mths. of age, the early adopted children were indistinguishable from the normal controls except on IQ. At 10 yrs., 5 mths., when compared to normal controls and to the early adopted children, the later adopted Romanian orphans had lower IQ scores, lower school achievement scores, more attention difficulties, and were more likely to have failed or been retained a grade (See Table 2).

Notably, 29% of the older adoptees had a clinical diagnosis of ADD/ADHD (LeMare, Audet, Kurytnik, Fernyhough & Warfiord, 2002).

Scandinavian outcome studies reported that children adopted from foreign countries after the age of two tended to have deficiencies in their vocabulary, and difficulties with writing, when they entered school (Dalen, 2001;Bohman & Sigvardsson, 1985; Gabby, 1998; Hoksbergen,

Table 2 Le Mare et al.'s research findings.

	Romanian orphans > 8 months institution	Early Adoptees, < 4 months institution	Canadian born
IQ	85	99	108
Spelling	88	95	102
Math	82	94	100
Word Identification	88	99	106
Comprehension	79	93	102
Grade retention	12%	<1%	0%

1995; Hoksbergen, 1997). A series of studies in Sweden, begun in 1971, looked at 207 children adopted from foreign countries at various ages (Bohman & Sigvardsson, 1985). Almost one half of the children had some language deficit. The children were at greater risk if they were

adopted after age 18 months, were of unknown age, had lived in an institution in the first two years of life, had physical illness at arrival, or had other diagnosed behavioral problems. The language difficulties cited included gaps in basic vocabulary, difficulty listening to and understanding speech, and trouble writing ideas (Bohman & Sigvardsson, 1985).

A similar study in Norway found that one third of the adopted children (50% of the children adopted after age 2 years) had language problems. Saetersdal and Dalen (1987) studied the social and academic problems of 182 children adopted to Norway, who came primarily from Vietnam. The authors stated:

> Gradually, the adoptive parents and teachers became aware that even though the children had a good command of the spoken language, they still lacked a deeper understanding of many everyday words and expressions. These language problems seemed to be qualitatively different from dyslexic problems of Norwegian-born children. The difficulties were not generally discovered until later years, when a greater degree of abstract thinking was demanded. As they progressed through the school system, their learning difficulties became more and more apparent. Though many children did well in their early years, gradually, they began to do poorly academically, as the information became more theoretical. (p.43)

Why were the parents and teachers unaware of the adopted children's language problems at an earlier stage? Dalen speculated that perhaps they were taken in by the rapid language learning of these children. These children had the facade of language -they used accent-free pronunciations, and could respond appropriately in ordinary conversational situations. Parents also had problems getting people to recognize their adopted children's particular difficulties, precisely because they functioned so well in their everyday language usage. Saetersdal and Dalen

concluded, “we know too little about what it means for a child’s cognitive development to have his or her first language drastically cut off” (p. 48).

A second study by Dalen (2001b) examined a sample of 193 children adopted from Columbia and Korea who were matched with Norwegian-born children and tested for school competence. As a group, the adopted children had significantly lower school performances, especially in the ability to use language at a higher cognitive level. Country of origin contributed significantly (Colombian < Norwegian<Korean), but age of adoption did not explain much of the variance.

Hoksbergen (1997) reported on a national Dutch research project that looked at the frequency and causes for disruption of the adoption and subsequent residential placement of internationally adopted children between the years of 1984-86. They identified 349 out of 8291 internationally adopted children who were referred for later placement in residential institutions. This rate was five times the rate for Dutch-born non-adopted children. The older the adopted child was upon arrival into the adoptive family, the greater the likelihood of later placement in residential institutions. When the child was two years of age or older upon arrival, and had lived primarily in institutions pre-adoption, a higher incidence of interpersonal, emotional problems, and a more complicated educational process were noted.

DeGeer, in a 1992 English translation described a study by Gardell completed in Sweden in 1979. Gardell studied 207 children internationally adopted who were between 10-18 years and who had lived in Sweden for at least five years. The results of his investigation were that 47% of the children had language deficiencies. According to Gardell, these language deficiencies appeared “only when the child is in the higher grades when new demands are placed of their language command. The deficiencies are mainly of three types: unexpected gaps in comprehension of basic words, poor listening and understanding of teacher lectures, and writing

difficulties in sentence composition and word inflection. In the younger grades, children have a seemingly perfect verbal language and deficiencies are covered by a "quick speech stream" (p 23). DeGeer argued that the language problem appears similar to that presented by Cummins (1979). Cummins argues that there are two constituents of language proficiency. One constituent is basic interpersonal skills (BICS), which concerns basic vocabulary; oral fluency as used in every day concrete situations. The other constituent, cognitive/academic language proficiency, represents a more abstract language use of which refined grammatical rules, synonyms, and idioms are examples. DeGeer concluded that "as with immigrant children or Swedish children with language problems, it is probably the same mechanisms that are disturbed"(p 23).

Conversely, American studies as reported in the *ASHA Leader*. Letters to the Editor, published March 19, 2002, by Pollock, Price, Robert, Krakow, Wang, and Glennen stated:

> Preliminary results from our own more recent studies of children adopted from China and Eastern Europe as infants and toddlers indicate that despite initial delays, the long range outcome (two years or more post-adoption) is quite good, and the percentage of children with persistent speech and language disorders is fairly small". (See references at www. professional.asha.org/news/ltr2031bcfm). Interestingly a substantial number of children are excelling in language. In the early years post- adoption we also have observed considerable variation in language progress, with some children showing significant delays that require intervention. However, it appears that most will not have long-term problems learning the English language and in fact may excel in this area. (p. 31)

This statement raised significant concern in the international adoption community. Gindis (2003) writes, "72 of Glennen's 130 participants (Russian adoptees) were adopted under age 12 months. Due to the age of her cohort, her perspective is rather pragmatic (e.g. articulation,

fluency, and communicative qualities) characteristics of the language mastery, not functions of the language as cognitive tool and as regulator of behavior. We know from experience and some limited research that communicative qualities of language in international adoptees do not always transfer into cognitive/academic aspects of the language use. Further, two years old as a span, does not represent a long-term outcome. My experience is with children who are school-age internationally adopted, and I can certify that language disorders, impairments, and delays are the "standard features" in many of them (Personal communication, September 2003).

A second concern with this letter was that the data combined five studies-three of children from Chinese orphanages and two studies of children from Eastern European orphanages. In a later publication Pollock acknowledged that the findings regarding Eastern European children may not apply to Chinese children who may have better health and orphanage conditions. She writes, "Russian orphanages have numerous risk factors for development of specific language disorder, fetal alcohol exposure, low gestational birthweight, maternal smoking, and chronic otitis media to name a few. I believe that there are vast differences between children coming from China and those coming from Eastern Europe. The overwhelming majority of children in Chinese orphanages are girls representing a complex socio-cultural and political situation rather than health or poverty issues" (Pollock & Price, 2003, p. 31).

Finally, a recent study was conducted recently by psychologist Seth Pollak and colleagues at the University of Madison-Wisconsin. The team examined 24 children, ages 5 to 6 years, who spent the first 7 to 41 months of their lives in Russian or Romanian orphanages. Following a battery of tests, they concluded that although the children performed well on memory tasks involving vision, they had much more difficulty remembering tasks for verbal information (Pollak, 2003).

2.8. Summary of the Literature

There are a number of methodological constraints inherent in studying this population. Information about residential maltreatment and other parameters of orphanage care is only available in autobiographic materials and personal interviews. Despite these limitations the available data from all sources consistently has indicated that the majority of children adopted from Eastern European orphanages present with multiple medical, developmental and psychological needs. Studies across a number of different domains and countries have supported the findings of the negative effects of institutionalization and lend credence to the concern for the overall development, and especially the speech-language development, of these children.

2.8.1. Overall developmental concerns.

Frank et al. (1996) concluded, "the developmental delays described in children adopted from Eastern European orphanages are as profound as those described in American orphanages before World War II " (p. 572). The medical factors that place the children adopted from Eastern European orphanages at risk for developmental disabilities have been well documented in the literature. Studies by Albers et al. (1997), Galler and Ross (1998), Hersh et al. (1991), Johnson et al. (1992), Johnson (1997), and Paquet et al.(1993) cited medical factors that included poor prenatal, natal, and postnatal care, prematurity, toxic substance exposure, ear infections, malnutrition, and high incidence of infectious diseases. Johnson reported that most adopted children made tremendous physical gains in growth and head circumference during the first two years with their adoptive parents (Johnson, 1997; Johnson et al., 1996). However, it is not yet known how many improve to age-level expectations.

Very few studies are available that have evaluated the motor skills of these children post-institutionally. The studies of both gross motor and fine motor development by Sweeney and

Bascom (1995) indicated initial significant delays, but these delays appeared to diminish for the majority of the children over time.

The number of studies investigating the sensory processing abilities of children adopted from Eastern European orphanages is also very small. Two studies, Cermak and Daunhauer (1997) and Haradon et al. (1994), reported abnormal sensory processing abilities in children adopted from Eastern European orphanages, including both hyper- and hypo- reactive responses to stimulation.

In contrast, behavioral issues have been better documented than those discribing sensory and motor development. There were a number of studies available that looked at the behavioral difficulties present in these children (Ames et al., 1994; Chisholm et al., 1995; Groza & Ileana, 1996; Marcovich et al., 1995). The results point to significant behavioral problems including: indiscriminate friendliness, attachment difficulties, stereotypic behaviors, and behavior regulation difficulties. Difficulties with peer relations and social skills were noted in a number of studies (Groza & Ileana, 1996; McGuinness, 1998; Rutter et al., 1998).

The conclusions to be drawn regarding cognitive development results are not as clear. A percentage of the children do lag behind, but the overall impression is that more than half of the children performed more or less at the same level as their non-adopted peers (Hoksbergen, 1995). In the few reports available on Romanian orphans, several researchers reported IQ test results within the normal range (Benoit et al., 1996; Rutter et al., 1998), while others (Kaler & Freeman, 1994; McMullen & Fisher, 1992) found IQs that were low normal and below normal. One study reported rapid cognitive gains initially, but a leveling off by age six years to low normal (O'Connor et al., 1998). Studies of Russian orphans are not yet available.

2.8.2. Effects of Length of Institutionalization.

The effects of length of institutionalization on development were also examined, with the majority of authors (Ames et al.,1992; Groza, 1995; Benoit et al., 1996; Macovei, 1986; Marcovich et al.,1995; Rutter et al., 1998) concluding that length of time in the institution was directly related to the presence of deficits. The longer a child remained in the institution the higher the incidence of language difficulties, medical growth retardation, physical delays, cognitive delays, and decreased motor skills (Groza & Ileana, 1996). Whether there is a correlation between the length of institutional stay and the level of severity of the developmental delays has not been established.

2.8.3. Speech and language issues

Although specific types of language difficulties have not been investigated, earlier studies on institutionalization have demonstrated that speech and language skills are particularly sensitive to deprivation (Brodbeck & Irwin, 1945; Goldfarb, 1943; Groza & Ileana, 1996; Helm & Frank, 1997; Johnson, 1997; Johnson et al., 1996; Provence & Lipton; 1963; Tizard et al., 1972; Willig, 1996). The children, on arrival to the United States from Eastern European orphanages, immediately experience language challenges. Upon arrival the children face a new language, food, climate, and living conditions totally unlike the ones to which they were accustomed. Previously, in the orphanages, most of the children reportedly had had minimal exposure to the sounds of their own language because interaction and attachment to caregivers was discouraged (Ames, 1990; Cermak & Daunhauer, 1997; Hunt, 1998; Macovei, 1986; Tabacaru, 1999). It is also improbable that the children were exposed to the sounds of English during orphanage residence. As noted earlier, the children had few opportunities to use language to make choices or express their needs in the orphanage (Cermak, 1995; Groza et al., 1997; Hunt, 1998); there were few careworkers and many children. Once adopted, the children were suddenly in a situation where the entire language- not only the words, but the gestures, sounds,

cadence, pitch, and prosody- were very different from that which they were used to seeing, hearing or speaking. For most of these children there was no one familiar with their native language from whom to obtain help.

Research in this area has been limited and methodological issues are evident. There have been no studies reported on the specific types of language deficits that are found in an orphanage population, or on the severity levels of the deficits. Some studies did not use standardized instruments (Brodbeck & Irwin, 1946; Provence & Lipton, 1963), or used small sample sizes (Goldfarb, 1943; Willig, 1996). Other studies drew conclusions based on orphanages with a relative sufficiency of resources. For example, Bohman and Sigvardsson's 1985 study reported infant to caregiver ratios of three to one, and in the studies by Tizard and colleagues (Tizard, 1991,Tizard et al., 1972, Tizard & Joseph 1970), though the caregiver ratios were not as small (8:1) as in Bohman and Sigvardsson's study, the basic nutrition, medical services, and shelter were adequate. These conditions are in stark contrast to the environments reported in Eastern European orphanages.

Research on caregiver neglect confirms the association between lack of early stimulation experiences and poor language development. The majority of studies of caregiver neglect were notable for their findings of delayed language given a lack of caregiver-child interaction (Bousha & Twentyman, 1984; Fox et al., 1988). However, the studies also did not identify specific language difficulties and were conducted with non-adopted American children. Whether the same pattern is evident in children adopted from Eastern European orphanages has not been substantiated. Likewise, the fundamental relationship between attachment and language development remains unclear for both typically developing children, as well as children post-institutionally.

Studies on English as a second language have contributed valuable information to our understanding of the language learning process experienced by the Eastern European adoptees, but fail to account for the absence of a poor first language foundation due to limited environmental exposure or other deprivational conditions in the orphanages, and the lack of support in the native language upon adoption. For example, it has been found that children from immigrant families, who have developed first language skills, usually acquire the second language faster and easier (Cummins, 1996). In fact, immigrant children show peer-appropriate second language conversational skills within about two years of arrival. For orphanage children the reverse may also to be true. Based on reports of language functioning both in their native country orphanages (Dubrovina, 1991; Kaler & Freeman, 1994; Sloutsky, 1997) and on language screening at time of adoption, the majority of post-institutionalized children (Groza & Ileana, 1996; Johnson, 1996; Rutter et al., 1998) have weak first language skills. They appear not as able as immigrant students to apply the information learned about their first language to support the acquisition of their new language (Gindis, 1997).

3. STATEMENT OF THE PROBLEM

The majority of recent research studies appear to support the premise that many of the children adopted from Eastern European countries have speech and language problems, but many questions remain to be answered. Methodological problems were present. Of the existing studies, only one study (Willig, 1995) provided in-depth speech and language assessment of the children. Other studies (Hough, 1996; Glennen & Masters, 2002) relied on screening instruments or parent report alone to reach their conclusions. Yet, other studies (Pollock et al., 2002) combined results of children from several different countries.

Willig's study (1995) was a useful preliminary investigation, but the number of participants was small (8), the age range of the children was wide (4 months to 9 years), and the assessment instruments were not consistent across participants. Further, the study, which used no control group, did not report on factors of syntax errors, auditory processing abilities, pragmatics, or vocabulary levels. No study is presently available that provides information on the types of speech and language deficits that are found in this population, patterns of language acquisition or the severity levels of the deficits.

Other studies such as Groza and Ileana (1996) reported survey results in which standardized measures of speech and language were not used. Conclusions were based on the parents' abilities to rate their children's speech and language abilities without operationally defining these terms. The report by Helm and Frank (1997) was descriptive in nature, and was based on a two-subject case study, and Johnson et al. (1996) used results from the *Denver Developmental Screening Test* (Frankenburg et al., 1970) rather than diagnostic speech and language assessments to determine the presence of a speech and language deficit.

When discussing the language skills of post-institutional children, one cannot assert with any certainty what percentage of these children have abnormal language skills, and whether these capabilities change over time (Johnson, 1997). We do not yet have a clear picture of the risk factors affecting the long-term language development of these children. Perhaps there are factors such as age at adoption, length of time in the orphanage, attachment status, and age at placement in the orphanage that predict which children will or will not have future speech and language difficulties. The relationship between language development and such risk factors have not been studied. The specific language areas and/or structures that are impacted have not been explored, nor has the impact of poor language skills on social competence been examined. Do delays remediate with exposure to the natural environment? Is intervention warranted and within what time period should intervention be expected to occur? Finally, we do not yet know what the long-term effects of institutionalization on speech and language development are.

In summary, few research studies exist on the speech and language development of school-aged children adopted from Eastern European orphanages. What little data are available from other countries suggest that these children's language skills may be more delayed than those of their non-institutionalized peers (Dalen, 2002; Dubrovina, 1991; Kaler & Freeman, 1994; Sloutsky, 1997). Anecdotal evidence in parents' and teachers' reports corroborates this impression. Language difficulties may compromise the adopted child's abilities to understand, negotiate, and adjust to a new family and environment.

The present research expands our understanding of the impact of institutionalization on the language and pragmatic functioning of school-aged post-institutionalized children by assessing most of the basic aspects of language including pragmatic processes and language learning capabilities and determining whether factors relating to institutionalization predict their language abilities. Presently, there are no empirical data available that address these issues.

The specific research questions for this study were:

Question # 1: What specific types of language difficulties (semantic, syntactic, morphological, pragmatic, expressive language, receptive language, and reading) are present in school-aged children adopted from Eastern European orphanages (EEA-PI)?

(A): Are the semantic levels of EEA-PI children consistent with age expectations?

(B): Is the acquisition of the syntactic forms of English consistent with age expectations?

(C): Is the acquisition of morphological forms of English consistent with age expectations?

(D): Are pragmatic communication behaviors "at-risk" for this population?

(E): Are the expressive language levels of EEA-PI children consistent with age expectations?

(F): Are the receptive language levels of EEA-PI children consistent with age expectations?

(G): Are the overall language levels of EEA-PI children consistent with age expectations?

(H): Are the literacy levels of EEA-PI children consistent with age expectations?

Question #2: Are the adopted children's abilities to acquire new vocabulary commensurate with age expectations?

Question # 3: What factors predict the language development of EEA-PI children?

(A): Is there a relationship between age level competence in language acquisition and age at placement in the orphanage? (Note: If the majority of the children were placed in the orphanage at birth there will not be enough data to determine this.)

(B): Is there a relationship between age level competence in language acquisition and length of time in the orphanage?

(C): Is there a relationship between age level competence in language acquisition and age of first exposure to English?

(D): Is there a relationship between age level competence in language acquisition and the time the child has spent in the USA?

(E): Is there a relationship between age level competence in language acquisition and the gender of the child?

(F.): Is there a relationship between age level competence in language acquisition and the reception of speech therapy services?

Despite the number of challenges in designing studies to assess the nature of these children's speech and language difficulties, one can remain optimistic. These adopted children have experienced language learning environments that are unique, and studies of their abilities may answer important questions about early language learning or the effect of institutionalization on language development by determining what factors of early institutionalization predict language development. The importance of the questions and the answers should not be underestimated. The information can have a direct influence on the selection of appropriate assessment measures and language objectives for these children and other children experiencing neglect in our country.

4. METHODOLOGY

4.1. Participants

A group of 44 children adopted from Eastern European orphanages, ages 6 to 12 years, participated in this study. This age range was chosen because of reports that language difficulties persist well into this age range and long after they can be attributed to bilingual or adjustment issues (Gindis, 2000b; McGuinness, 1999). To be included in the study, children had to meet the following criteria: Eastern European country of adoption, non-verbal IQ in the range of low average or above, vision within normal limits with correction, and hearing abilities within normal limits. Children with physical disabilities were not eligible. Children must have spent the majority (at least 50%) of their pre-adoptive lives in an institution and have resided with their adoptive families for a minimum of two years.

4.1.1. Recruitment.

The participants for this study were drawn from a combination of referral sources. This included two pediatric practices that specialized in international adoption medicine, two local adoption agencies specializing in international adoptions, and one local and two national parent support groups. In order to insure confidentiality, the adoption agencies were asked to send a mailing to the parents of all children appearing to meet the study's criteria. The mailing included a self-addressed card that contained information about contacting the researcher in order to participate. Pediatric practices posted flyers in waiting rooms, and parent support groups included information about the study in their newsletters and on their web sites. Volunteering parents were mailed a brief description of the study, along with consent forms, and a copy of the *International Adoption Speech and Language Survey.* Following return of the *International*

Adoption Speech and Language Survey, parents/children whose demographic data met the criteria for the study were contacted to complete the study.

Because the children were recruited through waiting room flyers, the Internet, and newsletters, it is difficult to determine the number and characteristics of those families who heard about the study and elected not to participate. Over 150 adoptive parents from throughout the USA called or e-mailed for information about the study. The most common reason given for not participating was the travel distance. However, four families did travel from out-of-state to participate.

Of the 50 children who were recruited for the study, six were not included in the final data analysis. Two children failed the hearing screening, one had a cleft lip and palate, one did not pass the minimal requirements for IQ, and two were disqualified because they were unable to complete testing due to attention difficulties. This left 44 children whose data could be used.

4.1.2. Demographics.

Demographic information was collected from the adoptive parents of the children using the *International Adoption Speech and Language Survey* (See Appendix A) created by the author. This survey included participant age, gender, institutional history (e.g., amount of time spent in orphanage, type of institution, age at adoption, medical history), adoptive family history (e.g., siblings, SES, parent ages), communication levels, and education history.

In distributions of gender, 25 (56%) of the children were male; 19 (44%) were female. This ratio was consistent with the published data for EEA-PI children (Johnson, 2001; Glennen, 2002; Price, Castendan, & Hoang, 2001). The great majority of the children were adopted from Russian orphanages (89%; 39/44); three were from Ukraine and the remaining two from other Eastern European countries (i.e., Romania, Uzbekistan). The mean chronological age of the group was 98.3 months (8-2 yrs.) (See Table 3). The average age at time of adoption was 26.3

months. All children had been in the USA for a minimum of two years. The average length of time in the U.S. was 72.1 months (6-0 yrs). The average time in the institution was 22.3 months and the majority were placed in the institution within one month of birth (34/44, 77%).

Table 3 Descriptive Data for the 44 EEA-PI Children (in months)

Orphanage children N= 44			
	M	SD	Range
Chronological Age	98.3	20.5	70 - 142
Age at Adoption	26.3	16.1	7 - 81
Time in U.S. (min. 2 years)	72.1	22.9	31 - 124
Time in Institution	22.3	13.2	7 - 58
Age at Institutional Placement	3.75	8.9	0 - 33

Of the 39 parents who volunteered their income levels, 28 (72%) indicated income levels of $75,000 or higher placing them in the upper SES range, above the national average. All but two of the parents were married; the two who were not, identified themselves as single parents (one divorced, one single). Of the 42 parents who answered the survey question, 40 reported that their children received at least one special service in school at the time of survey completion.

Four of the children had received speech therapy for stuttering/dysfluency. Two of the children with dysfluencies were discharged and two were currently receiving therapy. Twenty-eight out of 43 (64%) received speech/language therapy services at some time between arrival to the U.S. and the time of testing, and 22 (52%) were continuing to receive speech/language

therapy at the time of testing. One of the children who never received therapy had a mother who was a Speech-Language Pathologist and was not included in the analysis.

Medication use was high among these children from Eastern European orphanages. Data showed that 23/44 (52%) were reported to be taking medications. Several children were on multiple prescriptions: 12 were on attention regulation medications (e.g., Ritalin, Concerta,); 3 were on behavior regulating drugs (e.g., Paxil); 10 received medications for breathing difficulties (e.g., Allegra, Claritin); and 4 were on miscellaneous medications (e.g., hormone growth, helioc pyloria,) (See Figure 2)

Parents were asked to indicate if they spoke the birth language to their children after adoption. None of the families reported using the birth language beyond the level of simple words and an occasional phrase, and none judged that they were fluent in their children's birth language. In reviewing the children's use of native language, parents reported that 6 spoke more than 500 native words prior to adoption, 2 spoke approximately 50-100 words, 2 spoke approximately 6-10 words, and 7 spoke 1-5 words. The rest (39%) had no reported word use of their child's birth language prior to adoption. English expressive vocabulary emerged quickly for the majority of the children after adoption. Range for emergence of the first English word for those children who were 12 months or older at adoption (N=38) was from 1 day to 2 years, with the first English word being spoken an average of 3.02 months (SD=14.9) after coming to the U.S.

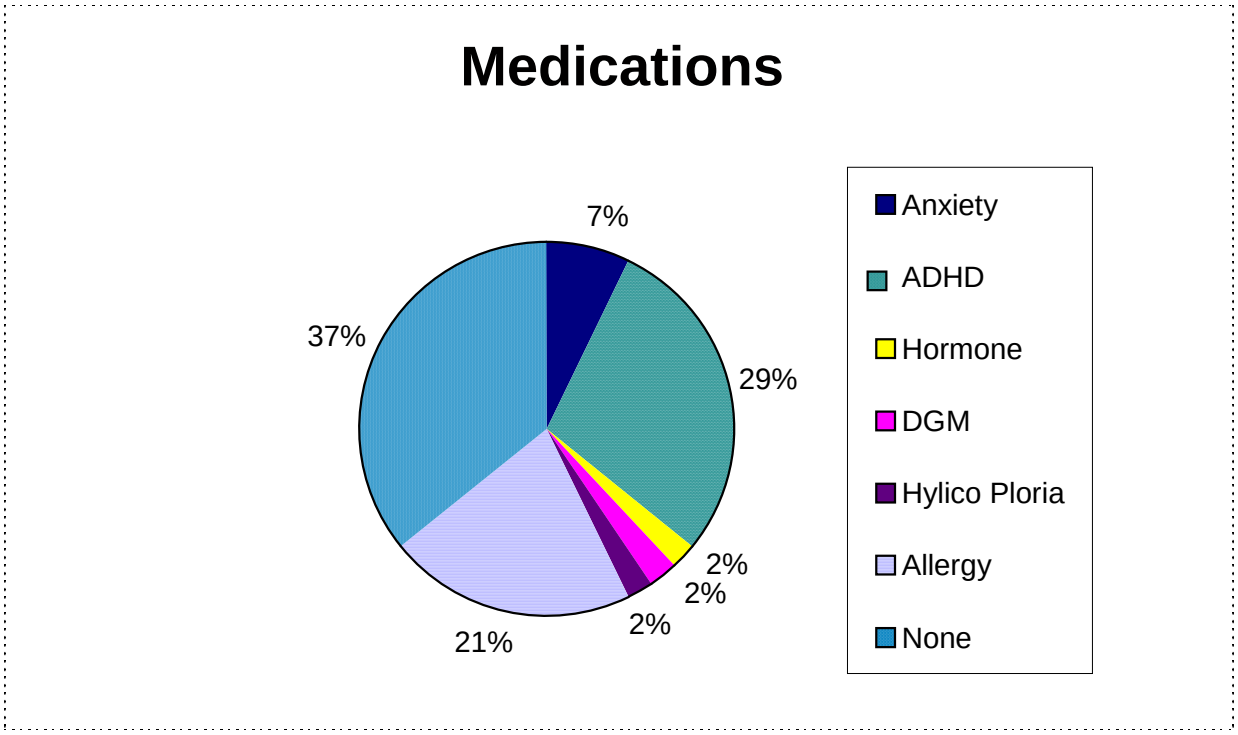

Figure 2 Medication Use in EEA-PI children

4.2. Measures/Instrumentation

In addition to parental completion of the *International Adoption Speech and Language Survey*, a hearing screening, a nonverbal intelligence test, and a series of language tests including a language sample were administered to each child (See Table 4). These measures are described in detail below.

Table 4 Test Battery Summary

Hearing Screening at 20 dB
Nonverbal test of intelligence-
Leiter International Performance Test -R (Leiter, 1998)
Language testing
*Test of Language Development-Primary (TOLD P:3) (ages 6- 9 years)(*Newcomer & Hammill, 1997) or
Test of Language Development-Intermediate: 3 (ages 9-11years) (Hammill & Newcomer, 1997)
Comprehensive Assessment of Spoken Language, (CASL), (Carrow-Woolfolk, 1999)
Nonword Repetition Test (Dollaghan & Campbell,1998)
Language Sample- set of novel toys. (CHILDES analysis)
Communication Competence Checklist (CCC) (Bishop, 1998)
Woodcock Reading Mastery Tests, WRMT-R/NU (Woodcock, 1998)

4.2.1. Screening Tests.

A hearing screening using standard audiological procedures was performed to rule out peripheral hearing loss. Standard pure-tone screening at 20 dB for 1000 Hz through 4000 Hz in a sound-attenuated booth were administered.

A nonverbal test of intelligence was given. The Brief Screener of the *Leiter International Performance Scale-Revised* (Roid & Miller, 1997), standardized for ages 2-5 to 21 years, provided an index of cognitive functioning that was relatively independent of verbal abilities and had acceptable correlation with other measures of intelligence (*Leiter,*1979; Roid & Miller, 1997). The IQ Screener is a collection of 4 subtests in the *Leiter-R* battery that provides consistent and reliable measurement of global intelligence within a level. The levels include low, low-average, average, high-average and high. The screening scale was developed to meet the needs of examiners who are interested in a brief, but reliable measure of intellectual level when the *Leiter-R* is used in a battery of tests (*Leiter* Examiners Manual, 1997, p. 2). Since language scores are known to correlate highly with intelligence test scores (Abbeduto & Rosenberg, 1992), those children who scored low on the Leiter were not included in the study.

4.2.2. Language Tests.

The language tests consisted of the *Test of Language Development (TOLD-I:3)* (Hammill & Newcomer, 1997) or the *Test of Language Development (TOLD-P:3)* (Newcomer & Hammill, 1997), the Pragmatic Judgement subtest of the *Comprehensive Assessment of Spoken Language Test (CASL)* (Carrow-Woolfolk, 1999), the *Nonword Repetition Test* (Dollaghan & Campbell, 1998), the *Children's Communication Checklist* (Bishop, 1998), the *Woodcock Reading Mastery Tests-R/NU* (Woodcock,1998), and a 20-30 minute language sample.

