

**SOCIAL SKILLS IN POST-INSTITUTIONAL ADOPTED CHILDREN**

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Submitted to the Graduate Faculty of  
Arts and Sciences, Department of Psychology in partial fulfillment  
of the requirements for the degree of  
Master of Science

University of Pittsburgh

2010

UNIVERSITY OF PITTSBURGH  
FACULTY OF ARTS AND SCIENCES  
DEPARTMENT OF PSYCHOLOGY

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Many children who are adopted internationally into the USA spent time in an institution prior to adoption. While the majority of adoptees fall within the normal range of adjustment, post-institutional (PI) children have been found to have higher rates of peer difficulties than non-adopted parent-reared children, they may display indiscriminate friendliness and difficulty understanding social cues and social boundaries, and they may have difficulty with self-regulation which is likely to relate to social skills (Gunnar, 2001; Gunnar, van Dulmen, & The International Adoption Project Team, 2007; Rutter and the ERA Study Team, 1998; Rutter, Kreppner, & O'Connor, 2001). The purpose of this study was to examine the parent-reported social skills (using the Social Skills Rating System; Gresham & Elliott, 1990) of children adopted to the USA from Russian orphanages that were primarily deficient in their social-emotional environments (The St. Petersburg-USA Orphanage Research Team, 2008). PI children who were adopted before 18 months had higher/better scores than children adopted after 18 months, and there does not appear to be a significant decrease in social skills with later ages (e.g., 24+ months) at adoption, suggesting a step function at 18 months of age at adoption. Further, the Elementary school age sample had higher/better scores than the Secondary school age sample.

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## **1.0 INTRODUCTION**

In 2003, there were an estimated 143 million orphans in 93 countries in sub-saharan africa, asia, latin america, and the caribbean (unaids, unicef, usaid, 2004). Many of these children, an estimated 8 million (united nations, 2006), particularly in low-resource countries, are raised in institutions. While some children remain in institutions until they reach adulthood, others spend only a limited time in institutions and then enter family care.

### **1.1 EARLY REARING ENVIRONMENTS**

Institutions are quite variable in quality. For example, the Romanian orphanages of the early 1990s were globally deficient in all respects, while those in St. Petersburg (Russian Federation) provide adequate health, nutrition, safety, toys, equipment, and learning materials (The St. Petersburg-USA Orphanage Research Team, 2005). However, even when care is otherwise adequate, many institutions, especially those in Eastern Europe, have an “institutional behavioral culture” in which there are many and changing caregivers with limited education who provide insensitive and unresponsive care (Rosas & McCall, 2009; The St. Petersburg-USA Orphanage Research Team, 2005).

More specifically, children’s caregivers change frequently so children may be exposed to 60 to 100 different caregivers by the time they are 19 months old (The St. Petersburg-USA

Orphanage Research Team, 2008). These frequently changing caregivers generally do not attempt to create a relationship with the children in their care, so their care tends to be void of affect, and everyday caretaking tasks like feeding, bathing, and changing are done in an assembly-line like manner. Children usually live in same-age groups, so it is difficult for a caregiver to devote one-on-one attention to a child while other children are otherwise occupied. Care in the institutions is rarely contingently responsive—caregivers’ actions are not typically responsive to a child’s cues. Further, the institutional environment tends to encourage group conformity; children often eat, sleep, and play at specified times and in a prescribed manner with little room for creativity or flexibility. Even playtime is almost exclusively adult-directed, so children are shown the “right” way to play with toys and corrected if they deviate from that method. At some institutions, such as those in Nicaragua, playtime involves either no toys or a single toy (the same type) is given to each child sitting against the wall with no adult interaction at all.

The institutional environment is strikingly different from care in a typical family during the first two years of life. Primarily, families tend to be comprised of a small number of primary caregivers and a small number of children of various ages. While older children are playing by themselves, a parent can devote more attention to a younger child, and while a younger child is napping, a parent can attend to older children. While most parent-reared children have additional caregivers other than their parents, these alternate caregivers (e.g., often relatives, babysitters) are typically fairly consistent—it would be unusual to have a different babysitter every week. Notably, parents typically make many efforts to develop a relationship with their child, so even caretaking tasks are filled with child-directed speech, affect, eye contact, and contingently responsive care. While parents certainly differ in the degree to which this is true, many parents

choose to follow their children's cues and play is often child-directed. Thus far, it is unknown how the socially-emotionally depriving environment of institutions impacts post-institutional (PI) children's later social skills.

## 1.2 BUILDING BLOCKS OF SOCIAL BEHAVIOR

During these first years of life, the caregiver-child relationship theoretically contributes to a number of “building blocks” that seem to form the foundation of later social behavior (Ainsworth, 1973; Bretherton & Munholland, 1999). When children experience a consistent caregiver, they typically experience a great amount of social-emotional stimulation from the caregiver, likely the result of a caregiver's attachment to the child. This frequent stimulation is likely to promote the development of the child's attachment to a caregiver, as well as a basic understanding of contingencies and social cues (Sroufe & Waters, 1977). Further, a reciprocal caregiver-child relationship may give children experience with how their behavior affects those around them. It is plausible that these basic skills—reading social cues, understanding contingencies, and developing a sense of agency—are fundamental to socially skilled behavior in childhood and adolescence.

It is likely that a *consistent* caregiver is key to this process. In fact, for an infant to develop an attachment to a caregiver, the caregiver must behave sensitively and responsively *and* be a consistent presence in the infant's life over a period of time (Thompson, 2006). Consistency makes contingencies easier to learn and social cues easier to understand because a consistent caregiver makes it more likely that stable patterns of behavior will develop. It is plausible that noticing these patterns of social behavior is a crucial first step to developing social skills, and

interactions with a sensitive, responsive, stable caregiver contribute to an infant's development of an internal working model of social relationships.

But, the institutional environment does not generally provide a consistent set of stable caregivers that in turn give children consistent experiences with social cues and interactions; the institutional environment is instead characterized by frequently changing caregivers who tend to provide insensitive and unresponsive care (Rosas & McCall, 2009; The St. Petersburg-USA Orphanage Research Team 2005). While it is not clear what the specific consequences are of not having an early stable caregiver and developing an early internal working model of social relationships, it is plausible that PI children would experience social difficulties later in childhood and adolescence, and a longer duration of residence in a socially-emotionally depriving institution is likely related to increased social difficulties.

### **1.3 POST-INSTITUTIONAL CHILDREN**

In fact, while most PI children fall in the normal range of adjustment after adoption, PI children do show higher rates of problems than never-institutionalized parent-reared children in a variety of domains, including some that are related to social skills. Problems that often occur in higher rates among PI children include:

- Poorer general developmental quotients, language development, and academic achievement than children who have never spent time in an institution (Le Mare, Vaughan, Warford, & Fernyhough, 2001; Morison, Ames, & Chisholm, 1995; Morison & Ellwood, 2000; O'Connor, Rutter, Beckett, Keaveney, Kreppner, & the ERA Study Team, 2000b; Rutter & the ERA Study Team, 1998; Vorria, Rutter, Pickles, Wolkind, & Hobsbaum, 1998);

- Stunted physical development, even when health and nutritional needs are met in the institution (Benoit, Jocelyn, Moddeman, & Embree, 1996; Carlson & Earls, 1997; Chugani, Behen, Muzik, Juhász, Nagy, & Chugani, 2001; Johnson et al., 1992; Morison et al., 1995; Rutter and the ERA Study Team, 1998);
- Behavior problems, including externalizing behaviors, eating problems, stereotyped behavior, peer problems, attentional difficulties, poorer executive functioning, and poorer emotion regulation (Ames, 1997; Beckett et al., 2002; Fisher, Ames, Chisholm, & Savoie, 1997; Goldfarb, 1943a, 1943b; Hodges & Tizard, 1989; Markovitch et al., 1997; Tizard, 1977; Verhulst, Althans, & Verslius-Den Bieman, 1990a, 1990b);
- Indiscriminate friendliness or “superficial, impersonal, and rarely reciprocal” friendships (Chisholm, 1998; Fernyhough, Audet, & Le Mare, 2002; Goldfarb, 1955; Hodges & Tizard, 1989; O’Connor, Bredenkamp, Rutter, & the ERA Study Team, 1999; O’Connor, Rutter, & the ERA Study Team, 2000a; Provence & Lipton, 1962; Tizard, 1977; Tizard & Hodges, 1978; Tizard & Rees, 1975); and
- Attachment difficulties with their adoptive parents, which are often slower to develop and are more often insecure (Chisholm, 1998; Markovitch et al., 1997; O’Connor et al, 2003; Tizard, 1977).

### **1.3.1 Social behaviors of PI children**

The social behaviors of PI children are not often assessed, but when they are, they are measured either as social competence or social problems.

### **1.3.1.1 Social competence**

Evidence is mixed regarding the social competence of internationally adopted children, and it is often unclear whether studies included children who spent time in institutions prior to their adoption. Glennen and Bright (2005) examined social skills in a sample of 6- to 9-year-old internationally adopted children predominantly from Eastern Europe (mainly Russia). They found that internationally adopted children had somewhat poorer social skills, as assessed by the Social Skills Rating System, than the test norms for non-adopted USA children according to both parent and teacher report, but this difference was only significant for teacher-report. However, Glennen and Bright (2005) did not report children's pre-adoptive environment, so it is unclear whether or how many of the children in this study were actually exposed to institutions.

Similarly, Brodzinsky, Schechter, Braff, and Singer (1984) found that adopted children were rated lower in social competence on the Child Behavior Profile (Achenbach & Edelbrock, 1983) than nonadopted children, but again it is unclear whether the children in this study had resided in institutions prior to their adoption. Conversely, Stams, Juffer, Rispen, & Hoksbergen (2000) found that 7-year-old internationally, transracially adopted girls were more socially competent and more popular with their peers than nonadopted girls. While some from this sample had spent time in institutions prior to adoption, most children were adopted before 6 months of age and thus had limited institutional experience.

### **1.3.1.2 Social problems**

Several studies have addressed whether PI children have more social problems, rather than social skills, than never-institutionalized children. For example, evidence regarding the Child Behavior Checklist's Social Problems subscale suggests that PI children, particularly those adopted from the globally-depriving Romanian orphanages in the 1990s, may have higher mean Social



Problems scores than non-adopted, never-institutionalized children (Groza, 1999; Groza & Ryan, 2002; Hawk & McCall, 2010; Hawk & McCall, in press; Hoksbergen, Rijk, van Dijkum, & ter Laak, 2004; Stams et al., 2000). However, while no studies found results in the opposite direction, several studies have found no differences in Social Problems between PI children and never-institutionalized children (Cederblad, Hook, Irhammar, & Mercke, 1999; Hawk & McCall, 2010; Merz & McCall, 2010; Tan & Marfo, 2006; Verhulst et al., 1990a). The CBCL Social Problems subscale addresses a variety of problems including “acts too young, clings to adults or too dependent, doesn’t get along with peers, gets teased, not liked by peers, clumsy, prefers younger children, overweight, withdrawn, lonely, cries, feels unloved, feels persecuted, feels worthless, and accident-prone.”

