Early Deprivation and Peer Relationships: The Roles of Inhibitory Control, Disinhibited Social Engagement, and Parenting Quality.

A Dissertation
SUBMITTED TO THE FACULTY OF
UNIVERSITY OF MINNESOTA
BY

Clio Elisabeth Pitula

IN PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF
DOCTOR OF PHILOSOPHY

Megan R. Gunnar, Adviser
Bonnie Klimes-Dougan, Co-adviser

August 2016

Acknowledgements

I would like to thank the families from the International Adoption Project for kindly agreeing to participate in this longitudinal research project. I wish to acknowledge my funding sources over the last few years, particularly the Social Sciences and Humanities Research Council of Canada and the University of Minnesota's Graduate School. Sincere gratitude is extended to my advisor, Dr. Megan Gunnar, for her exceptional support, mentorship, and loyalty throughout my graduate school career. I would also like to thank my dissertation committee, composed of Dr. Bonnie Klimes-Dougan, Dr. Glenn Roisman, and Dr. Dante Cicchetti, for committing their time and providing me with helpful feedback. In addition, I wish to acknowledge Dr. Nicki Crick, whose work has been an inspiration to me and countless other researchers. Importantly, I am indebted to the staff members and volunteers who devoted countless hours to study recruitment, data collection, and data management, in particular, Shanna Mliner, Bao Moua, Kaitlin Lucas, and Sarah Stellern. I would also like to thank members of the Gunnar Lab (Bonny Donzella, Jamie Lawler, Elisa Esposito, Adrienne VanZomeren-Dohm, Jena Doom, Kristin Frenn, Alyssa Miller, Kaitlin Lucas, Bao Moua, Anna Johnson, Camelia Hostinar, and Kalsea Koss) and Crick Lab (Pete Ralston, Kathryn Hecht, Adrienne Banny, Chelsea Hetherington, Wan-Ling Tseng, Amy Gower, Annie Murray-Close and Lindsay Mathieson) for providing their support, expertise, and time throughout my graduate school career. Finally, I wish to thank my wonderful family and friends who have encouraged and supported me in this process.

Dedication

This thesis is dedicated to my husband, Damon Bonelli.

Abstract

The successful navigation of peer relationships in childhood is an important precursor to later socioemotional adaptation, and problematic peer relationships predict difficulties in academic, psychiatric, social, and behavioral domains. Early experiences with inconsistent caregiving, such as experienced by children raised in psychosocially depriving orphanages, have been associated with social difficulties in past research. However, past studies have been limited by a focus on older children, a reliance on parents as informants, a narrow conceptualization of peer functioning, and a lack of appropriate comparison groups. The present study investigated peer relationship functioning among kindergarten-aged PI children, compared with children adopted from foster care and children born and raised in the US, using a prospective longitudinal design. Teachers, parents, and trained observers provided ratings of peer relations. Possible mechanisms (poor inhibitory control, disinhibited social engagement; DSE) and risk/protective factors (parenting quality, gender) were also examined. Results indicated that PI children exhibited poorer peer functioning compared with NA children, according to teachers and observers but not parents. Inhibitory control abilities partially mediated the relationship between PI status and teacher-rated peer functioning, but DSE behaviors did not. Contrary to expectations, higher parenting quality did not appear to protect PI children from risk for poor inhibitory control or DSE. There was minimal evidence for gender moderation. Implications and future directions are discussed.

Table of Contents

List of Tables

List of Figures

Early Deprivation and Peer Relationships: The Roles of Inhibitory Control, Disinhibited Social Engagement, and Parenting

Children whose psychological and social needs are neglected early in life risk embarking on a developmental trajectory characterized by maladaptation in various domains of functioning. In orphanage settings, adversity often takes the form of profound psychosocial neglect, with multiple staff members providing minimal care in a setting primarily devoid of cognitive or social stimulation (Johnson, 2000). Adoption into a family in the United States typically results in a shift to very responsive care in an enriched environment and, consequently, rapid recovery of physical growth, resolution of medical problems, and improvements in cognitive and emotional development (Ames, 1997; Gunnar, Bruce, & Grotevant, 2000). Nonetheless, difficulties in social and emotional functioning for many PI children persist long after adoption (for a review, see Gunnar 2001), suggesting a sensitive period for the full development of systems underlying socioemotional competence. Importantly, it appears that inconsistent caregiving rather than failure to meet physical needs is the primary contributor to these deficits. For example, even in ideal institutional settings where children are not deprived of physical resources (e.g., food, water, medical care) but do experience high caregiver turnover, youth show lasting deficits (Hodges & Tizard, 1989; Tizard & Hodges, 1978). Children adopted within their own countries also demonstrate elevated socioemotional difficulties (Brodzinsky, Schechter, Braff, & Singer, 1984; Juffer & van IJzendoorn, 2005), consistent with the idea that it is psychosocial deprivation, rather than global deprivation, that leads to long-term problems.