Tests of Language Development. The *TOLD* tests comprise an individually administered, research-based, language battery for children. Two versions of the tests are available: the *Test of Language Development-Primary:3 (TOLD-P:3)* (Newcomer & Hammill, 1997), used in this

study for children ages 4 through 8 years and the *Test of Language Development-Intermediate (TOLD-I:3)* (Hammill & Newcomer, 1997), used for children ages 9 through 12 years. (Reference to both tests will be abbreviated in this document as: *TOLD P/I:3*). Linguistics traditionally has made distinctions between communicative competence and actual performance (Bates & MacWhinney, 1989). Competence refers to the underlying principles or rules that a person must have in order to be a proficient speaker of a given language. These "rules" are generally divided into five areas: the sounds used in speech (phonology), the internal organization of words (morphology), the structure of sentences (syntax), the meaning of words or word combinations (semantics), and the use of language in the social context (pragmatics). The *Test of Language Development-Primary (TOLD-P:3)* along with its companion test, the *Test of Language Development-Intermediate (TOLD-I:3),* consist of subtests for each of these areas except pragmatics. Separate scores (i.e., Standard Scores, percentile ranks, test-age equivalents and quotients) are available for the individual subtests, and composite scores are available for overall spoken language proficiency, receptive language, expressive language, syntax and semantic areas. Composite scores can also be converted to standard scores, percentile ranks and test-age equivalents.

The *TOLD-P:3* was normed on over 1,000 children, ages 4-0 to 8-11 years, stratified to meet the 1997 U.S. national census data for gender, race/ethnicity, region, educational levels of parents and age. The *TOLD-I:3* was normed on over 779 children ages 8-0 to 12-0 years, in 23 states and stratified to meet the 1997 U.S. national census data for gender, race/ethnicity, region, educational levels of parents and age. Test reliability, which was investigated for both tests using co-efficient alpha and test-retest methods, was high enough (>.80) to warrant use with individual children. Validity of these tests has been studied extensively. Content validity was established by relating the tests' content to actual children's language and by individual item analyses.

Criterion related validity was assessed by correlating subtests with two commonly used children's language tests. Information about the specific subtests, taken from the *TOLD P/I:3* test manuals (*TOLD* Examiners Manual- I:3, 1997, p. 35; *TOLD* Examiners Manual-P:3 , 1997, p. 27), is listed below. The language area assessed for the research questions is in parenthesis.

1. *Sentence Combining* measures the child's ability to combine two to four short sentences into one complex sentence while retaining all of the meaning in the short sentences. (Morphology)

2. *Picture Vocabulary* measures the ability to understand the meanings of one word and two word terms when spoken. (Lexical/Semantics)

3. *Word Ordering* measures the ability to construct a meaningful sentence from a set of words presented orally in a random sequence. (Syntax)

4. *Generals* measures the ability to identify the abstract relationships existing among a set of three spoken words. (Lexical/Semantics)

5. *Grammatic Understanding* measures the ability to understand grammatical sentences of increasing complexity. (Receptive Language)

6. *Malapropisms* measures the ability to recognize when a word has been incorrectly used in place of a word that sounds like it. (Lexical/Semantics)

7. *Relational Vocabulary* measures the ability to define relationships between two words. (Lexical/Semantics)

8. *Oral Vocabulary* measures the ability to give oral definitions for common English words meaningfully. (Expressive Language)

9. *Grammatic Completion* measures the ability to understand sentence formations and use accurate morphological forms such as possessives, verb tenses, and plurals. (Morphology)

10. *Sentence Imitation* measures the ability to accurately repeat sentences of increasing length and complexity. (Syntax)

11. *Grammatic Comprehension* measures the ability to recognize and correct ungrammatical sentences with errors in morphological inflections. (Receptive Language)

Pragmatics tests. The *Comprehensive Assessment of Spoken Language (CASL*; Carrow-Woolfolk, 1999) is an individually administered research-based language battery for children ages 3 to 21 years. The Pragmatic Judgment subtest, which examines knowledge/use of language in communicative contexts, was the only section of this test administered. The *CASL* was normed on 1,700 children stratified to meet the 1990 U.S. Census data of gender, race/ethnicity, region, and mothers' educational levels. Raw scores can be converted to age-based scores, standard scores, percentiles, and test-age equivalents. Comparisons with the normal group can be made for those children falling 1 or more standard deviations (mean=100, SD=15) below the mean for their age.

The *Children's Communication Checklist* (*CCC*; Bishop, 1998) was developed to assess aspects of communicative impairment that are believed to be clinically important but not adequately evaluated by contemporary standardized language tests. The *CCC* is designed to provide additional information about a child's use and interpretation of language in relation to a social context in which it occurs. Children with semantic-pragmatic deficits can have severe difficulties in everyday communication even though scores on traditional speech and language tests are in the normal range (Bishop, 2001). The *CCC* consists of a checklist rating of 70 items grouped into nine scales. The first subset of scores, which is entitled "Speech," assesses parent ratings of articulation production/intelligibility, and the second subset, named "Syntax," assesses syntactic complexity. The next five scales -- assessing inappropriate initiation, cohesion, stereotyped language, use of context, and rapport --are combined to give a pragmatic composite.

Ratings must be made by an individual who has known the child for at least 3 months. The *CCC* has an inter-rater reliability and internal consistency of approximately .8, and has proven reliable for discriminating between children with a diagnosis of semantic-pragmatic disorder and those with specific language impairment (SLI).

All *CCC* measures are scaled so that a low score indicates impairment. Normally developing children typically obtain scores close to test ceilings (mean for normal children is within 2 points of maximum for all areas.) Bishop suggests that a cut off score of 132 provides the best discrimination between children with typical SLI and those with pragmatic language impairments. Comparisons with the normal group can be made for those children falling 2 or more standard deviations below the mean for their age.

Reading tests. The *Woodcock Reading Mastery Tests* (*WRMT-R/NU* ; Woodcock, 1998) were used to assess reading levels. The Total Reading-Full Scale cluster is a combination of four reading achievement tests: Word Identification, Word Attack, Word Comprehension, and Passage Comprehension. *Word Identification* measured the participants' abilities to accurately pronounce printed English words ranging from high to low frequency of occurrence. The *Word Attack* subtest measured the ability to read pronounceable nonwords varying in complexity, assessing the child's ability to apply phonic and structural analysis skills to pronounce the unfamiliar words. *Word Comprehension* measured reading vocabulary at several different levels including three subtests: antonyms, which measured the ability to read a word and then respond orally with a word opposite in meaning; synonyms, which required the child to read a word and then state another word similar in meaning; and analogies, which required the child to read a pair of words and to complete the analogy appropriately. In order to form a single composite score for the Word Recognition test, standard scores were converted from these three subtests to z scores using weighted means and standard deviation of the norm sample. Finally, the *Passage*

Comprehension subtest used a cloze procedure to measure the child's ability to read a short passage and identify a key word missing from the passage.

Scores from the Total Reading cluster served as a broad measure of global reading ability. This cluster required approximately 30 minutes to administer. The test was normed on over 6, 000 children across the U.S. This test provides norms for ages 5-0 to 35+ years and a full array of derived scores including Age Equivalent, Grade Equivalent, and Standard Scores. The reliability and validity of the *WRMT-R/NU* are high and meet technical standards for use as a diagnostic instrument. Comparisons with the normal group can be made for those children falling 1 or more standard deviations below the mean for their age.

For children in kindergarten, early literacy knowledge was also assessed by administering the *Letter Identification* subtest. This task measures the children's ability to name letters of the alphabet presented in upper or lower case letters. Because letters are shown in various typefaces this test may also be sensitive to individual differences in literacy experiences.

Vocabulary learning ability test. Another test included in the battery, the *Nonword Repetition Test* (NRT; Dollaghan & Campbell, 1998), is a non-language based test, that was given to assess the child's abilities to learn new vocabulary regardless of cultural and experiential background. A number of researchers in the past few years have used the *Nonword Repetition Test* to explore the cognitive processes underlying normal language development (Bishop, 1998; Campbell, Dollaghan, Needleman & Janosky, 1997; Dollaghan & Campbell, 1998; Dunn, Flax, Sliwinski & Aram, 1996; Ellis-Weismer et al., 2000). Researchers cite the usefulness of nonword repetition tasks in providing culturally non-biased assessments of linguistic abilities by assessing the children's abilities to manipulate linguistic units without drawing on prior experience and knowledge. The *NRT* explores the ability of the child to learn

new information when given the opportunity to learn in a nonthreatening environment (Ellis-Weismer et al., 2000).

A major component of learning new vocabulary involves learning the novel sequences of sounds that represent the word. However, it can be difficult to examine the processes involved in learning the sound patterns of "real" new words, because it is often impossible to be certain that the new sound pattern has never been heard before. Researchers have theorized that the use *nonwords* (e.g. nibe) which conform to the phonological rules of English provides a good test of vocabulary learning because it ensures that the new word to be learned is novel (Gathercole & Baddeley, 1993; Weismer et al., 2000). Therefore, testing whether or not a child is able to repeat a nonword immediately upon hearing it for the first time (nonword repetition) is relevant to understanding how they eventually learn new words (Weismer et al., 2000).

The *Nonword Repetition Test* consists of sixteen nonwords, four at each of four different syllable lengths and controlled for all English phonemes with the eight late developing sounds (i.e., s, z, l, r, sh, dz, th, and ch) being omitted to minimize articulatory difficulty and ensure that errors represent learning interference. None of the words correspond to an English or Russian equivalent (B. Gindis, personal communication, October 11, 2003). For the *Nonword Repetition Test*, the children listen to a tape recording of the 16 nonwords with 3-second pauses in between. The children were asked to repeat the words that they heard. Only one presentation of the word was allowed. This test was normed on children ages 5-8 to 12-2 years.

4.2.3. Language Sample Analysis .

In addition to administering the standardized tests, additional assessment information was collected using an analysis of language samples. Aspects of linguistic vulnerability that are not ordinarily evident from performance on standardized language tests may be revealed through language sample analysis (Hadley, 1998). Regardless of the language sample format, Cole,

Mills and Dale (1989) recommend the collection and analysis of at least two different samples of 50 to 100 units, preferably from different contexts. The usefulness of conversation as the only discourse type may be questionable with older children because most conversational exchanges will not be challenging enough to reveal communication breakdown or production errors (Hadley, 1998). The decision to assess conversational discourse in both a free play and a restaurant interaction, with their parents, was related to both the availability of normative data from the *Wisconsin Language Reference Database* (Leadholm & Miller, 1992) and the intent to obtain as valid a language sample as possibl*e.* Therefore, the analysis of the language audio/video samples included transcriptions of a corpus of 100 consecutive, complete, intelligible and non-imitative sentences (50 from the parent/child conversational discourse and 50 from the parent/child restaurant interaction) of the children engaged in 20-30 minutes of conversation in a one-to-one situation with a parent. A standard set of novel toys and restaurant props were available to facilitate conversation.

The language samples from the EEA-PI children were initially formatted in accordance with the CHAT transcription conventions of the CHILDES child language data archive (MacWhinney, 1995). Care was taken to include approximately equal segments of free play conversation and restaurant language samples. All full or partial imitations, responses to yes/no questions and exclamations/ interjections were excluded from the analyses. For analysis and database comparisons, transcriptions were then converted to the Systematic Analysis of Language Transcripts (SALT, Miller & Chapman, 2000) program. Both MLU and TTR were computed using SALT-based analyses. Utterance segmentation and the identification of bound morphemes (C-units) were based on the guidelines specified by Klecan-Aker and Hedrick (1985) (Appendix F). The SALT reference database, version 7.0, included spontaneous speech data collected on a large sample of normally developing children that included measures of TTR,

NDW and MLU. For each subject, an age-matched (within 6 months for younger children and one year for children ages 10 and up) comparison sample of 15-45 children from the database was selected to compare the scores obtained from the EEA-PI children to this SALT normative sample. Comparability between the subjects and the database comparison group was controlled in two ways: (a) by standardizing the stimuli and the instructions for the parents and (b) by controlling the number of utterances analyzed. These parent instructions and procedures are described in detail in the next section.

There are few linguistic profiling systems or quantitative measures that have been applied widely to language samples of older children. As children mature they comprehend and produce increasingly complex language and their spoken utterances become longer and more highly subordinated with clauses as the children age. These two changes (i.e., increasing complexity and length) can be captured from language samples of school-aged children using several types of quantitative measures of complexity (Scott & Stokes, 1995). The number of different words spoken can be used for lexical/semantic comparisons using both type-token ratio (Templin, 1957; Miller, 1981) and total number of different words spoken. Mean Length of Utterance (MLU)) can be calculated for syntax analysis.

Type-token ratios. One of the best known and standardized measures of lexical/semantic diversity is the type-token ratio (TTR) (Watkins et al., 1995; Hess, Haug & Landry ,1989). In 1957, Templin first suggested a procedure for calculating vocabulary usage based on the number of different words produced in a 50-utterance sample and the total number of words produced in such a sample. The relationship between these two measures was calculated by dividing the total number of words used into the total number of different words. The resulting number is called a type–token ratio (TTR). The higher the type-token ratio, the less frequent the repetition of words. Templin reported that for 480 children ages 3 to 8 years, ratios of .50 occurred. Using

Templin's approach, Miller (1981) reported that a ratio of .45 occurred consistently for the first 50 utterances of a sample across all age groups from 3 to 8 years. This research set the baseline for scores for typically developing school-aged children for comparison to the EEA-PI children. Further, TTRs may provide valuable information about the spontaneous language sample when compared to age-matched samples from the *Wisconsin Language Reference Database* (Leadholm & Miller, 1992).

However, type-token ratios have recognized limitations. These limitations include the recognition that the larger the conversational sample size, the smaller the TTR ratio will be. In addition, if the speaker remains on the same topic and reuses content words related to that topic the TTR will continue to be reduced. The literature offers several ways to adjust TTR to accommodate for these variations including using a standard number of utterances (Templin, 1957), using a standard set of tokens (Klee, 1992), and controlling content by using standard toys/activities (Owens & Leonard, 2002). For this study a controlled set of 100 utterances was used, and content was guided by a standard set of parent instructions, toys and activities.

Number of Different Words . Klee (1992) found that for measures of vocabulary diversity TTRs controlled for sample size were valid indices of development in both groups but were unable to differentiate between normal and SLI children. The Number of Different Words (NDW), however, was valid as a discriminating criterion. Watkins, Kelly, Harbors, and Hollis (1995) studied 25 preschool children with SLI compared with 25 age-matched and 25 language-matched controls on TTR (50 utterances), TTR (100 utterances), number of different words (NDW) (50 utterances), NDW (100 utterances), NDW (100 tokens) and NDW (200 tokens). Neither TTR measure showed any group differences. However, for all NDW measures the age matched group was significantly higher than the other 2 groups. There were no significant differences between the children with SLI and the language-matched controls. Watkins et al.

(1995) recommended the use of NDW rather than TTR. However, in this study both TTR and NDW were included.

Mean Length of Utterance. Sentence length measurement counts words (or morphemes) for each utterance in a sample, sums, and divides by the number of sentences yielding an average length of sentence or Mean Length of Utterance. At one time, it was thought that sentence length measures were only useful indicators in young preschool children. Current research documents a slow steady increase in the average length of spoken and written sentences throughout elementary and secondary school (Scott & Stokes, 1995). A source of average sentence length data for spoken language in children ages 3 to 13 years can be found in the *Wisconsin Language Reference Database* (Leadholm & Miller, 1992). This database is part of the Systematic Analysis of Language Transcription (SALT) database. As per the Wisconsin database, morphemes were counted for this study. As a general rule, spoken sentence length matches chronological age (i.e. a 7-year old child's average sentence length is 7 words long) until the age of approximately 9 years when the growth curve begins to slow. By the later secondary years, adolescent conversational utterances average 10-12 words.

Although language samples may identify many aspects of linguistic difficulties that are not ordinarily evident from performance on standardized language tests (Hadley, 1998), there is little data to support the extent to which standardized tests predict performance in more naturalistic contexts (Scott & Stokes, 1995). Language sample analysis can support descriptively the abilities of school-aged children and indicate appropriate structures for future intervention.

4.3. Testing Procedures

Testing was performed at the Children's Therapy Center of The Washington Hospital by trained speech and language pathologist(s) or graduate students with experience in child language assessment. A total of 4 examiners participated in the administration of the test batteries. One examiner was certified as a speech-language pathologist (myself) and the remaining examiners had undergraduate degrees in speech and hearing and were enrolled in Masters level Speech Pathology programs. In addition, all student examiners received at least two days of training on the administration of the test protocols and observed at least one test battery being given.

Approval from the University of Pittsburgh and The Washington Hospital's Institution Review Boards was obtained prior to beginning the study. All language testing was videotaped. Children were tested for a period of approximately 3 and 1/2 hours.

A hearing screening lasting approximately 5-10 minutes was given first. Next, the screening subtests of the *Leiter*, which takes about 20 minutes to administer, were given. The *Leiter* was administered according to prescribed standard procedures as outlined in the test manual. Only the data from children who passed the hearing testing and scored at or above the low normal range on the *Leiter* were used in the analysis. A short 5-minute break was given; the child was allowed to pick a small, edible treat, and the testing site was relocated from the audiology booth to an evaluation room in the center.

After the short break, approximately 35-45 minutes of formal testing on the age appropriate subtests of the *TOLD P/I:3* and the Pragmatic Judgement subtest of the *CASL* (20–25 minutes) took place. Next, the *Nonword Repetition Test* was presented under headphones, taking about 5 more minutes to complete. Subject responses to this test were audio and video taped

using an external microphone to obtain the high quality recordings needed for phonetic transcription.

After a 15-30 minute break, the children completed the reading testing on the *Woodcock Reading Mastery Tests* (30-35 minutes). This was followed by the 10-15 minute language sample in which the subject was audio and video taped interacting with a parent during free play using the standard set of novel toys and another 10-15 minute language sample with the parent using the restaurant props. External microphones were used for the language samples to improve intelligibility of responses. Instructions on how to structure the interaction and a set of possible questions/comments were provided to the communication partners (Appendix C). Parents were instructed to interact using the novel toys for approximately 10 minutes and then to introduce the "restaurant toys" (kept out of sight on the floor) using some of the figures in the first toy bin as play characters.

All participants were tested during 3 to 4 hour sessions with short breaks given as indicated except for 3 children, who required two testing sessions due to short attention spans.

5. RESULTS

The purpose of this study was to examine the language skills of school-aged children adopted to the U.S. from Eastern European institutions. This study documented the extent and types of language problems present in the areas of semantics, morphology, syntax, reading, and pragmatics, and explored the factors of institutionalization that might predict language outcomes. Excel and SPSS were used for statistical analyses of results of formal testing, spontaneous language samples, and parent questionnaires. The data analysis for each research question is addressed below.

5.1. Reliability of Data Collection

Language tests. A second independent examiner, who was trained in the scoring of the language tests and the *WRMT-NU/R,* randomly selected and independently watched videotapes from 11 children (25%) and scored them. Inter-rater reliability for all tests was .948 or higher (r = .996, range .948 to 1.000). (See Table 5.) For the responses on which there was disagreement, the first or primary coder's responses were used in the data analyses.

Nonword Repetition Test. The Nonword Repetition Tests for all children were initially scored through consensus agreement by two examiners who listened to the tapes together. Then, for 11(25%) of the recordings, a third independent examiner listened to and scored the tests. Agreement was calculated for each child by determining the number of agreements and then dividing by the number of agreements plus disagreements. For the responses on which there was disagreement, the initial scores were used in the data analyses. Inter-rater reliability for the 11 participants averaged .981 (range = .931 to .999).

Language Samples. All language sample tapes were first transcribed by a trained researcher, and then 100% of the tapes were viewed a second time by the principal investigator for accuracy. Next, an independent judge with extensive knowledge of SALT viewed five (10%) of the tapes and transcribed them, using transcript cuts to reduce the transcripts to 100 utterances, following procedures as described in the SALT Manual (SALT, Online Lesson guide) and the guidelines in Appendix F. Then, this reviewer ran SALT analyses using the established criteria for SALT analysis listed earlier. Inter-rater reliability, calculated by Pearson correlation, averaged .998. Agreements ranged from .996 to 1.000.

In summary, intra-rater reliability for all three sets of the reliability scores using the Pearson product moment coefficients was .94 or higher. Scoring was considered to be reliable. (See Table 5).

5.2. Question 1. Types of Language Difficulties

Answers to the first research questions were determined by analyzing the scores of specific language subtests of the *TOLD P/I:3*, Full Scale Reading Cluster scores of the *WRMT-R/NU* , Pragmatic Judgement subtest of the *CASL,* the *CCC* and the language sample. Scoring of the *TOLD P/I:3, CASL*, and *WRMT-R/NU* tests was conducted using procedures described in the respective test manuals and materials. The primary statistical approach for both individual and group analyses involved comparing the means of the standard scores obtained from the study participants with the means available in the test norms using standard deviations.

Data analysis also examined several combined components of language development. The *TOLD P/I:3* has composite scores available for Spoken Language, Listening, Speaking, Semantics, and Syntax. The standard score that corresponds to the composites is called a quotient and is used to pool the standard scores of the subtests that make up the composites. All

TOLD P/I:3 composite quotient scores have a mean of 100 and a standard deviation of 15. The criteria for language impairment follow the recommendations of the authors of the *TOLD P/I:*3 and were consistent with other researchers in the area of speech and language impairments.

Table 5 Inter-rater Reliability for Language Measures (Pearson Correlation Coefficients)

Test	Subscale	r
WRMT	Letter ID	.993
	Word ID	1.000
	Word ATT	.989
	Word COMP	1.000
	Passage COMP	.999
TOLD P	Picture Vocabulary	1.000
	Relation Vocabulary	1.000
	Oral Vocabulary	.948
	Gram Understanding	1.000
	Sentence Imitation	.980
	Gram Completion	1.000
TOLD I	Sent Completion	.992
	Picture Vocabulary	1.000
	Word Order	.995
	Generals	.991
	Gram Comprehension	.998
	Malapropisms	.998
CASL	Pragmatics	.945
Nonword	Nonword	.981
Lang Sample	MLU	.965
	TTR	1.000
	NDW	.999

Researchers consider those children who score 1 SD below the mean on two or more individual subtests (i.e., a standard score of 7 or less and equal to the 16th percentile)) or 1.25 SD below the mean for the Composite Quotient (i.e., a score of 81 or less and equal to the 10th percentile) *(TOLD* manual, p. 32-33) as "below average/poor." These are the level that researchers generally diagnose as "language impaired" (Fey et al., 2004; Tomblin, Records & Zhang, 1996; Redmond, 2003).

After determining the number of children in this category, group comparisons were then made. Results were obtained using the z-score formula recommended by the test authors. This consisted of calculating the mean Composite Quotient scores for the EEA-PI children and then calculating the z-score, which compares the range/mean values of the EEA-PI children to the standardization groups. Most standard scores, when expressed as *z* scores, range from –3.0 to +3.0 with a mean of 0 and a standard deviation of 1. A small fraction of z scores may be beyond the range stated. The values required for statistical significance are 1.96 (0.05 level) and 2.58 (0.01 level) for 2- tailed tests. Values can be either plus or minus.

Results for individual subtests:

5.2.1. Semantics.

Of the 44 participants, 28 were tested on the *TOLD P:3* and 16 were tested on the *TOLD I:3*. Raw scores from both the *TOLD P:3* and *TOLD I:3* were converted to standard scores for each subtest. For semantics, as recommended in the test manual, standard scores from the *TOLD P:3* on the Picture Vocabulary, Relational Vocabulary and Oral Vocabulary subtests were combined to generate a Semantics Composite Quotient that was used to determine adequacy of semantics for children ages 6-0 to 8-11 years. Likewise, the Picture Vocabulary, Generals, and Malapropisms subtests' *(TOLD I:3)* standard scores were combined to generate a Semantics

Composite Quotient that was used to determine adequacy of semantics for children ages 9-0 to 11-11 years.

On the *TOLD P:3*, the 28 younger children produced a mean Composite Quotient of 93.11 (SD = 17.01, range = 66-119). Eight children (28.6%) scored 1.25 or more standard deviations below the mean. Results from the older group taking the *TOLD I:3* produced a mean Composite Quotient of 86.13 (SD = 14.62, range = 53 -113). Out of 16 children five (31.3%) scored at or below 1.25 SD below the mean. Combining the numbers for both groups produced a total of 13 (29.5 %) scoring at or below 1.25 SD below the mean. In contrast, 5 of the 44 children (8.8%) scored at or above 1 SD above the mean (See Table 6).

Comparisons of the children were made for the Semantics Composite Quotients of the older and younger test groups. For the older EEA-PI group (children 9-0 to 11-11 years), the z-score was calculated as:

$$Z = \frac{86.13 - 100.00}{15/\sqrt{16}} = -3.689$$

The z-score revealed that the semantic performance of the EEA-PI group was significantly lower than the norm group as determined by a 2- tailed test at $p < .001$.

For the younger group (children 6-0 to 8-11 years), the z-score was calculated as:

$$Z = \frac{93.11 - 100.00}{15/\sqrt{28}} = -2.435$$

The z-score indicated that the semantic performance of the EEA-PI group was significantly lower than the norm group as determined by a 2- tailed test at $p < .01$.

The scores on the Picture Vocabulary subtest were also analyzed separately in order to examine vocabulary (lexical) diversity. Since the mean standard score for both the younger and older *TOLD* tests is set at 10 with a standard deviation of 3, the scores from both tests could be combined. The mean for the entire EEA-PI group was 9.61 (SD = 2.78, range = 5 to 18). Data

Table 6 Children's Scores on Standardized Language Tests and Spontaneous Measures

	N	M	SD	Range	# (%) >/= 1 SD below norm
TOLD subtests					
Picture Vocabulary	44	9.61	2.78	5 - 18	11 (25.0%)
Grammatic Completion	28	8.76	2.93	2 - 14	8 (28.6%)
Combining Sentences	16	8.58	3.06	4 - 16	8 (50.0%)
TOLD Composites					
Semantics					
6-9 yrs.	28	91.66	16.92	66 - 119	8 (28.6%)
9-12 yrs.	16	86.13	14.62	53 - 113	5 (31.3%)
Combined	44			53 - 119	13 (29.5%)
Syntax					
6-9 yrs.	28	89.84	19.68	53 - 123	11(39.3%)
9-12 yrs.	16	88.63	15.47	54 - 109	5 (31.3%)
Combined	44			53 - 123	16 (36.4%)
Listening (Receptive)					
6-9 yrs.	28	94.48	14.19	73 - 124	5 (17.9%)
9-12 yrs.	16	93.38	17.00	52 - 126	2 (12.5%)
Combined	44			52 - 126	7 (15.9%)
Speaking (Expressive)					
6-9 yrs.	28	89.20	17.36	62 - 121	11 (39.3%)
9-12 yrs.	16	86.13	14.62	53 - 113	6 (37.5%)
Combined	44			53 - 121	17(38.6%)
(Spoken) Language					
6-9 yrs.	28	89.20	17.36	62 - 121	10 (35.7%)
9-12 yrs.	16	90.56	13.20	71 - 121	5 (31.3%)
Combined	44			62 - 121	15(38.6%)
2 or more subtest < 7					9 (20.5 %)
CASL- Pragmatics	44	91.34	15.8	77 - 117	14 (38%)
Nonword Repetition	44	73.48	14.61.	41 - 97	21(47.7 %)[a]
Spontaneous Speech Measures					
MLU (in morphemes)	44	–2.58 SD	1.0	– 4.6 - .08	32 (72%)
TTR	44	1.62 SD	1.1	–1.72 - 4.12	0 (0%)
# Different Words	44	–2.47 SD	1.22	-4.90 - .92	29 (66%)
Total Words	44	–2.55 SD	1.00	-4.38 - -0.3	31 (71%)
Total number w/ deficits	44				29 (66%)

Note. *TOLD* = Test of Language Development; *CASL* = Comprehension Assessment of Spoken Language; MLU = mean length of utterance; TTR = type token ratio; [a] Scores determined by 70% cut-off criteria

showed that 11 (25%) of the children scored at or below 1 SD below the mean, and 4 (9.1 %) scored at or above 1 SD above it. Fewer children scored below average on the Picture Vocabulary Test than the Semantic Composite Quotient (See Table 6). Another measure of lexical diversity is the type-token ratio. Type-token ratios of the spontaneous language samples were calculated using the Systematic Analysis of Language Transcripts (SALT, Version 7.0; Miller & Chapman, 2002) by dividing the total number of words used into the total number of different words. Results were compared to average TTRs of children in the Wisconsin Language Database whose age range was within +/- 3 months for the younger children and +/- 6 months for the older children. Results showed that none (0%) of the EEA-PI children scored at or below 2 SD on TTRs in comparison to the mean for the age-matched children in the database. For group comparisons, Miller's research reported that ratios of approximately .45 occurred consistently across all age groups, sex groups, and SES (Miller, 1981). The mean TTR for the EEA-PI group was 0.42 (SD =0.038, range = 0.32 to 0.51) indicating that groups scores fell within 1 SD (i.e., 0.42 + 0.038 = 0.458) of Miller's normal scores for vocabulary diversity.

Number of different words (NDW) is also a measure of lexical diversity that has been found to distinguish between children whose language development is normal and those who have SLI (Klee, 1992). Consequently, NDWs were calculated from the language sample and compared to children matched for age in the Wisconsin database. Twenty nine (65.9%) of the EEA-PI children scored at or below 2 SDs in comparison to their age-matched children in the database. For the EEA-PI children as a group, the mean NDW was 150.02 (SD =24.48, range = 95 to 235) and the average standard deviation was –2.55 (SD = 1.00, range = -4.38 to -0.3).