Thus, while there is some evidence supporting the notion that PI children have higher levels of social problems, it is unclear how PI children fare in terms of more positive social skills. Further, the CBCL Social Problems subscale only assesses certain kinds of social problems; for example, social problems resulting from reactive or unregulated behavior are not addressed.

### **1.3.1.3 Peer relationships**

Peer relationships may prove problematic for some PI children. Both parent- and teacher-reports suggest that PI children have higher rates of peer difficulties than non-adopted parent-reared children (Ames, 1997; Fisher et al., 1997; Gunnar, van Dulmen, & The International Adoption Project Team, 2007; Rutter, Kreppner, & O’Connor, 2001), but these problems may subside after sufficient time (e.g., 8 years) in the adoptive home (Warford, 2002).

#### **1.3.1.4 Indiscriminate friendliness**

Indiscriminate friendliness, which is often thought to relate to attachment problems (Rutter et al., 2001) and difficulty understanding social cues and social boundaries (Rutter & the ERA Study Team, 1998), may be observed in PI children as well (Chisholm, 1998; Fernyhough et al, 2002; Goldfarb, 1955; Hodges & Tizard, 1989; O'Connor et al., 1999, 2000a; Provence & Lipton, 1962; Tizard, 1977; Tizard & Hodges, 1978; Tizard & Rees, 1975). Further, indiscriminate friendliness tends to relate to behavior problems, such as attention problems, hyperactivity, and disruptive behavior (Chisholm, 1998; Le Mare & Audet, 2002; O'Connor et al., 1999, 2000a), and might be related to deficits in inhibitory control more than to attachment (Bruce, Tarullo, & Gunnar, 2009).

#### **1.3.1.5 Autistic-like behaviors**

Autistic-like features have been reported in PI children, but these characteristics are thought to have a different etiology than autism itself (Rutter et al., 1999). Specifically, Rutter et al. (1999) found that compared to children adopted domestically before 6 months of age, 1990s Romanian PI children had more repetitive stereotyped behavior as well as poor social skills characterized by poor reciprocity, poor appreciation of social cues, and a lack of normal social boundaries.

#### **1.3.1.6 Self-regulation**

Self-regulation may be related to poor social skills. For example, children's ability to cooperate with peers and respond well to disagreements likely depends in part on their ability to inhibit impulsive and socially inappropriate responses. PI children are known to have problems with concentration, attention regulation, and inhibitory control (Gunnar, 2001). More specifically, higher levels of attention problems have been reported in PI children relative to parent-reared or

earlier-adopted (either PI or Non-PI) children based on the Attention Problems subscale of the CBCL (Ames, 1997; Gunnar et al., 2007; Le Mare & Audet, 2002; Hoksbergen et al., 2004), the Rutter behavioral scales (Kreppner, O'Connor, & Rutter, 2001), and Attention Deficit Disorder (ADD) or Attention Deficit Hyperactivity Disorder (ADHD) diagnoses (Le Mare & Audet, 2002).

### **1.3.1.7 Interpersonal functioning in adulthood**

When PI individuals reach adulthood, some report that they still experience interpersonal difficulties in some domains. While some have found that PI adults do not differ from non-adopted adults in their peer problems (Westhues & Cohen, 1997) or number of confidants (Sigal, Perry, Rossignol, & Ouimet, 2003), others have found that PI adults may have no one to turn to for advice (Weiner & Kupermintz, 2001) and fewer social supports, and men may have less frequent social contact (Sigal et al., 2003). When the quality of institutional care is relatively good, however, PI adults were reported to have fewer peer problems than a normative sample (Myers & Rittner, 2001). PI adults have also been found to be less likely to be married than a non-adopted matched sample (Lindblad, Hjern, & Vinnerljung, 2003; Sigal et al., 2003; Sigal, Rossignol, & Perry, 1999; Tieman, van der Ende, & Verhulst, 2005), and more likely to have marital problems (Rutter & Quinton, 1984) or to be divorced than the general population (McKenzie, 1997). However, the adult outcome literature contains a substantial proportion of individuals who came to the orphanages later than the infant-toddler period, so it is uncertain what outcomes are typical for adults who experienced mostly very early (e.g., in the first two years of life) social-emotional deprivation.

### **1.3.1.8 Conclusion**

The literature addressing PI children's social behavior is relatively sparse, but some conclusions regarding PI children's social behavior can be made. PI children may be less socially competent and have more social problems than children without the experience of early institutionalization, and these general differences appear to last into adulthood. PI children have more problems with peer relationships and are more likely to demonstrate indiscriminately friendly and autistic-like behaviors, suggesting a failure to understand appropriate social boundaries. Further, PI children are known to have more problems with self-regulation and attention, which could make social relationships and the demonstration of social skills more difficult.

## **1.4 TIME IN INSTITUTION**

The problems that PI children experience often vary as a function of the length of time a child spends in an institution (Gunnar, 2001; MacLean, 2003). Time in an institution is typically not available, and because it is often highly correlated with age at adoption, the latter is often used and likely more accurately reported by parents. An older age at adoption is associated with:

- Greater deficits in developmental milestones, language development, and academic achievement (Le Mare et al., 2001; Morison et al., 1995; Morison & Ellwood, 2000; Rutter & the ERA Study Team, 1998);
- Stunted physical growth (Ames, 1997; Johnson et al., 1992; Rutter & the ERA Study Team, 1998);
- More behavior problems (Ames, 1997; Beckett, et al., 2002; Fisher et al., 1997; Marcovitch et al., 1997; Verhulst et al., 1990a, 1990b; Warford, 2002);

- Indiscriminate friendliness (Bruce et al., 2009); and
- Executive functioning deficits (Merz & McCall, in press).

More specifically, problems are typically found to be elevated in children adopted after 6-24 months of age, depending on the severity of the institutional environment, relative to children adopted before this age (Gunnar, van Dulmen, & the International Adoption Project Team, 2007; Hoksbergen, Rijk, van Dijkum, & ter Laak, 2004; Kreppner, O'Connor, & Rutter, 2001; Marcovitch et al., 1997). Some studies (Kreppner et al., 2007; Merz & McCall, 2010) suggest that there is little or no additional increase in behavior problems when institutionalization persists beyond this point. There is evidence that this step function occurs at approximately 18 months of age in PI children from one set of social-emotionally depriving institutions (Hawk & McCall, in press; Merz & McCall, 2010).

## **1.5 ADOPTIVE HOME**

Problems additionally depend on the care children receive after they leave the institution; children receiving qualitatively better care show greater improvements in IQ post-adoption (Morison et al., 1995; Morison & Ellwood, 2000), and attachment with the adoptive parent improves with increased time in the adoptive home (Chisholm, 1998).

## **1.6 AGE AT ASSESSMENT**

Age at assessment may also relate to the problems displayed by PI children. Overall, more problems (e.g., CBCL somatic complaints, anxious/depressed, delinquent behavior, aggressive behavior) tend to be reported at older ages for PI children, but internalizing problems may be more typical of children aged 1.5 to 5 years and externalizing problems may be more typical of children 6 years and older (Groza, Chenot, & Holtedahl, 2005; Groza & Ryan, 2002; Hawk & McCall, 2010; Merz & McCall, 2010; Verhulst & Versluis-Den Bieman, 1995). While only marginally significant, one study (Hawk & McCall, in press) found CBCL social problems to be more prevalent in older PI children, especially females.

## **1.7 GENDER**

Gender differences are not commonly examined in this literature; when gender differences are reported on behavior problems, their results are not consistent across studies (Groza, 1999; Hawk & McCall, 2010; Hoksbergen et al., 2004; Stams et al., 2000; Verhulst et al., 1990a).

## 2.0 THE CURRENT STUDY

The purpose of this study is to determine what kinds of social skills (and deficits of social skills) are typical of PI children relative to Non-PI parent-reared USA children, and how age at adoption relates to PI children's levels of social skills. Given the inconsistent literature, the present study sought to determine if parents perceived PI children to have different levels of social skills than Non-PI children. These questions were addressed with attention to age at adoption, age at assessment, and gender. The specific sample consists primarily of children adopted from socially-emotionally depriving institutions in St. Petersburg, Russian Federation.

The Social Skills Rating System (SSRS; Gresham & Elliott, 1990) was utilized to assess PI children's social skills. Broadly, the SSRS assesses parents' reports of children's positive, pro-social behaviors, rather than problems, relevant to "social competence and adaptive functioning at school and at home." Four subscales comprise the SSRS: Cooperation, Responsibility, Assertion, and Self-Control. The *Cooperation* subscale reflects behaviors such as sharing, complying with directions, and helping others. *Assertion* refers to starting conversations with others, joining group activities, and accepting friends' ideas for playing. Communicating appropriately with adults and following household rules go into the *Responsibility* subscale, and the *Self-Control* subscale focuses on responding appropriately in conflict situations and compromising. There are separate, but similar, scales for children in Elementary and Secondary grades.

Specifically, this study addresses the following questions:

## **2.1 AT WHAT AGE AT ADOPTION IS THERE A CHANGE IN SSRS SCORES?**

Prior studies with the current sample have found that behavior problems (using the CBCL; Hawk & McCall, in press) and executive functioning (using the BRIEF; Merz & McCall, in press) demonstrate a step function of increasing risk at approximately 18 months of age at adoption. The specific age at which a step function occurs for social skills was investigated, and this age was used to define “earlier” and “later” adoption in subsequent analyses. This was hypothesized to occur at 18 months of age at adoption. Not only are earlier-adopted children exposed a shorter time at an earlier age to the institution, but they are more likely to form a secure attachment with their adoptive parents at an earlier age, so they may be less prone to later difficulties resulting from attachment problems and residence in a socially-emotionally depriving institution.

## **2.2 HOW DO EARLIER- AND LATER-ADOPTED CHILDREN COMPARE ON TOTAL SOCIAL SKILLS, SUBSCALES, AND INDIVIDUAL ITEMS FROM THE SSRS?**

Overall, it was hypothesized that later-adopted children would have relatively lower/poorer scores than earlier-adopted children because later-adopted children experienced a longer period of social-emotional deprivation. But, it is possible that earlier- and later-adopted children would have higher/better scores on different subscales and items. Earlier-adopted children may have



higher/better scores on items reflecting self-regulation due to their more limited early deprivation, and later-adopted children may have higher/better scores on items reflecting behaviors carried over from the institution such as indiscriminate friendliness, conformity, and obedience.

### **2.3 IN WHAT WAYS DO EARLIER- AND LATER-ADOPTED PI CHILDREN DIFFER FROM NON-PI CHILDREN (I.E., THE SSRS STANDARDIZATION SAMPLE)?**

Mean scores for Total Social Skills, subscales, and individual items as well as extreme scores for Total Social Skills were compared between the SSRS standardization sample and the current sample of PI children to determine the particular types of social skills that might differentiate PI from Non-PI children.