According to an organizational perspective of development, individual adaptation to stage-salient developmental issues at one stage of development lays the groundwork for functioning at the next stage of development, whereby competence prepares the child for subsequent adaptive functioning, and maladaptation disrupts the development of later competencies or adapts the child to a different developmental trajectory (Cicchetti & Valentino, 2006; Sroufe & Rutter, 1984). Beginning in early childhood, the development of healthy peer relationships is an important developmental task (e.g., Waters & Sroufe, 1983). Notably, post-institutionalized (PI) youth, especially those having experienced longer durations of adverse care, are reported to experience elevated social problems (Groze & Ileana, 1996; Gunnar, van Dulmen, & International Adoption Project Team, 2007; Hawk & McCall, 2011) and difficulties forming and maintaining friends (e.g., Hodges & Tizard, 1989; Tizard & Hodges, 1978). However, limited research has been devoted to describing and explaining peer difficulties in this population.

Given the importance of peer relationships in development, it is surprising that minimal attention has been paid to this subject by investigators of PI youths' adaptation. In particular, very little is known about the peer functioning of PI adoptees in early childhood. Moreover, our understanding of processes that may lead to, or influence the development of, problematic peer relationships among this at-risk group is limited. Thus, the current study investigated peer relationship functioning in kindergarten-aged, internationally adopted PI children. This paper begins with an overview of the extant literature on peer relationships in PI youth, highlighting gaps in our knowledge. Next, two potential mechanisms by which early deprivation may lead to peer relationship problems – inhibitory control deficits and disinhibited social engagement (DSE) – are

suggested. The role of parenting quality and child gender, two factors that are expected to influence the relationships between early deprivation and problematic developmental outcomes, will then be considered. Finally, the specific aims, methodology, and results of the current study will be presented, followed by conclusions and future directions for the field.

Identifying and describing the link between early deprivation and peer functioning is an important research goal for several reasons. First, peer relationships play a unique role in facilitating the development of important competencies, such as cooperation and conflict management, above and beyond child-adult relationships (Hartup & Moore, 1990). By providing a context for the acquisition and development of socioemotional skills, healthy peer relations make important positive contributions to mental health in childhood and beyond. Second, in normative populations, there is strong evidence that early problems with peer relationships, particularly being victimized and/or rejected by peers, are predictive of a host of negative outcomes such as juvenile delinquency, school dropout, and psychiatric illness (Boivin, Hymel, & Bukowski, 1995; Hawker & Boulton, 2000; Parker & Asher, 1987; Nansel et al., 2001; Reiijntjes, Kamphuis, Prinzie, & Telch, 2010; Rubin, Bukowski, & Parker, 2007). In PI populations, there is suggestive evidence that peer difficulties (victimization, rejection) are also associated with mental health problems, at least among adolescents (Pitula et al., 2014). Problems with peer relationships early in life may exacerbate developmental problems among PI children, and may help explain the higher occurrence of internalizing problems seen in PI youth once they reach adolescence (Colvert et al., 2008; Tieman, van der Ende, & Verhulst, 2005).

Third, consistent with the developmental psychopathology perspective (e.g., Cicchetti, 1984), research on atypically developing populations is important because it helps to inform our understanding of typical developmental processes. Similarly, the study of internationally adopted children may further inform our understanding of developmental outcomes among other at-risk populations who have experienced early adverse life circumstances (Gunnar, Bruce, & Grotevant, 2000). In maltreated samples, it is difficult to separate the influence of early abuse from the impact of continued adverse parent-child relationships because these children often remain in their maltreating homes. The experience of PI, internationally adopted children affords a valuable opportunity to examine the developmental effects of a circumscribed period of maltreatment without the confounding experience of ongoing hardship (Tarullo, Bruce & Gunnar, 2007). Moreover, given that many PI children do not show problems (Juffer & Van IJzendoorn, 2005; Rutter, Kreppner, & O'Connor, 2001; Verhulst, 2000), studying this population allows us to advance our understanding of processes promoting resiliency following exposure to high-risk environments.

Attachment Security and Peer Functioning

As mentioned above, deficiencies in the early caregiving environment are expected to be primarily responsible for PI children's later difficulties with peer relationships. According to an attachment perspective (e.g., Bowlby, 1980), individual's early experiences with attachment figures (e.g., in the first 12 months) are carried forward as internal working models of the self and of others that guide expectancies of, and behavior towards, other social partners. Indeed, a relationship with an attachment figure who provide stable, sensitive and well organized care promotes a sense of security in the

world, allowing the infant to rely on the caregiver as a base from which to explore the environment (Sroufe, 1979). Infants who are securely attached to their primary caregivers experience greater success during childhood and beyond in intimate friendships as well as in broader peer group interactions (Schneider, Atkinson, & Tardiff, 2001; Sroufe, 2000). In contrast, neglectful, traumatic, or rejecting experiences with caregivers are associated with the construction of mistrustful and insecure cognitions, as well as avoidance, withdrawal, and/or aggression in peer relationships (Bernath & Feshbach, 1995; Cicchetti & Valentino, 2006; Sroufe, 2000).