5.2.2. Syntax.

The Syntactic Composite Quotients were obtained by combining standard scores from the Grammatical Understanding, Sentence Imitation, and Grammatical Completion subtests of the

TOLD P:3 for the 28 children ages 6-0 to 8-11 years. The Syntactic Composite Quotient for the 16 children ages 9-0 to 11-11 years combined scores from the Sentence Combining, Word Ordering, and Grammatical Comprehension subtests of the *TOLD I: 3.*

The Syntactic Composite Quotient mean for the younger group was 89.84 (SD =19.68, range = 53-123). Eleven children (39.3%) scored at or below 1.25 SD below the mean. For the older group, the mean of the syntax composite quotients was 88.63 (SD = 15.47, range 54 -109). Five children (31.3%) scored at or below 1.25 SD below the mean. Altogether 16 of the 44 children (36.4%) scored at or below 1.25 SD (See Table 6). Three children (14.7 %) scored above 1 SD deviation above the mean.

Group comparisons were made by calculating z-scores. For the older group children (9-0 to 11-11 years), the z-score was calculated as:

$$Z = \frac{88.63 - 100.00}{15/\sqrt{16}} = -3.032$$

The z-score revealed that the performance on syntax of the EEA-PI group was significantly lower than the norm group per 2- tailed test at $p < .001$.

For the younger group (children 6- to 8-11 years), the z-score was calculated as:

$$Z = \frac{89.84 - 100.00}{15/\sqrt{28}} = -3.584$$

The z-scores shows that syntactic performance of the EEA-PI group on syntax was significantly lower than the norm group per a 2- tailed test at $p < .001$.

Another measure of syntax is the Mean Length of Utterance (MLU). A descriptive analysis of Mean Length of Utterance (MLU) was completed to compare EEA-PI children's sentence lengths in the language sample with age expectancies from the Wisconsin Reference Language database. MLUs were calculated using Systematic Analysis of Language Transcripts (SALT, Version 7.0, Miller & Chapman, 2002). Individual results were age-matched to the average of children in the Wisconsin Language Database whose age range was within +/- 3

months for the younger children and +/- 6 months for the older children. Thirty-two (72.7%) of the EEA-PI children scored at or below 2 SDs below the mean in comparison to the mean of the age-matched children in the database. For the EEA-PI children as a group, the mean MLU was 4.02 (SD = 0.87, range = 2.14 to 6.90). Comparisons of MLU from the EEA-PI sample to the database sample were made by computing the standard deviation from the age-matched mean for each EEA-PI child, and then averaging the standard deviations for the EEA-PI sample. The overall mean for MLU-SD for the EEA-PI sample was –2.58 (SD =1.0, range = –4.60 to .08) indicating significantly reduced length of utterances.

5.2.3. Morphology.

Standard scores from the Grammatical Completion subtest of the *TOLD P:3* were used for the children aged 6-0 to 8-11 years. For the children aged 9-0 to 11-11, standard scores from the Combining Sentences subtest of the *TOLD I:3* were analyzed. Scores were based on a Standard Score of 10 with a SD of 3. The mean for the younger group was 8.76 (SD= 2.93, range = 2 to 14). Eight (28.6%) of the children scored at or below 1 SD below the mean. The mean for the older children was 8.58 (SD= 3.06, range= 4 to16). Eight (50%) of the children scored at or below 1 SD below the mean.

Altogether 16 of the 44 children (36.4%) scored at or below 1 SD below the mean. Three (6.8%) children scored at or above 1 SD above the mean.

5.2.4. Pragmatics.

Scores were calculated using both the Pragmatic Judgement subtest of the *CASL* and the *Children's Communication Checklist (CCC)* for all children. Raw scores on the *CASL's* Pragmatic subtest were converted to standard scores for each child and analyzed according to age levels norms. The Pragmatic Judgement subtest of the *CASL* has a mean of 100 and a standard deviation of 15. The mean score for the EEA-PI sample was 91.34 (SD = 15.8, range = 77 to 117). According to recommendations by the test's authors, average scores at or greater than 1

SD below the age means are judged as "deficient". Fourteen (31.8%) of the children scored at or below 1 SD below the mean. Three (6.8%) children scored at or above 1SD above the mean.

To analyze the *Children's Communication Checklist*, according to the author's (Bishop, 2001) recommendations, the comparisons of the EEA-PI children's performance with the normal group can be made by determining those children who fall 2 or more standard deviations below the mean of Bishop's (1998) normal development sample. For pragmatics, in particular, subtests C-G (Inappropriate Initiation, Coherence, Stereotyped Conversation, Context and Rapport) are combined to produce a composite "pragmatic impairment score" (Bishop, 2001; Conti-Ramsden & Botting, 2004). Bishop suggests that a cut-off score of 132 on subtests C-G provides the best discrimination between children with typical language and those children with pragmatic language impairments. Those children scoring between 140 (the lowest score obtained by a child in the normal comparison group) and 132 on the pragmatic impairment composite are judged to be "at-risk" for a pragmatic impairment. In Bishop's research, the subgroup of children with a Speech and Language Impairment scored below the normal group (i.e., at or below 140), but only children with pragmatic language impairments scored below 132 (Bishop's composite cut-off score for pragmatic impairment). Table 7 shows the mean, SD, range of scores and percentage of EEA-PI children who scored more than 2 SD below the mean in comparison to the standardization group on the *CCC* subtests. Scores are given for each of the individual test scales and for the pragmatic composite (C-G).

On the pragmatic composite 15 (34.1%) children scored less than 132 indicating a pragmatic impairment. An additional six children (13.6%) scored in the 140 to 133 range indicating an "at risk" status for a pragmatic impairment. These scores were consistent with the pragmatic scores described in the paragraph above for the *CASL* Pragmatic subtest (i.e., 14 (31.8%)).

5.2.5. Expressive language.

The Speaking Composite Quotient of the TOLD P/I:3 was used as the overall measure of expressive language (i.e., the child's ability to communicate orally). The

Table 7 Children's Scores on Children's Communication Checklist (CCC)

	N	M	SD	Range	Standard Deviation(s) from Norm	#/Percentage >/= 2 SD below norm
A. Speech	44	30.79	5.2	19-37	-2.85	23 (52.3%)
B. Syntax	44	30.23	2.16	24-32	-2.19	18 (40.9%)
C. Appropriateness	44	25.20	3.14	19-30	-0.94	10 (22.7%)
D. Cohesiveness	44	29.84	4.85	21-36	-4.07	26 (59.1%)
E. Stereotypic	44	24.63	3.87	15-30	-1.58	14 (31.8%)
F. Context	44	26.18	4.08	16-32	-2.41	22 (50.0%)
G. Rapport	44	30.07	3.07	23-34	-1.9	18 (40.9%)
H. Social Relations	44	29.73	3.47	21-34	-1.63	17 (38.6%)
I. Interests	44	31.25	1.95	27-34	-0.24	1 (2.2%)
Total C-G score	44	135.93	15.58	97-161	-2.76	24 (54.5%) 15 (34.1%)[a]

[a] This percentage is obtained if one uses Bishop's more stringent criteria of 132, which is –3 SD below normal.

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subtests that comprise the Speaking Composite Quotient are Oral Vocabulary and Grammatic Completion for the younger children and Sentence Combining, Word Ordering, and Generals for the older children. The Speaking Composite Quotient mean for the younger group was 89.20 (SD =17.36, range = 62 to121). Nine children (39.3%) scored at or below 1.25 SD of the mean. For the older group, the mean of the Speaking Composite Quotient scores was 86.13 (SD = 14.62, range 53 to 113). Six children (37.5%) scored at or below 1.25 SD below the mean. Altogether 17 (38.6%) of the 44 children scored at or below 1.25 SD below the mean (See Table

6) on the Speaking Composite Quotient. Three of the younger children (6.8%) scored at or above 1 SD deviation above the mean.

Group comparisons between the standardization group and the EEA-PI sample were made by calculating z-scores. For the older group children (9-0 to 11-11 years), the z-score was calculated as:

$$Z = \frac{86.13 - 100.00}{15/\sqrt{16}} = -3.698$$

The z-score revealed that the performance on expressive language was significantly lower than the norm group as per a 2- tailed test at $p < .001$.

For the younger group children (6 to 8-11 years), the z-score was calculated as:

$$Z = \frac{89.20 - 100.00}{15/\sqrt{28}} = -3.598$$

The z-score shows that the performance on expressive language of the younger EEA-PI group was significantly lower than the norm group as per a 2- tailed test at $p < .001$.

5.2.6. Receptive language.

The Listening Composite Quotient of the *TOLD:3 P/I* was used to assess the child's ability to understand speech (i.e. receptive language). The subtests that comprise the Listening Composite Quotient were Picture Vocabulary and Grammatic Understanding for the younger children and Picture Vocabulary, Grammatic Comprehension, and Malapropisms for the older children. The Listening Composite Quotient mean for the younger group was 94.48(SD =14.19, range = 73 to124). Five children (17.9%) scored at or below 1.25 SD from the mean. For the older group, the mean of the Listening Composite Quotient scores was 93.38 (SD = 17.00, range 52 to 126). Two children (12.5%) scored at or below 1 SD from the mean. Altogether 7 (15.9%) of the 44 children scored at or below 1.25 SD below the mean (See Table 6) on the Listening Composite Quotient. Five of the children (11.4%) scored at or above 1 SD deviation above the mean.

Group comparisons between the standardization groups and the EEA-PI sample were made by calculating z-scores. For the older group children (9-0 to 11-11 years), the z-score was calculated as:

$$Z = \frac{93.38 - 100.00}{15/\sqrt{16}} = -1.76$$

The z-score revealed that the performance on listening (receptive language) was not significantly lower than the norm group as per a 2- tailed test at $p < .05$.

For the younger group children (6 to 8-11 years), the z-score was calculated as:

$$Z = \frac{94.48 - 100.00}{15/\sqrt{28}} = -1.94$$

The z-score shows that the performance on listening (receptive language) of the younger EEA-PI group was close to, and not significantly lower than the norm group as per a 2-tailed test at $p < .05$.

5.2.7. Overall language levels.

The Spoken Language Composite Quotient was used for all children to assess overall language levels. Though the *TOLD* test refers to this composite as the Spoken Language Composite Quotient, since it is easily confused with the Speaking Language Composite Quotient, in this paper it will be referred to as simply the Language Composite Quotient. The six subtests that comprise the Language Composite Quotient measure both receptive and expressive aspects of language. As such, it is "the best, most comprehensive estimate of a person's overall language abilities" (*TOLD* manual, p. 42). The Language Composite Quotient mean for the younger group was 89.20 (SD =17.36, range = 62 to121). Ten children (35.7%) scored at or below 1.25 SD from the mean. For the older group, the mean of the Language Composite Quotient scores was 90.56 (SD = 13.20, range 71 to 121). Five children (31.3%) scored at or below 1.25 SD below the mean. Altogether 15 (34.1 %) of the 44 children scored at or below

1.25 SD from the mean (See Table 7) on the Language Composite Quotient. Five of the children (11.4 %) scored at or above 1 SD deviation above the mean.

Nine children who had scores on the Language Composite in the 85-93 range scored below 1 SD on two or more of the *TOLDP:3 P/I* subtests. Of these nine children, 5 had additional language scores (i.e. pragmatics or reading tests) that would also have qualified them for a language deficit diagnosis (See Figure 24 or Appendix G).

Group comparisons between the standardization groups and the EEA-PI sample were made by calculating z-scores. For the older group children (9-0 to 11-11 years), the z-score was calculated as:

$$Z = \frac{90.56 - 100.00}{15/\sqrt{16}} = -2.52$$

The z-score revealed that the performance on overall language abilities was significantly lower than the norm group as per a 2-tailed test at $p < .05$.

For the younger group children (6 to 8-11 years), the z-score was calculated as:

$$Z = \frac{89.20 - 100.00}{15/\sqrt{28}} = -3.81$$

The z-score shows that the performance on spoken language of the younger EEA-PI group was significantly lower than the norm group as per a 2- tailed test at $p < .001$.

5.2.8. Discrepancy analysis.

A final language analysis was conducted called a Discrepancy Analysis. Although the composite quotients can enable an examiner to interpret a child's test performance on the major constructs (i.e., syntax, semantics, etc.), it is also important to determine discrepancies among a child's language skills. Most people are balanced across receptive and expressive language skills and as a result quotients rarely diverge more than one standard error of measurement. Divergences are of clinical interest. For example, the skills of a child whose listening composite score was very high, say 130-120, but whose speaking quotient was substantially lower (say 80)

and below average, should be examined to see if the difference is clinically meaningful. Therefore, the *TOLD P/I:3* manual (Hammill & Newcomer,1997) provides a calculation that determines the difference between two quotients that must be statistically significant at or beyond the 5% level of confidence for the difference to be relevant.

For the discrepancy analysis, this research examined the number of EEA-PI children with at least one score in the below average range (below average on the *TOLD P/I* is defined as less than 89 points on the Composite Quotient scores) and a discrepancy difference as determined in the Discrepancy Tables given in the *TOLD* manuals. Two composite quotient scores were compared; the Speaking and Listening Quotients. (See Appendix G) For the younger children taking the *TOLD P:3,* eight children met the discrepancy criterion of a 12 point difference at the .05% level of confidence (*TOLD* manual, p 45). No one had a speaking score that was 12 or more points higher than their listening scores, while eight had scores that were higher for listening than speaking. For the older children taking the *TOLD I:3,* four met the discrepancy criterion of a 7.8 point difference for a .05% level of confidence. Of these four, one had speaking scores higher than listening, while three scored lower on speaking than listening. Altogether, 12 of the 44 children met the discrepancy criterion, with 11 children whose listening scores were greater than speaking scores and 1 whose speaking scores were greater than listening. This calculation is important in light of research (Tekielli- Koay, 1993; Willig, 1995) that found auditory processing to be an area of particular difficulty for children adopted internationally, as auditory processing difficulties may be indicated when listening scores are lower than expressive scores (and this was not the case for most of the children in the sample). Phonological processing as a subset of audiological processing is addressed separately. The range of findings also strengthens the assertion of a wide range of abilities found in this population.

5.2.9. Reading levels.

Standard scores from the Total Reading Cluster of the *WRMT-R/NU* were calculated. Scores at or greater than 1 standard deviation below the age mean are considered by the test authors to be "delayed" scores. Table 8 shows the mean, SD, range of scores and percentage of EEA-PI children scoring at or more than 1 SD below the mean for each of the subtests and for the Total Reading composite score. The mean score for the Total Reading Composite score for the EEA-PI children was 90.89 (SD = 14.31, range 55 to127). Fourteen (31.8 %) of the 44 children scored at or below 1 SD below the mean (See Table 8) on the Total Reading Composite score. Three of the 44 children (7 %) scored at or above 1 SD deviation above the mean. Children in kindergarten and first grade were also given the Letter Identification subtest. Of the 15 children who took this test, 5 (33.3%) scored at or below 1 SD below the mean.

Table 8 Children's Scores on the Woodcock Reading Mastery Test: NU/R

	N	M	SD	Range	#/Percentage >/= 1 SD below norm
Letter Identification	15	87.40	10.29	67-99	5 (33.3%)
Word Identification	44	94.36	13.10	70-128	9 (20.1%)
Word Attack	44	95.82	12.95	79-135	11(25.0%)
Word Comprehension	44	92.57	15.37	44-120	13 (29.5%)
Passage Comprehension	44	87.66	13.24	52-119	20 (45.4%)
Total Reading	44	90.89	14.31	55-127	14 (31.8 %)

5.2.10. Relationship between reading and language.

To examine the issue of a relation between reading and language skills, a comparison of the reading achievement scores with language scores was made. The significant correlational results indicated that the reading outcome was related to language attainment for all language

areas (significant correlations ranged from .492 to .357) (See Table 10), further providing evidence of a relationship between developmental language impairments and reading disabilities. Given this finding, a further analysis was conducted to determine whether one domain or modality of language was more highly related to reading outcomes than another. The syntax composite (r = .492**) was more highly correlated with reading than was the semantic score(r =. 357*). Children with more severe language impairments (lower spoken language scores) also correlated highly with poorer reading outcomes (r= .434**).

5.2.11. Summary of results.

In summary, 29 (66%) out of 44 children, evidenced deficits of equal to or greater than 1 SD or 1.25 SD (as applicable) below expected age norms and met the criteria for an impairment. Fifteen children had a Language Composite Quotient score more than 1.25 SD below the mean; nine additional children had scores below 1 SD on 2 or more *TOLD* subtests. One additional child had a pragmatic impairment without a traditional language deficit, and an additional four children (without language impairments) evidenced a reading deficit greater than 1 SD. Conversely, 15(34%) scored in the average or above average range on all tests. (See Figures 3 and 24).

An in-depth analysis of the individual language deficits of the children was beyond the scope of this research. Gender results indicated a higher percentage of deficit scores for girls than boys in the language areas, whereas a slightly higher percentage of boys scored lower than the girls on the reading tests. (See Table 9 and Figure 4)

Table 9 Percentages of Children with Language Scores Below 1 SD across Language Domains by Age and Gender

	N	Semantic	Syntax	Receptive Language	Expressive Language	Overall Language	Pragmatic	Reading
Age								
All ages	44	30	36	16	39	34	32	32
6 to 8-11 yrs.	28	29	39	18	38	36	36	39.3
9 to 12 yrs.	16	31	31	13	39	31	25	18
Gender								
boys	25	20	20	12	28	20	20	36
girls	19	37	58	21	53	53	42	26

Note. Criteria: 1 SD or 1.25 SD below mean: for *TOLD P/I:3 Language Composite* = /< 81 SD; CASL =/< 85; *WRMT/NU* =/< 85; *Non Word Repetition* =/< 70%

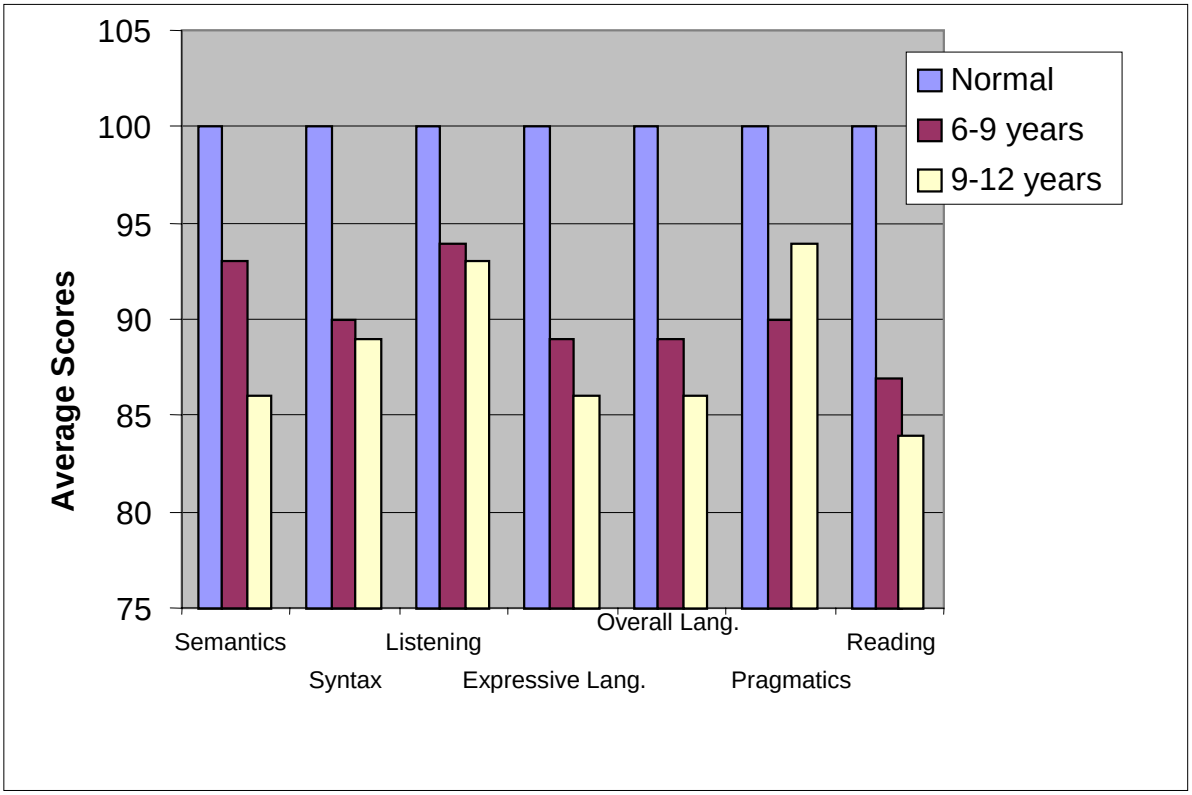

Figure 3 Comparison between Average (Mean) Language Scores of Typical and EEA-PI children

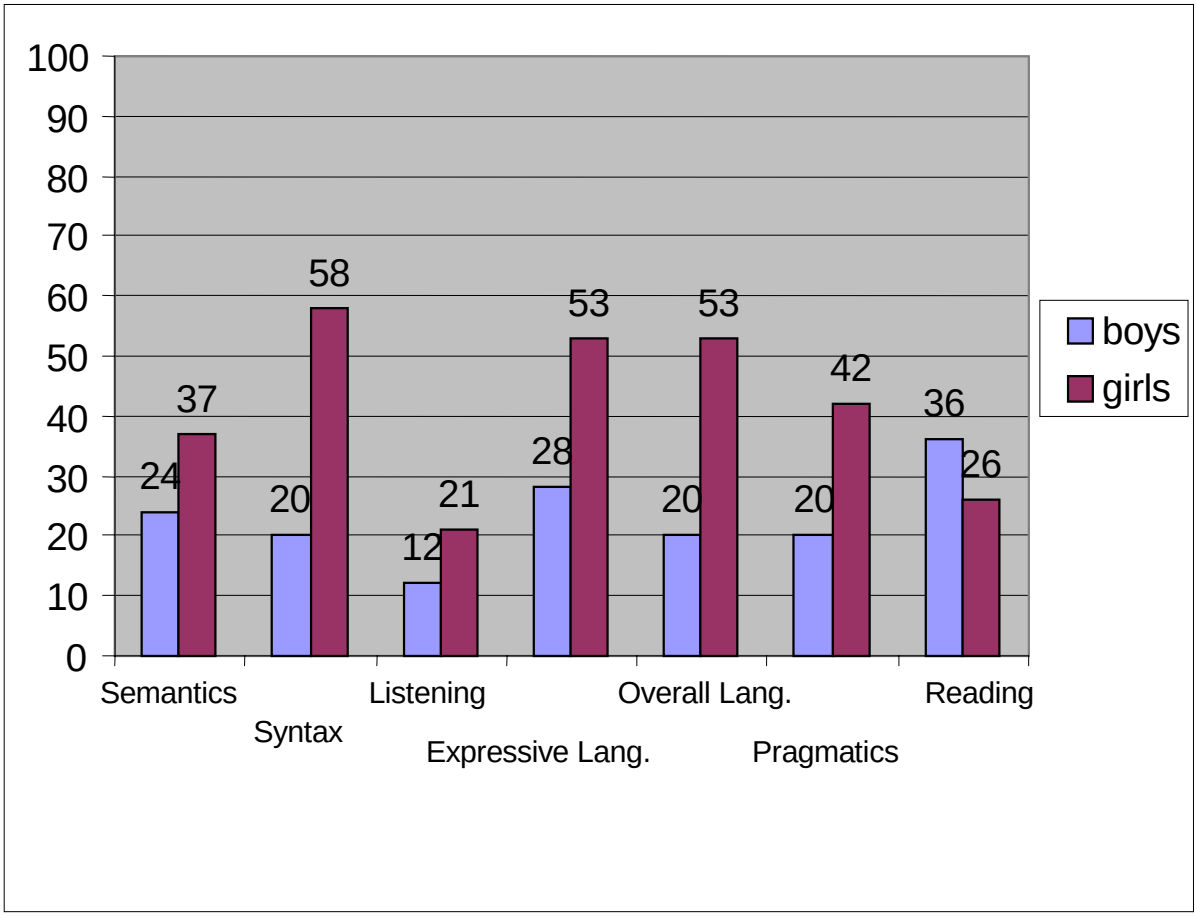

Figure 4 Percentages of EEA-PI chidlren scoring below 1 SD (or 1.25) on the language tests by gender. N= 25 boys, 19 girls

5.3. Question 2. Abilities to learn new vocabulary

The abilities of the EEA-PI children to learn new vocabulary were determined by using scores from the *Nonword Repetition Test.* Trained graduate research assistants who were blind to the children's language status scored the tests according to the guidelines presented by Dollaghan and Campbell (1998). Basic instructions included: Each phoneme was scored as correct or incorrect in relation to its target phoneme. Phoneme substitutions and omissions were scored as incorrect; distortions were scored as correct. Phoneme additions were not counted as errors. To obtain a total score, the number of phonemes repeated correctly was divided by the total number of phoneme targets, resulting in a Total Percentage of Phonemes Correct (TOT.PPC) score.

For the EEA-PI children, the mean TOT.PPC was 73.48 (SD =14.61, range = 41-97). This result was greater than 1 SD below the mean for the scores reported by Weismer et al. (2000) for 359 normal language children aged 6-10 to 8-11 yrs. (mean =83.3, SD=9.1). (See Table 6) Another way of analyzing the EEA-PI children's results uses the performance criteria employed by Dollaghan and Campbell (1998) for subjects ages 5-8 to 12-2 yrs. Their criteria were: A positive test result (rule-in the presence of a disorder) was defined as a TOT.PPC of 70% or lower, and a negative test result (rule-out the presence of a disorder) was defined as a TOT.PPC of 81% or higher. Scores falling between these criteria were considered to be questionable. In this study, 21children (47.7 %) scored at or below 70%, 15 (34.1%) scored at the 81% or higher level, and 8 (18.2%) scored between 71% and 80%. To examine the relationship between reading and learning new words, a comparison of the reading achievement scores with the scores on the *Nonword Repetition Test* was made. Results indicated that reading

outcome was moderately related (r =.425**) to nonword phonemic production in these children. (See Table 10)

5.4. Question 3: Factors predicting the language development of EEA-PI children

An analysis of the variables of institutionalization that might predict the language abilities of children was conducted. The standard scores from the *TOLD P/I:3,* including the Language Composite quotient (Overall language), Listening (Receptive Language) Composite quotient, Speaking Composite quotient (Expressive Language), Semantics Composite quotient, and Syntax Composite quotient; the Pragmatics subtest of the *CASL;* the *NonWord Repetition test;* and the *WRMT-R/NU* Total Reading Cluster were correlated with each other (See Table 10) and with the following variables (See Figure 5) from the *International Adoption Speech and Language Survey*: (1) age at orphanage (institutional) placement, (2) time in institution, (3) age of first exposure to English/age at adoption, (4) time in the U.S., (5) gender, and (6) reception of speech therapy services. (See Table 11)

Correlational analyses using Pearson product-moment coefficients were made to assess the strength of the associations between the various language tests and to determine if these measures group together into broader factors or dimensions for use in the multiple regression analysis. The correlations from the *TOLD* and the language sample that tap semantic, syntactic, morphological and pragmatic skills were calculated first, followed by reading and nonword repetition scores.

Correlations were found among all language tests with the exception of TTR (See Table 10). Moderate-to-strong correlations were found for the majority of the tests and most reached statistical significance. The strongest correlation was between the Speaking Composite Quotient

and the Language (Overall) Composite Quotient on the *TOLD P/I:3.* Pragmatics on the *CASL* showed significant correlation with other tests, but overall was lower than the others. Reading scores and MLU quotients showed the lowest correlation that was still significant. MLU was positively correlated with the Syntax Composite Quotient scores on the *TOLD:3 P/I*. Thus,

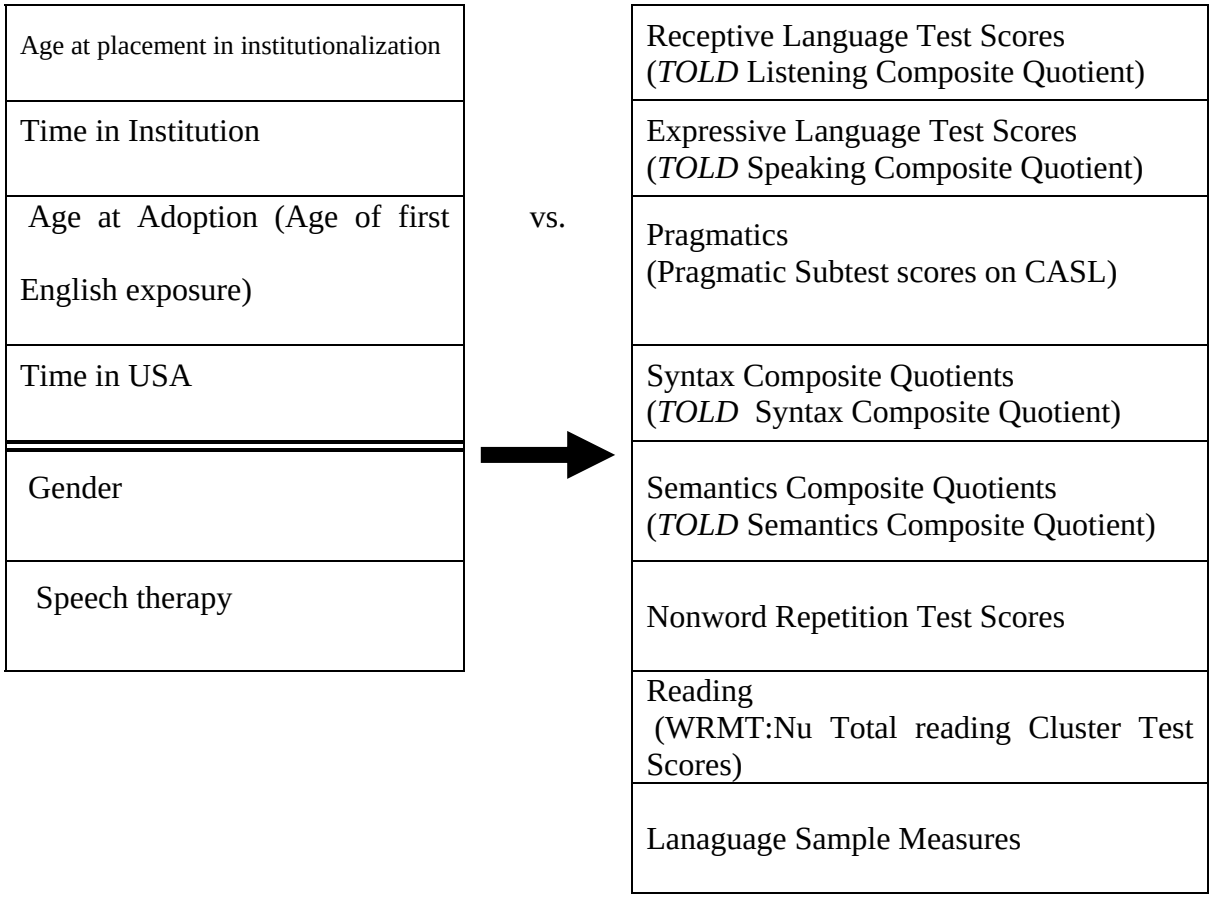

Figure 5 Relationship of Test Scores with Institutional Variables

Table 10 Correlations Between Language Tests

	Language CQs	Listening CQs	Speaking CQs	Semantics CQs	Syntax CQs	Reading Total SS	Pragmatics/ CASL SS
Language CQ							
Listening CQ	.803**						
Speaking CQ	.924**	.710**					
Semantic CQ	.899**	.815**	.851**				
Syntax CQ	.900**	.727**	.922**	.739**			
Reading SS	.434**	.361*	.434**	.357*	.492**		
Pragmatics/ CASL SS	.642**	.417**	.635**	.496**	.657**	.432**	
NonWord	.608**	.386**	.654**	.499**	.659**	.425**	.491**
MLU					.357*		
TTR				-.140			
NDW				.159	.411**	-.089	.448**

Note. Correlations were found among all tests with the exception of TTR. Moderate-to-strong correlations were found for the majority. CQ = Composite quotients, SS = standard scores, MLU= Mean Length of Utterance, TTR = Type Token Response, NDW= Number of Different Words.