#### **2.3.1 Age at adoption**

It was hypothesized that PI children who were adopted at younger ages, specifically before 18 months of age, would have fewer overall social skills deficits than PI children who were adopted at older ages.

### **2.3.2 Age at assessment**

Prior research has demonstrated that more behavior problems tend to be reported at older ages in PI populations (Groza et al., 2005; Groza & Ryan, 2002; Hawk & McCall, 2010; Merz & McCall, 2010; Verhulst & Versluis-Den Bieman, 1995), so it is hypothesized that younger PI children will more closely resemble Non-PI children in their levels of social skills, whereas older PI children will demonstrate more difficulty with social skills than Non-PI children.

### **2.3.3 Gender**

It was hypothesized that PI boys and girls would show similar patterns of social skills as the standardization sample; that is, PI girls were expected to have overall higher (“better”) social skills than PI boys.

## 3.0 METHODS

### 3.1 SAMPLE

#### 3.1.1 Baby home (BH) characteristics

The vast majority of PI children in this study (Elementary grades:  $N = 252$  of 297; Secondary grades:  $N = 79$  of 88) were adopted from “Baby Homes” or institutions for children up to four years of age in the Russian Federation, mostly in St. Petersburg. The remainder of the children in the Elementary sample were adopted from Belarus ( $N = 34$ ), Uzbekistan ( $N = 5$ ), a former Soviet republic other than Russia ( $N = 3$ ), or Ukraine ( $N = 1$ ;  $N = 2$  children had missing data). The remainder of the children in the Secondary sample were adopted from Uzbekistan ( $N = 7$ ), Belarus ( $N = 1$ ) or Bulgaria ( $N = 1$ ).

The nature of the St. Petersburg Baby Homes is well known (i.e., The St. Petersburg-USA Orphanage Research Team, 2005, 2008). They are typically adequate in terms of medical care, nutrition, safety, sanitation, toys, and equipment, but caregiver-child relationships are lacking. Caregivers often work 24-hour shifts on non-consecutive days, and children often “graduate” to new sets of caregivers and peers as they reach new developmental milestones. As a result, children don’t see the same caregivers today as they saw yesterday or will see tomorrow, and they can have 60-100 different caregivers by the time they reach 19 months of age.

Caregivers tend to provide insensitive, unresponsive, adult-directed care, and are rarely emotionally engaged with the children. Further, children who enter these Baby Homes often have delayed physical growth and development: At intake, 43-55% are below the 10<sup>th</sup> percentile in height, weight, and head and chest circumference relative to USA standards, and 60% score below the 10<sup>th</sup> percentile relative to the USA standardization sample on the Battelle Developmental Inventory. Even higher percentages of resident children show physical and developmental delays (The St. Petersburg-USA Orphanage Research Team, 2005), either because of the non-supportive orphanage environment or selective outplacement of the better children.

### **3.1.2 Participants**

A total of 385 parents of children (Elementary: 169 females, 128 males; Secondary: 49 females, 39 males) participated in this study. The children represented in the Elementary sample ranged in age from 5.01 to 12.88 years, and in the Secondary sample they ranged in age from 12.64 to 18.54 years. Their age at adoption ranged from 3.29 to 74.84 (Mdn = 11.71) months in the Elementary sample, and 4.89 to 189.09 (Mdn = 13.96) months in the Secondary sample. The Elementary sample had been in their adoptive homes between 1.10 and 12.04 (Mdn = 7.15) years and the Secondary sample between 1.89 and 16.01 (Mdn = 13.18) years. Children who experienced a social-emotional intervention in the Baby Homes in St. Petersburg were excluded from analyses.

## **3.2 PROCEDURE**

Adoptive parents were recruited through a local adoption agency. They were first made aware of the study through a newsletter or a letter from the director of the adoption agency. Packets containing numerous assessments including the SSRS were sent to parents on three waves of data collection in 2001, 2003, and 2008. The response rate was 40% in Wave 1, 37% in Wave 2, and 51% in Wave 3. While this response rate is lower than one of the largest international adoption follow-ups (Gunnar et al., 2007), it is higher than the largest follow-up of Romanian adoptees (Groza & Ryan, 2002). Parents were offered a modest payment for completion of the packet. Reminder post-cards were sent or phone calls (Wave 3 only) were made to parents several weeks after the packets were initially mailed.

## **3.3 MEASURES**

### **3.3.1 Social Skills Rating Scale**

The Social Skills Rating System (SSRS; Gresham & Elliott, 1990) is a widely used measure of social competence and adaptive functioning. This study utilized the parent-rated forms assessing children's social skills. There are separate forms for different age groups. The *Elementary* version is for children in kindergarten through 6<sup>th</sup> grade, and the *Secondary* version is for children in 7<sup>th</sup> through 12<sup>th</sup> grade. Because grade level was not reliably available in the current

sample, the Elementary sample was restricted to children aged 5 to 13 years, and the Secondary sample was restricted to children aged 12 to 19 years<sup>1</sup>.

The Elementary version of the SSRS contains 38 items; 10 items are included per subscale (Cooperation, Assertion, Responsibility, and Self-Control), and two items (“politely refuses unreasonable requests from others,” “reports accidents to appropriate persons”) are counted in two different subscales. The Secondary version of the SSRS contains the same four subscales with 10 unique items per subscale. A Total Scale is calculated by summing the four subscale scores. Of the 40 items on the Secondary version of the SSRS and 38 items on the Elementary version, 30 are substantively identical and the remainder are thematically similar.

Parents responded to items by reporting how often a behavior occurs: Never (0), Sometimes (1), or Very Often (2). For all items, *a higher score reflects better* (or at least more frequent displays of positive) social skills based on parent-reared norms. Gresham and Elliott (1990) characterize children scoring in the lowest 15% of the standardization sample as having “fewer” social skills, those in the highest 15% of the standardization sample as having “more” social skills, and those in between as having “average” social skills. For the current study, total and subscale scores and extreme scores in each direction will be examined.

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<sup>1</sup> In analyses that included both Elementary and Secondary samples, children who had data in both samples were only included in the Secondary sample to increase the sample size of the smaller Secondary sample.

### **3.3.2 Parent-reported information**

Parents reported on the child's gender, date of birth, date of adoption, and date the survey was completed. This information was used to calculate the child's age at adoption, age at assessment, and number of years of residence in their adoptive home.

## **4.0 RESULTS**

### **4.1 DATA PREPARATION**

#### **4.1.1 Missing Data**

If items were missing on a given subscale for a participant, the score value (0, 1, 2) closest to the mean of the remaining items on that subscale was imputed for the missing data; no participant in either the Elementary or Secondary sample had more than three items missing on a 10-item subscale. In the Elementary sample, 8.4% of participants (25 out of 297) had missing data imputed, and 0.3% of the total items were imputed (37 out of 11,286). In the Secondary sample, 15.9% of participants (14 out of 88) had missing data imputed, and 0.5% of the total items (20 out of 3520) were imputed. Because  $z$ -scores were available for both the Elementary and Secondary samples, some analyses compared Elementary and Secondary scores, with the understanding that the items are somewhat different and comparisons reflect relative standing on the same conceptual set of skills if not the same specific behaviors.



#### **4.1.2 Standard scores**

Because PI children are typically compared to Non-PI children by parents, teachers, and other children and because the current study is focused on differences associated with institutionalization rather than typical age and gender differences, standard scores based on the means and standard deviations of the Non-PI standardization sample were calculated for PI children and were used for most analyses on the SSRS Total Social Skills scores. Raw scores were utilized when PI and Non-PI children's scores were directly compared. Assumptions underlying this strategy were tested (see below) and found acceptable. Because individual item scores were not available for the Non-PI standardization sample, raw scores were used in all analyses of individual items.

#### **4.1.3 Extreme scores**

Extreme scores were calculated for the SSRS Total Social Skills score and subscales and were defined as scores that fall in the most extreme (high/good or low/poor) 15% of the SSRS Non-PI standardization sample. Because norms were not available for individual items, extreme scores could not be calculated for individual items. Extreme scores will be examined in addition to mean scores because the effects of institutionalization are often clearer with respect to extreme scores than means; variation in the normal range isn't always discriminative (Gunnar et al., 2007).

#### **4.1.4 Theory-based subscales**

Sets of items that are theoretically believed to relate to the experience of institutionalization (i.e., indiscriminate friendliness and self-regulation) were defined based on descriptions available in the literature. The author, three other clinical-developmental psychology graduate students, and a faculty advisor separately identified SSRS items that fit each theoretical dimension. Items that were selected by at least four of the five judges were included in the “theoretical scale.” No items were included on both theoretical scales.

To provide some psychometric substantiation of these a priori scales, the items that were identified for these two theoretical subscales were entered into a factor analysis, separately for the Elementary and Secondary samples. In both cases, the items from the Indiscriminate Friendliness subscale (5 items in the Elementary sample and 6 in the Secondary sample) loaded primarily on one factor whereas the items from the Self-Regulation subscale (14 items in the Elementary sample and 19 in the Secondary sample) loaded on the rest of the factors. Thus, it appeared that the judges identified two dimensions that were seen as distinct by parents rating their children.

## 4.2 PRELIMINARY ANALYSES

### 4.2.1 Do SSRS scores for PI children differ as a function of age and gender in the same manner as the Non-PI standardization sample?

To support the use of the Non-PI sample to calculate  $z$  scores, the PI and Non-PI samples were tested for any age and gender differences. Age at assessment in years and gender were examined separately in the Elementary and Secondary samples through PI-Status (PI, Non-PI) x Age at Assessment (Elementary: Ages 5-11; Secondary: Ages 12-17) x Gender ANOVAS on the Total Social Skills scores. In the Elementary sample, there was a significant effect of Gender,  $F(1, 1009) = 4.48, p = .04$  and PI status,  $F(1, 1009) = 16.95, p < .001$ , as well as a Gender x PI Status interaction,  $F(1, 1009) = 6.09, p = .01$ . Specifically, PI males, on average, scored one point (out of 80) higher than PI females, and Non-PI females, on average, scored three points higher than Non-PI males; overall, PI children had higher scores than Non-PI children. When this analysis was repeated in the Secondary sample, no effects reached significance. Although there is somewhat more gender difference among Non-PI children, this does not seem to be a crucial limitation on using the Non-PI sample as a standard for PI children. Thus, further analyses will use  $z$ -scores based on the age and gender differences in the standardization sample so that any age and gender differences found in the current PI sample can be attributed to the experience of institutionalization.

#### 4.2.2 Is the internal structure of the SSRS similar for PI and Non-PI children?

Factor analyses were performed separately on all the SSRS items in the Elementary and Secondary PI samples to determine whether the existing SSRS subscales based on Non-PI children are appropriate for the current PI samples. In both samples, each of the first four factors that were derived contained primarily items from one of the a priori SSRS subscales respectively. This finding was replicated in both the earlier-adopted and later-adopted subsamples in the Elementary sample, and in the later-adopted group in the Secondary sample. An exception was one of the first four factors in the earlier-adopted Secondary sample included items from all the a priori subscales; it is possible that this partial non-replication is due to the smaller number of participants in the Secondary sample ( $N = 88$  vs.  $N = 297$ ). Generally, however, these factor analyses suggest that it is appropriate to use the existing SSRS subscales in this sample of PI children and adolescents.