Given the high turnover in caregivers and the lack of stable and responsive care in the institutional setting, it is not surprising that PI children are reported to experience difficulties forming secure attachment relationships with their institutional caregivers, even when these are identified as favorite or regular caregivers (Bakermans-Kranenberg et al., 2011; Smyke, Dumitrescu, & Zeanah, 2002). In fact, the majority of institutionalized children show an absence of attachment behaviors, making it difficult to classify the relationship as secure or insecure (Bakermans-Kranenberg et al., 2011). Once children are adopted, however, attachment behaviors become more evident (Bakermans-Kranenberg et al., 2011). Although many children are able to form secure attachment relationships with their adoptive caregivers (Juffer, Bakermans-Kranenburg, & Van IJzendoorn, 2005), PI children, particularly those adopted after 12 months of age, continue to be at greater risk for insecure and/or disordered attachments, presumably due to internal working models carried forward from the earlier unresponsive caregiving relationship(s) that were experienced during critical developmental periods (Barcons et al., 2012; Chisholm, Carter, Ames, & Morison, 1995; O'Connor, Marvin, Rutter, Olrick,

Britner, & ERA Study Team, 2003; Van den Dries, Van IJzendoorn, & Bakermans-Kranenburg, 2009). In turn, attachment insecurity is expected to influence PI children's later relationships. Although the present study will not examine attachment relationships, it is important to keep this background in mind when considering additional risk and protective factors that will be tested in the present study. I will return to the potentially remediating role of supportive adoptive parenting later in the introduction.

Peer Relationship Functioning in PI Youth

Over the last few decades, several different research teams have published extensively on the adjustment of international adoptees, many of whom have experienced institutional care. However, few studies have made peer relationships their primary subject (exceptions include Julian, 2010; Pitula et al., 2014; Raaska et al., 2012; Tan & Camras, 2011; Tieman et al., 2006). Rather, peer functioning has typically been examined relatively grossly alongside several other broad indices of functioning (e.g., externalizing and internalizing problems, Merz & McCall, 2010). Findings to date have generally pointed to elevated social difficulties among PI youth compared with non-adopted, never-institutionalized youth (Ames, 1997; Groza, 1996; Gunnar et al., 2007; Fisher, Ames, Chisholm, & Savoie, 1997; Pitula et al., 2014; Raaska et al., 2012; Sonuga-Barke, Schlotz, & Kreppner, 2010), and to heightened social problems among adoptees with longer durations of institutional care (e.g., more than 12 months, Pitula et al., 2014; more than 18 months, Hawk & McCall, 2011; Julian 2010; more than 24 months, Gunnar et al., 2007). However, several researchers have failed to detect significant differences between adopted and non-adopted youth on measures of social functioning (Merz &

McCall, 2010; Rutter et al., 2001; Tan & Camras, 2011; Tan & Marfo, 2006; Warford, 2002 as cited in MacLean, 2003).

One possible explanation for these discrepancies relates to the fact that studies on PI youths' peer functioning have varied widely in terms of the participants' age at assessment, age at adoption, and pre-adoption history. Studies have also differed in terms of characteristics of the comparison sample, study time frame, measures of social and/or peer functioning, and the relationship of the informant(s) to the participants. Rather than constituting a source of error, contrasting results based on differences in sampling and measurement may actually be informative. For instance, if older children show peer problems whereas younger ones do not, this may suggest a "sleeper effect" of early institutional care on later peer difficulties (Hawk & McCall, 2011) that may emerge, for instance, as the peer landscape becomes more complex in adolescence (Steinberg & Morris, 2001). In addition, parents and teachers often have different perspectives on youths' social functioning, so that different outcomes resulting from using one or the other informant may reflect context-dependent problems (e.g., the child functions well at home but not at school). How one conceptualizes and measures peer functioning may also impact study findings; in particular, studies that exclude certain forms of peer problems (e.g., relational aggression or victimization, Crick, 1996) may underestimate peer difficulties among PI youth. Finally, whether or not internationally adopted youth are judged to have problematic social functioning may depend on the uniformity of pre-adoption adversity experienced by the adopted participants, as well as on the selection of appropriate comparison group(s) to account for both pre-institutionalization risk and the post-adoption environment. In the next sections, the extant literature on PI youths' peer

relations will be reviewed in more depth in order to clarify the gaps in our current knowledge, with particular attention to participant age, informant use, methods of conceptualizing and measuring peer functioning, and pre-adoption history.

Participant Age at Assessment. The majority of findings pertaining on PI youth's peer functioning have focused on middle childhood and adolescence. Pioneering work by Tizard and colleagues (Hodges & Tizard, 1989; Tizard & Hodges, 1978) suggested that, even coming from exemplary institutions providing adequate medical care and sufficient stimulation to support intellectual development, youth who experienced institutional care in the UK until between two and 4 years of age exhibited later difficulties forming and maintaining intimate friendships with peers. At ages 8 and 16 years, these youth were rated by their teachers as solitary, not much liked by peers, and less likely than other kids to have a best friend. Parent and self-report data corroborated teachers' reports at the 16-year assessment, with PI adolescents rated more often as having difficulty in their peer relationships than matched comparison youth. However, in this study, the sample was relatively small ($N = 65$), and there was large variability in children's post-institutional environment, with some adopted within country, others having returned to their natal families, and still others remaining in institutional care. In this instance, it is difficult to tease apart the effects of early deprivation from those of ongoing environmental adversity or caregiving instability, as may have been experienced by children remaining in the institution or returning to families who may not be prepared to accept them. Indeed, at the 8-year-old assessment, Tizard and Hodges (1978) concluded, "The subsequent development of the early institutionalized child depends very much on the environment to which he is moved" (p. 113). Nevertheless, this work

provided early evidence that the sequelae of early institutional care extended to peer relationship difficulties, at least once youth reached middle childhood.