*p < .05, two-tailed. **p <.01, two- tailed.

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a spontaneous speech measure correlated with the standardized test measure. Conversely, the poor correlation between TTR and Semantics highlights difficulties in using TTR as a measure of vocabulary diversity.

Results of the correlations for the institutional factors with the language tests are shown in Table 11. Correlations with the *TOLD* language tests were low and not statistically significant with the exception of reception of speech therapy services, which showed that reception of speech therapy now or in the past, was the strongest correlate with the majority of language areas.

Reception of speech therapy services also correlated negatively with reading and nonword scores. For reading there were three additional correlations that reached significance. Age of Adoption and Time in Institution correlated negatively, while Time in the U.S. showed a positive correlation. For reading, the highest correlation was Time in Institution ($r = –.387$, $p < .01$ level). Age of Adoption ($r = -.339$) and Time in U.S. ($r = .319$) were significant at the $p < .05$ level.

Next a stepwise multiple regression analysis was run to determine what institutional variables best predicted the reading scores. The computer selected the variable with the largest correlation that was also significant at the .05 level to enter into the regression equation first. Controlling for the first variable (in this case, Time in Institution), the computer analysis then looked for another variable that was also significant at the .05 level. No other variables met this statistical criterion and therefore only one of the variables was considered to be a predictor (See Table 12). The regression analysis showed that Time in Institution was significant, $F_s(1,43) = 7.390$, $p<.01$. Time in Institution alone explained 15% of the variance (R-squared =.15).

For the nonword repetition scores, three correlations were significant. For the nonword repetition scores, Time in the U.S. showed a strong positive correlation, ($r=.481$, $p< .01$) while

Table 11 Correlations between Language Tests and Institutional Factors

	Language CQs	Listening CQs	Speaking CQs	Semantics CQs	Syntax CQs	Reading Total SS	Pragmatic CASL SS	Nonword SS	MLU SS	NWD SS
Age at Institutional Placement	-.076	-.018	-.018	-.054	-.105	-.040	.037	-.042	-.038	
Age at Adoption	-.122	-.100	-.070	-.115	-.130	-.339*	-.013	-.305*	.045	0.051
Time in U.S.	.173	.118	.102	0.60	.185	.319*	.117	.481**	.217	0.262
Time in Institution	.098	-.110	.-.073	-.104	-.088	-.387**	-.041	-.345*	.081	0.020
Child gender	.257	.295	.193	.246	.222	.064	.125	-.003	-.005	
Speech therapy services	-.330*	-.062	-.367*	-.268	-.335*	-.122	-.432**	-.315*	-.427**	

Note. CQ= Composite quotient, SS = Standard Scores, CASL = Comprehensive Assessment of spoken Language, MLU= Mean Length of Utterance, NDW=Number of Different Words

*p < .05, two-tailed. **p <.01, two- tailed.

Table 12 Summary of Multiple Regression Analysis for Institutional Variables Predicting Adoptees' Reading Levels (N=44)

Variable	*B*	*SE B*	β
Time in Institution	-.555	.164	-.467

Note. No other variables met criteria

Time in Institution (r= -.345, p<.05) and Age of Adoption (r= -.305, p<.05) showed negative correlations. A stepwise multiple regression analysis was run on the scores from the *Nonword Repetition Test* (see Table 13). When Time in the U.S. was the only predictor that was entered, Time in the U.S. alone explained 23.1% of the variance (F(1,42 =12.632, p<.01) and this was significantly greater than would be expected by chance. The second predictor entered by the computer, Time in Institution, explained 11.9% of the variance (Fs(1,42)=12.632, p<.01). Together these two variables explained 25.7% of the variance in the *Nonword Repetition* scores. The amount of variance in *Nonword Repetition* scores explained by these two variables was significantly greater than would be expected by chance alone (Fs (2,41)= 7.096, p< .002).

It is essential in multiple regression analysis that the explanatory variable of interest not be correlated perfectly with one or more of the other explanatory variables. If there was a perfect correlation between two variables one could not separate out the effect of the variable of interest on the dependent variable from the effect of the other variable. One approach to this problem is to drop the questionable variable from the regression to determine whether its exclusion makes a difference. Age of Adoption correlated highly with Time in Institution because the vast majority

of children were place in the orphanage at birth. Age of adoption, therefore, was excluded in the analysis by the statistical program.

Table 13 Summary of Multiple Regression Analysis for Institutional Variables Predicting Adoptees' NonWord Repetition Scores (N=44)

Variable	*B*	*SE B*	β
Time in U.S.	.260	.094	.408
Time in Institution	-.195	.163	-.177

Note. No other variables met criteria

5.4.1. Hierarchical Multiple Regression.

Because it appeared that several of the variables may be interrelated, making it difficult to ascertain the independent contribution of each one, a hierarchical multiple regression analysis was then conducted to address this issue. In hierarchical multiple regression, unlike standard stepwise multiple regression analysis, the researcher decides not only how many predictors to enter, but also the order in which they are entered. Usually the order is based on theoretical considerations (Glass & Hopkins, 1996). The purpose of this analysis was to learn which aspects of institutionalization were the strongest for each of the following variables (or dimensions) of language competence: total language (Language Composite Quotient), receptive language (Listening Composite Quotient), pragmatics (CASL-pragmatics score), reading (Total Reading Cluster Score *WRMT-R/NU*), and language learning (Nonword Repetition Test). Since the morphology results were comprised of two different subtests rather than composite scores from the *TOLD*, this area could not be analyzed due to the small number of subjects in the two groups.

Also a hierarchical multiple regression analysis was not done separately for the Semantics and Syntax Language Composite Quotients because the Language Composite contained all the Standard scores from the expressive language, semantics, and syntax subtests, and the factors correlated so highly that the statistical analysis would be almost identical. Consequently, only the Language Composite Quotient was used as a Summary Score. The Listening Composite Quotient was run separately because listening was the only factor that did not reach significance in the group comparisons. Again, Time in Institution correlated so highly with Age at Adoption/First Exposure to English that when entered, Age at Adoption/ First Exposure to English were excluded by the statistical program.

In this analysis, the first block of predictor variables entered included gender and whether or not the child received speech therapy. These two variables were included first because, although the main interest of this study is the role of the specific institutional factors, gender and speech therapy are both known to be related to language development, and were considered to be confounding variables. Therefore, these two variables were entered before the others in order to control for their influences (See Tables 14,15,16,17,18). These analyses showed that receiving speech therapy was the strongest predictor of language problems and was significant for all but the Listening Composite Quotient analysis. Speech therapy accounted for approximately 68 % of the variance and was significant at $F_s(1,42)=5.262$, $p<.05$. The hierarchical regression model showed that the contributions of gender were not significant in the equation; though for listening, gender scores approached but did not reach significance.

The second block of predictor variables entered into each analysis included the institutional factors (i.e., time in institution, age at placement in institution, and time in the U.S.). This made it possible to determine which of these variables were the strongest predictors of language competence after controlling for gender and speech therapy. For all five analyses, the

results indicated that age at placement in institution, time in institution, and age of adoption were negatively correlated with language scores but did not reach significance (See Table 14). Time in U.S. showed a positive correlation with the language scores in all five analyses; however, it was only significant for the Nonword test at $F_s(1,42)=12.63$, $p<.01$.)

Table 14 Summary of Hierarchical Regression Analysis for Variables Predicting Overall Language Scores by Institutional Variables (N=44)

Variable: Overall Language	*B*	*SE B*	β
Step 1			
Gender	8.42	4.65	.26
Speech therapy	-11.47	4.85	-.34*
Step 2			
Gender	9.75	4.73	.30
Speech therapy	-13.36	4.94	-.40*
Age at placement in Institution	-0.22	0.28	-.12
Time in Institution	-0.04	0.21	-.03
Time in U.S.	0.16	0.12	.23

Note. Spoken language correlated so highly with Speaking, Syntax, and Semantics that this analysis would be almost identical. Therefore, the Language Composite Quotient was used as a summary score.
Listening was run separately because it was the only factor that was not significant for the group comparisons. Age of Adoption correlated so highly with Time in Institution that the statistical program excluded this factor.

*p<.05

Table 15 Summary of Hierarchical Regression Analysis for Variables Predicting Receptive Language Scores by Institutional Variables (N=44)

Variable: Listening	*B*	*SE B*	β
Step 1			
Gender	8.92	4.65	.29
Speech therapy	-2.33	4.84	-.073
Step 2			
Gender	9.41	4.89	.30
Speech therapy	-2.98	5.11	-.09
Age at placement in Institution	-0.11	0.29	-.01
Time in Institution	-0.77	0.22	-.06
Time in U.S.	0.109	0.12	.161

*p<.05

Table 16 Summary of Hierarchical Regression Analysis for Variables Predicting Pragmatic Language Scores by Institutional Variable (N=44)

Variable: Pragmatics	*B*	*SE B*	β
Step 1			
Gender	4.53	4.48	.142
Speech therapy	-14.48	4.67	-.44*
Step 2			
Gender	5.77	4.70	.18
Speech therapy	-15.51	4.91	-.47*
Age at placement in institution	-0.62	0.28	-.03
Time in Institution	0.70	0.20	-.05
Time in U.S.	0.14	0.12	.20

*p<.05

Table 17 Summary of Hierarchical Regression Analysis for Variables Predicting Reading Scores by Institutional Variable (N=44)

Variable: Reading	*B*	*SE B*	β
Step 1			
Gender	-4.20	.34	-.18
Speech therapy	.80.	.35	-.33*
Step 2			
Gender	-.49	0.35	-.21
Speech therapy	9.16	0.37	.38*
Age at placement in Institution	0.22	0.21	-.17
Time in Institution	-0.01	0.16	-.05
Time in U.S.	0.00	0.09	.06

*p<.05

Table 18 Summary of Hierarchical Regression Analysis for Variables Predicting Nonword Repetition Scores by Institutional Variables (N=44)

Variable: Nonword	*B*	*SE B*	β
Step 1			
Gender	-.022	4.39	-.001
Speech therapy	-9.63	4.59	-3.15*
Step 2			
Gender	-.94	3.73	-.03
Speech therapy	-11.07	3.89	- .36*
Age at placement in Institution	0.06	0.22	-.036
Time in Institution	-0.288	0.16	-.24
Time in U.S.	0.30	0.09	.463*

*p<.05

5.4.2. Scatterplots.

Individual scatterplots were also run for each language area to acquire a subjective sense of the correlation strength. To determine whether there were any observable trends or patterns for these comparisons, scatterplots were made of the Language Composite Quotient scores compared to the variables: chronological age (C.A.), time in institution, Time in U.S. and age at adoption (See Figures 6, 7, 8, 9.) No trends were observed. Additionally, for semantics, a scatterplot of the TTR scores against the children's age levels, Time in Institution, and Time in U.S. was run. No trends were apparent on visual inspection. (See Figures 10, 11 & 12.) For syntax, scatterplots of the MLU scores against the children's age levels and institution factors were run to determine trends. (See Figures 13, 14 &15.) MLUs tended to increase with age, as expected. There was no apparent trend observed between MLU and Time in Institution /Age of Adoption, or Time in the U.S.

To obtain subjective impressions of the results, scatterplots of the reading standard scores on the *WRMT-R/NU* were run against C.A., Time in Institution, Time in U.S. and Age of Adoption. (See Figures 16, 17, 18 & 19.) A negative trendline showed that reading scores decreased as the length of time in the institution increased and as the age of adoption decreased. A positive trendline was noted for Time in the United States in relation to reading scores.

Finally, scatterplots of the TOT.PC scores on the *Nonword Repetition Test* were run against several institutional factors to provide a visual representation of the strength of these associations. (See Figures 20, 21, 22, & 23.) Apparent negative trends were observed for Time in Institution and Age at Adoption. A positive trend was noted for Time in the United States for the scores.

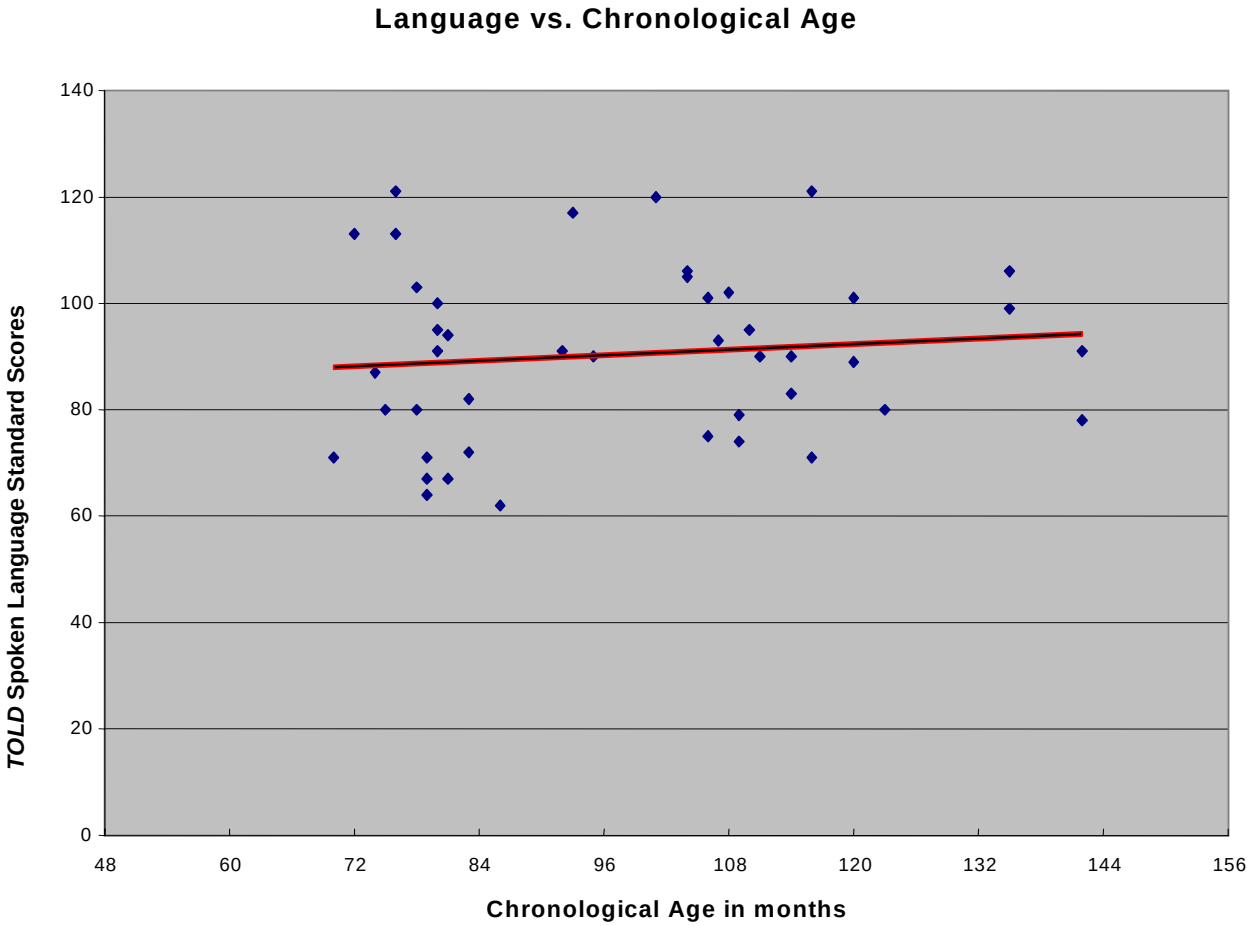

Figure 6 Scatterplot of Language Composite Quotient Scores from the Test of Language Development (TOLD P/I:3) vs. Chronological Age. (r = .110)

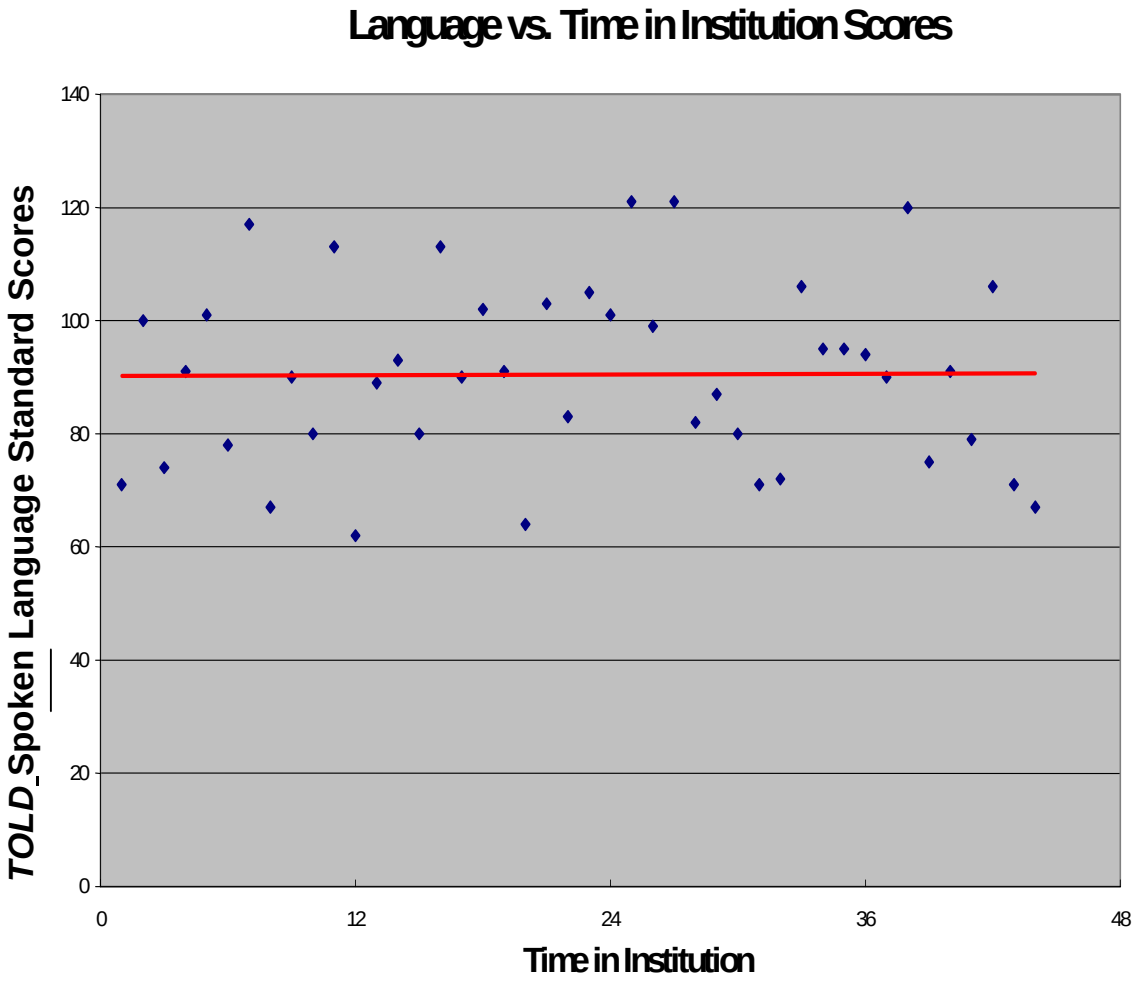

Figure 7 Scatterplot of Language Composite Quotient Scores from the Test of Language Development (TOLD P/I:3) vs. Time in Institution (r = .098)

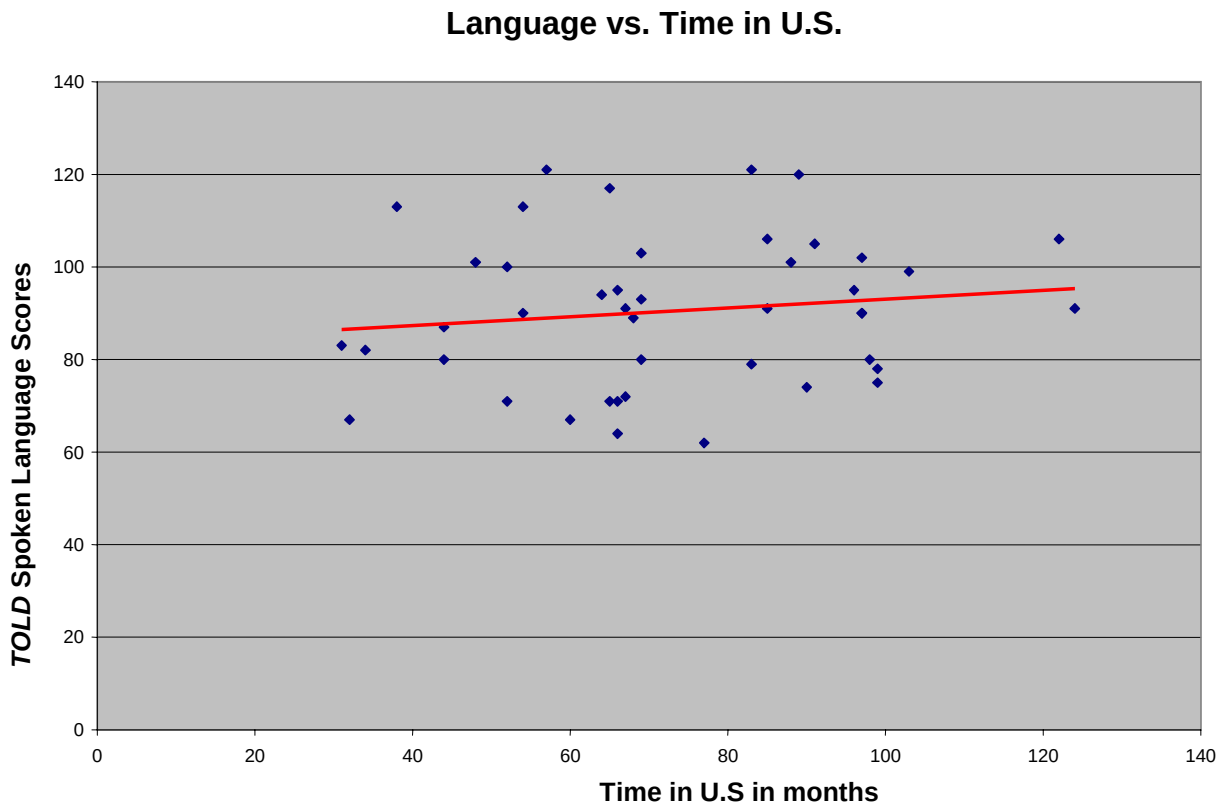

Figure 8 Scatterplot of Language Composite Quotient Scores from the Test of Language Development (TOLD P/I:3) vs. Time in U.S. (r=.173)

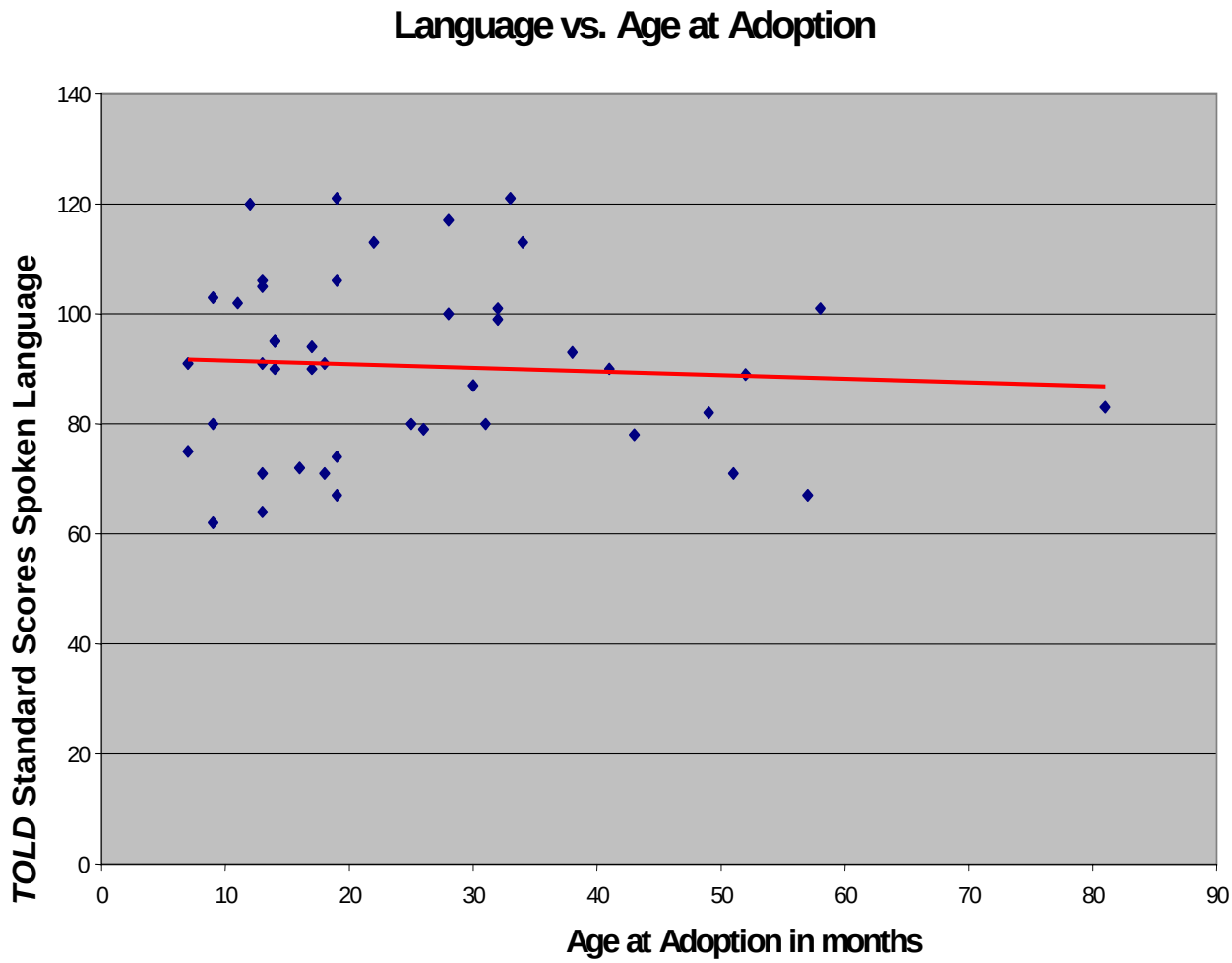

Figure 9 Scatterplot of Language Composite Quotient Scores from the Test of Language Development (TOLD P/I:3) vs.Age at Adoption. (r =-.122)