However, while these mathematical procedures that force orthogonality of weighted items are able to distinguish the a priori SSRS subscales, in practice the subscales of unweighted items are highly inter-correlated. The bivariate correlation between each subscale and Total Social Skills score minus that subscale ranged from  $r(295) = 0.68$  to  $0.75$ ,  $ps < .001$ , in the Elementary sample, and  $r(86) = 0.61$  to  $0.86$ ,  $ps < .001$  in the Secondary sample. Further, the subscales were correlated with each other between  $r(295) = .56$  to  $.68$ ,  $ps < .001$  in the Elementary sample and  $r(86) = .46$  to  $.87$ ,  $ps < .001$ , in the Secondary sample. Together, this suggests that in practice, the subscales assess largely the same social skills, and the subscales are not substantially distinguishable in the current sample. Thus, further analyses utilizing the a priori SSRS subscales were not conducted.

### 4.2.3 Are there alternative explanations for results?

Age at adoption, age at assessment, and years in adoptive home are all interrelated such that knowing two of these factors, one can derive the third. Further, each of these factors may plausibly relate to a child’s level of social skills (Table 1). The primary aim of the current study was to examine how children’s social skills relate to the length of institutionalization (for which age at adoption is a proxy); but to focus interpretation on age at adoption, it first needs to be determined whether social skills are more closely related to the potentially confounding variables of age at assessment and years in adoptive home.

**Table 1.** Correlations between SSRS Total Social Skills, Age at Adoption, Age at Assessment, and Years in Adoptive Home

		SSRS Total Social Skills (z score)	Age at assessment (years)	Years in adoptive home
Elementary	Age at adoption (months)	$r(292) = -.15^*$	$r(292) = .20^{**}$	$r(292) = -.31^{**}$
	Years in adoptive home	$r(295) = .04$	$r(295) = .87^{**}$	
	Age at assessment (years)	$r(295) = -.04$		
Secondary	Age at adoption (months)	$r(86) = -.23^*$	$r(86) = .59^{**}$	$r(86) = -.83^{**}$
	Years in adoptive home	$r(86) = .14$	$r(86) = -.04$	
	Age at assessment (years)	$r(86) = -.21^*$		

\* $p < .05$ ; \*\* $p < .01$

#### 4.2.3.1 Age at assessment

The relation between SSRS Total Social Skills scores and age at assessment was examined through several methods. For the Elementary sample, the bivariate correlation between SSRS Total Social Skills and age at assessment was not found to be significant in males,  $r(126) = .06$ ,  $p = .51$ , females,  $r(167) = -.08$ ,  $p = .28$ , or in the full sample,  $r(295) = -.04$ ,  $p = .48$ . One-way ANOVAs revealed a main effect of age for Elementary females,  $F(7, 168) = 2.50$ ,  $p = .02$ , but not males  $F(7, 127) = 1.02$ ,  $p = .42$ , and a marginal effect for the full Elementary sample  $F(7, 296) = 1.96$ ,  $p = .06$ , but there was no systematic pattern of means across age. Further, a Chi-Square test comparing the percentage of participants in the extreme low/poor range across age groups revealed that there was a significant association between percent more extreme low/poor scores and older age in the Elementary sample,  $X^2(7, N = 297) = 20.01$ ,  $p < .01$ , but again, plots of the percent extreme scores did not demonstrate a systematic age trend. There was no association between percent extreme high/good scores and age in the Elementary sample,  $X^2(7, N = 297) = 10.88$ ,  $p = .14$ .

In the Secondary sample, bivariate correlations demonstrated that age at assessment and SSRS Total Social Skills were significantly negatively associated in the full sample,  $r(86) = -.21$ ,  $p = .05$ , and in females,  $r(47) = -.29$ ,  $p = .04$ , but not in males,  $r(39) = -.16$ ,  $p = .34$ . However, there were no significant effects of age at assessment in one-way ANOVAs for males,  $F(6, 38) = 1.15$ ,  $p = .36$ , females,  $F(6, 48) = .61$ ,  $p = .72$ , or the full sample,  $F(6, 87) = 1.36$ ,  $p = .24$ . Further, there was no significant association between age and the percentage of extreme high/good,  $X^2(6, N = 88) = 3.36$ ,  $p = .76$ , or extreme low/poor scores,  $X^2(6, N = 88) = .425$ ,  $p = .64$ , in the Secondary sample. Overall, there is no clear, systematic relationship between SSRS

scores and age at assessment within each sample, so findings in this study cannot simply be attributed to year-to-year changes in age at assessment.

#### **4.2.3.2 Years in adoptive home**

The bivariate correlation between SSRS Total Social Skills and years in adoptive home was not significant for the Elementary,  $r(295) = .04$ ,  $p = .55$ , or Secondary,  $r(86) = .14$ ,  $p = .21$ , age groups. Further, one-way ANOVAs failed to find a significant effect of years in adoptive home on SSRS Total Social Skills for the Elementary sample,  $F(10, 296) = 1.39$ ,  $p = .18$ . A similar one-way ANOVA in the Secondary age group revealed significantly higher/better social skills with increased a years in the adoptive home,  $F(6, 68) = 2.89$ ,  $p = .02$ , but an examination of the data revealed that this effect was driven by one participant who had been in his or her adoptive home for only one year and scored over 5 standard deviations below the mean on Total Social Skills. Similarly, Chi-Square tests comparing the percentage of participants in the extremely high/good range across years in adoptive home groups revealed no significant associations for the Elementary,  $X^2(10, N = 297) = 9.02$ ,  $p = .53$ , or Secondary age groups,  $X^2(6, N = 69) = 2.72$ ,  $p = .84$ , and no significant association was found between extreme low/poor scores and years in adoptive home groups for the Secondary age group,  $X^2(6, N = 69) = 9.28$ ,  $p = .16$ .

Extreme low/poor scores were significantly associated with a lower number of years in the adoptive home for the Elementary sample,  $X^2(10, N = 297) = 27.31$ ,  $p < .01$ . However, this effect appeared to be driven by 3 of 3 participants in the lowest years in adoptive home group (1 year in home) being classified as extreme low/poor; there was no apparent pattern to the percentage of extreme low/poor scores in the middle years in adoptive home groups. Thus, SSRS scores do not have a clear, consistent, systematic relationship with the number of years

children have lived with their adoptive families, so findings in this study cannot simply be attributed to years in adoptive home.

### **4.3 MAIN ANALYSES**

The goal of this study was to determine how social skills compare between earlier- and later-adopted PI children and Non-PI children in both the Elementary (Table 2) and Secondary (Table 3) samples. First, the scores for PI children were examined to determine whether they follow the hypothesized step-function within both the Elementary and Secondary samples. Next, earlier- and later-adopted PI children were compared on Total Social Skills, the theoretical subscales, and individual items on the SSRS. Last, Elementary and Secondary PI children were compared to Non-PI children, but because Non-PI children cannot be classified into earlier- and later-adoption, all comparisons with Non-PI children were performed separately for earlier- and later-adopted PI children.



**Table 2.** Elementary sample SSRS Total Social Skills scores by age at adoption and gender.

		Gender		
		Male	Female	Overall
Age at adoption	<18 months	$m = 58.70$ $sd = 10.54$ $n = 101$	$m = 57.77$ $sd = 12.32$ $n = 123$	$m = 58.19$ $sd = 11.54$ $n = 224$
	>18 months	$m = 56.36$ $sd = 11.31$ $n = 25$	$m = 53.16$ $sd = 14.22$ $n = 45$	$m = 54.30$ $sd = 13.26$ $n = 70$
	Overall	$m = 58.24$ $sd = 10.69$ $n = 126$	$m = 56.54$ $sd = 12.98$ $n = 168$	$m = 57.27$ $sd = 12.06$ $n = 294$
Standardization sample		$m = 51.75$ $sd = 9.54$ $n = 332$	$m = 54.91$ $sd = 8.16$ $n = 331$	$m = 53.33$ $sd = 8.88$ $n = 663$

**Table 3.** Secondary sample SSRS Total Social Skills scores by age at adoption and gender.

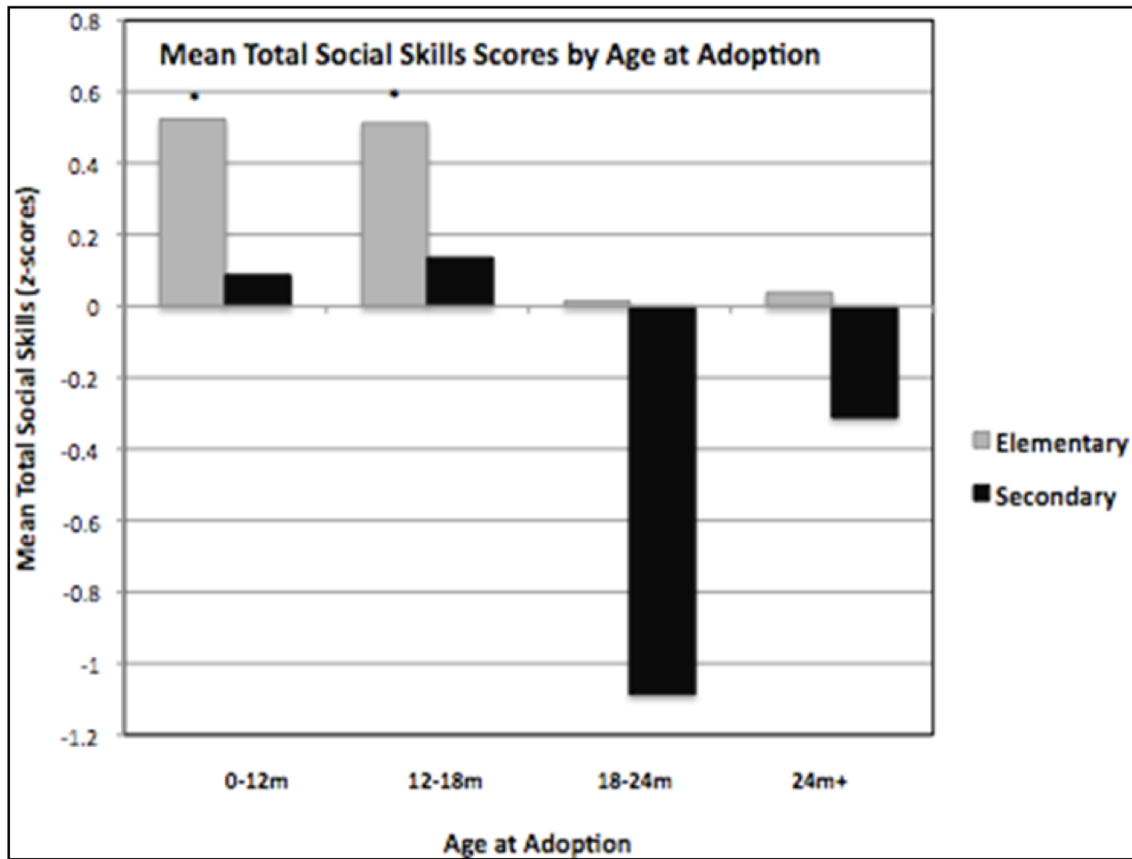
		Gender		
		Male	Female	Overall
Age at adoption	<18 months	$m = 57.8182$ $sd = 14.79587$ $n = 22$	$m = 55.7692$ $sd = 12.48458$ $n = 26$	$m = 56.7083$ $sd = 13.48278$ $n = 48$
	>18 months	$m = 52.6471$ $sd = 14.33065$ $n = 17$	$m = 49.8696$ $sd = 16.23773$ $n = 23$	$m = 51.0500$ $sd = 15.32712$ $n = 40$
	Overall	$m = 55.5641$ $sd = 14.63556$ $n = 39$	$m = 53.0000$ $sd = 14.52154$ $n = 49$	$m = 54.1364$ $sd = 14.54457$ $n = 88$
Standardization sample		$m = 54.28$ $sd = 10.48$ $n = 72$	$m = 56.66$ $sd = 9.48$ $n = 98$	$m = 55.65$ $sd = 9.91$ $n = 170$