More recent work has generally agreed that early institutional care, particularly when experienced for longer durations, is associated with elevated peer problems compared to non-adopted controls in middle childhood/elementary school (Merz & McCall, 2010; Raaska et al., 2012; Sonuga-Barke et al., 2010; Stams, Juffer, Rispens, & Hoksbergen, 2000; but see also Julian, 2010) and in adolescence/secondary school (Julian, 2010; Sonuga-Barke et al., 2010; although see also Tan & Camras, 2011). Moreover, when several age groups have been sampled in the same study, results suggest that social difficulties increase with age within the PI group (Hawk & McCall, 2011; Julian, 2010). Longitudinal findings have also demonstrated increases in peer problems in the same group of children as they progressed from 6 to 11 years of age (Sonuga-Barke et al., 2010). In contrast with these findings, Warford (2002, cited in MacLean, 2003) reported that, 8 years post-adoption, Romanian orphanage children did not differ from early adopted or Canadian-born comparison youth on ratings of peer acceptance, number of friends, ease of making new friends, or feelings of social competence and loneliness. Yet, orphanage children *did* report feeling less social support from their peer group or from a close friend. Thus, even when certain elements of peer relationships improved with time in the adoptive family, some peer difficulties remained.

Two distinct possibilities are that the difficulties reported in older PI youth represent a continuation of difficulties from early childhood, or that they emerge later in life as the social landscape becomes increasingly complex. However, our understanding of younger PI children's peer functioning is somewhat limited. Many studies that cover

early childhood have grouped younger PI children together with older ones, encompassing a broad range of ages at the time of testing (e.g., 2 to 19 years old, Groza, 1996; 4 to 18 years old, Gunnar et al., 2007). For example, although Groza (1996) employed a sample with a mean age of 5.7 years, and most (62%) participants were between 2 and 5 years old, the overall sample ranged from 2 to 19 years of age. Thus, it remains possible that older adoptees with very elevated problem scores were responsible for group differences between adoptees and the norm group.

Nevertheless, a few studies have examined peer functioning among a discrete group of younger PI children. Fisher et al. (1997) obtained interview and questionnaire data from adoptive parents of Romanian orphans after children had been in their Canadian adoptive families for 11 months. The Romanian orphanage children were adopted between the ages of 8 and 53 months and were two to six years old at testing, with a median age of 2.5 years. Results demonstrated heightened peer problems among the Romanian orphanage children compared both to Canadian-born children and to Romanian children adopted before 4 months. In particular, the degree of social withdrawal was considered elevated among PI participants. A few years later, when most adoptees were aged 4.5 years (range = 4.5 – 9 years old), the Romanian orphanage children continued to exhibit more social behavior problems than their Canadian-born comparisons, with early adopted Romanian children in the middle and not different from either group (Ames, 1997). This time, it was not clear whether social withdrawal remained the primary concern. The measure of social functioning used encompassed a range of behaviors, with the majority seeming to focus on externalizing behaviors, including aggression.

In contrast, other researchers have failed to find significant effects of institutionalization on peer functioning among younger PI children. For example, in a study of Chinese girls adopted from institutions before the age of 2 years, preschool-aged adoptees showed equal or better performance on the Social Skills Rating Scale compared with US normative data (Tan & Camras, 2011; Tan & Marfo, 2006). In addition, in the follow up to their longitudinal study of Romanian PI children adopted in the UK, Rutter et al. (2001) did not find differences in the rate of peer difficulties between 6-year-old Romanian PI children and a comparison sample of within-UK adoptees. However, in subsequent analyses published separately, group differences emerged for the same 6-year-old Romanian PI children when they were compared to a pooled comparison group consisting of UK adoptees, non-PI Romanians, and Romanians adopted prior to 6 months (Sonuga-Barke et al., 2010). Thus, the evidence for peer problems among younger PI children is mixed, with some studies pointing to elevated peer difficulties and others finding no differences, or even improved functioning among PI children. Further research is needed to clarify the social functioning of very young PI children. Thus, the first aim of the present study is to examine and describe peer functioning in a sample of PI children who were all in kindergarten at the time of testing.