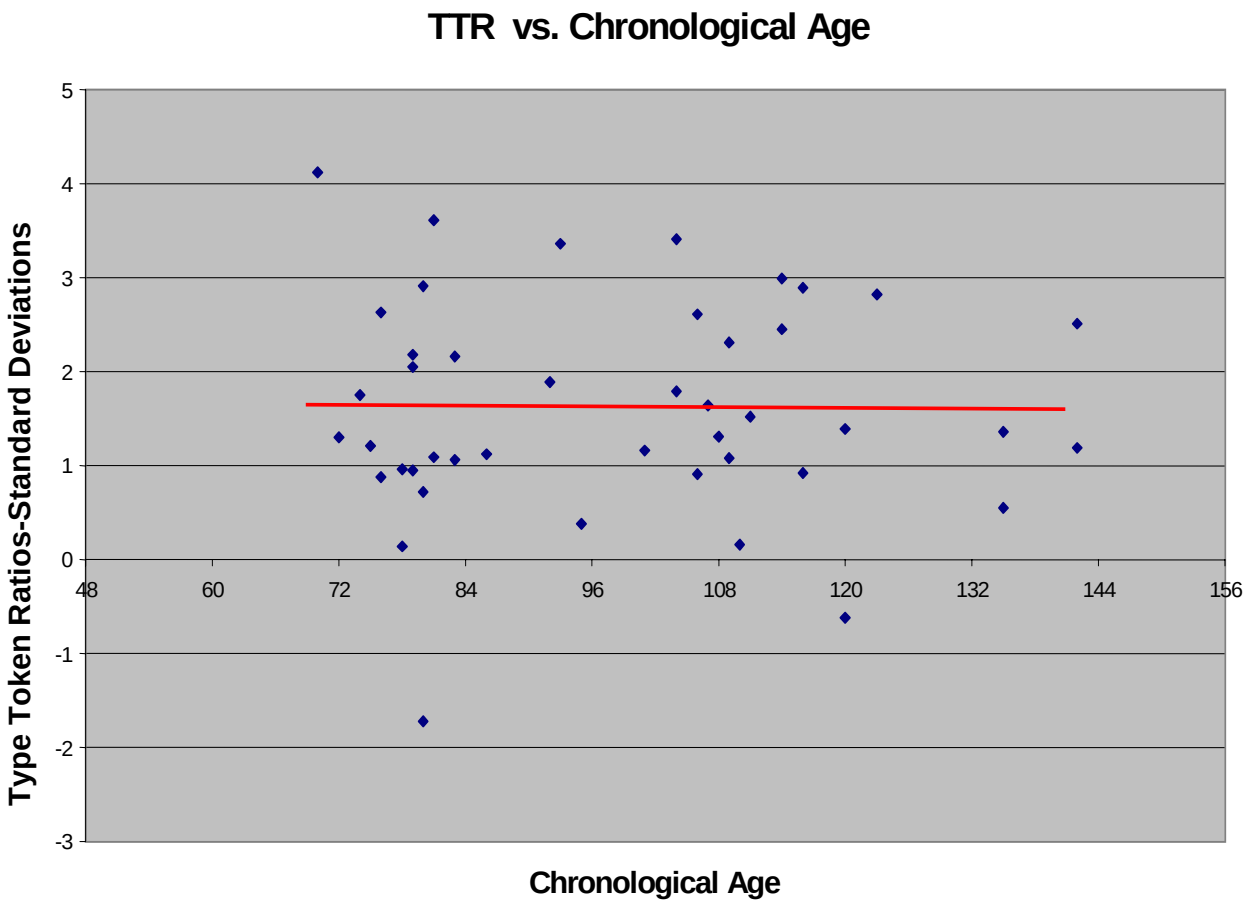

Figure 10 Scatterplot of Type-Token Ratios vs. Chronological Age (in months).(r = -.057)

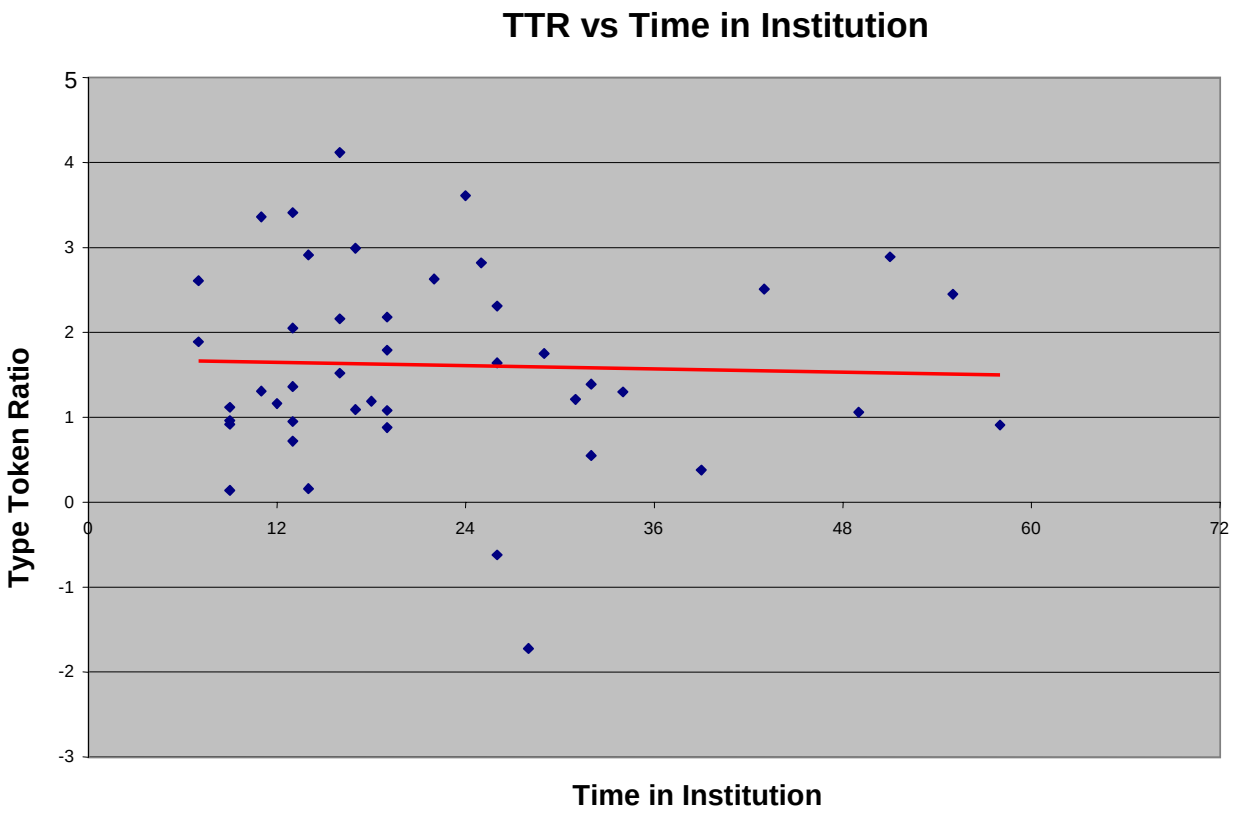

Figure 11 Scatterplot of Type-Token Ratios vs. Time in Institution in months (r = -.030)

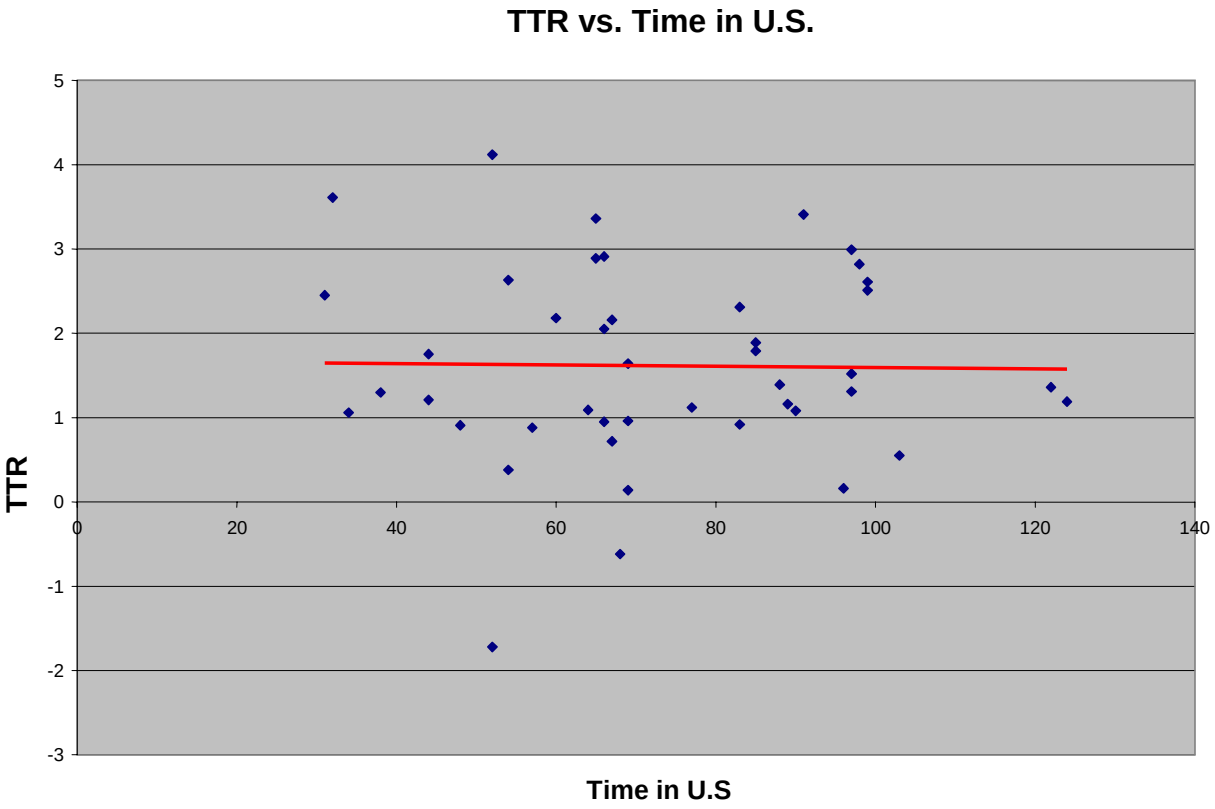

Figure 12 Scatterplot of Type-Token Ratios vs. Time in US (in months) (r = -.074)

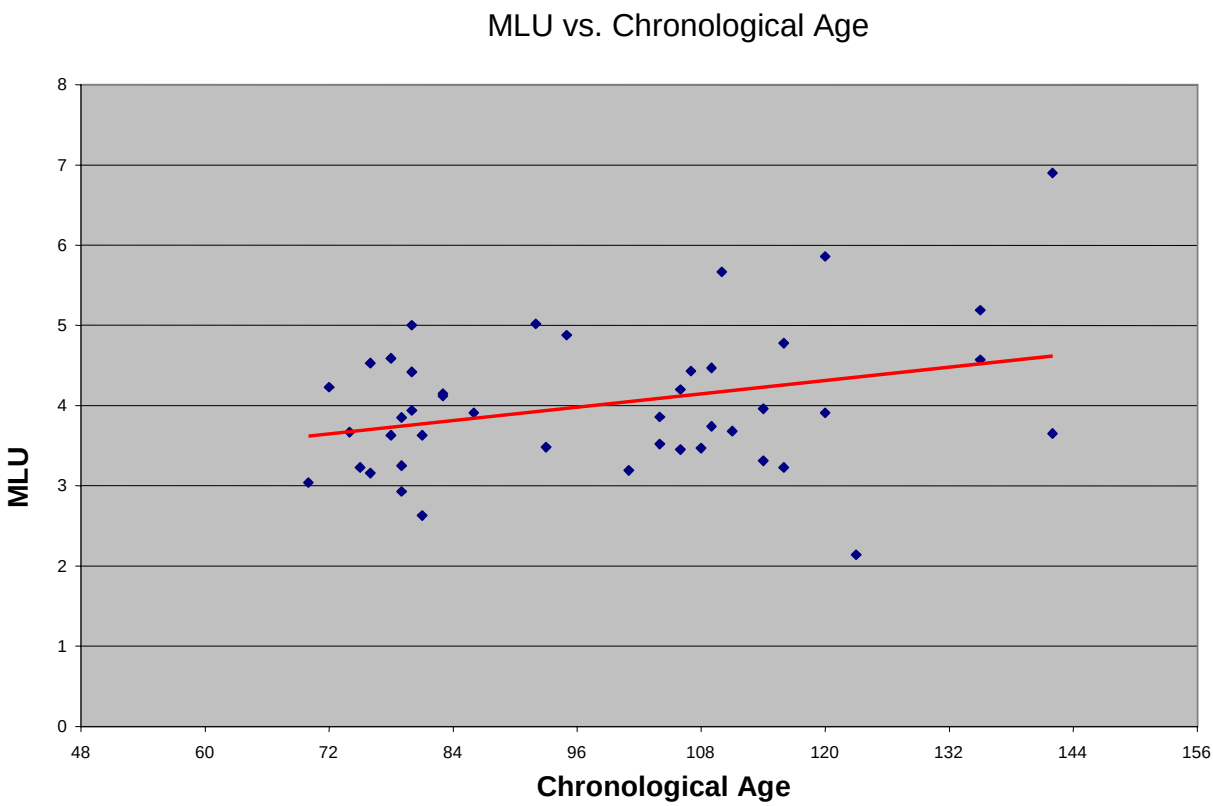

Figure 13 Scatterplot of Mean Length of Utterances in morphemes vs. Chronological Age (in months) (r =.318)

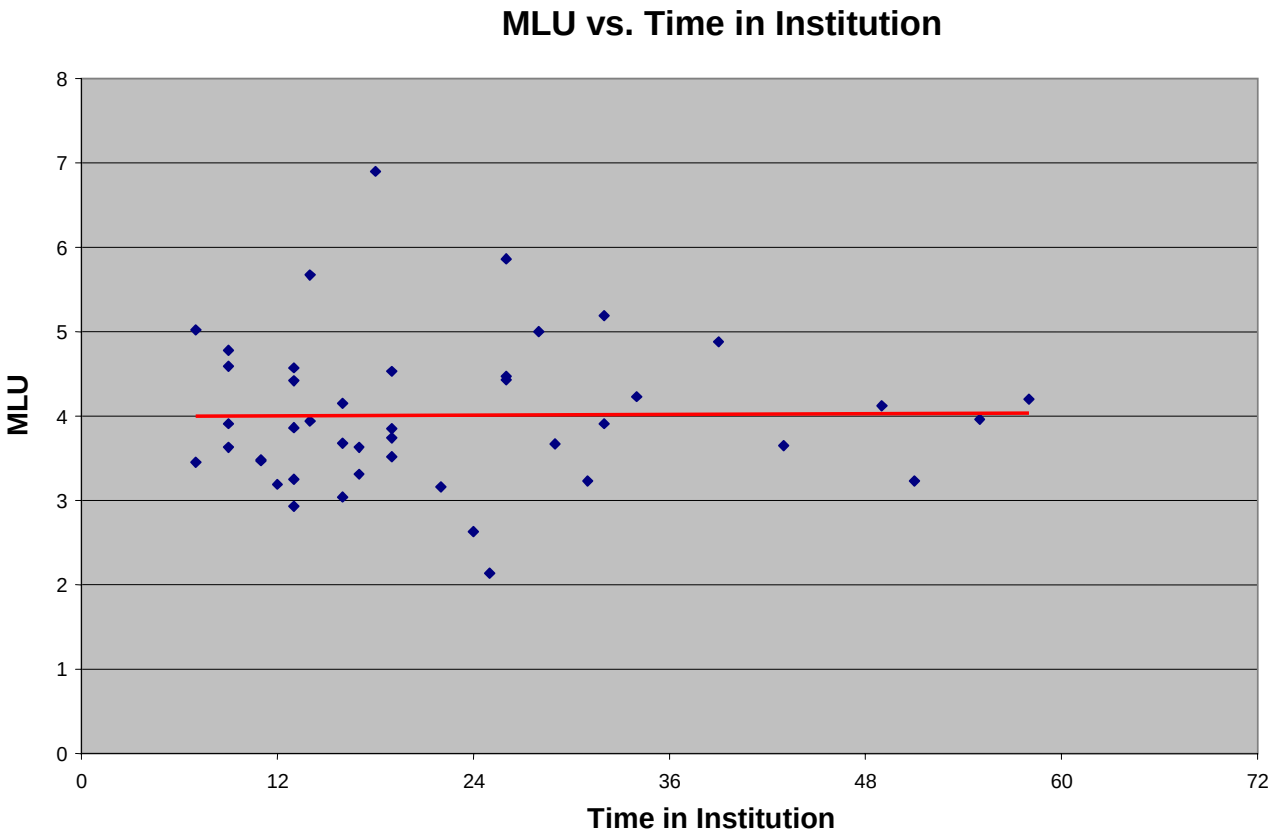

Figure 14 Scatterplot of Mean Length of Utterances in morphemes vs. Time in Institution (in months) (r = .012)

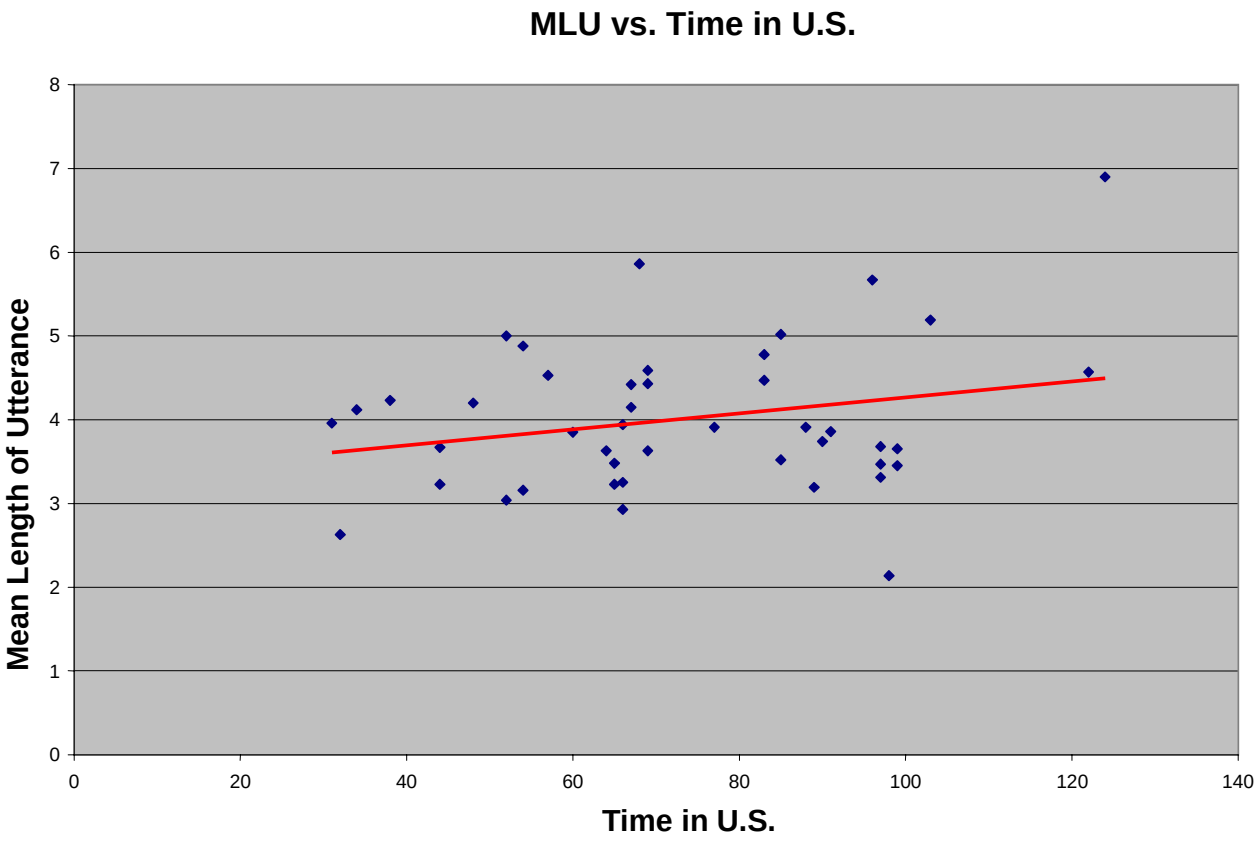

Figure 15 Scatterplot of Mean Length of Utterances in morphemes vs. Time in U.S. (in months). (r =.246)

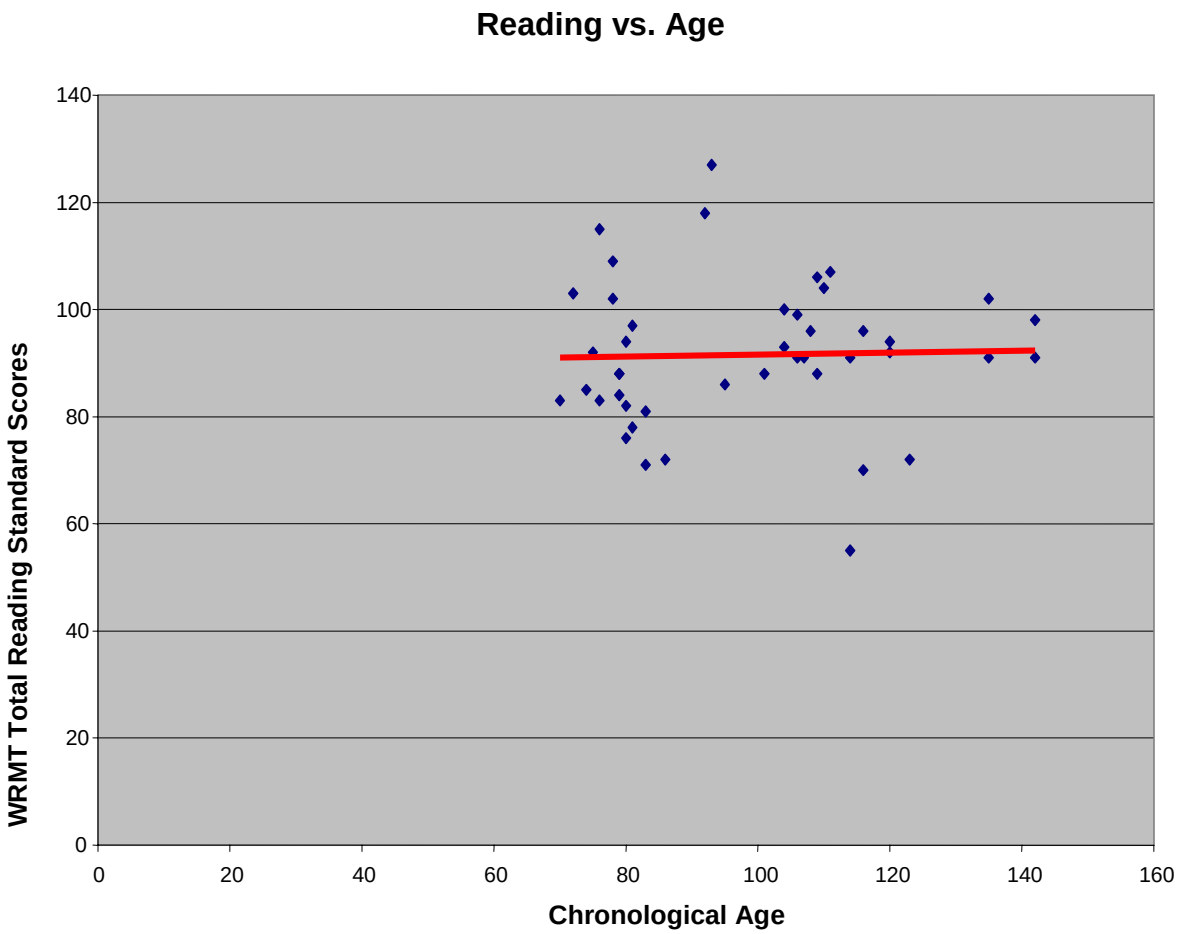

Figure 16 Scatterplot of Reading Scores from the Woodcock Reading Mastery Tests- Total Reading Cluster vs. Chronological Age (in months). (r = .027)

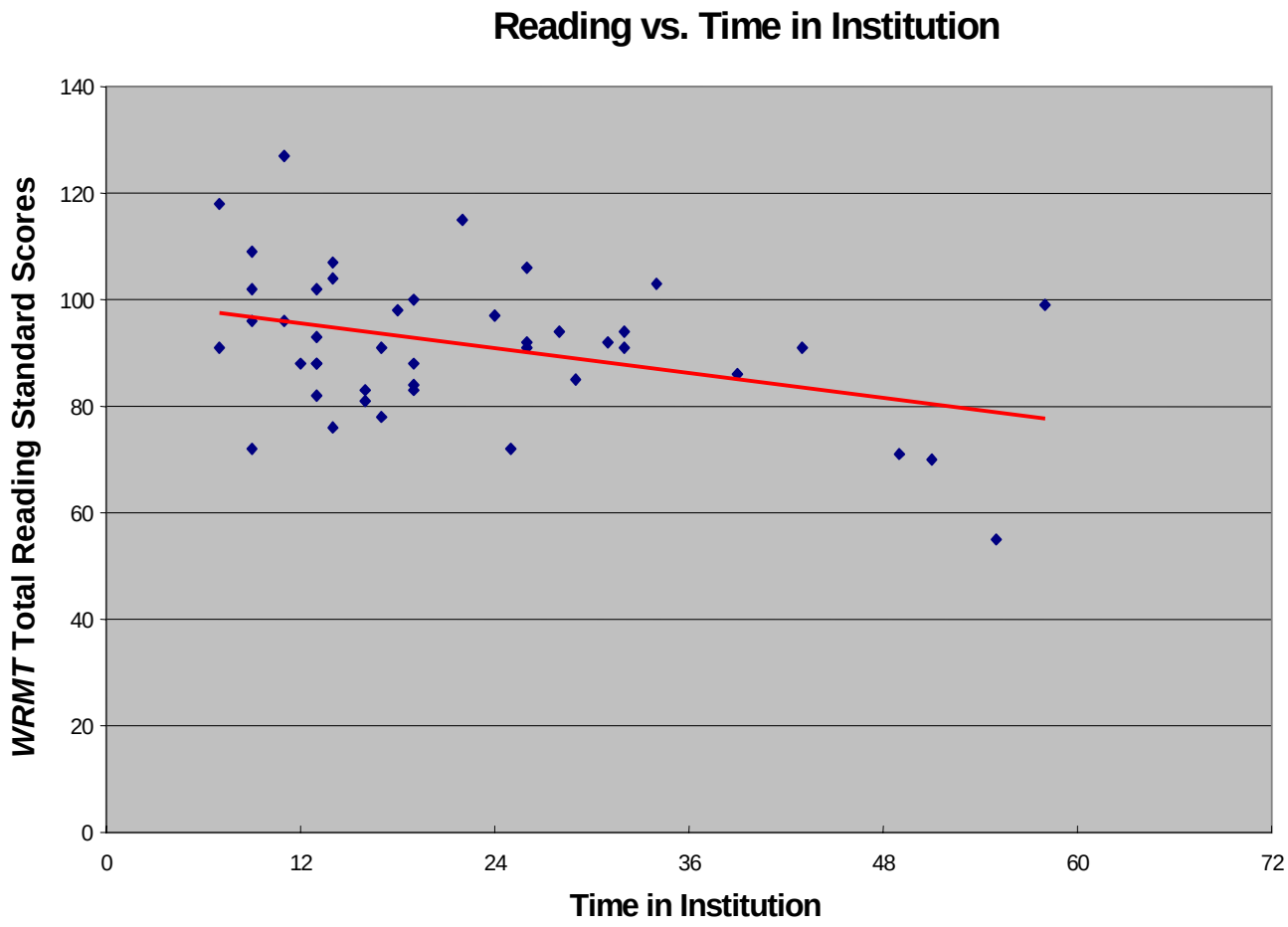

Figure 17 Scatterplot of Reading Scores from the Woodcock Reading Mastery Tests- Total Reading Cluster vs. Time in Institution (in months). (r= -.387)

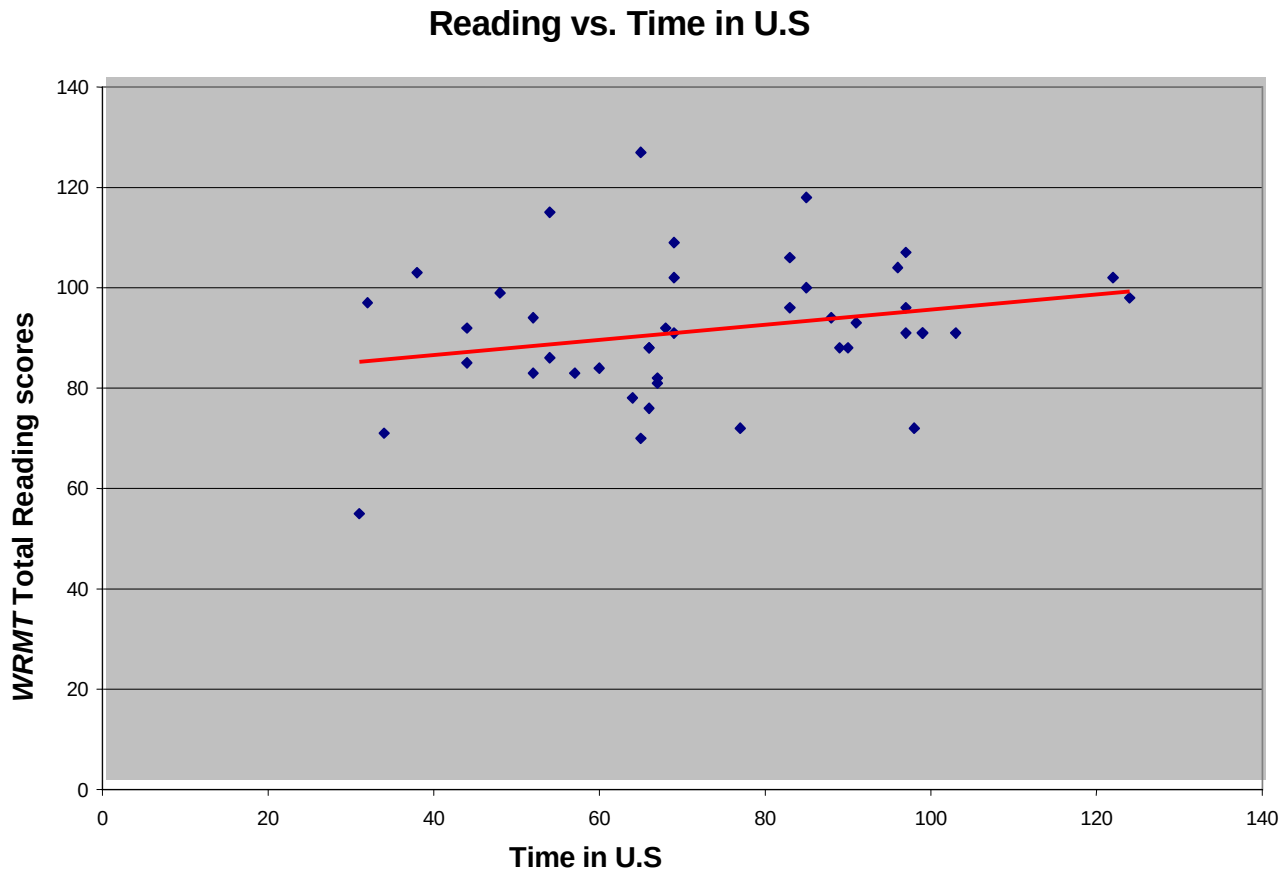

Figure 18 Scatterplot of Reading Scores from the Woodcock Reading Mastery Tests- Total Reading Cluster vs. Time in U.S. (in months). (r = .319)