### **4.3.1 At what age at adoption is there a change in SSRS scores?**

Previous analyses with other measures (CBCL behavior problems, Hawk & McCall, in press; BRIEF executive functioning, Merz & McCall, in press) in this PI population have shown a step-function for age at adoption such that children adopted before 18 months had better outcomes no different than Non-PI children, and children adopted after that age had somewhat worse outcomes without further significant increases with more prolonged exposure to the institution. Thus, Total Social Skills scores were examined for both the Elementary and Secondary age groups using 6-month intervals of age at adoption, and the specific hypothesis of a step function at 18 months of age at adoption was also examined. The 0-6 month and 6-12 month age at adoption groups were combined due to the limited number of participants adopted before 6 months (Elementary:  $N = 11$ ; Secondary:  $N = 2$ ).

#### **4.3.1.1 Mean scores**

A Sample (Elementary, Secondary) x Age at Adoption (0-12 months, 12-18 months, 18-24 months, 24+ months) ANOVA on Total Social Skills  $z$ -scores revealed a significant effect of Sample,  $F(1, 381) = 7.74, p < .01$ , and Age at Adoption,  $F(3, 381) = 3.51, p = .02$  (Figure 1). There was no interaction. Specifically, earlier-adopted PI children had higher/better average Total Social Skills scores than later-adopted PI children, and the Elementary sample had higher/better average Total Social Skills scores than the Secondary sample. It should be noted that while there is much overlap in the items included on the Elementary and Secondary versions of the SSRS, the test versions are not identical; nevertheless, this analysis reflects the relative standing of these scores.



**Figure 1.** Mean z-scores for age at adoption groups

Note: Although z-scores existed for both the Elementary and Secondary samples, they were based on somewhat different items. \* $p < .05$ .

Further, specific contrast tests revealed that the significant Age at Adoption effect was due to the difference between children adopted before 18 months versus after 18 months, as

hypothesized<sup>2</sup>. In particular, there was no significant difference between children adopted between 0-12 months of age and 12-18 months of age, Contrast Estimate<sup>3</sup> = -.02,  $p = .94$ , nor was there a significant difference between children adopted at 18-24 months of age and 24+ months of age, Contrast Estimate = -.40,  $p = .22$ . In contrast, children adopted before 18 months had significantly higher/better scores than children adopted after 18 months, Contrast Estimate = 1.30,  $p < .01$ . Thus, there appears to be a step function at 18 months of age at adoption, and the Secondary sample had overall lower/worse scores than the Elementary sample.

#### 4.3.1.2 Extreme scores

An examination of the percentage of Total Social Skills scores falling in the extreme high/good and extreme low/poor range of the SSRS standardization sample revealed a similar pattern: earlier-adopted children had more extreme high/good scores and fewer extreme low/poor scores than later-adopted children (see Figure 2). Specifically, in the Elementary sample, age at adoption (0-12 months, 12-18 months, 18-24 months, 24+ months) was marginally associated with percents of extreme low/poor scores,  $X^2(3, N = 294) = 7.43, p = .06$ . When this effect was broken down, the 0-12 months and 12-18 months at adoption groups were not significantly different,  $X^2(1, N = 224) = .16, p = .69$ , nor were the 18-24 months and 24+ months at adoption groups,  $X^2(1, N = 70) = .09, p = .77$ . But, as hypothesized, children adopted after 18 months had significantly more extreme low/poor scores than those adopted before this age,  $X^2(1, N = 294) = 7.19, p < .01$ . For extreme high/good scores, there was not a significant association with age at

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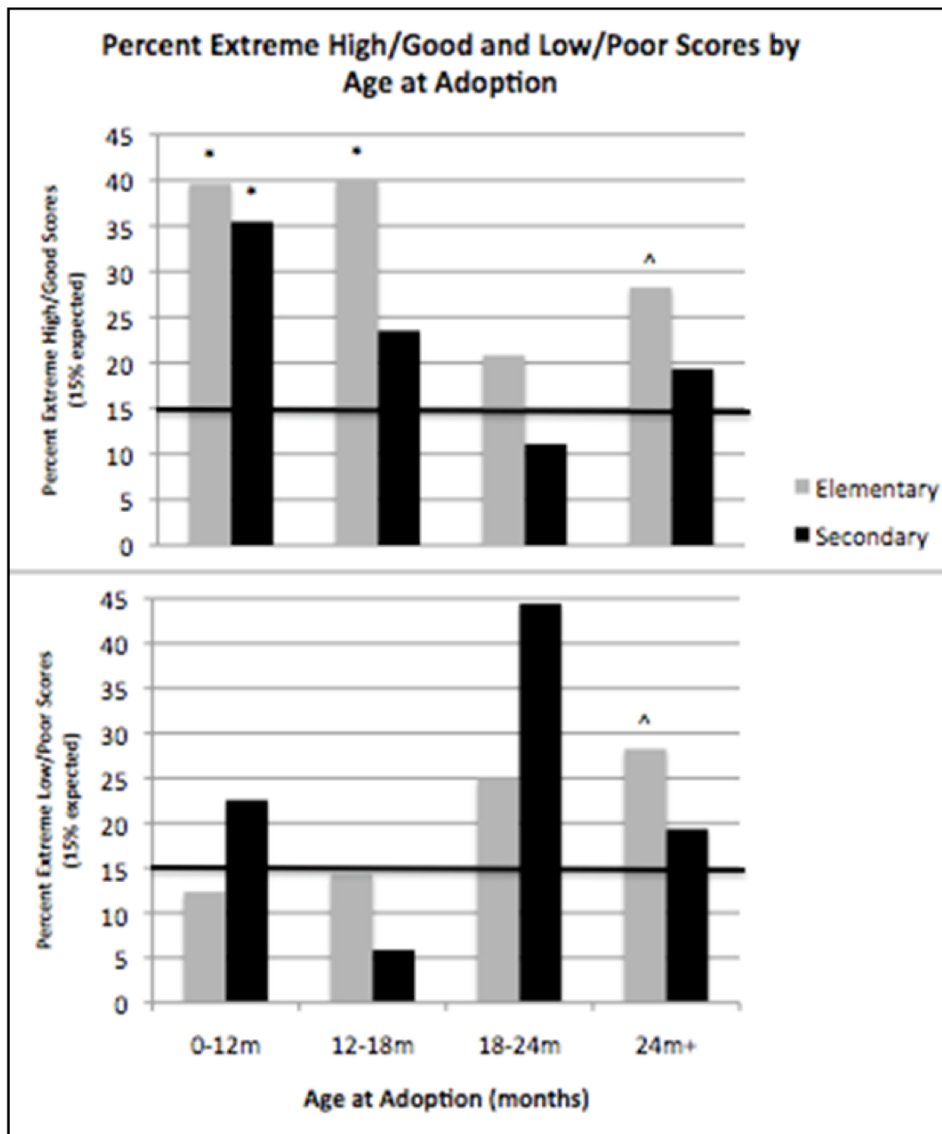
<sup>2</sup> Orthogonal polynomial trend analyses were not conducted because there was a specific hypothesis as to what age the step function would occur.

<sup>3</sup> The Contrast Estimate is the difference between the marginal means of the two age-at-adoption groups being compared, and the error term for this estimate is the error estimate from the full ANOVA (Kirk, 1982).

adoption when this factor was divided into four groups,  $X^2(3, N = 294) = 5.17, p = .16$ , nor was there a significant distinction between the earlier two groups,  $X^2(1, N = 224) = .003, p = .96$ , or the later two groups,  $X^2(1, N = 70) = .47, p = .50$ . However, as hypothesized, children adopted after 18 months had significantly fewer extreme high/good scores than those adopted before this age,  $X^2(1, N = 294) = 4.70, p = .03$ .

While the same general trends were apparent in the Secondary sample, the effects failed to reach significance for both the extreme low/poor and extreme high/good scores for both the four-group, extreme low/poor:  $X^2(3, N = 88) = 5.62, p = .13$ , extreme high/good:  $X^2(3, N = 88) = 3.36, p = .34$ , and two-group, extreme low/poor:  $X^2(1, N = 88) = .93, p = .34$ , extreme high/good:  $X^2(1, N = 88) = 2.25, p = .13$ , age at adoption comparisons. However, a comparison of 12-18 months and 18-24+ months at adoption revealed a significant association in the expected direction between age at adoption and extreme low/poor scores,  $X^2(1, N = 26) = 5.49, p = .02$ , but the effect was not significant for extreme high/good scores,  $X^2(1, N = 26) = .63, p = .43$ .

The age-at-adoption effect at 18 months was clearly and consistently demonstrated for means scores. Although the extreme score effects were more clearly displayed for the Elementary than the Secondary sample, the mean and extreme score findings for Total Social Skills seem to be generally consistent with a step function at 18 months of age. Children adopted before 18 months of age tend to have higher/better social skills than children adopted after this age, and there does not appear to be a significant decrease in social skills with later ages (e.g., 24+ months) at adoption. Because these results are most consistent with a step-function at 18 months of age at adoption, further analyses will use 18 months at adoption as the cut-off between earlier- and later-adopted children.



**Figure 2.** Extreme high/good (top) and extreme low/poor (bottom) scores for Elementary and Secondary samples, relative to the 15% extreme scores typical of the Non-PI standardization sample

Note: Although extreme scores existed for both the Elementary and Secondary samples, they were based on somewhat different items; the Elementary and Secondary samples were not analyzed in the same analyses. \* $p < .05$ , ^ $p < .10$ .