Informant. To date, the majority of studies on adopted youths' social functioning have relied on reports by parents only (Brodzinsky et al., 1984; Fisher et al., 1997; Groza, 1996; Groze & Ileana, 1996; Gunnar et al., 2007; Hawk & McCall, 2010; Julian, 2010; Merz & McCall, 2010; Muhamedrahimov et al., 2014; O'Connor, Bredenkamp, Rutter, and ERA Study Team, 1999; Tan & Marfo, 2006), teachers only (Tizard & Hodges, 1978), or teachers and parents (Ames, 1997; Glennen & Bright, 2005; Hodges & Tizard,

1989; Juffer, Stams, & van IJzendoorn, 2004; Rutter et al., 2001; Sonuga-Barke et al., 2010; Tan & Camras, 2010). In a few cases, self-reports of older PI participants have been used (in youth, Hodges & Tizard, 1989; Raaska et al., 2012; in adults, Collishaw, Maughan, & Pickles, 1998; Tieman et al., 2006) and only one study described using peer informants in addition to parents and teachers (Stams et al., 2000). Thus, the extant literature is weighted heavily towards parent respondents. Moreover, when more than one informant has been used, different informants' ratings have often been combined into one scale for analysis (e.g., Rutter et al., 2001), precluding the possibility of differentiating between different informants' contributions.

Yet, it is quite possible that different informants perceive PI children's social functioning differently. To begin with, parents have the advantage of seeing their child beyond the classroom setting; children may have friends in other classes whom they see only at lunchtime or recess, and friends in the neighborhood or at church (Parker & Asher, 1997). Conversely, whereas parents may be limited in their contact with developmentally typical peers, teachers' reports benefit from the broader perspective of seeing multiple children interact with one another every day. Then again, teachers' perspectives may be skewed by their role in maintaining classroom order; indeed, in normative populations, teachers often report that children who fail to conform to rules and who show inattentive and disruptive behaviors are more likely to be rejected (Coie, Dodge, & Kupersmidt, 1990). Moreover, both teachers and parents may be swayed in their ratings of peer relationship behaviors by their knowledge of peer status (i.e., rating children who they know to be less accepted as also more victimized, without having directly observed these experiences). Importantly, unbiased, trained observers – such as

research staff or graduate students – are unaware of status and unbiased by previous contacts with the children. As a result, they are well positioned to provide objective behavioral information about experiences with and behaviors towards peers (Pepler & Craig, 1998). However, to date, observers have not been utilized as informants in research on the peer relationships of PI youth. Given that parents, teachers, and observers are expected to contribute unique and additive variance to our understanding of peer relationships in PI youth, the present study will incorporate information from all three informants.

Measurement of Social or Peer Functioning. Just as studies have varied in their sources of information, research on PI youth reflects a wide range of measurement tools and associated conceptualizations of social functioning. In some cases, very little information has been provided to readers about the content of measurement tools, making it difficult to ascertain how social adaptation was measured and, consequently, how to interpret results. For instance, although Groze and Ileana (1996) report that many Romanian adoptees in their sample were reported by parents to have "delayed social skills", individual items are not provided. Thus, we do not know which social skills were considered in parents' reports. Moreover, since there was no normative comparison group, parents may have used different bases of comparison for judging delays in social skills. In the present study, every effort was made to use clearly operationalized variables that represent definable peer functioning constructs.

In particular, two constructs that have been consistently included in studies of typically developing populations are peer aggression and victimization. In recent decades, there has been a push towards adopting a gender-balanced approach to the study of

aggression and victimization. In the past, researchers tended to focus on overt or physical aggression (i.e., harming others via threatened or actual physical damage), to the exclusion of relational aggression, defined as the infliction of harm via the manipulation of relationships (e.g., exclusion, threats to withdraw friendship; Crick & Grotpeter, 1995). Early research on relational aggression indicated that, in young children, relationally aggressive behaviors were more characteristic of girls' than boys' social interactions (Crick & Bigbee, 1998; Crick, Casas, & Mosher, 1997; Murray-Close, Ostrov, & Crick, 2007; Putallaz et al., 2007). More recently, however, Card, Stucky, Sawalani, and Little (2008) reported meta-analytic findings suggesting that, although boys are more physically aggressive than girls, the gender difference in relational aggression is too small to be meaningful. Nevertheless, Ostrov and Godleski (2010) argue that gender schemas shape children's selection of aggressive strategies, such that girls will be more likely to engage in relational than physical forms of aggression, particularly against other girls, a suggestion that has been confirmed in several studies (e.g., Cullerton-Sen & Crick, 2005; Pullataz et al., 2007). As a result, a failure to assess relational forms of aggression and victimization will lead researchers to overlook the majority of aggressive and victimized girls, with significant implications for our understanding of the link between early adversity and peer functioning.

Moreover, there is evidence that emotional problems show stronger associations with relational victimization than with physical victimization (e.g., Hoglund, 2007), and that relational victimization is a better predictor of girls' internalizing adjustment than is physical victimization (Crick & Bigbee, 1998; Crick & Grotpeter, 1996; Prinstein, Boergers, & Vernberg, 2001). Thus, the inclusion of relational forms of victimization in

addition to its physical forms ensures that peer experiences that are relevant to mental health outcomes are captured for both girls and boys. Unfortunately, many studies of PI youths' peer functioning have failed to assess relational aggression and victimization (e.g., Rutter et al., 2001). To address this limitation, the present study includes assessments of physical and relational forms of aggression and victimization, as perceived by parents, teachers, and observers. Additional constructs assessed include peer acceptance or rejection, prosocial behavior, social skills, and social withdrawal. All of these constructs have shown strong empirical associations with overall social adjustment beginning in early childhood (Boivin et al., 1995; Coie et al., 1990; Egan & Perry, 1998; Parker & Asher, 1997; Schwartz, 2000; Veenstra et al., 2005). Both rating scales and discrete coding measures will be used in a multi-method assessment protocol. With data from three informants reporting on a wide range of peer experiences and behaviors, the present study will be the most comprehensive assessment to date of PI youths' peer functioning.