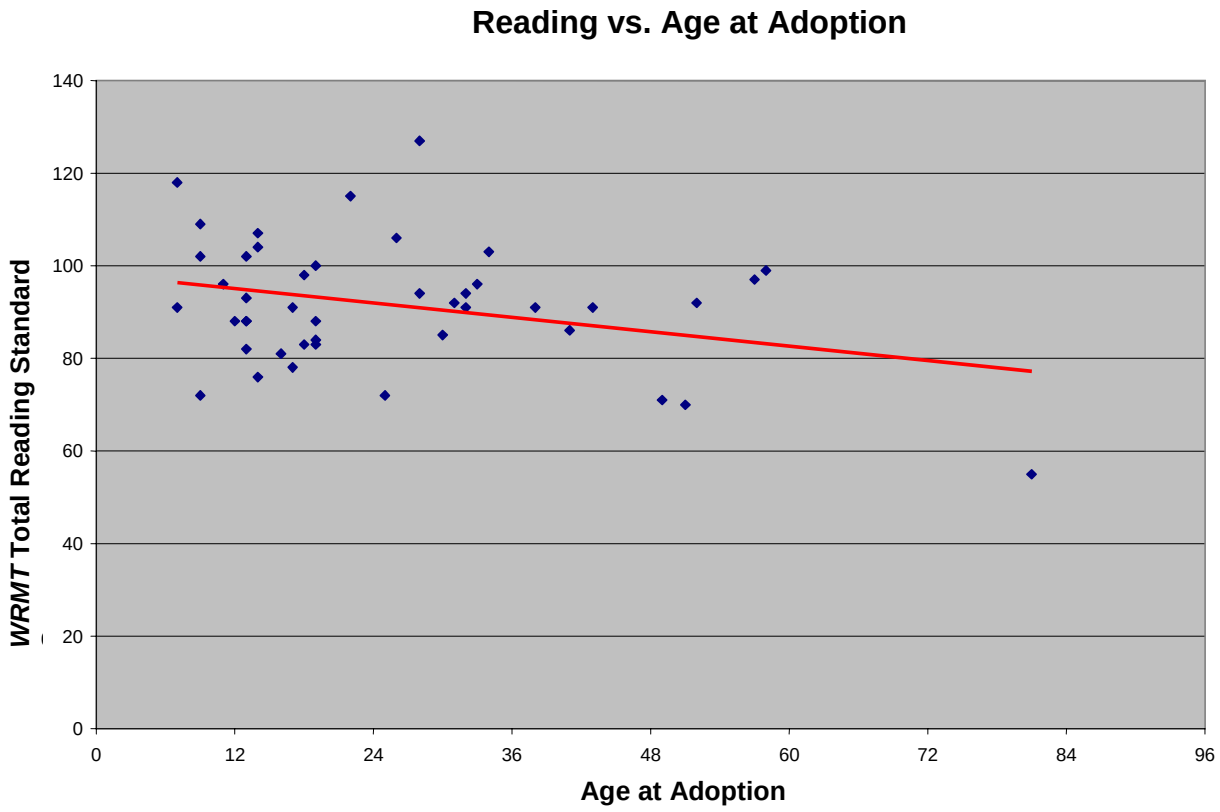

Figure 19 Scatterplot of Reading Scores from the Woodcock Reading Mastery Tests- Total Reading Cluster vs. Age at Adoption (in months). (r = -.339)

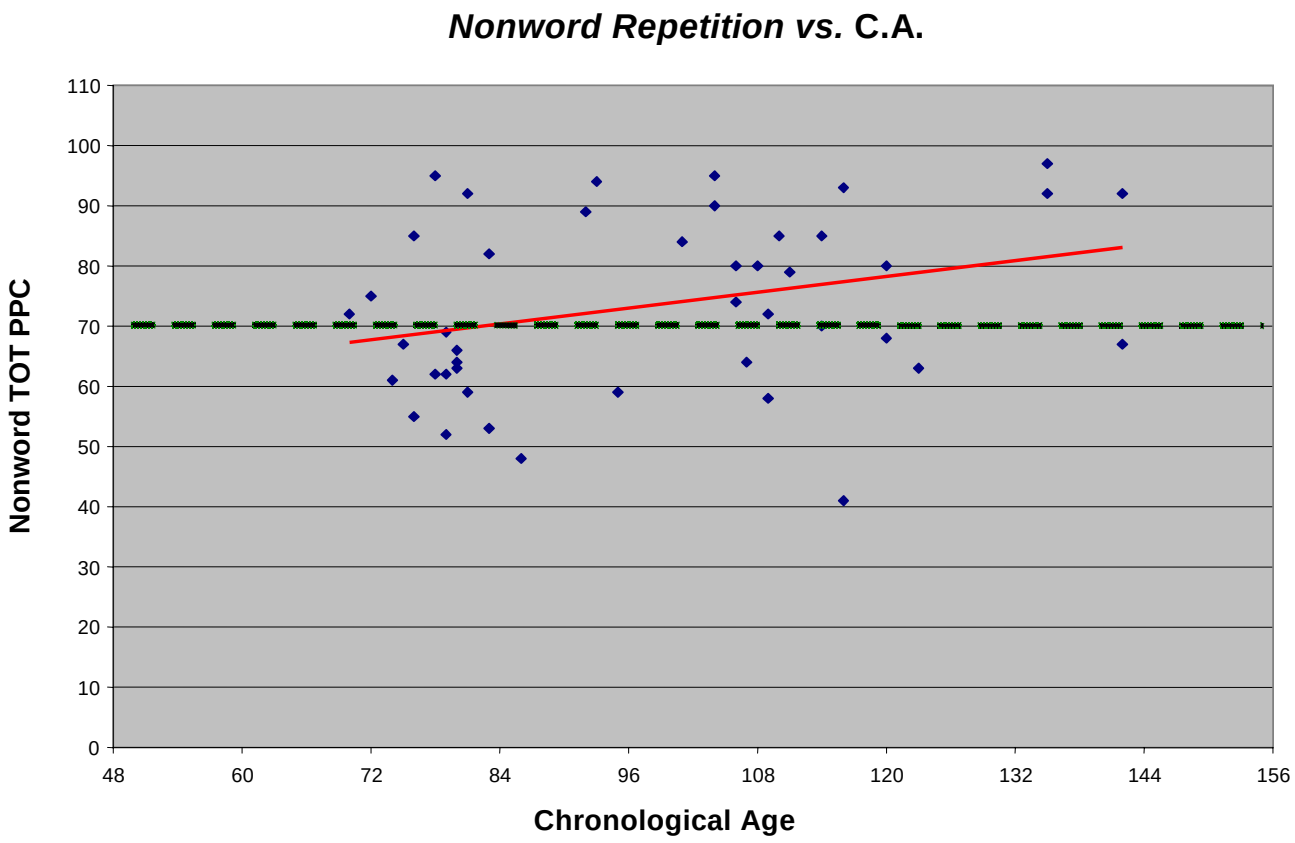

Figure 20 Scatterplot of Nonword Repetition Total Percentage of Phonemes Correct (TOT.PPC) Score vs. Chronological Age (in months). (r = .307)

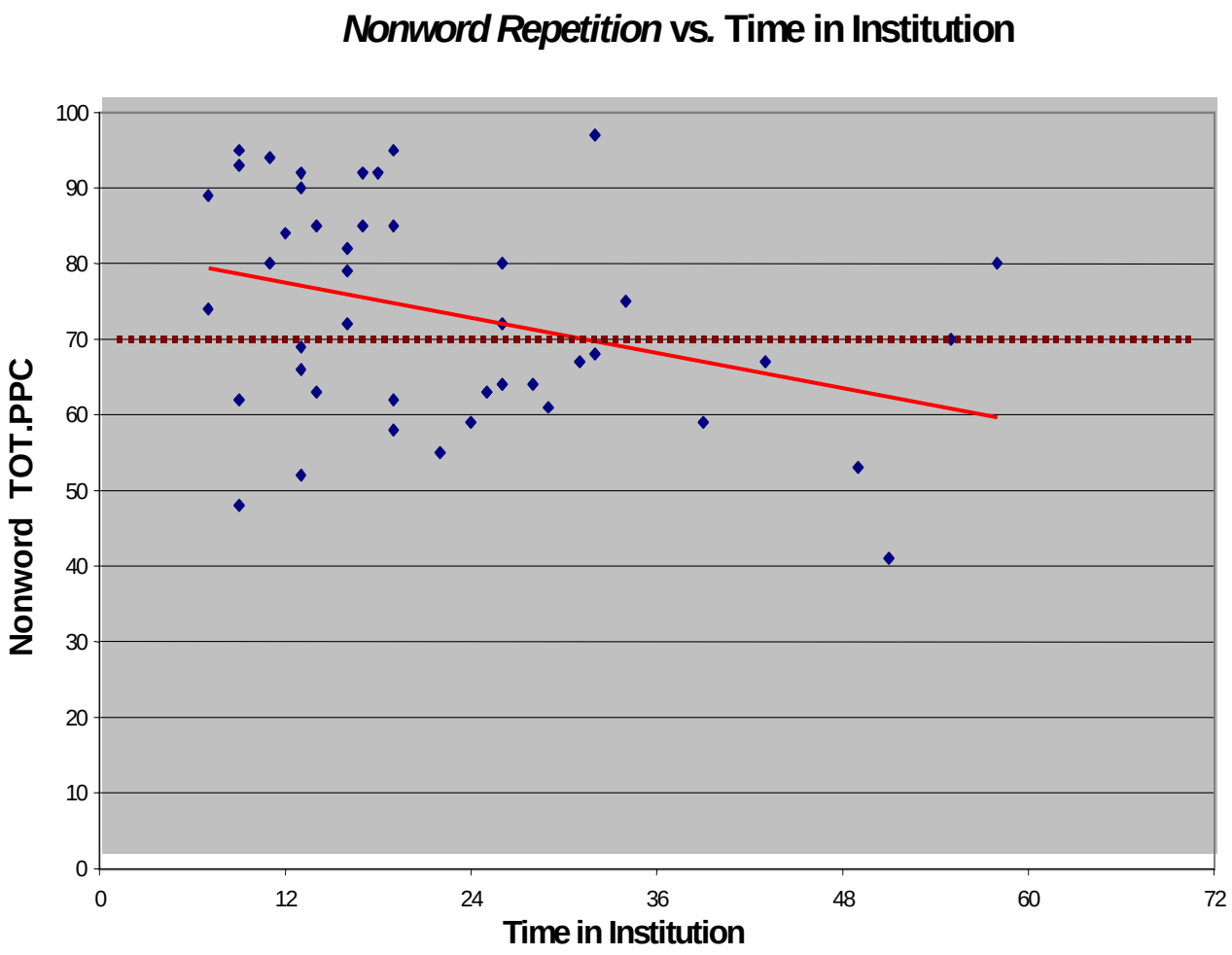

Figure 21 Scatterplot of Nonword Repetition Total Percent Phonemes Correct Score (TOT.PPC) vs. Time in Institution (in months). (r = .-.345)

Figure 22 Scatterplot of Nonword Repetition Total Percentage of Phonemes Correct (TOT.PPC) vs. Time in U.S. (in months). (r = .481)

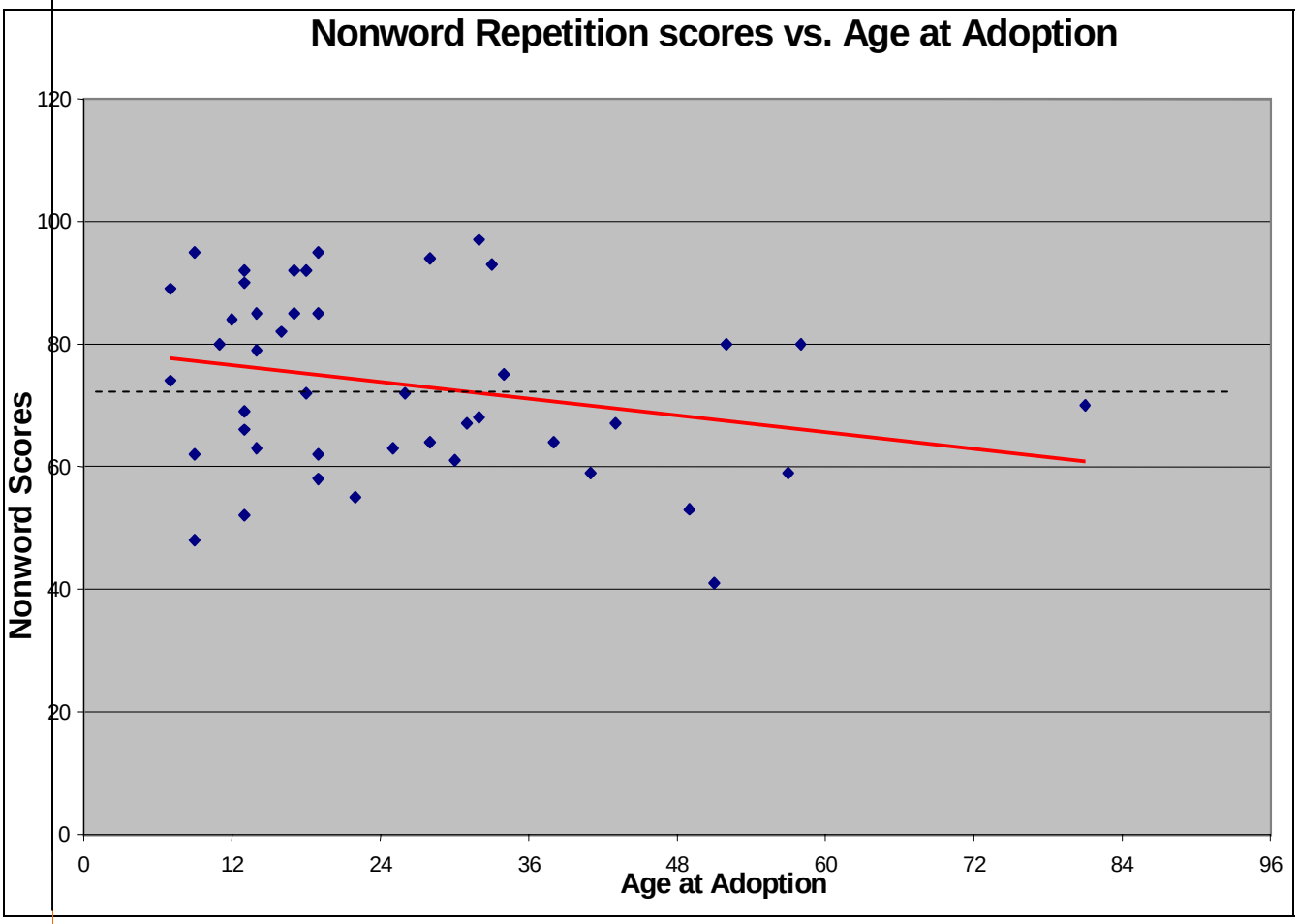

Figure 23 Scatterplot of Nonword Repetition Total Percentage of Phonemes Correct (TOT.PPC) score vs. Age at Adoption (in months). (r = .-.305)

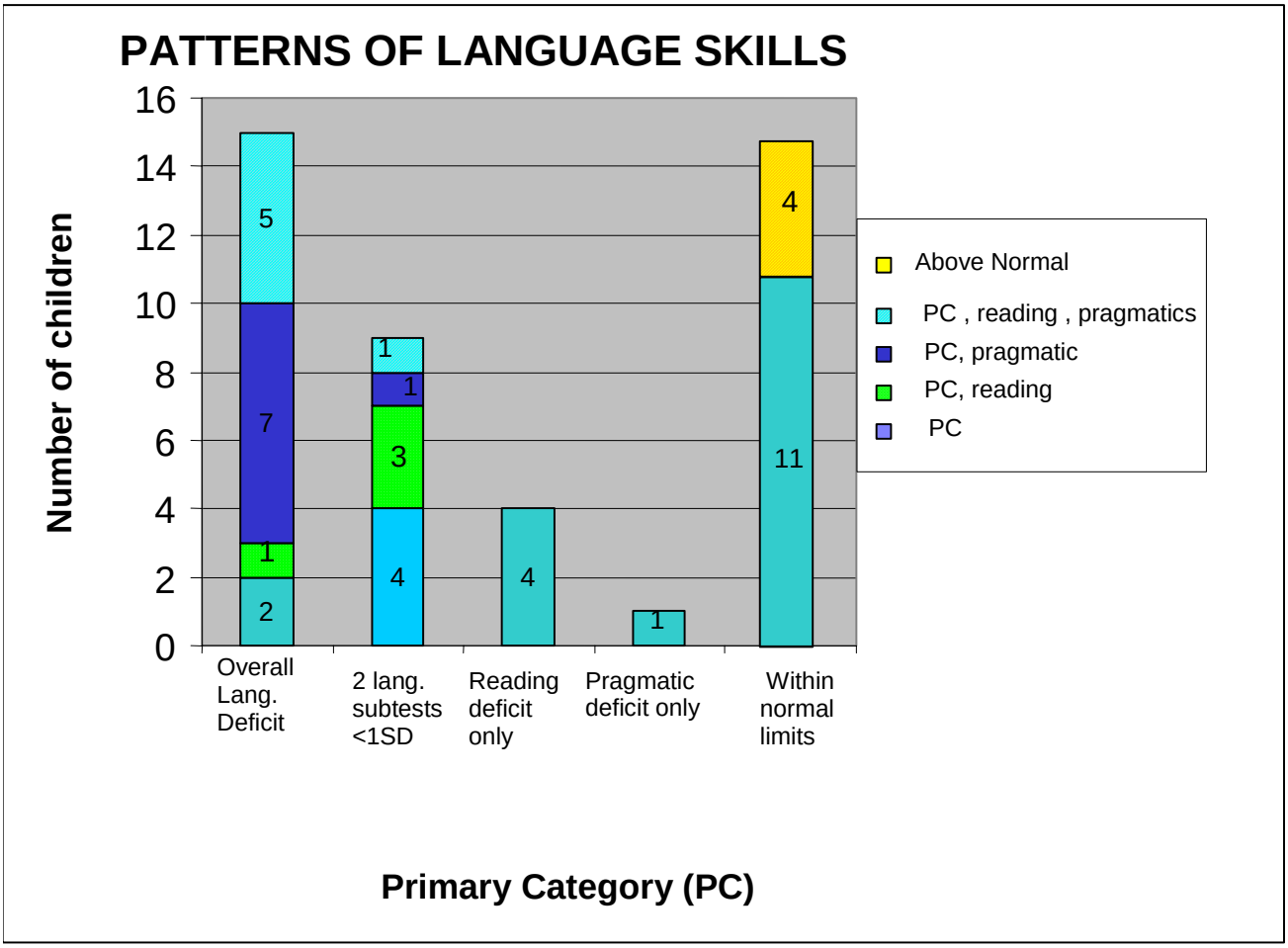

Figure 24 Summary Chart of EEA-PI Children Patterns of Language

6. DISCUSSION

Children adopted from Eastern European orphanages present with many complex issues and factors that interact to influence their abilities to learn English. Their early institutional social environment combined with inadequate health and nutritional care clearly place them "at risk" for speech and language disorders. The aim of this study was to examine the long-term language outcomes of school-aged children adopted from Eastern European orphanages, and to explore institutional factors that might predict long-term language outcomes. This study extends the literature on the language abilities of U.S. EEA -PI children and examines whether relationships exist among expressive language, receptive language, reading, and orphanage variables using actual clinical assessments of the children.

6.1. Demographics

The demographic characteristics of the subject population of this study were comparable to those of earlier research reports. This study corroborates what others have revealed: that the EEA-PI population is fairly evenly split between males and females (Albers et al., 1997; Johnson et al., 1996), that in the U.S. EEA-PI children are generally adopted as toddlers, around 26 months of age (Groza, 1995;Albers et al., 1997; Johnson et al., 1996), that the adoptive parents are typically from middle to upper socioeconomic levels (McGuinness,1998; Groza, 1995), and that the majority of children were placed in the institution within one month of birth (Albers et al., 1997; Johnson et al., 1996). It further supported the reports that these children quickly begin learning English (Gindis, 1997; Glennen & Masters, 2002) and that high percentages of the children receive speech and language services. At the time of testing, 28 out of 43 (63%) had

received speech/language therapy after arrival to the U.S. and 22 (52%) were continuing to receive speech/language therapy at the time of testing. Current prevalence data indicate that large numbers of children adopted internationally are receiving speech-language therapy. Glennen (2002) reported that 35% of her Eastern European adoptee subjects were receiving speech/language therapy services as were 57% of Pollak's (2000).

6.2. Research Question 1. Types of language difficulties.

The first research question asked if the children exhibited greater than expected difficulties in language skills. In comparing the participants that were EEA-PI to normative data on the standardized and spontaneous speech measures, the study found that, as a group, the EEA-PI children performed lower than age expectation on all of the measures, with the exception of measures of Listening (Receptive Language). Listening scores were lower than the comparison normal group, but the difference from the norms may not have reached significance due to the contribution of strong single word vocabulary scores. (This finding is discussed below). Although some of the children scored within the normal range (scores ranged from 52 % to 64% of the children scoring within the normal range across the individual language domains), 66% had impairments in at least one aspect of language as assessed by the standardized measures included in this study. These results support the findings of language deficits as reported in other studies that used parent survey information (Hough, 1996; Clauss & Baxter, 1998; McGinnis, 1999) or were conducted in other countries (Ames,1997; Dalen, 2001; Rutter et al., 1998)

This sample of school-aged EEA-PI children exhibited delays across multiple dimensions of language. Twelve children displayed discrepancies between their receptive and expressive language scores; more children (11) had higher receptive scores than expressive scores than the other way around. Syntax and morphology were notable areas of concern, with semantics being

less impaired. This suggests that for most of the children the difficulties were part of a more general linguistic deficit, one that seems to follow the patterns of children with Specific Language Impairment (SLI) rather than children with language delays or auditory processing deficits. Fey (2003) states that children with SLI, when compared to their age–level peers, may have deficits in any or all domains of language including phonology, syntax, semantics, pragmatics, and morphology. Further evidence for characterizing many of the children in this study as having SLI is supported by examining various definitions of SLI and other criteria.

According to the *Diagnostic and Statistical Manual of Mental Disorders, Version 4* (*DSM-IV*) (American Psychiatric Association, 1994), Specific Language Impairment (SLI) is comprised of a discrepancy between nonverbal ability and language abilities, usually of at least 1 SD, with evidence that the child's language negatively affects either social functioning or academic achievement. Craig and Washington (1993) defined Specific Language Impairment (SLI) as a disorder associated with a significant language deficit, with no evidence of frank neurological damage, no hearing impairment, no cognitive impairment, and no social/emotional impairment. The children in this study meet all of the criteria identified in these definitions with the possible exception of social/emotional impairment. The eligibility criteria for this study excluded children with physical and sensory impairments and nonverbal IQs below normal. No specific testing, however, was done for social/emotional impairments. In accordance with these definitions, the diagnosis of Specific Language Impairment for the EEA-PI children in this study is particularly conceivable because they showed a developmental deficit in language acquisition even though their nonverbal intelligence was within or even above normal range.

Admittedly, in terms of classification there can be potential overlap or unclear distinctions between young children regarded as "slow expressive language learners" (also

commonly called late-talkers) and children with Specific Language Impairments. Although the clinical profile of both general language delay and SLI is characterized by greater difficulty on grammatical subtests than on semantic or narrative tasks, one distinguishing feature and important aspect to consider is the presence of deficits in other developmental domains (Gray, 2004). In the definition of SLI, however, the term "specific" denotes a deficit *specific* to language without any other concomitant developmental disabilities (Deevy & Leonard, 2004). Specific Language Impairment is diagnosed when verbal skills develop slower than skills in other cognitive domains (Craig, 1996).

Children with SLI diagnoses may have impaired expressive language ability combined with limited understanding of language (Craig & Washington, 1993). Though they often are thought to have expressive problems only, in actuality, they also have trouble with understanding multi-word utterances, concepts (time, space, relationships), and multiple meanings of words. These same problems were noted by the adoptees' parents on the *CCC* and in the oral vocabulary subtests of the *TOLD*. The semantic findings in this study that reported higher vocabulary skills, but overall difficulties with higher-order language concepts, support to some degree Glennen's (2002) research with very young adoptees (i.e., 12 to 36 months) that showed individual word vocabulary to be less affected than other language areas. Type-token ratios that were within the normal range did not support this finding, however. TTRs in the normal range may not be reliable indicators of language competency. As noted earlier, when Watkins and associates (1995) compared TTRs for normally developing children vs. SLI children using controlled utterance sample size (50 & 100 utterances), neither measure differentiated normal developing children from language impaired children. Likewise, Owens and Leonard (2002) reported that children with SLI performed similarly to age-matched peers at both older and younger ages on tests of lexical diversity (They used D measure, a derivative of TTR). They suggested that many

children with SLI might have only subtle lexical (vocabulary) deficits on measures taken from spontaneous speech. Owens and Leonard (2002) stated:

> One suspects that in spontaneous speech the children had control of the conversation and therefore the lexical items used. Faced with tasks in which their use of lexicon is controlled by others (i.e. formal tests), the children may appear decidedly weaker in their lexical abilities. Nevertheless these findings seem to reinforce the view that many children with SLI are more proficient in using vocabulary in spontaneous speech than in using morphosyntax (p 936).

An alternative measure of the variety of spontaneous expressive vocabulary (semantics) was the Number of Different Words score (NDW). The majority of EEA-PI children in this study (72%) were 2 or more SDs below the mean for this measure, scores that were more consistent with the results on formal testing. The reasons for this finding appear complex. One might explain the reduced numbers on NDW by considering the research of language development cited earlier by Hart and Risley (1995). Hart and Risley found that the "amount of parent talk accounted for all the correlation between socioeconomic status (and/or race) and the verbal intellectual accomplishments…. the more parents talked to their children, the faster the children's expressive vocabularies grew." Did the impact of the children's early experience in an "extraordinarily quiet," understaffed orphanage (Hunt, 1998), with limited verbal interaction between caretakers and children contribute to the finding of reduced different words, even though the children were subsequently placed in an affluent American home with increased stimulation? The finding of no correlation between Time in Institution and NDW seems to contradict this. Other children placed in early deprivational environments also demonstrate significant language delays (Coster, Gersten, Beeghly, & Cicchetti, 1989; Culp et al., 1991; Fox, Long, & Langlois, 1988). The reasons remain unclear. However, one cannot rule out the

possible contribution of other factors such as critical learning periods for language acquisition, the individual child's learning abilities or environmental factors such as nutrition and environmental toxins.

Despite an understanding that the language deficits in SLI appear in many different language aspects, morphology has clearly received the most theoretical and research attention to date. This focus on grammar development is appropriate because this is the one area in which developmental patterns of children with SLI have been shown to differ consistently from those of younger, typically developing children (Fey, 2004). The differences usually are reported in terms of the age of acquisition and in the time it takes to acquire more syntactically complex forms. Rice (2004) reported that children with SLI perform similarly to younger controls in the level of utterance length and receptive vocabulary over time, but the grammatical tense markers lag behind. In this study, an in-depth analysis of the types of grammatical errors exhibited by the children was not performed. Such an analysis would be a promising avenue for further research. Also, the language difficulties of children with SLI are usually first noted in the child's conversational speech in the preschool years, but continue to manifest in older children in the comprehension and production of other forms such as narratives and reading (Fey, 2004). This study noted a high number of children with reading difficulties, but their narrative skills were not examined.

It is not known how young children, following exposure to a first language, reprogram their abilities to perceive new sound patterns when confronted with a new language. If they are like typical bilingual language learners, children adopted EEA-PI should have no difficulty initially perceiving and producing phonemes that were meaningful in the native language (Glennen, 2002). Fortunately, only three Russian consonants have no real English equivalent. Conversely, English morphemes that add a single phoneme such as /s/ to form possessive, plural

or third-person singular verb/s/ or /z/ endings should be more difficult for Russian children to recognize because the English phoneme patterns do not fit the L1 patterns. The Russian language lacks an overt *be* copula in the present tense and has no *be* auxillary in any tense except compound future. Other possible areas of difficulty might occur because there are no articles in Russian and all Russian nouns are masculine, feminine, or neuter. It was beyond the scope of to this research or the examiner's expertise to examine these patterns; however, it would be a fascinating study for the future.

Syntax, as noted earlier, was an area that produced lower than expected scores, with 36.4% of the children scoring at or below 1 SD on the formal language tests. Of particular interest was the corroborating findings from the spontaneous measures showing that the majority (66%) of the children were 2 or more Standard Deviations below the norm in the length of the sentences they produced (MLU).