### **4.3.2 How do earlier- and later-adopted children compare on Total Social Skills, theoretical subscales, and individual items from the SSRS?**

#### **4.3.2.1 Total Social Skills**

An Age at Adoption (< 18 months, > 18 months) x Sample (Elementary, Secondary) x Gender ANOVA was performed to examine the effect of these variables and their interaction on SSRS Total Social Skills (*z*-scores). The ANOVA revealed that SSRS Total Social Skills scores are significantly higher/better for earlier-adopted than later-adopted PI children,  $F(1, 381) = 7.03, p < .01$ , Elementary than Secondary PI children,  $F(1, 381) = 7.33, p < .01$ , and males than females,  $F(1, 381) = 8.39, p < .01$ . There were no interactions.

*T*-tests were performed to compare earlier- and later-adopted children. Earlier-adopted Elementary children scored significantly higher/better than later-adopted Elementary children on Total Social Skills (*z*-scores),  $t(292) = 2.52, p = .01$ , but this effect was only marginal in the (smaller) Secondary sample,  $t(86) = 1.85, p = .07$ .

#### **4.3.2.2 Theoretical subscales**

An Age at Adoption (<18 months, >18 months) x Sample (Elementary, Secondary) x Gender MANOVA was performed on the two theoretical subscales. There was a significant multivariate effect of Age at Adoption,  $F(2, 374) = 3.28, p = .04$ . Specifically, earlier-adopted PI children were rated as having marginally higher/more indiscriminate friendliness,  $F(1, 382) = 3.51, p = .06$ , and significantly higher/better self-regulation,  $F(1, 382) = 5.38, p = .02$ , than later-adopted PI children. Note, however, that the indiscriminate friendliness subscale is unable to distinguish between appropriately “good” social skills and less desirable indiscriminate friendliness. There were no other main effects or interactions.

*T*-tests revealed that earlier-adopted Elementary children had marginally higher/more indiscriminate friendliness,  $t(292)= 1.91, p = .06$ , and marginally higher/better self-regulation,  $t(292)= 1.94, p = .05$  than later-adopted children. There was no significant difference between earlier- and later-adopted children in the Secondary sample on these subscales.

#### **4.3.2.3 Individual items**

Earlier-adopted children scored significantly higher/better than later-adopted children on 12 items of the SSRS in the Elementary sample (Table 4) and 6 items of the SSRS in the Secondary sample (Table 5). In both samples, the significant items did not clearly relate to either self-regulation or indiscriminate friendliness, and there was no apparent thematic difference between the items that reached significance and those that did not. While there is substantial overlap in the items that are included in the Elementary and Secondary versions of the SSRS, only one of these overlapping items (“The child will be liked by others”) was significant in both samples.



**Table 4.** Elementary: *t*-tests comparing earlier and later-adopted children on individual items

		Mean for <18m (N=224)	Mean for >18m (N=70)	<i>t</i>	<i>p</i>
SR	32. The child will respond appropriately to teasing from friends or relatives of his or her own age.	1.41	1.10	3.947	<b>.000</b>
SR	14. The child will avoid situations in the home or community that are likely to result in trouble.	1.50	1.26	2.998	<b>.003</b>
IF	7. The child will ask sales clerks for information or assistance when appropriate.	1.21	.96	2.394	<b>.017</b>
SR	17. The child will receive criticism well.	1.15	.96	2.410	<b>.017</b>
	27. The child will give compliments to friends or other children in the family.	1.56	1.37	2.407	<b>.017</b>
SR	35. The child will change easily and appropriately from one activity to another.	1.66	1.47	2.381	<b>.019</b>
IF	30. The child will be self-confident in social situations such as parties and group outings.	1.62	1.43	2.254	<b>.026</b>
	23. The child will be liked by others.	1.85	1.71	2.240	<b>.027</b>
	1. The child will use free time at home in an acceptable way.	1.75	1.59	2.200	<b>.030</b>
SR	33. The child will use time appropriately while waiting for a parent's help with homework or some other tasks.	1.28	1.09	2.188	<b>.031</b>
	11. The child will congratulate or praise family members on accomplishments.	1.51	1.33	2.095	<b>.037</b>
SR	8. The child will pay attention to speakers at meetings such as in church or youth groups.	1.43	1.27	1.992	<b>.049</b>
	34. The child will accept friends' ideas for playing.	1.59	1.46	1.913	.057
IF	5. The child will introduce herself or himself to new people without being told.	1.27	1.11	1.646	.101
	12. The child will make friends easily.	1.71	1.57	1.606	.111
	21. The child will attempt household tasks before asking for parental help.	.98	.87	1.427	.155
	31. The child will request permission before leaving his or her house.	1.83	1.74	1.339	.184
	18. The child will answer the telephone appropriately.	1.66	1.54	1.275	.205
SR	6. The child will respond appropriately when other children hit or push him or her.	1.55	1.46	1.263	.207
	2. The child will keep her or his room clean and neat without being reminded.	.86	.74	1.257	.210
	9. The child will politely refuse unreasonable requests from others.	1.44	1.34	1.142	.254
	4. The child will join group activities without being told to.	1.68	1.60	1.113	.267
	36. The child will cooperate with family members without being asked to do so.	1.48	1.40	1.101	.272
SR	19. The child will help the parent with household tasks without prompting.	1.04	.96	1.008	.314
SR	3. The child will speak in an appropriate tone of voice at home.	1.58	1.51	.899	.362
SR	25. The child will end disagreements with the parent calmly.	1.15	1.23	-.850	.396
SR	26. The child will control her or his temper in conflict situations with the parent.	1.18	1.26	-.840	.402
	16. The child will volunteer to help family members with household tasks.	1.23	1.17	.743	.458
	38. The child will report accidents to appropriate persons.	1.83	1.80	.614	.540
IF	24. The child will start conversations with others rather than waiting for others to talk first.	1.61	1.66	-.609	.543
SR	28. The child will complete assigned household tasks within reasonable time.	1.28	1.33	-.572	.568
SR	22. The child will control her or his temper in arguments with other children.	1.38	1.33	.538	.591
	13. The child will show interest in a variety of things.	1.82	1.79	.534	.594
IF	10. The child will invite others to his or her parents' home.	1.57	1.53	.483	.630
SR	15. The child will put away toys or other household property in appropriate places.	1.08	1.04	.415	.678
	20. The child will appropriately question household rules that may be unfair.	1.23	1.20	.341	.733
	37. The child will acknowledge compliments or praise from friends.	1.73	1.71	.278	.781
	29. The child will ask permission before using another family member's property.	1.26	1.27	-.097	.923

Note. IF=Indiscriminate Friendliness theory-based subscale. SR=Self-Regulation theory-based subscale.

**Table 5.** Secondary: *t*-tests comparing earlier and later-adopted children on subscales and individual items

		Mean for <18m (N=48)	Mean for >18m (N=40)	<i>t</i>	<i>p</i>
	14. The child will make friends easily.	1.62	1.20	2.785	<b>.007</b>
IF	12. The child will invite others to her or his home.	1.54	1.22	2.588	<b>.011</b>
	37. The child will be liked by others.	1.83	1.52	2.598	<b>.012</b>
	38. The child will answer the phone in an appropriate manner.	1.92	1.68	2.336	<b>.023</b>
	5. The child will politely refuse unreasonable requests from others.	1.40	1.10	2.246	<b>.027</b>
SR	20. The child will speak in an appropriate tone of voice at home.	1.50	1.22	2.074	<b>.041</b>
SR	30. The child will use time appropriately while waiting for parent's help with housework or some other task.	1.23	.95	1.924	.058
SR	13. The child will avoid situations that are likely to result in trouble.	1.50	1.28	1.672	.098
SR	10. The child will respond appropriately when other children hit or push him or her.	1.62	1.42	1.608	.111
SR	25. The child will attend to the parent's instructions.	1.50	1.28	1.582	.117
IF	26. The child will join in group activities without being asked or told to do so.	1.54	1.30	1.573	.120
SR	23. The child will appropriately express feelings when wronged.	1.42	1.20	1.563	.122
SR	31. The child will receive criticism well.	1.21	1.00	1.550	.125
	32. The child will inform parents before going out with friends.	1.85	1.70	1.526	.131
	36. The child will report accidents to appropriate persons.	1.88	1.72	1.437	.155
SR	33. The child will follow household rules.	1.65	1.48	1.425	.158
SR	28. The child will put away belongings or other household property.	1.02	.82	1.378	.172
	11. The child will volunteer to help family members with tasks or chores.	1.00	.82	1.370	.175
	4. The child will participate in organized activities such as sports or clubs.	1.65	1.45	1.362	.178
	3. The child will attempt household tasks before asking for the parent's help.	.81	.65	1.251	.215
	21. The child will acknowledge compliments or praise appropriately from friends.	1.69	1.55	1.210	.229
SR	22. The child will control her or his temper in arguments with other children.	1.67	1.52	1.189	.238
	7. The child will use free time at home in an acceptable way.	1.54	1.40	1.130	.262
	40. The child will appear self-confident in social interactions with opposite-sex friends.	1.40	1.55	-1.123	.265
	17. The child will show concern for friends and relatives of his or her own age.	1.67	1.52	1.074	.286
SR	18. The child will control her or his temper in conflict situations with her or his parents.	1.19	1.02	1.035	.304
IF	34. The child will appear self-confident in social situations such as parties or group outings.	1.46	1.32	.953	.343
SR	2. The child will help parents with household tasks without being told.	.79	.68	.836	.406
IF	39. The child will ask sales clerks for information or assistance.	1.44	1.55	-.794	.430
SR	9. The child will respond appropriately to teasing from friends or relatives of his or her own age.	1.48	1.38	.738	.462
	8. The child will say nice things about himself or herself when appropriate.	1.23	1.32	-.631	.530
SR	19. The child will end disagreements with his or her parents calmly.	1.08	1.00	.534	.595
	35. The child will demonstrate interest in a variety of things or activities.	1.56	1.50	.452	.652
IF	1. The child will start conversations rather than waiting for others to talk first.	1.21	1.15	.405	.687
SR	15. The child will keep her or his room clean and neat without being reminded.	.71	.65	.405	.687
IF	6. The child will introduce himself or herself to new people without being told.	1.12	1.08	.319	.750
SR	29. The child will wait her or his turn in games or other activities.	1.75	1.78	-.255	.799
SR	24. The child will follow rules when playing games with others.	1.71	1.70	.073	.942
SR	16. The child will complete household tasks or chores within a reasonable time.	1.17	1.18	-.068	.946
SR	27. The child will compromise in conflict situations by modifying or changing own ideas to reach agreement.	1.17	1.18	-.065	.948