Pre-adoption History. Many studies of peer relationships in internationally adopted youth have grouped together participants adopted from very diverse, or unknown, circumstances. For example, participants in Raaska and colleagues' (2012) sample came from institutions, foster care, or reportedly "many placements", although the nature of these placements was not clarified. Yet, we might expect PI youths' social functioning to vary as a function of their history of caregiving consistency and resource availability prior to adoption (e.g., Merz & McCall, 2010). Indeed, it has been consistently reported that children adopted from foster care fare better than those adopted from institutional care (e.g., Chisholm, 1998; Fisher et al., 1997; Gunnar et al., 2007;

Sonuga-Barke et al., 2010). For example, Groze and Ileana (1996) studied Romanian children who experienced institutional care, foster care, and/or family care. Although in the overall sample, 25.7% of children were reported by parents to have delayed social skills, a full 90% of those children with delayed social skills came from institutional care. Thus, grouping together participants with varied histories, including foster care, may obscure the more detrimental effects of institutional caregiving. For this reason, it is very important to carefully qualify the nature of the pre-adoptive environment among study participants. In the present study, PI participants were carefully screened to ensure that they had spent the majority of their pre-adoptive lives in institutional care. In order to examine how similar or different the PI children were from children reared all their lives in the US, PI adoptees were compared with children raised in their families of origin in the Midwestern United States, who live in homes similar to PI children's adoptive homes.

Although the US birth comparison group allows for an examination of the impact of psychosocial deprivation versus in-home care, it does not control for certain facets of adversity that are not exclusive to institutional care (e.g., prenatal care, birth complications) and that may also affect social functioning. For example, in a study of Russian orphans placed in Russian families after adoption, the percentage of children scoring in the clinical range on the Social Problems scale of the CBCL was significantly higher among adoptees than among the US standardization sample (Muhamedrahimov et al., 2014). However, when these children were contrasted with never-institutionalized children raised in their Russian birth families, a comparison group that aimed to approximate the degree of prenatal adversity experienced by PI children, Social Problem scores were not different. These findings suggest that prenatal adversity may have

contributed to social problems among the Russian adoptees (although both groups likely experienced continued adversity in their Russian birth or adoptive families).

To control for the contribution of prenatal adversity to later social functioning in our sample of PI children, the present study included an additional comparison group of children adopted internationally as infants from countries using foster care for wards of the state. These children are expected to have somewhat similar levels of prenatal care and birth conditions as orphanage-reared children, and they have also experienced international adoption and associated disruptions or stress. Thus, foster care (FC) children are expected to differ from PI children only in the experience of the severe psychosocial deprivation that is characteristic of the institutional setting. Both non-adopted (NA) and FC children were matched to PI children on age and family socioeconomic status. Kindergarten-aged PI youth were hypothesized to experience more problems with peer functioning than both NA and FC youth, reflecting the effects of a circumscribed period of psychosocial deprivation above and beyond the experiences of prenatal adversity and international adoption shared by both FC and PI youth.

Mechanisms Linking Early Institutional Care with Later Peer Functioning

An additional goal of the present study is to clarify mechanisms and developmental progressions that are involved in explaining the probabilistic relationship between early deprivation and peer relationship problems. To date, limited research has examined mechanisms linking early institutional care with peer relationship difficulties in PI youth. Two potential mechanisms that will be considered in the present study are self-regulation and disinhibited social engagement (DSE).

Inhibitory Control. One possibility is that PI children have difficulties regulating emotions and behaviors within the social context, and that these difficulties contribute to PI children's peer relationship problems. Executive function, broadly defined as encompassing the skills needed for purposeful, goal-directed activity, is thought to underlie the regulation of behaviors and emotions across various contexts, particularly when situations are novel or unfamiliar (Lezak, 1995). The ability to control inappropriate responses or behaviors by inhibiting an automatic or prepotent response, known as inhibitory control, is a dimension of executive function and plays an important role in the successful navigation of social interactions, beginning in infancy (Eisenberg et al., 2003; Lengua, Honorado, & Bush, 2007). For example, when meeting new peers or interacting with familiar ones, children must inhibit impulses to intrude on personal space and grab toys away from others (see Hay, Payne, & Chadwick, 1991). Children who struggle to control these impulses have been shown to experience social exclusion or rebuff, and they are more likely to be aggressive with and victimized by peers (e.g., Park et al., 2005; Schwartz, 2000; Shields & Cicchetti, 2001). Conversely, better inhibitory control abilities have been associated with children's higher social competence and social adjustment, characterized by popularity, low externalizing problems, and frequent prosocial behaviors (Liew, Eisenberg, & Reiser, 2004). Thus, inhibitory control is an important predictor of social success.