Pragmatic language use as measured by both the *CASL* and the *CCC* indicated that 34% and 38% of the children respectively scored poorly in this area. For the vast majority of children, basic skills were present and included the ability to request, to respond, and to call notice. The children were able to make wants known effectively and able to ask questions (despite a little difficulty with the grammar) in order to mediate their environment. However, an analysis of the assessment items of the *CASL* and *CCC* revealed difficulties in understanding higher-order, subtle language cues. Items such as why you would not tell a teacher your father's salary or how to politely turn down unwanted invitations frequently caused difficulties. Likewise, parents reported on the subtests of the *CCC* that the children had significant difficulties staying on a topic (cohesiveness) and in understanding content (context), particularly indirect language; subtle hints were often not comprehended. The findings of lower than normal pragmatic scores were consistent with the findings of the research in other countries

investigating the development of international adoptees that have focused on pragmatic forms of language skills (Saetersdal & Dalen,1987; Dalen, 2001a). As Dalen (2001a) noted, "the adoptees' pragmatic language problems seem to be linked, in particular, to the use of the language at a higher language-cognitive level. The child's competence with basic skills in every day language may mask difficulties with de-contextualized language. In their day-to-day speech, children can utilize situational and non-verbal language, and for that reason language difficulties are often not revealed until demands for more abstract language production and understanding are made" (p. 7). Dalen also noted, "This is just the kind of language demands that children must face in later elementary school. The initial perception that the child has good language skills is to a certain extent, connected with the fact that many of them are clever at using the language knowledge they have when communicating with others. In this way, they can hide difficulties in understanding language and other language problems – 'the language façade that dazzles'" (p. 8).

Another research question examined the reading outcomes of children adopted from Eastern Europe. Using a cut-off value similar to that used in other studies of reading problems in young children (Catts, Fey, Tomblin & Zhang, 2002; Paul, Murray, Clancy, & Andrews, 1997), the test results indicate that 32% of the EEA-PI children scored significantly below the normal sample. These results appear lower than those reported in a recent study by McGuinness and McKay (2003) who followed the social and academic development of 51 former Eastern European orphans. When parents were asked whether their 9-to 13-year-old children had trouble reading, 53% of the 51 respondents replied affirmatively. In this study, 18.7% of the children, ages 9-12 years, scored below 1SD below the mean. Most, but not all, of the children in the current study who were classified as poor readers based on reading comprehension scores would also have been identified as poor readers based on word decoding scores. The significant

correlational results indicated that the reading outcome was related to language attainment for all language areas, further providing evidence of a relationship between developmental language impairments and reading disabilities. The children's syntax abilities were more highly correlated with reading than were the semantics scores. Finally, children with more severe language impairments (lower spoken language scores) clearly tended to have poorer reading outcomes.

6.3. Research Question 2. Learning new vocabulary.

The second research question examined the children's abilities to learn new vocabulary. A major component of learning new vocabulary involves learning the novel sequences of sounds that represent a word. Researchers have theorized that the use of *nonwords* (e.g. nibe) which conform to the phonological rules of English, provides a good test of vocabulary learning because it ensures that the new word to be learned is novel (Gathercole & Baddeley, 1993; Weismer et al., 2000.) In this study, nearly 50% of the children were 2 or more SDs below their age peers in reproducing these nonwords.

Phonological processing, which has been defined as "the ability to recognize and manipulate the phonemic segments of words, to hold phonemic strings in memory and to access phonemic memories rapidly" (Lomardino, Riccio, Hynd & Pinherio, 1997, p. 291.) If the adopted children's difficulties were ones of poor phonological processing as one would have expected to see a pattern of poor nonword scores. Furthermore, if phonological processing representations are learned at very young ages, as documented in the literature on infant sound processing research (Gopnik, Meltzoff, & Kuhl, 1999; Kuhl, et al., 1997; Lust, 1998; Werker, 1994), then early learning experiences that included decreased exposure to language sounds and decreased verbal stimulation at critical learning periods, such as the environment of an orphanage, should impact later phonological processing abilities. This would also be reflected in the lower morphology scores and reading difficulties. The findings of this study suggest that

phonological processing may be an area of difficulty for many of these children, but further research on phonological processing specifically would need to be completed to confirm this.

Research question 3. Institutional factor analysis results.

The third set of analyses investigated the relationship between the different language measures and institutional factors using both correlational and regression statistical methods.

Correlations. There were strong positive correlations between all of the language measures except TTRs. The TTRs did not even correlate with the standardized test scores for semantics. The data from this study suggests that TTR may not be a useful spontaneous speech measure for semantics. MLU appears to be a more reliable measure of spontaneous speech, as it provided a significant correlation with the standardized test scores for syntax. Both syntax and MLU scores were consistent with reduced expressive language skills. In addition, all expressive language testing correlated strongly with the reception of speech and language services, indicating that children with significant language problems were receiving speech therapy services.

Correlations between language factors and institutional factors indicated both positive and neutral relationships. Length of Time in the United States was not correlated with any of the spoken language scores indicating that the language acquisition problems of children adopted from Eastern Europe should be viewed as both problems of second language acquisition and of remedial language acquisition. If language difficulties were related solely to differences in length of exposure to English, it would be merely a matter of allowing extra time for children to "catch-up" developmentally. This was not the case, as the children with greater time in the U.S. and subsequently longer English exposure did not perform significantly better than did children with less time in the U.S. in any of the basic language areas (i.e., Spoken Language, listening,

pragmatics). Conversely, several of the children with less time of exposure to English language scored well on all of the tests.

Regression. Two regression models were used in the analysis, stepwise and hierarchical. The stepwise regression analysis did not find relationships between the language test scores (expressive language, receptive language, syntax, semantics or pragmatics) and the institutional factors. However the data on the reading measures supported the conclusion that time in the institution did account for a small percentage of the variance. A negative trendline showed that reading scores decreased as length of time in the institution increased; scores also increased with increased time in the United States. Children adopted at a later age had more difficulties in reading than children adopted at an earlier age. These results follow Dalen's (2001b) reports that higher order academic language skills are impacted more severely by institutional residency. Adopted children who had good conversational skills in their first language, but limited proficiency with cognitive-academic language tasks did not achieve expected skills in literacy in Dalen's study. Dalen states, "In academic tasks children are expected to provide explicit information about referents and events without assuming shared knowledge with their listeners. They are expected to answer questions about texts based on both information from the text and their own world knowledge as sources of information (rather than responding only from their own experiences). Children with limited literacy achievement would be predicted to have limited proficiency with de-contextualized language tasks." (Dalen, 2001a, p. 8)

In the second stepwise regression analysis that examined word repetition abilities, Age of Adoption and Time in Institution were considered so similar that Age of Adoption was excluded from the analysis. Time in Institution (and consequently Age of Adoption) was a significant factor in predicting abilities to learn new words. From this analysis, we can say that word repetition abilities were decreased the longer time a child spent in the institution and the later a

child was adopted. Time in the U.S. however, showed a positive correlation; that is, the longer the child spent in the U.S., the higher the repetition scores. One could speculate that shifting languages at an early age might affect later phonetic sensitivity. From birth onwards, infants are able to discriminate between the consonants of their native language as well as the sounds of unfamiliar languages (Jusczyk,1987; Kuhl,1997). As noted earlier, at approximately age 10 months, babies' general sound sensitivity is replaced by a sensitivity to those sound contrasts occurring in their language environment (Werker, 1994)). As the baby matures, this sound sensitivity must include learning the meanings of the sounds and sound combinations (i.e., words). A decrease in attention to phonetic details results (Werker, 1994; Jusczyk, 1987). Werker (1994) reported that 14-month-old infants process less phonetic detail than 8-month-old infants when learning new words than when they are simply listening to sounds. Another developmental change occurs after the lexical burst, generally occurring around 18-24 months, in which vocabulary is enlarged quickly, which allows the encoding of finer sound discriminations to occur (Lust, 1997). It is generally right around this time that children are adopted and must begin to learn a new language. As a result, they may be delayed in the lexical restructuring. Metsala (1999) proposed a model in which vocabulary growth is responsible for the increasing specification of phonological representations. Lexical specification is gradual and word-specific, depending on factors such as overall vocabulary size, familiarity with words, and phonological similarity. Perhaps EEA-PI children with reduced new word vocabularies have not yet completed phonological specification skills in their L1. As they stay in the U.S. and as their vocabulary increases, their skills improve. The data seem to support this idea.

Finally, the hierarchical regression model showed that reception of speech therapy services was significant for all areas and explained 68% of the variance. As expected, children enrolled in speech/language therapy services were likely to have more severe language problems.

Surprisingly, the hierarchical regression model also showed that the contributions of gender approached, but did not reach significance in the equation, although we expected that boys would have significantly more language problems than girls, as written and spoken language impairments are more likely to be diagnosed in boys (see Stromswold, 2001). In this study, a higher percentage of girls exhibited spoken language difficulties than the boys. It is unclear exactly why this occurred. A possible explanation may lie in the ages at which the children were adopted, typically around 24-28 months. Under current law, Russian parents have priority for adoption of children younger than 8 months, and exclusive access to babies less than 4 months. Most of the children adopted by Americans are at least one year and more often 2 years of age or older because of the time needed to complete the legal proceedings (Williams, 1998). In this study the average age at adoption was 26.3 months. The average age at adoption for the girls only was 25.0 months (range = 7 to 49 months).

There are differences in the development of boys' and girls' brains, but they are subtle, and a product of both nature and nurture. It is generally acknowledged that girls reach the accepted 'developmental milestones' in language earlier than boys do (Ryan, 2005). Electrical measurements reveal differences in boys' and girls' brain function from the moment of birth (Elliot, 1999). By three months of age, boys' and girls' brains respond differently to the sound of human speech. Girl babies tend to be somewhat more socially-attuned -- responding more readily to human voices or faces, or crying more vigorously in response to another infant's cry (Baron, 1992). One explanation is that the biological substrates related to language emerge at an earlier age for girls than for boys (Elliot, 1999). The left hemisphere of the brain that processes language comes into use earlier in girls; therefore girls talk earlier, and at the age of 16 months, on average, have twice the vocabulary of boys. Because toddler girls ordinarily talk before boys, they often have a headstart in using language, particularly between the ages of two and three

years, when they are just beginning to move into word combinations. Likewise, girls' overall cognitive abilities change more between the ages of 14 and 20 months, whereas boys show a greater change between 20 and 24 months (Rezncik et al., 1997). While, genes set the foundations for language development, they do not fully account for gender differences in children. Environmental experiences also play a fundamental role.

Studies of the relationship between gender and language development suggest that girls are more influenced by their early environmental experiences than are boys. Plomin and Dale (2001) in England examined the vocabulary development of a large sample of twins at age 2-years. When genders were analyzed separately, significant genetic influences were found for boys, but not for girls in lexical (vocabulary) development and syntactical development. Boys were more aligned with their parents than girls (higher heritability). Likewise, VanHulle, Goldsmith, and Lemery (2004) studied 386 toddler twin pairs and concluded that for vocabulary, genetic heritability was higher for boys than for girls. Shared environment accounted for 48-68% of the individual variation. Girls' vocabulary appeared to be more susceptible to the influence of environment. These results point to possible developmental differences between the EEA-PI girls and boys, by noting innate gender differences in heritability and environmental influences at this age (20 to 38 months). That is, gender differences are reflected in the different developmental timetables of girls and boys. Girls may be more likely than boys to enter a syntactical developmental period around 24 months (Ryan, 2005). Van Hulle et al., (2004) noted that by most measures of sensory and cognitive development, infant girls are slightly more advanced.

The physiological (nature) and environmental (nurture) evidence discussed above delineates clear differences in cognitive and language development as a factor of gender. Critical periods in the development of language development are also apparent: certain skills (such as

grammar and phonology) are more sensitive than others (such as vocabulary size) to a child's experience with language in the first few years of life. Girls and boys appear to be on somewhat different timetables for both vocabulary and two-word combination (early syntax) use. Girls' early talking may give them more practice and opportunities to acquire different types of language forms and more vocabulary in their first language before adoption and relocation. However, it may also predispose girls to greater disruption of language development once they are adopted and abruptly find themselves in a totally different language environment without support for their first language. This may be because their critical period for specific language aspects may have passed. Boys, on the other hand, may experience less disruption because their language is less advanced and the critical period for specific language aspects may not as yet have passed, perhaps even better equipping them for the abrupt change in languages.

In many research studies, the age of adoption has been considered to be a very important variable. Logically, one would predict that a child adopted at a young age would have the best opportunity for a normal, healthy development. Some studies have supported this idea (Hoksberger, 1987; Lemare et al., 2001; Rutter, 1998), but others have shown that age of adoption did not play a crucial role in the child's development (Kaler & Freeman, 1994; Dalen, 2001a; Dalen 2001b). This study showed that age of adoption did not, as predicted, explain the variance in language performances in the adopted group as a whole. Several children who were adopted as young babies also had long-term language difficulties. This seems to indicate that age of first exposure to English alone is not the critical factor in predicting its future development. In the past, it was thought that adopting very young children would insure against having a child with language problems because the first two years of life is a particularly sensitive period for language development and there is more time available for the child to learn English before starting school in an improved learning environment. Although it is not

surprising that institutional care as an infant or toddler may lead to deficits in verbal skills that persist into school age and adolescence, the results of this study indicate that neither the adoption of a child at a young age or with minimal (less than 12 months) institutional time should be considered predictive of eventual basic language outcomes. The finding appears to contradict Newport's (1990) proposed hypothesis to explain the nature of the constraints required to successful language learning. She hypothesized that language learning abilities actually decrease from childhood to adulthood, not because of the weakening of some innate faculty but due to increases in cognitive abilities. Her "less is more" theory proposes that the limited perception and memory capabilities possessed by children force them to attend to smaller bits of information thus reducing the number of possible interpretations and simplifying the language learning task. The young child's limited processing abilities provide the basis for successful language acquisition and paradoxically the advantage disappears as the child's cognitive capacities mature.

Nutrition is another factor that may contribute reduced language development skills. Brain development is most sensitive to a baby's nutrition between mid-gestation and two years of age. According to Hanual (1998), children who are malnourished--not just fussy eaters but truly deprived of adequate calories and protein in their diet--throughout this period do not adequately grow, either physically or mentally. Their brains are smaller than normal, because of reduced dendritic growth, reduced myelination, and the production of fewer glia (supporting cells in the brain which continue to form after birth and are responsible for producing myelin). Inadequate brain growth explains why children who were malnourished as fetuses and infants suffer often lasting behavioral and cognitive deficits, including slower language and fine motor development, lower IQ, and poorer school performance. Children living in orphanages could almost certainly be considered to have experienced malnourishment.

6.4. Implications

As a group, the EEA-PI children in this study performed lower than age expectations on all of the measures with the exception of measures of listening (receptive language). Thirty-four percent of the children evidenced deficits on the Language Composite Quotient scores of the TOLD:3 P/I, and an additional 20% demonstrated language scores 1 or more SD below the mean on 2 or more TOLD language subtests. The language deficits of these 24 children (54%) existed in the absence of mental retardation or frank neurological or sensory factors that might adequately explain the significant difficulties these children exhibited in language acquisition. The normal or above normal nonverbal intelligence scores of these children coupled with overall language deficits and particularly low syntax and morphology scores suggests that Specific Language Impairment might be an appropriate diagnosis for many of these children. What is especially startling, however, is that the prevalence of language deficits in this population of children seems to be considerably higher than that of children generally. According to the American Speech and Hearing Association (2004), the overall estimate for speech and language disorders is widely agreed to be 5% of school-aged children. For Specific Language Impairment, data on school aged children is less available. Rice (2002) estimated that 7-8% of kindergarten children are affected by SLI.

6.5. Abrupt Language Switch

Children adopted internationally are exposed to unique language acquisition experiences. The term *Abrupt Language Switch* is proposed to characterize this novel situation. The EEA-PI children are forced, by their adoption into a family in a country maintaining a totally different linguistic community, to abruptly halt their learning of one language and to immediately start learning another language. The birth language is suspended, quickly undergoing attrition as the new language begins to develop. Unlike traditional ESL children, the first language is not

supported in the new environment, as their adoptive parents are rarely fluent in the native language. The adoptive parents are unable provide a language transition for the child beyond perhaps a few isolated words or phrases. As shown in the literature review, many of these children are leaving living situations in which there has probably been very limited language exposure. Consequently, the abrupt language shift occurs in a context in which the newly adoptive parents usually have little information about the language environment in which the child has been living or about the child's level of speaking and understanding in the native language, further compounding the difficulties in providing a supportive linguistic transition. Parents are essentially confronted with the task of discovering what a child understands through their interactions with him without the support of a common language to facilitate that communication. Unlike parents of ESL children, their interactions lack a common history and they must in essence begin to construct that joint history, hopefully identifying ways along the process to support the transition.

Internationally adopted children who arrive in their new country at an older age may also legitimately be considered ESL learners. They may only need to acquire a new word label in the second language for an already existing concept in L1 (Additive bilingualism). On the other hand, younger adopted children who do not yet understand the meaning of the concept in their first language have a very different and more complex task (Cummins, 1984). They must not only acquire the word, but also the concept for the word. This cannot be considered subtractive bilingualism, because the child has no language patterns established that are interfering with the acquisition of the second language and the child does not maintain the first language. These children are more appropriately said to have experienced an Abrupt Language Switch.

6.6. Discussion of Limitations

6.6.1. Data collection methodology limitations.

The study has several limitations in data collection methodology. First, the study was a self-selected sample of an already heterogeneous population. Adoption agencies are not permitted to give out information regarding children's adoptive placements for confidentiality reasons. Therefore, parents had to volunteer to participate. This created other difficulties. Although parents of children without problems were solicited to participate in the study, it is possible that fewer parents of children not experiencing problems volunteered to participate. However, the percentage of children that participated and that did not evidence expressive (spoken) language problems (approximately 61% is obtained if one subtracts the percentage of children scoring above -1.25 SD on the Language Composite Quotient) lends support to the credibility of the findings. Conversely, the study participation criteria that specified normal IQ, no hearing losses, or overt physical disabilities, along with the evidence that several children could not complete testing due to attention difficulties, may have played a role in underestimating the prevalence of the language difficulties.

Some parents might have been skeptical about volunteering personal information, or may have feared that something might be found wrong with their child or with their parenting abilities. Still, even though the subject pool was self-selected and may not represent all of the children adopted from Eastern European orphanages, the findings do help to identify general trends in this population.

6.6.2. Subject information limitations.

Research in this area presents a number of other methodological challenges. One factor that has clouded the effect of early deprivation on language disorders is the lack of pre-adoptive placement information. For many of the children, medical histories were minimal or unknown. There was often no data available on the characteristics of the biological parents, and hence no

information on the possible genetic or prenatal influences. Doubtless these factors played a role in individual differences within the group of adoptees. No study of this population should claim to determine cause and effect. The inference that institutionalization was the cause of the reading delays cannot be made. Future studies of prenatal, genetic and environmental factors in interaction with institutionalization factors would be pertinent. The effects of mediating and moderating orphanage conditions such as caregiver-to-child ratios, availability of toys, or location (rural vs. urban) have not been established, and would bear scrutiny. Unfortunately, for most children adopted from Eastern European orphanages this information is not obtainable.

Secondly, there were no data available on the reason(s) the children were initially admitted to the institution. One might argue, as did Rutter et al. (1998), that such reasons play a noncontributory role in the findings, because of the very young age at which the majority of the children entered the institutions. Most were institutionalized at birth. There would be no reason to suspect that the children were placed there as a result of their own handicaps, with the exception of those children with apparent physical deformities and sensory disabilities, and these children were excluded from the study. However, some children may have experienced abuse/neglect prior to being institutionalized.

Finally, there is controversy in the literature regarding the amount of time necessary for a child to become proficient in a new language. Because most researchers agree that school age children are proficient at least in social communication after two years of intensive exposure to their new language, the criterion of two years residence in the United States post-adoption was included as one of the criteria for participation in the study and the average length of time in the U.S. for the children in this study was 72 months. Initial reports by researchers may have been premature in their conclusions that American children adopted post-institutionally have achieved adequate language skills by 36 months post adoption (Glennen, 1999; Pollock et al., 2002) – and

that those abilities would be maintained through the early school years (Glennen & Masters, 1999; Pollock et al., 2002).

6.6.3. Use of a control group.

Another consideration involved the decision not to use a control group against which to compare the performance of the adopted children. Several investigators (Ames et al.,1994; Cermak & Daunhauer, 1997; McGuinness, 1998) have recently noted the difficulties of obtaining matched sample groups in their investigations and several opted not to use them.

For this study a variety of control groups were considered. A comparison of language capabilities between institutionalized children, and their non-institutionalized peers in their native country would be useful to separate the effects of being raised in Eastern European countries from institutionalization. Perhaps all Eastern European children have difficulties learning English as a second language, but the appropriate comparison would require extended residence in an E.E. country. On the other hand, perhaps adoption was the factor that affected the language/learning abilities. By comparing these children to a group of American children who were adopted, factors relating to adoption could be clarified. However, in America it is very difficult to obtain information about the background of any adopted child. The international adoption organization's records of children's lives in the country of origin are very limited. Often, the information given to the adoptive parents about the child is not valid (Dalen, 2001; Tepper, 1996). In this study, the limited access to information and questionable quality made it difficult to reliably match a given adopted child with American adopted and non-adopted children. Furthermore, a control group of children adopted in America would be difficult to obtain due to strict confidentiality laws, and due to the fact that many of the American children would be coming out of a foster care setting and are generally much older at the time of adoption. Finally, a control group of children of Eastern European immigrants would also be

difficult to use as a match because of availability because the numbers are very small, and because the immigrant children would be in an environment that continued to include bilingual support from their families.

It might be argued that since the children adopted from Eastern Europe are not being raised in a bilingual environment, and because the language levels that they will be expected to attain by their families and educators are American standards, perhaps a control group of American children matched for age, gender, and SES would be acceptable. Several adoption foreign researchers including Rutter et al. (1998) and Ames (1997) have chosen to use native born children as controls. Access to healthcare in England and Canada differs from American access. Match controls were not feasible for this study because of the large travel distance often involved for the families, and the long length of time required for testing.

A final concern about the choice of a control group specific to this study arises when attempting to match the groups with control groups for language levels. Should the groups be matched for chronological age or for language age? Thal, O'Hanlon, Clemmons, and Fralin (1999) used two different control groups in their study on the reliability of the MacArthur Communication Development Inventory (Fenson et al.,1993) for the older aged, language delayed children. One was matched for chronological and the other for language age. Thal et al. noted difficulties with this approach. For example, if used with this population of children, one could conceivably pair orphanage children as old as 95 months chronologically with children, non-adopted, who were at a chronological age of 48 months, but at the same language age of the adopted child.

Unfortunately, while the use of a control group may be optimal, the reality of the availability of a parallel control group against which to benchmark the children's language skills provided a significant area of difficulty. Since the key variables under consideration were the

presence/absence of language deficits and institutional variables that predict such deficits, then the use of norm-based measurements, and statistics using correlations against the institutional factors appeared to be both appropriate and achievable.

6.6.4. Assessment methodology limitations.

Eastern European children adopted post-institutionally (EEA-PI) do not follow the pattern of bilingual children and should not be viewed as bilingual (Gindis, 1997; Gindis, 2000b). Children adopted from Eastern European orphanages rapidly lose their native language and over a short period of time a new language replaces the first one. Children adopted internationally should be viewed rather as having limited English Proficiency (LEP) until English is adequately acquired. Based on previously cited research, (Lightbown & Spada, 1993; Snow & Hoefnagel-Hohle, 1978; Wong-Fillmore, 1991), a period of two years is required to acquire basic English language proficiency. Therefore, in this study, a minimum of two years U.S. residence was set as the criterion for using English standardized assessment tools. The children in fact averaged a length of U.S. residence of 6-0 years with a range from 2-7 years to 10-3 years further supporting the validity of using English normed test measures.

Several authors (McLaughlin et al., 1995; Roseberry-McKibbin, & Eicholtz, 1994; Schiff-Myers, 1992; Shoemaker, 1997), as noted previously, suggest that currently available language assessment tools are culturally normed and biased. Seymour (1992) recommended using language sampling in a naturalistic setting, followed by criterion referenced language probing. Lahey, in 1992, suggested as a partial solution the use of assessment techniques that are based on children's abilities to learn aspects of an artificial language rather than on a description of their current language use. Two studies using such a strategy involve examining the children's abilities to repeat phonologically complex "nonwords" (Dollaghan & Campbell , 1998; Kamhi, Catts, Mauer, Apel & Gentry, 1988). Both sets of researchers concluded that

accuracy on such a task is related to non-language-impaired children's abilities to acquire vocabulary in their native language and in English as a second language. Both the CHILDES language sample obtained in a naturalistic setting and the Nonword Repetition Test were included in the test battery in an effort to ameliorate the aforementioned testing difficulties.

As a final note on assessment limitations, because the orphanage children who were adopted are now in more stimulating environments and may be receiving additional therapeutic services, the length of time spent in the new families and the amount of therapy received had to be examined carefully. The literature indicated that lower language levels were present in children from low SES families (Gindis, 2000b; Hart & Risley, 1995). Most children adopted internationally now live in middle to upper class families with well-educated parents (Groza & Ileana, 1996), who may serve as actual remedial factors for language learning.

6.7. Future Directions

Adoption research continues to attempt answers to the questions about the pattern for recovery following removal from a deprivational environment and the provision of a normal rearing environment. Confusion may occur in studies that combine international adoptees from a variety of disparate countries into one large subject pool. Children adopted from Eastern Europe differ from those adopted from China, Vietnam, Korea, and South American countries in fundamental ways including cultural, economic and child rearing practices. For example, studies repeatedly show that children adopted from Korea have higher scores in all academic areas than those from other countries of origin. Caution should be taken with any research that does not make these distinctions, and future research examining factors of country of origin and institutional factors' impact on future language development would be helpful. Studies on how prenatal care, nutrition, and drug and alcohol exposure may interact with institutionalization

would be pertinent. The effects of mediating and moderating orphanage conditions such as caregiver-to-child ratios, availability of toys, or location (rural vs. urban) have not been established, and would bear scrutiny.

Continued longitudinal follow-up of the children would help to ascertain if the apparent strengths in vocabulary skills are maintained over time, and to determine if the *Nonword Repetition Test* scores continue to improve with time in the United States as the analyses in this study indicated. Other aspects need to be explored in greater depth. Although not the focus of this study, the results from the informal articulation observations and the speech scores on the *CCC* and comments from the parents concerning articulation errors suggest that these sound errors are indeed occurring, and are present past the time when the errors would be expected to resolve. Further testing is indicated in this area. Research to explore possible connections between the poor scores on the *Nonword Repetition Test*, the lower reading scores, and the informal observations of higher than expected incidence of articulation difficulties may also prove informative.

Further analysis of this study's data could be made on the previously noted phenomenon that often affects a child's abilities in acquiring a new language - language loss. In this country, rapid first language (L1) loss is often seen in children who are learning languages sequentially, particularly during preschool and early elementary school (Anderson, 1999; Schiff-Myers, 1992). The same grammatical error patterns noted in L1 language loss have also been noted in children with specific language impairment (Dunn et al., 1996; Leonard, 1999; Restrepo, 1998; Rice, 1997; Rice, in press). Common patterns observed in children who present with L1 language difficulties occur mainly at the grammatical and semantic levels, with the grammatical errors primarily involving higher than normal error rates in verb morphology, as well as the use of clitics, articles, and prepositions. Higher than normal rates of verb inflection errors in person

and aspect as well as regularization of irregular forms (e.g., goed/went) (Anderson, 1999) have been noted. Because of these similarities it would be important to study the grammatical language development of sequential language learners (i.e. the EEA-PI children) in an effort to contrast grammatical patterns in those who are experiencing language loss -- those children whose language issues resolve with time versus those children who continue exhibiting atypical language development. Additionally, exploration of narrative story re-telling collected for this study could be possible due to the availability of normative data of these two discourse contexts in the SALT (Version 7.0, 2002) database. Studies of the interaction pattern between child and caregiver in relation to long-term language outcomes would also prove educational.

International adoption research is rich with possibilities. This extended research could further our professional knowledge for the selection of appropriate language objectives and teaching methods for the children experiencing later language learning in our country.

7. SUMMARY

The large number of children arriving from orphanages during the past decade coupled with the intense media attention publicizing the inhumane conditions under which the children lived has focused national attention on the sequelae of early childhood institutionalization (Johnson, 2001). Research to determine the specific effects of early deprivational learning experiences on later development has been challenging, but valuable information has been gathered from follow-up studies of children adopted after early deprivation in orphanages.

This study clinically evaluated the language skills of 44 children, ages 6 to 12 years, who were adopted to the U.S. from Eastern European institutions. The aim of the study was an effort to document the extent (epidemiology), and the patterns of language problems present in the areas of semantics, morphology, syntax, pragmatics and reading, and to explore the factors of institutionalization that might predict future language development. The results indicated that as a group, EEA-PI children, in comparison to the normative data on the standardized and spontaneous speech measures, performed lower than age expectation on all of the measures, with the exception of measures of Listening. The disparity within the children's performance was notable. Though institutional factors of time in institution, age of adoption, and time in U.S. did not correlate with measures of receptive and expressive language, they were significant for reading and nonword scores.

Increasingly, developmental researchers are being asked to provide answers and guidelines for policy in international adoption (Groza & Ileana, 1996; Serbin, 1997). Unlike motor and nonverbal development, which develop continuously from pre-adoption to post adoption, children EEA-PI, must abruptly halt their current language development and

immediately start learning a new language. Their birth language is suspended and quickly undergoes attrition while the new language begins to develop. The term *Abrupt Language Switch* is used to describe this novel pattern. Many children are resilient and complete the switch seamlessly, while others have difficulty. In the early years after adoption, researchers report considerable variation in language progress, with approximately one third of the children showing significant delays that require intervention. It remains unclear whether these represent delays or true language deficits. Early assessment can not determine the true number of EEA-PI children with language disorders, only long-term testing can determine this. The results of this study support the idea of genuine language and/or reading deficits for approximately two-thirds of the children. Therefore, given a history of institutionalization and the abrupt switch in language environment, children adopted internationally should be considered at risk, carefully monitored, and provided therapeutic services as necessary. Early testing within one or two years of arrival may not be adequate. Subtle learning problems may not become apparent until the child reaches school age.