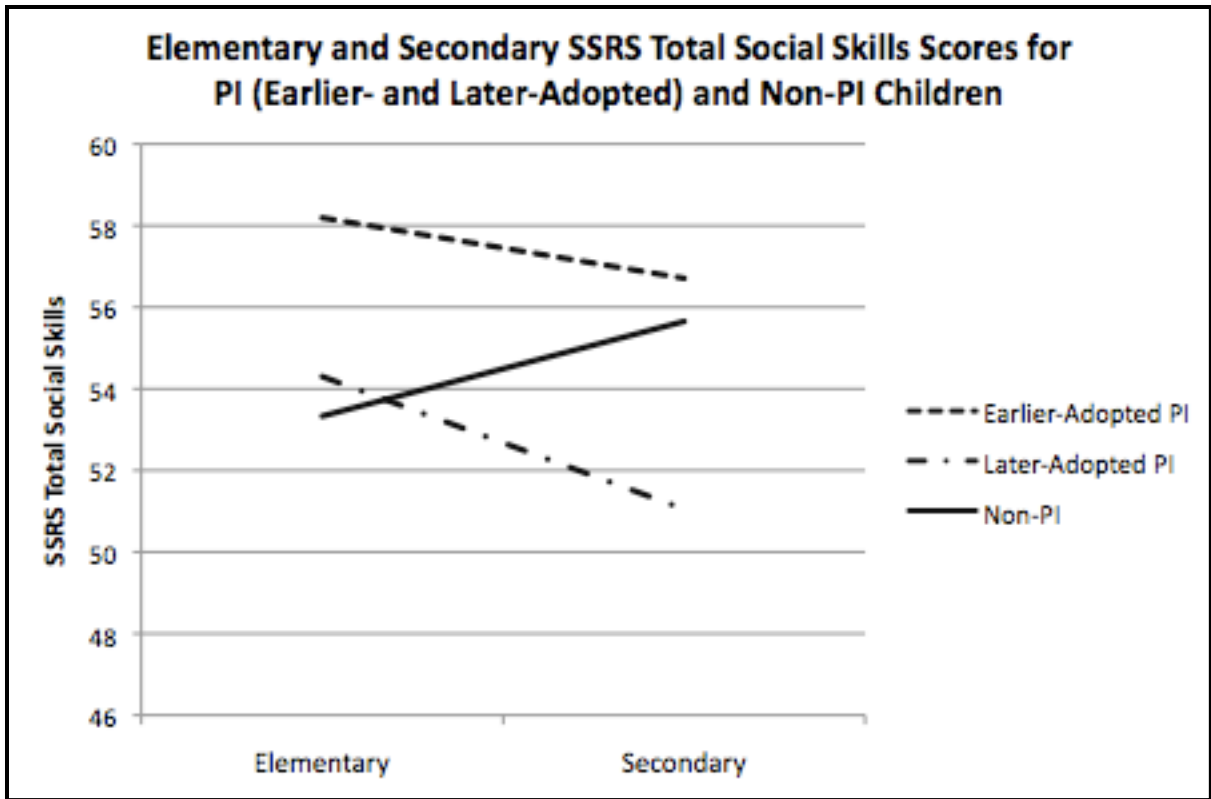
Note. IF=Indiscriminate Friendliness theory-based subscale. SR=Self-Regulation theory-based subscale.

### **4.3.3 In what ways do earlier- and later-adopted PI children differ from Non-PI children (i.e., the SSRS standardization sample)?**

PI children's Total Social Skills scores were compared to the Non-PI standardization sample through both mean scores and extreme scores.

#### **4.3.3.1 Mean scores**

To determine how PI children compare to the Non-PI standardization sample, SSRS Total Social Skills scores for the Elementary and Secondary PI samples were compared to Non-PI children in PI-Status (PI, Non-PI) x Sample (Elementary, Secondary) x Gender ANOVAs. Because Non-PI children cannot be classified by age at adoption, earlier- and later-adopted PI children were compared to Non-PI children in separate analyses. The results for earlier- and later-adopted children were largely similar (Figure 3). For both earlier- and later-adopted PI children, there was a significant PI-status x Sample interaction, earlier-adopted:  $F(1, 1097) = 3.99, p = .05$ , later-adopted:  $F(1, 935) = 6.81, p = .01$ , as well as a significant PI-status x Gender interaction, earlier-adopted:  $F(1, 1097) = 5.65, p = .02$ , later-adopted:  $F(1, 935) = 7.12, p = .01$  (Figure 3). Specifically, PI children (especially males) score higher/better in the Elementary years and they (especially females) score lower/poorer in the Secondary years, whereas Non-PI children score higher/better in the Secondary years. In the earlier-adopted sample (but not in the later-adopted sample) there was a main effect of PI-status,  $F(1, 1097) = 12.07, p < .001$ , with PI children scoring higher/better than Non-PI children.



**Figure 3.** SSRS Total Social Skills Scores for Earlier- and Later-adopted PI children and Non-PI Children

Note. Earlier-adopted and later-adopted PI children were not analyzed in the same analyses. Each group was separately compared to Non-PI children.

Follow-up *t*-tests comparing PI children to the Non-PI standardization sample on Total Social Skills were also performed for each Sample (Elementary, Secondary) x Gender x Age at Adoption (<18 months, >18 months) cell (Table 6). The Elementary sample as a whole (and males overall) scored higher/better than the standardization sample, as did earlier-adopted males and females. Further, later-adopted Elementary males scored marginally higher/better than the standardization sample, and later-adopted Elementary females did not differ from the standardization sample. In the Secondary sample, on the other hand, PI adolescents did not differ significantly from the standardization sample overall, and nor did earlier-adopted males and females. However, later-adopted females, and females as a whole, scored marginally lower/poorer than the standardization sample, whereas later-adopted Secondary males did not differ. Again, this suggests that earlier-adopted PI children, especially males, scored higher/better than Non-PI children in the Elementary years, and later-adopted PI children, especially females, scored somewhat lower/poorer than Non-PI children in the Secondary years.

**Table 6.** Elementary: *t*-tests comparing PI sample to standardization sample

	Adopted <18 months			Adopted >18 months			Male	Female	Full sample
	Male	Female	Overall	Male	Female	Overall			
Elementary	( <i>n</i> = 101)	( <i>n</i> = 123)	( <i>n</i> = 224)	( <i>n</i> = 25)	( <i>n</i> = 45)	( <i>n</i> = 70)	( <i>n</i> = 128)	( <i>n</i> = 169)	( <i>n</i> = 297)
	<i>t</i> = <b>6.583</b> <i>p</i> < <b>.001</b> (PI higher)	<i>t</i> = <b>2.469</b> <i>p</i> = <b>.015</b> (PI higher)	<i>t</i> = <b>5.710</b> <i>p</i> < <b>.001</b> (PI higher)	<i>t</i> = 2.016 <i>p</i> = .055 (PI higher)	<i>t</i> = -.884 <i>p</i> = .382 (PI lower)	<i>t</i> = .154 <i>p</i> = .878 (PI higher)	<i>t</i> = <b>6.887</b> <i>p</i> < <b>.001</b> (PI higher)	<i>t</i> = 1.568 <i>p</i> = .119 (PI higher)	<i>t</i> = <b>4.934</b> <i>p</i> < <b>.001</b> (PI higher)
Secondary	( <i>n</i> = 22)	( <i>n</i> = 26)	( <i>n</i> = 48)	( <i>n</i> = 17)	( <i>n</i> = 23)	( <i>n</i> = 40)	( <i>n</i> = 39)	( <i>n</i> = 49)	( <i>n</i> = 88)
	<i>t</i> = 1.107 <i>p</i> = .281 (PI higher)	<i>t</i> = -.360 <i>p</i> = .722 (PI lower)	<i>t</i> = .521 <i>p</i> = .605 (PI higher)	<i>t</i> = -.483 <i>p</i> = .636 (PI lower)	<i>t</i> = -2.003 <i>p</i> = .058 (PI lower)	<i>t</i> = -1.917 <i>p</i> = .063 (PI lower)	<i>t</i> = .529 <i>p</i> = .600 (PI higher)	<i>t</i> = -1.759 <i>p</i> = .085 (PI lower)	<i>t</i> = -1.021 <i>p</i> = .310 (PI lower)

#### **4.3.3.2 Extreme scores**

Chi-squared tests were used to determine whether the percentage of participants scoring in the extreme high/good or low/poor range for Total Social Skills differed from the expected 15%. Earlier-adopted children generally had more extreme high/good scores than expected; this was true for Elementary males and females, Secondary males, and marginal for Secondary females (Table 7). Further, earlier-adopted PI males had fewer extreme low/poor scores than expected. Later-adopted Elementary males similarly had more extreme high/good scores than expected, but this effect was only marginal in the Secondary sample. Both later-adopted Elementary and Secondary females had more extreme low scores than expected.

Overall, these results demonstrate that earlier-adopted PI children, especially males, have higher/better SSRS Total Social Skills scores than Non-PI children, and this is true with respect to both mean and extreme scores. Later-adopted PI children, on the other hand, score more similarly to Non-PI children, and later-adopted PI females may score especially poorly. Whereas PI children have higher/better scores at younger ages (i.e., Elementary), Non-PI children have higher/better scores at older ages (i.e., Secondary).

**Table 7.** Elementary: Chi-Squared tests comparing percent extreme scores on Total Social Skills to 15%

		Adopted <18 months			Adopted >18 months			Male	Female	Full sample
		Male	Female	Overall	Male	Female	Overall			
Elementary	Extreme Low	(n = 101)	(n = 123)	(n = 224)	(n = 25)	(n = 45)	(n = 70)	(n = 128)	(n = 169)	(n = 297)
		$X^2 = 3.970$ $p = .046$ (<15%)	$X^2 = .415$ $p = .520$	$X^2 = .741$ $p = .389$	$X^2 = .176$ $p = .674$	$X^2 = 14.913$ $p < .001$ (>15%)	$X^2 = 8.095$ $p = .004$ (>15%)	$X^2 = 4.120$ $p = .042$ (<15%)	$X^2 = 6.299$ $p = .012$ (>15%)	$X^2 = .314$ $p = .575$
	Extreme High	$X^2 = 60.231$ $p < .001$ (>15%)	$X^2 = 48.398$ $p < .001$ (>15%)	$X^2 = 107.464$ $p < .001$ (>15%)	$X^2 = 5.667$ $p = .017$ (>15%)	$X^2 = 1.841$ $p = .175$	$X^2 = 6.303$ $p = .012$ (>15%)	$X^2 = 61.693$ $p < .001$ (>15%)	$X^2 = 46.489$ $p < .001$ (>15%)	$X^2 = 106.316$ $p < .001$ (>15%)
Secondary	Extreme Low	(n = 22)	(n = 26)	(n = 48)	(n = 17)	(n = 23)	(n = 40)	(n = 39)	(n = 49)	(n = 88)
		$X^2 = .032$ $p = .858$	$X^2 = .365$ $p = .546$	$X^2 = .105$ $p = .746$	$X^2 = .093$ $p = .760$	$X^2 = 4.298$ $p = .038$ (>15%)	$X^2 = 3.137$ $p = .077$	$X^2 = .005$ $p = .946$	$X^2 = 3.461$ $p = .063$	$X^2 = 2.053$ $p = .152$
	Extreme High	$X^2 = 7.875$ $p = .005$ (>15%)	$X^2 = 2.899$ $p = .089$	$X^2 = 9.941$ $p = .002$ (>15%)	$X^2 = 2.769$ $p = .096$	$X^2 = .717$ $p = .397$	$X^2 = .196$ $p = .658$	$X^2 = 10.281$ $p = .001$ (>15%)	$X^2 = .436$ $p = .509$	$X^2 = 6.902$ $p = .009$ (>15%)

## **5.0 DISCUSSION**

This study aimed to examine how PI children's social skills relate to age at adoption and Non-PI children's social skills in a sample of Elementary and Secondary aged PI children adopted primarily from socially-emotionally depriving institutions in St. Petersburg, Russian Federation. Overall, the results of this study converge on several general conclusions. First, children adopted after 18 months of age appear to have lower SSRS scores than those adopted before this age, without substantial decrements in social skills beyond this age at adoption. Second, PI children assessed at older ages (Secondary sample) had overall lower scores than children assessed at earlier ages (Elementary sample), whereas the reverse was true for Non-PI children. This suggests a longitudinal study might observe a decline in social skills with age in PI children. Third, earlier-adopted Elementary PI children (especially boys) score higher/better than the standardization sample, whereas later-adopted Secondary PI children (especially girls) score lower/poorer than the standardization sample.