In previous studies of PI youth, evidence has emerged for difficulties with executive functioning following the experience of early deprivation. For example, PI children have been rated as more impulsive and less attentive by their parents and teachers, compared with never-institutionalized children (Bos, Fox, Zeanah, & Nelson,

2009; Merz & McCall, 2011; Merz, McCall, & Groza, 2013; Wiik et al., 2011). Moreover, internationally adopted children have demonstrated poorer performance than non-adopted comparison children on behavioral measures of inhibitory control, including refraining from reaching for a toy to instead verbally describe the toy they want (dinky toys task), selectively responding to a target stimuli while inhibiting responses to equally salient nontarget stimuli (go/no-go task), not peeking into a tempting gift box (gift delay task), selectively attending to relevant stimulus attributes while inhibiting attention to irrelevant attributes (attentional control task), and delaying immediate gratification in favor of a later, larger reward (delay of gratification task) (Bruce, Tarullo, & Gunnar, 2009; Hostinar, Stellern, Schaefer, Carlson, & Gunnar, 2012; Pollak et al., 2010, see also Ames, 1997).

Problems with self-regulation are likely to place PI children at greater risk for social dysfunction. Yet, although there is some evidence that inhibitory control mediates the association between childhood maltreatment and social functioning (Kim & Cicchetti, 2010; Pears, Fisher, Bruce, Kim, & Yoerger, 2009), the relationship between inhibitory control and peer functioning has not been examined in PI children. Thus, the second aim of the present study is to examine the role of inhibitory control as a mediator of the relationship between early institutional care and peer functioning in kindergarten. It is expected that institutional care will predict lower inhibitory control abilities, which will in turn predict poorer peer functioning.

Disinhibited Social Engagement. Another possible mediator of the link between early institutional care and later peer problems is a known correlate of institutional care that relates directly to social interactions, particularly as they concern unfamiliar adults.

Previous research suggests that some PI children tend to act overly friendly in their social interactions with others (Ames, 1997; Bruce et al., 2009; Hodges & Tizard, 1989; O'Connor et al., 1999). This collection of behaviors has most recently been termed Disinhibited Social Engagement (DSE; Lawler, Hostinar, Mliner, & Gunnar, 2014) and it is characterized by inappropriate physical closeness, asking intrusive questions and sharing personal information, and a tendency to wander off with strangers without checking back with the adoptive attachment figure.

Although DSE behaviors have been noted for many years in institutional samples, their association with other aspects of social development (e.g., social competence) is not clear. It may be that, as PI children transition to school, existing DSE behaviors place them at risk for peer maltreatment and dislike. There is some evidence to support this hypothesis. For instance, in Hodges and Tizard's (1989) sample of previously institutionalized adolescents, children who were overly friendly at the age of 8 years appeared more likely at the age of 16 years to behave in a friendly way with any peer that was friendly towards them rather than choosing their friends more discriminatingly, according to parents' reports. In Romanian orphanage adoptees in Canada, indiscriminately friendly behaviors were positively correlated with social problem scores (Ames, 1997). In addition, in a different sample of Romanian orphanage adoptees, mild or marked social disinhibition at 6 or 11 years of age was associated with increased peer problems at 11 (O'Connor et al., 1999). However, both of these latter findings were correlational, and neither considered the additional predictive role of institutional care. To date, a test of the role of DSE behaviors in the prospective association between institutional care and later peer functioning has not been conducted. Thus, the third aim

of the present study is to test whether elevated DSE behaviors mediate the relationship between the experience of early deprivation and later peer outcomes.

Relationship Between Inhibitory Control and DSE. Although DSE was initially thought to represent problems in the attachment relationship, that hypothesis has not consistently been supported by research findings (Ames, 1997; Chisholm et al., 1995; O'Connor et al., 1999). Instead, more recent research suggests that DSE may be related to self-regulation among PI children. In particular, higher ratings of DSE have been associated with lower performance on inhibitory control tasks (Bruce et al., 2009; Pears, Bruce, Fisher, & Kim, 2010; Roy, Rutter, & Pickles, 2004). Indeed, DSE has been described as inappropriate social approach behaviors where the child is notably lacking awareness of or respect for interpersonal boundaries (O'Connor et al., 1999). Thus, it may be that inhibitory control deficits are causally related to DSE behaviors among PI children. On the other hand, it is also possible that a third, underlying factor is responsible for problems with both inhibitory control and DSE among PI children. Because the link between these two constructs is not yet clear, in the present study, inhibitory control and DSE were conceptualized as two separate mediators. Yet, given past associations between these variables, both were included in the same model to ensure that unique effects for each mediator were obtained. Measures of inhibitory control and DSE were collected at least 6 months before the kindergarten assessment of peer functioning to provide a prospective test of mediation.

Moderators of the Link between Institutional Care and Peer Problems

Several factors may influence the strength of the relationship between early institutional care and peer relationship difficulties. In particular, the quality of parenting

that PI children receive in their adoptive homes may be able to buffer PI children from the negative effects of institutional care on the development of inhibitory control and socially indiscriminate behaviors and, consequently, on peer functioning. Gender may also moderate these associations.