APPENDIX A

International Adoption Speech and Language Survey

Appendix A. International Adoption Speech and Language Survey

Today's Date:_____

Parent's Name :_____

Address: _____

_____

Phone # (H)_____ (W) _____

Thank you for agreeing to enroll your child in this research study. Please complete the following information.

A. Child Data

1. Child's Name: _____
2. Child's date of birth _____mo/____day/ ____year
3. Child's current age: ___years/____ months
4. Child's gender: M___ F ____
5. Child's Country of Birth: _____
6. Date the child joined your family: _____mo/ ____day/___year
7. Child's age at adoption: ____yrs./___mths.

B. Pre-adoption History

1. Age when placed in the Eastern European institution (includes baby hospital, orphanage) ____yr/ mo___

2. Total length of time in Eastern European institution(s) ? _____yrs. _____mths.

Special circumstances? _____

_____

3. Please indicate where your child was living during the following time periods until adoption. If uncertain of child's location indicate with a question mark. If child was in two different locations, please provide details at the bottom of the page.

Time Period (child's age)	Birth Family	Maternity Hospital	Orphanage	Hospital	in U.S. with adoptive family
0-1 months					
2-6 months					
7-12 months					
13-24 months					
25-36 months					
37-48 months					
+49 months					

4. Any known medical problems?_____

_____

5. Does your child appear to have at least average intelligence? Yes____ No___
If No, please explain _____

6. Is your child's hearing normal? Yes___ No___
If No, please explain_____

7.Is the child taking any medication? Yes ___ No ___ If yes, please describe_____

8. Is your child's vision normal (with or without glasses)? Yes___ No___
If no, please explain_____

9. Does your child have any physical disabilities? Yes____ No____
If yes, please describe:_____

C. Adoptive Family information

1. Marital status: Married ___ Single ____ Divorced _____
2. Annual Income (in thousands):
   less than $15 ___
   between: $15 -40____ $40-75 ____ $75-150 ____
   over $150 ___

3. Other children in the adoptive family? Please list:

Name	Age	Gender	Adopted? Please indicate country if yes

4. Child's exposure to his or her native language since adoption. (Check all that apply).

___ No exposure
___ Limited words spoken by adoptive parent
___ Conversational language spoken by adoptive parent
___ Limited exposure to an adult native language speaker (<2 times/wk)
___ Frequent exposure to an adult native language speaker (>3 times per week)

D. Child's Present Educational Background

1. Child currently attends:
   Regular elementary school _____ Grade:_____
   Regular class plus resource room _____
   Special program _____ Please describe _____

2. Has your child received any of the following diagnoses? (check all that apply)

_____Sensory Integration Deficit ____ Attention Deficit Disorder
____ Cleft lip/palate ____ Learning Disabilities
____ Speech/Language Delay ____ Autism/ PDD
____ Fetal Alcohol Syndrome ____ Developmental delay
____ Attachment Disorder ____ Auditory processing
____ Other: (specify) _____

3. Is your child receiving speech therapy now ?: Y____ N_____

Did he/she receive speech therapy in the past? Y ___ N_____

E. Child's Speech and Language Development

1. Was the child speaking words in his or her native language at the time of adoption? Yes____ No___

2. If yes, please estimate the approximate number of individual words spoken by your child in his/her native language.

____ 1-5 words
____ 6-19 words
____ 20-49 words
____ 50-99 words
____ 100-500 words
____ 500+ words

3. Was he/she speaking in sentences? Yes ___ No____

4. Did you receive any information regarding your child's language abilities at the time of adoption? Yes____No____ If yes, please describe_____
_____

5. At what age (approximately) did your child say his/her first English word?
___yrs./___months _____how long after the adoption?

6. At what age (approximately) did your child say his/her first 2 word English phrase? __yrs./ ____months __how long after adoption?

7. How would you describe your child's speech and language skills in comparison to children of approximately the same age?

____below the other children
____at the same level as the other children
____above the level of the other children

Comments:_____

8. How would you describe your child's reading skills in comparison to children of approximately the same age?

____below the other children
____at the same level as the other children
____above the level of the other children

Comments: _____

Thank you for taking the time to complete this questionnaire. Please fax it, Attn; S Hough to 1 (724) 942-6104 or mail it to Susan Hough, 1751 Hastings Mill Dr. Pittsburgh, PA 15241. We will notify you regarding your child's participation as soon as possible.

APPENDIX B

Consent to Participate in Clinical Research

Appendix B. Consent to Participate in Clinical Research

Language Development Study of Children Adopted from Eastern European Institutions:
Ages 6 to 11 years

Dear Parent:

I am a doctoral student at the University of Pittsburgh. I am conducting a study of the language abilities of young children adopted to the United States from Eastern European orphanages who are now school aged. To date there is very little scientific published data to describe how these children learn, process and use language. There is little known about the types of language skills they may or may not exhibit. Since it is critical to have a large sample of children I hope you will consent to participate.

The benefit for your child is that he or she will be evaluated for speech, hearing, language and reading abilities. This information will be made available to you and if you wish to your child's teachers.

The 2 1/2 hour test battery will consist of the following:

- Hearing Screening at 20 dB.
- Nonverbal test of intelligence- Screening
  -Leiter International Performance Test -R (Leiter,1998)
- Language testing-
  -Test of Language Development -Primary:3 (ages 6-8 years) or
  Test of Language Development-Intermediate: 3 (ages 9-11years)
  (Hammill & Newcomer, 1997)
  -Nonword Repetition Test (Dollaghan & Campbell,1998)
  -Language Sample- 10 minutes of unstructured play with a parent, 10 minutes of structured play with the examiner
  -Children's Communication Checklist (Bishop, 1998) - checklist completed by the parent
  -Woodcock Reading Mastery Tests -Revised/NU (Woodcock, 1998)
  -Pragmatic subtest of the *CASL*

No risk beyond those associated with the usual educational testing procedures will be presented to your child. The information from this study may be described in reports of the research, but your child's name will not be used in the reports or description of the study. At no time will information be released that is directly attributable to your child, your family or your adoption agency. General information about the children who participate (e.g. ages, genders, etc.), however, will be included. The information will be confidential in that only the staff on the research project will have access to the information. The exception required under Pennsylvania law, is that should the researcher learn that you or someone with whom you are involved is in serious danger or harm, they must inform the appropriate agencies. All data will be maintained for at least five years. Any future requests to share video tape results will be made in writing to you for permission.

Testing will be performed at the Children's Therapy Center in McMurray, PA. No costs to you will be associated with your child's participation in the research with the exception of your travel costs to and from the therapy center. We will not be able to make any payments to you for allowing your child to participate. However, we will mail to you a compilation of your child's pertinent test results within 3 weeks. If you would like reports of the completed research, you may receive a free copy by contacting Susan Hough, Director, Children's Therapy Center of The Washington Hospital, 1000 Waterdam Plaza Dr. Suite 120, McMurray PA, 15317. (E-mail: shough@ washingtonhospital.org)

If you are interested in participating in this research, please respond using the e-mail address, or business address listed above. Following your contact you will receive an informational survey and a description of the speech and language tests. The survey takes about 15-20 minutes to complete. It requests information about your child's pre- and post-adoptive experiences, as well as, language development. If there are questions that you can not or do not wish to answer please feel free to skip them.

If you have any questions or concerns regarding this form or the research project, please contact Susan Hough during work hours at (724) 942-6100, Gary Weinstein, Chairman of The Washington Hospital's Institutional Review Committee (724) 223-3008, or the Univ. of Pgh., Human Subject Protection Advocate (412) 578-8570. Participation in this research is strictly voluntary. You may refuse to allow your child to participate or withdraw your consent after providing it without penalty. If after providing consent to participate you decide not to allow your child to participate, please call Ms. Hough at the above number and inform her.

If you agree to participate in this study, would you please indicate it by signing the statement below. There are two copies provided, one for you to keep and one to be returned. Again, thank you for your consideration

Sincerely,

Susan D. Hough, M.A. CCC/SLP

_____(child's name) has my permission to be evaluated as part of the research project on Language Abilities of Children adopted from Eastern European Institutions. I certify that I have explained the purpose of the research to my child in age appropriate language. I have answered any questions that he or she may have and he/she has agreed to participate in the research. If I have further questions at any time, I can call Susan Hough at (724) 942-6100. I am voluntarily giving permission for my child to participate, and I understand that no guarantees are offered. I also understand that I can withdraw my permission at any time.

_____ _____

(Signature of Parent/Guardian) (Signature of Parent/Guardian)

Phone: (h)_____ (w) _____ Date _____

_____

Verification of Explanation

I certify that I have carefully explained the purpose and nature of this research to _____ in age appropriate language. He/she has had an opportunity to discuss it with me in detail. I have answered all his/her questions and he/she provided affirmative agreement (i.e., assent) to participate in this research.

_____ _____

(Principal/Co-Investigator Signature) (Date)

APPENDIX C

Language Sample Video Taping Protocol

Appendix C. Language Sample Video Taping Protocol

Setting: a large fairly empty clinic treatment room with a large box of toys on the floor or table. Video camera will be positioned preferably on the other side of a one-way mirror or in the corner of the room.

List of toys:

2 clear plastic jars with cereal, one glued shut
unusual kitchen tools
paper and markers
tin can with a large rubber spider inside
3 wind-up toys, one is broken
several puppets/action figures
very large and very small sunglasses
flashlight, works inconsistently
restaurant with small plastic foods

Instruction to Parents

You will be video taped interacting with your child for about 20 minutes. There will a box of toys in the room to help you find something to talk about. After exploring the toys for a while, you can use the restaurant along with some of the toys in the box for a restaurant scene.
We will try to get at least 100 different utterances (sentences) from your child so that we can analyze the way that s/he talks in a natural context. After 20 minutes an examiner will join you, and you will be asked to move to one side of the room. The examiner will continue to talk with your child for a few more minutes and then tell them a short story from a book. Your child will be asked to re-tell the story to you.

Relax. Remember, you as the play partner, are not being assessed. Just talk the way you normally do. There are no right or wrong ways to interact.

Helpful ideas: Hopefully, many of the toys will be novel to your child. Let them tell you what they think the toy is or does before you clue them in. Some of the toys may appear to be broken. This is intentional and designed to get your child to notice them.

FYI : One of the plastic jars has cereal in it and can be opened, the other one is glued shut. Pretend to be disappointed, but don't break the jar.

If you have any questions let me know. Thank you again.

Instructions to Examiners for Obtaining Language Sample

Materials: Good Dog Carl, by Alexandra Day

After about 10 minutes of interaction with their parents you are to join the child and the parent. Suggest politely to the parent that they leave the table- "Can I spend a little time talking with _____ now?"

Ask the child to show you their favorite toy from the box and ask why it was the favorite?

Ask if they got anything thing like it for their last birthday? Ask them to tell you about their last birthday. (Looking for past tense constructions)

Tell them about a special book that you got for your birthday when you were younger and present Good Dog Carl. "Read" the story then them to tell you or their parent the story, as appropriate.

Finally, ask the child to pretend that Carl was coming to visit them next weekend. Ask them "What will you do to have fun?" (Looking for future tense constructions)

APPENDIX D

Report to Parents Sample

Appendix D. Report to Parents- Sample

SPEECH AND LANGUAGE EVALUATION

NAME: Irina Smith (not her real name) PHONE: (412) 513-9895
PARENTS: Kathy/Michael DOE: 11/13/2003
ADDRESS: Smith Residence DOB: 04/2/1997
Pittsburgh, PA 19103 CA: 6-9 yrs.

EVALUATORS: Susan D. Hough M.A. CCC/SLP
Kristin McCormick, B.S. Research Assistant

TESTS ADMINISTERED:
Test of Language Development-Primary (TOLD-P)
Woodcock Reading Mastery Test-NU/R
Leiter International Performance Test- Brief Screener
Children's Communication Checklist (CCC)
Pragmatic Judgement subtest of CASL
Informal Speech and Language tasks
Audiological Screening

BACKGROUND INFORMATION
Irina was a 6 year and 9 month old young lady who was seen for a speech, language and hearing evaluation as part of a research study entitled Language Development in Children Adopted from Eastern European Institutions. Significant case history, which may have influenced Irina's speech and language development, included:

- Irina was adopted to the U.S. at age 4 yr, 9 mths. from residence in a Russian orphanage. Irina lives in at home with her mother, father. Her sister, Jessie, is in college. Irina is currently attending first grade with learning support (1.2). Irina receives speech therapy at this time.
- History of respiratory difficulties. Irina takes a variety of medications to control her reactions.

HEARING
Irina passed a pure tone audiological screening at 20 dBs, bilaterally. Response to sounds was exceptional. She was able to hear very faint tones.

ARTICULATION/PHONOLOGY
Formal articulation testing was not completed at this time. Informal observations revealed an f/th substitution and distortions of /r/ (inconsistent) and /r/ blends. Intelligibility of speech production at the phrase level was good, with good intelligibility noted at the conversational speech level. Phonological productions were readily improved on stimulation.

FLUENCY
No evidence of dysfluent production was indicated during this evaluation;

VOICE AND RESONANCE

All parameters of voice (including pitch, loudness and quality) and resonance appear to be appropriate for age and gender.

LANGUAGE

Screening -Leiter Non Verbal Test of Intelligence-R: Scores on the Brief Screener were in the Average Range

The Test of Language Development -P: 3 (TOLD) was administered to evaluate Irina's knowledge and use of vocabulary, sentence and grammar formation abilities. The Comprehensive Assessment of Spoken Language (CASL) was given to assess use of appropriate language in communication situations. Results from the TOLD-P:3 & CASL. Subtests from the TOLD:

1. Picture Vocabulary measures the ability to understand the meanings of one word and two word terms when spoken.
2. Relational Vocabulary measures the ability to define relationships between two words.
3. Oral Vocabulary measures the ability to give oral definitions for common English words meaningfully.
4. Grammatic Understanding measures the ability to understand grammatical sentences of increasing complexity.
5. Sentence Imitation measures the ability to accurately repeat sentences of increasing length and complexity
6. Grammatic Completion measures the ability to understand sentence formations and use accurate morphological forms such as possessives, verb tenses, and plurals.

.

Subtest Name	Raw Score	Standard Score (Mean of 10; Standard deviation of 3)	Test Age Equivalent (yr-mth)	%ile rank	Interpretation: (at, above, or below age expectations)
Picture Vocabulary	13	9	6-0	37	Borderline Normal
Relational Vocabulary	3	3	<3-0	1	Below
Oral Vocabulary	1	3	3-6	1	Below
Grammatic Understanding	13	6	4-9	9	Below
Sentence Imitation	1	1	3-0	>1	Below
Grammatic Completion	14	9	6-6	37	Borderline Normal
Pragmatic subtest on CASL	12	7.3	5-1	4	Below

Interpretation

Receptive Language Skills

Irina demonstrates moderate to severe deficits in receptive language development at this time. Strength was noted in comprehension of single word vocabulary and recognition of many

common objects was demonstrated. Semantic development (understanding of word meanings) was a characterized by the ability to identify concrete words (mirror, light bulb, etc.) but significant difficulty with abstract vocabulary (i.e. weep, medical). She had substantial trouble producing category names. The ability to understand superlatives and comparatives was not yet observed. Similarly, comprehension of quantitative (i.e few, more/most) and temporal attributes (i.e before, after, yesterday) was limited.

She had difficulty processing and remembering information. When asked how 'one' and 'four' are alike she said, "four and five- five is bigger than four". When asked how a 'couch' and a 'chair' were alike she replied "couch and a blanket?" When the question was repeated, she correctly identified that you could sit on them. Receptive understanding of morphology was considered to be delayed, as comprehension of higher order markers -i.e., negatives (ex. can't, neither); irregular plurals, and tense markers (ex. Will be, had been) was inconsistently demonstrated. The understanding of "wh" questions such as "why", "when", and "how" appears to be emerging. Logic and reasoning were generally concrete. The ability to make inferences/predictions from auditorily presented information was not established. Overall, Irina had significant difficulty understanding information that she heard auditorily,

Expressive Language Skills

Expressive abilities appear to be moderately delayed at this time. Difficulties were found in both syntactic and morphological development. Phrase structures and simple grammatical sentences primarily characterize expressive utterances. Single word vocabulary development was judged to be mildly delayed. Expressive morphological development was also delayed. Usage of regular plurals, first person pronouns, and basic negatives is established at this time. Irina was inconsistent in her use of the pronouns "him/we/they"; the possessives " 's", their's and "those", regular and irregular past tense and future tense verbs. She was unable to repeat a 5-word sentence accurately. Expressively, though, Irina's most significant area of difficulty involved organizing sentences about a topic. Irina, when asked to describe a "bird" said, "a bird can fly all day, in the night and in the afternoon." When prompted for more information, she responded "that's all I know." Similarly when asked to describe the word "apple" she answered " apple, you can eat it, then you can eat it in the morning." She could not use inversion to formulate questions. In sentence repetition tasks, she changed all question forms into statements.

READING

The Woodcock Reading Mastery Tests-Revised/NU (WRMT-R/NU) were administered to assess your child's current reading abilities. These tests include tasks of work attack, and word and paragraph comprehension.

Subtest Name	**Raw Score**	**Standard Score** (Mean of 100; SD of 15)	**Test Age Equivalent**	**Grade Equivalent**	**Percentile ****	**Interpretation** (at, above, or below age expectations)
Letter Identification	32	95	6-4	1.0	37	At
Word	24	110	7-2	1.7	74	Above

Identification						
Word Attack	0	81	>5-0*	>k.0*	10	Below
Word Comprehension	452	103	6-11	1.3	58	At
Paragraph Comprehension	1	79	5-7	K.4	7	Below
Total Reading Cluster	430	97	6-7	1.0	42	At

*Test norms are not available at levels below 5-0 or K.0
**These are age norms

Interpretation

Irina performed with enthusiasm on the reading tests, On the Letter Identification test, she identified all printed letters but did not yet recognize most cursive letters. On the Word Identification test Irina recognized several words immediately. She did not attempt to sound out words she did not immediately recognize, rather simply stated "I don't know". On the Word Attack test, she attempted the first three words but said she did not know them. They were not sight words that she had memorized. After repeated assurances that the words were made-up, she did attempt to read them. She was able to consistently identify the initial sound of the word but did not use correct vowel associations. For several items, for example, "un", she noted that if you put an /r/ in front of the word it said run but she could not read the word without the /r/. On the Word Comprehension Test Irina had significant difficulty with decoding the words. She also could not give an opposite or synonym for the few words that she did read. Her scores reflect her language difficulties. Finally, on Passage Comprehension test, Irina attempted to answer the first few test items where she could use the pictures to guess the answer, but responses were inaccurate. As the passages became more difficult and answers dependant on the written text, she correctly indicated that she did not know the words. While Irina's scores are below expectations for her age, Irina's scores are within normal limits for her school placement at this time. Given her struggles on the Word Attack subtest, it is anticipated that reading will become substantially more difficult as she is required to use phonemic decoding rather than simply sight-word recognition to read.

COMMUNICATIVE INTERACTIONS

Test scores from the CASL and the CCC indicate that pragmatic language skills were limited. The ability to make needs and wants known was established. She used greeting and polite responses very appropriately. However, she had difficulty understanding conversational speech aimed at her and often responded inaccurately. Irina had significant difficulty comprehending information heard auditorily, especially in conversation with several sentences at a time. Her abilities to interpret her surroundings often covered the fact that she was having these difficulties.

Often, Irina had difficulty regulating her actions. She wiggled in her seat; even falling off on occasion. Eye gaze was appropriate during testing sessions. As noted above, Irina had significant difficulty formulating question syntax to be able to ask questions in order to mediate her environment. She demonstrated confusion frequently when asked to use appropriate language in communication situations. For example, when asked what the boy should say to upon entering

his class in the morning, Irina said, “Don’t be late for school.” When asked how she would ask a new boy in school if he were in third grade, she said, “he had to go to kindergarten, then first grade then second grade?”

Irina’s language deficits, especially her difficulties understanding complex directions and formulating question syntax caused frustration and could, at times, be attributed incorrectly to disruptive or non-compliant behaviors.

SUMMARY

Hearing: Within Normal Limits
Receptive Language: moderate to severe deficits
Expressive Language: moderate deficits
Articulation: mild deficits
Auditory Processing: area of difficulty
Reading: currently at grade level- monitor decoding

Since Irina has been in this country for over 2 years, it is unlikely that her speech and language problems can be attributed solely to issues of English as a Second Language.

RECOMMENDATIONS

- It is strongly recommended that Irina continue to receive speech and language therapy. Further it is recommended that therapy focus on identification and remediation of comprehension difficulties at this time rather than expressive or articulation goals. As comprehension improves a shift to expressive language would follow with emphasis being on formulation of syntactically correct sentences such as questions and negation. Basic therapy goals at a minimum should include:
  - To explore auditory processing skills. Formal assessment should be done. I would recommend Maxine Young as a potential evaluator. (See below)
  - To improve language concept development.
  - To increase the comprehension of language
  - To improve expressive language skills in the area of syntactic and morphological development.

- Parents should consider evaluation with physician regarding attention difficulties and impulsively.
- Further audiological assessment is recommended in order to rule out any auditory deficits particularly auditory hyper-sensitivity and auditory processing.
- Careful monitoring of reading skills in the area of decoding during the next two years.
- Parents should be involved /included in treatment as they are very important in the carryover of skills.
- I strongly recommend that the Smiths contact Lois Hannon . Lois is a co-founder of a Parent support group for International adoptees and she has moved to the area. She has had to find speech services for her daughter and can provide insight and guidance from her experience. Her phone number is 215/ 659-4453.

If there are any questions or concerns about this report, please feel free to call me at (724) 942-6100.

Susan D. Hough M.A. CCC-SLP
Children's Therapy Center

APPENDIX E

Request for Participation of International Adoption Agencies

Appendix E. Request for Participation of International Adoption Agencies

8/26/05

Dear Agency Director,

Very little is known about the language skills of children who have been adopted to the USA from Eastern European orphanages. Many parents report their children quickly learn the new language and are doing well in their reading programs. Other parents describe learning difficulties, often times attributed to difficulties with understanding or using language. To date, there have been no research studies which test the actual speech, language and reading levels of these children. The truth is, we really do not know the patterns of language acquisition or if there are aspects of language that may be more difficult for the children to learn.

I am asking your agency to consider joining our efforts in a research study of the language development of these children. We would like to assess children between the ages of 6 and 11 years who have been in the USA for at least two years. Your agency would not be asked to disclose names or breech confidentiality. Rather, your involvement would be informing adoptive parents that free, in-depth language evaluations are available for their children ages 6 to 11 years, and providing a phone number for the parent to call if they are interested in participating.

This study has been approved and funded by University of Pittsburgh and the Washington Hospital Research Boards. Enclosed is a copy of the letter that will be sent to an

interested parent. Information about their adoption agency will not be collected, though we would be happy to acknowledged your agency's assistance in the research report. Please let us know of your decision by faxing the attached letter to us at (724) 942-6104. We would appreciate a response within the next two weeks. Thank you for your consideration.

Yours Truly,

Susan Douglass Hough

Principle Investigator

Response Reply : Please fax to 724 942-6104 Attn.: Susan

_____My agency is willing to participate in the University of Pittsburgh Research study on the Language Development of Children Adopted from Eastern European Orphanages. Please contact us with additional information.

_____ My agency is considering participating but is interested in learning more about the research study.

_____ We are not able to participate at this time.

Agency Name:_____

Agency Representative _____

Phone Number: _____

Appendix F. Rules for Dividing Utterances into Conversational units (C Units)

1. Exact repetitions of words or phrases were not counted
2. Syntactic and /or semantic revisions, which did not have a complete thought, were not counted. (e.g. then the next (no another) day came) “no another” was placed in parenthesis and not counted. Hesitations and false starts were not counted.
3. C-units that were not grammatically correct were included.
4. Direct quotation (i.e. "He said 'I want to go' ” were considered one c-unit).
5. Subordinate clauses were not counted unless they could logically be placed with a separate independent clause (e.g. I saw the boy, that there drives, and he was tipping over the car.) Clauses coordinated by *and, but, so* and *then* would typically be coded as separate units.
6. Unintelligible words were counted as one. If they were an important part of the sentence (i.e. the subject) they were not counted.
7. If there was more than one unintelligible word per C-unit, the entire utterance was discounted.
8. Only subject-verb contractions were counted as two words. All other contractions counted according to CHILDES guidelines.
9. Proper and compound nouns counted as one word.
10. Answers to yes/no questions were not counted

Klecan-Aker, J. & Hedrick, D. (1985). A study of the syntactic language skills of normal school-aged children. *Language, Speech and Hearing Services in the Schools, 16* 187-198

APPENDIX G

Test Score Summary Table (Shaded cells represent scores in the Deficit Range; Colors represent Tests)

Appendix G . Test Score Summary Table (Shaded cells represent scores in the Deficit Range; Colors represent Tests)

ID	Sub-ject	CA	Gen-der	Overall Lang	Listen-ing	Speak-ing	Seman-tics	Picture Vocab	Syn-tax	Morph o-logy	Prag-matics	Relation Vocab-ulary	Oral Vocab-ulary	Comb Sent	Wd Ordr	Gener-als	Gram Under-stand	Sent. Imita-tion	Gram Com-preh	Mala-propism	Read-ing	Non-word
Subjects with Overall Language Scores in the Deficit Range on the *TOLD* (N=15)																						
12	RS	86	M	62	79*	55	76	8	53	2	68	8	3				5	1	2		72	48
22	JB	79	M	64	82*	67	66	7	68	6	69	2	3				7	2	6		88	52
8	AF	79	F	67	82*	67	70	7	68	5	73	5	4				7	3	5		84	62
46	KM	81	F	67	85	76	68	9	70	9	73	3	3				6	1	9		97	59
1	AD	116	M	71	79*	68	79	8	68	4	90			4	3	8	8			3	70	41
33	KF	79	F	71	79	73	85	8	61	5	75	9	6				5	2	5		88	69
45	AM	70	F	71	73	76	72	7	74	7	91	5	5				4	7	7		83	72
34	MC	83	F	72	82	73	72	8	76	7	81	5	4				6	6	7		81	82
3	AB	109	F	74	74	76	72	5	79	6	82			6	7	6	7			6	88	58
41	RS	106	M	75	79	74	72	5	81	7	71			7	4	7	10			5	91	74
6	JP	142	F	78	83	76	81	7	79	5	94			5	6	8	9			6	91	67
43	EO	109	F	79	87*	74	81	6	81	7	117			7	3	8	11			7	106	72
10	AH	123	F	80	85	79	94	9	70	6	40			6	4	10	6			8	72	63
15	RR	78	M	80	100*	73	83	10	81	4	75	5	7				10	7	4		109	62
32	EH	75	F	80	76	74	96	10	68	9	80	9	9				2	4	9		92	67
Subjects with 2 or more *TOLD* Subtests in the Deficit Range (N=9)																						
30	VS	83	F	82	97*	82	96	12	70	6	84	9	6				7	3	6		71	53
24	VB	114	M	83	85	83	76	7	91	8	95			8	8	6	10			6	55	70
31	IH	74	M	87	85	94	81	7	96	10	87	6	8				8	10	10		85	61
13	AH	120	M	89	85	94**	89	8	89	12	110			12	5	10	8			7	92	80
9	JM	111	M	90	91	89	96	7	83	8	100			8	7	10	8			11	107	79
17	NG	95	F	90	94	85	83	7	98	10	95	10	5				11	8	10		85	59
39	BE	114	M	90	102*	79	91	10	89	6	93			6	6	8	13			8	91	85
4	DT	142	M	91	96*	87	89	8	94	6	82			6	11	7	10			10	98	92
14	MH	107	M	93	106*	85	91	10	94	9	90	10	6				12	7	9		91	64
Subjects with Reading Only Deficits (N=4)																						
21	MB	80	M	91	115*	72	100	12	83	8	88	9	9				13	1	8		82	66
38	CE	81	M	94	94	97	89	9	100	12	100	9	7				9	9	12		78	92
36	DR	80	M	95	109	94	102	10	89	8	92	11	10				13	4	8		76	63
29	ES	76	M	121	103	115	117	11	121	14	117	16	11				10	16	14		83	85

Subject with Pragmatics Only Deficit (N=1)																						
28	ABO	135	F	99	104	94	91	9	106	9	83			9	10	8	14			9	91	97
Subjects within Normal Limits (N=11)																						
37	MR	110	F	95	91	100	94	10	98	10	111			10	10	10	9			7	104	85
2	ED	80	M	100	106	97	109	12	91	10	92	13	9				10	6	10		94	64
5	EB	120	F	101	106	96	94	11	109	9	95			9	12	7	13	9		9	94	68
26	KB	106	M	101	103	103	104	11	98	11	91	11	10				10	8	11		99	80
20	NMC	108	M	102	113	91	106	15	98	9	92			9	8	9	12			9	96	80
23	SD	78	M	103	97	103	100	10	106	12	96	11	9				9	12	12		102	95
25	RG	104	F	105	103	112	111	10	117	10	86	11	14				11	8	10		93	90
35	MCL	135	F	106	109	102	106	12	103	10	116			10	10	11	13			9	102	92
44	AS	104	M	106	104	106	102	9	109	13	110			13	9	11	12			11	100	95
11	NM	76	M	113	124	106	109	12	115	12	108	12	10				16	9	12		115	55
16	RB	72	M	113	118	103	115	13	109	11	87	14	10				13	10	11		103	75
Subjects within Normal Limits and *TOLD* Overall Language Scores Greater than 1 SD above the Mean (N=4)																						
7	DS	93	M	117	109	112	119	11	113	10	110	14	14				12	14	10		127	94
40	NV	101	M	120	119	117	124	17	113	16	113			16	9	12	11			11	88	84
42	MS	92	F	120	115	127	124	11	113	12	109	13	17				14	10	12		118	89
27	LS	116	F	121	126	113	132	18	106	12	106			12	10	14	11			13	96	93

TOLD
CASL
WRMT-R/NU
NonWord

* = Discrepancy favors speaking
** = Discrepancy favors listening

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