### **5.1 STEP FUNCTION**

Prior analyses on this sample using other measures (CBCL behavior problems, Hawk & McCall, in press; BRIEF executive functioning, Merz & McCall, in press) have found a step function such that PI children adopted after 18 months have significantly poorer outcomes than those



adopted before this age, and additional time in the institution beyond 18 months does not seem to contribute to further declines. The present study expands these prior findings and demonstrates that a step function is also evident for PI children's social skills. This step function was statistically significant for mean scores in the full sample (Elementary and Secondary combined), and for percent extreme scores in the (larger) Elementary sample; while not statistically significant in the Secondary sample, the same general trends for percent extreme scores were apparent there as well.

Age at adoption is often associated with time in the adoptive home and age at assessment, and both of those variables could logically explain the relation between age at adoption and SSRS scores. However, there was no consistent, systematic relation between SSRS scores and children's age at assessment or years in the adoptive home, so these factors do not obviously explain the relation between age at adoption and SSRS scores. Further, the step function appears to be relatively robust, in that it is apparent with regard to both mean scores and only somewhat less emphatically for extreme scores for the SSRS as well as CBCL (Hawk & McCall, in press) and BRIEF (Merz & McCall, in press) in this population, although all three measures represent reports of the same population of parents.

It is notable that SSRS scores and the other outcomes follow a step-function rather than a simple linear trend with age at adoption. This suggests that exposure to a socially-emotionally depriving institutional environment may be maximally influential when children are exposed at certain critical ages. The critical ages appear to be 18-24 months. But the step function is also consistent with a cumulative exposure hypothesis. Unfortunately, these cannot be separated, because there are very few data of any kind in any study on children who enter the orphanage after 18 months, and parent report of their child's history is likely to be inaccurate and

incomplete. Nevertheless, because the step function appears at about 18 months of age at adoption, it is important to consider what developmental milestones are occurring during the first two years of life. Institutionalized children tend to be developmentally delayed, so milestones that tend to happen at certain ages in parent-reared children may occur at later ages for institutionalized children.

One possibility is that an attachment relationship typically develops with a caregiver in the second half of the first year of life. But, because institutionalized children are developmentally delayed and have IQs around 70 (The St. Petersburg-USA Orphanage Research Team, 2005), they may not reach this developmental level until around 18 months of age. The institutional environment does not support the development of attachment relationships because of the constantly changing caregivers and insensitive, unresponsive care that children are typically provided. A lack of one-to-one interactions with a specific, consistent caregiver seems to preclude the development of an attachment relationship in parent-reared children. In fact, evidence suggests that when attachment relationships exist within the institutional environment, they are often classified as D (disorganized; The St. Petersburg-USA Orphanage Research Team, 2008; Vorria et al., 2003, Zeanah, Smyke, & Dumitrescu, 2002). Because parent-reared infants with a D attachment classification are often found to have more problems later on (Thompson, 2006), it follows that poor or non-existent attachment relationships in the institution could set the stage for later difficulties in this population.

Another possibility is that the step function is partially a function of social learning or the lack of it that occurs in the institution, some of which occurs before 18 months. Institutions are typically characterized by substantial neglect, lack of contingent responsiveness, and minimal stimulation and talking. At older ages, care is overwhelmingly adult-directed, and conformity

and obedience to adults are emphasized. Thus, presumably children's development of agency is stifled, they are likely to internalize the sense that their behavior does not make much of a difference in their environment, and they are likely to stop trying to affect their environment, including adults and other children. Thus, institutionalized children have little experience with social interaction, reading social cues, or examples on how to appropriately interact with other people.

## 5.2 ELEMENTARY VS. SECONDARY

Within the PI sample, this study found that Elementary PI children scored higher/better than Secondary PI children, but the opposite was true for Non-PI children. While this study did not include a longitudinal sample, these results suggest a possible negative progression of PI children's overall social skills from the Elementary to the Secondary-school ages. It is important to note that within each sample (Elementary, Secondary) there were no clear associations with age at assessment in years. Thus, it is possible that age at assessment is associated with SSRS scores only in terms of broad developmental stages (e.g., childhood, adolescence). The fact that PI and Non-PI children appear to have different age trends, suggests these changes do not simply reflect peculiarities of the two different test forms but are associated with the institutional experience and the ages at which long-term deficiencies become manifest in PI children.

Earlier-adopted PI children score higher than later-adopted PI children at both Elementary and Secondary ages. Specifically, earlier-adopted Elementary PI children, especially males, unexpectedly, had *higher/better* scores than Non-PI children. Later-adopted Elementary PI children, however score similarly to the Non-PI sample. Analogously, earlier-adopted

Secondary children score similarly to the Non-PI sample, and later-adopted Secondary children, especially females, score *lower/poorer* than the Non-PI sample. It is possible that poor social skills in PI children relative to Non-PI children emerge only in adolescence. Contrary to expectations, earlier-adopted PI children had higher/more indiscriminate friendliness than later-adopted PI children, but this is likely due to the inability of this measure to distinguish between indiscriminate friendliness and appropriately “good” social skills.

It is possible that PI individuals have particular difficulties with social skills in the adolescent years. Alternatively, it is possible that some of the behaviors that are relatively common among PI individuals, such as indiscriminate friendliness and poor self-regulation, may be interpreted differently by parents when their children are younger versus older. Specifically, parents may view indiscriminate friendliness more positively in childhood, but this same behavior may stand out as more atypical and be judged more negatively in adolescence. Similarly, children’s difficulties with self-regulation may be dismissed as age-appropriate in childhood but judged as a problem in adolescence when adults apply higher standards for social behavior. Further, it is possible that conformity, obedience, and a lower sense of agency carried over from the institutional environment for younger children and are perceived as “well-behaved.” Thus, changes in parental perception and behaviors carried over from the institution could explain why PI children are overall judged to have better social skills than a standardization sample whereas PI adolescents are judged to have similar-to-poorer levels of social skills than a standardization sample.

### 5.3 LIMITATIONS

This study has a number of limitations. First, the item pool of the SSRS is limited, and there is a substantial degree of thematic overlap between items within and between subscales. For example, an attempt was made to isolate items on the SSRS that reflect self-regulation, but one third to one half of the SSRS items were identified as reflecting this construct. Also, the SSRS subscales were highly intercorrelated, reflecting a relative undifferentiated set of items. Furthermore, it was impossible to distinguish between appropriately “good” social skills and indiscriminate friendliness, partly due to parents likely judging indiscriminately friendly behavior positively, especially at younger ages, and partly due to the limited response options (e.g., “never”, “sometimes,” or “always,” but not “too much”) on this scale. These characteristics precluded the examination of specific social behaviors, using the SSRS subscales, and limited the contribution of the theory-based subscales that were developed in this study.

A second limitation is that this study utilized only parent-report. Parent-reports may have an advantage for the assessment of relatively low frequency behaviors, because parents experience their children across a variety of domains. However, if parents suspect that their adopted children may be at higher risk for problems, they may be more or less likely to respond to questionnaires at all or to report problems. Further, parent reports depend on parental perceptions and standards, which vary between parents and may change with their children’s ages. Thus, age trends found in the current study may reflect to an unknown degree changes in parent perceptions of the same children’s behavior exhibited at one versus a later age. While teacher-reports are desirable as a supplement to the parent-report, they are not available in the current database. Prior research with a PI sample demonstrated that parent- and teacher-report on the SSRS showed similar trends, but only the teacher-report was significant (Glennen &

Bright, 2005), so parent-report may be considered a more conservative estimate of social skills than teacher report. Further, teacher-reports may be subject to many of the same biases as parent-report, and teachers typically only experience children in one context whereas parents tend to have knowledge of their children in several contexts. Despite these limitations, parent perceptions have a certain social reality and should not be dismissed as irrelevant to children's social behavior and adjustment.

Further, this study is limited by the use of the SSRS standardization sample as the comparison group. The standardization sample differs from the PI sample in ways other than the experience of institutionalization (e.g., SES, assessment date, ethnicity). However, as explained above, the standardization sample appears to be an appropriate comparison group in that it has similar trends for gender and age within a sample and a similar factor structure to the current PI sample.

It is possible that higher rates of problems or poorer social skills in PI children result from factors other than time in the institution. For example, poor prenatal care (including the mother's alcohol use and nutrition) and pre-institutional care (in a hospital or with the biological family) could relate to later adoption and more subsequent problems. Because limited information is available on the child's pre-institutional care, it is impossible completely rule out these explanations. But, perinatal circumstances have not been found to be related to later problem behavior, including in the current sample (Bruce et al., 2009; Kreppner et al., 2007; Merz & McCall, 2010, in press). Similarly, increases in problems after a longer duration of institutionalization could be associated with selective adoption of "better" children at earlier ages, but some (e.g., Rutter & the ERA Study Team, 1998) have found that selective outplacement doesn't explain effects of the length of institutionalization.

## 5.4 FUTURE DIRECTIONS

Future studies would benefit from utilizing other measures that may better be able to distinguish different types of social skills, particularly indiscriminate friendliness versus typical “good” social skills and self-regulation. Examining more discrete categories of social skills would give better insight into whether early social-emotional deprivation affects all types of social skills or only certain specific types. Further, it would be helpful for future studies to obtain child-report and teacher-report of social skills to counter the possible bias in adoptive parents’ responses and to determine whether PI children are viewed as having poorer social skills outside of the family context. Lastly, it would be ideal to compare PI children with their peers or siblings on social skills, rather than a standardization sample, because those are the individuals who they are most often compared to in their everyday lives.

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