Parenting Quality. Previous research in normative samples has shown that high quality parenting, characterized by positive regard, emotional support, and effective limit setting, plays an important role in predicting children's social adjustment (e.g., Landry et al., 2006; Petit, Bates, & Dodge, 1997). In addition, there is evidence that parenting quality moderates the relationship between risk due to fearful temperament (Shin & Kim, 2008) or peer behavior (e.g., aggression, Karreman, de Haas, van Tuijl, van Aken, & Deković, M., 2010) and social maladjustment. In particular, sensitive and responsive parental care in infancy is thought to be critical in the development of early self-regulation, as dyadic regulatory processes are internalized and the child moves towards more autonomous regulation (Sroufe, 2000). Findings from human and animal studies support the role of parental sensitivity and responsiveness in predicting regulatory abilities (e.g., Bernier, Carlson, & Whipple 2010; Hofer, 2006). It is not surprising, then, that PI youth are more likely to exhibit inhibitory control difficulties.

Yet, in PI samples, adoptive parents may play a role in reversing some of the negative consequences of early institutional deprivation. According to Gunnar et al. (2000), given data showing that proxy measures for the degree of privation experienced in institutional settings are poor predictors of recovery, developmental outcomes are likely to also relate to children's post-adoption experiences. Indeed, there is some evidence that, within PI samples, the quality of adoptive parenting is associated with

better cognitive and social development (Ames, 1997; Stams, Juffer, & van IJzendoorn, 2002, but see also Jaffari-Bimmel, Juffer, van IJzendoorn, Bakermans-Kranenburg, & Mooijaart, 2006). Aiming to improve the physiological and behavioral regulatory capacities of children exposed to early adverse caregiving, several research teams have implemented parenting interventions with the foster parents of maltreated and PI children (see Dozier, Zeanah, Wallin, & Shauffer, 2012 for a review). So far, results suggest successful outcomes in cognitive, behavioral, and physiological domains (Dozier et al., 2006; Nelson et al., 2007). Given these findings, in the present study, parenting quality was considered as a potential moderator of the link between institutional status and behavioral outcomes (inhibitory control, DSE). It is hypothesized that among children who experience higher quality parenting, the relationships between institutional rearing and inhibitory control and DSE behaviors will be attenuated.

Gender. Consistent with the developmental psychopathology principle of multifinality (Cicchetti & Rogosch, 1996), it is possible that the processes linking institutional care and peer functioning may differ for boys and girls. For example, in previous research with PI adolescents, gender interacted with institutional care history to predict greater risk for peer rejection and overt and relational victimization, such that later adopted boys experienced more problems (Pitula et al., 2014). This is consistent with other research documenting more adverse effects for adopted boys compared to adopted girls with respect to externalizing and internalizing behaviors (Bos et al., 2011; Stams et al., 2000), peer victimization (Raaska et al., 2012), peer group popularity (Stams et al., 2000), and intimate relationships in adulthood (Tieman et al., 2006). In contrast, other studies have failed to find gender interactions (Gunnar et al., 2007; Juffer & van

IJzendoorn, 2005), or have reported increased impairment among adopted girls but not boys compared to non-adopted controls (Bimmel, Juffer, van IJzendoorn, & Bakermans-Kranenburg, 2003). In the current study, it may be that institutional care more negatively impacts social and behavioral adjustment among boys, placing PI boys at increased risk for inhibitory control deficits, DSE behaviors, and social maladjustment compared to PI girls.

Moreover, it is also possible that the association between inhibitory control/DSE and peer functioning varies for boys and girls. For instance, given that cooperativeness is more relevant to girls' than to boys' adjustment (Dodge et al., 1990), impulsive behaviors may be more aversive to peers when exhibited by girls than by boys. Conversely, socially intrusive behaviors such as asking intrusive questions or disclosing personal information may be perceived less favorably when performed by boys, consistent with the lesser role of self-disclosure in male than female friendships (McNelles & Connolly, 1999; see Rose & Rudolph, 2006 for a review). In the present study, the possible moderating role of gender will also be considered as concerns the relationships between inhibitory control, DSE, and peer functioning.

Hypotheses

1. PI children will show poorer peer functioning in kindergarten compared with their NA and FC comparisons.
2. Inhibitory control abilities will mediate the relationship between early institutional care and later peer functioning, such that early institutional care will predict poorer inhibitory control abilities, which in turn will predict poorer peer functioning.

3. DSE behaviors will mediate the relationship between early institutional rearing and later peer functioning, such that institutional rearing will predict higher ratings of DSE behaviors, which in turn will predict poorer peer functioning.
4. Parenting quality will moderate the relationships between a) early deprivation and inhibitory control and b) early deprivation and DSE. In other words, in children with higher parenting quality, the relationship between early institutional care and lower inhibitory control will be attenuated. In children with higher parenting quality, the relationship between early deprivation and DSE behaviors will be attenuated.
5. Gender will moderate the relationship between early institutional rearing and peer functioning. Gender may also moderate the relationships between early deprivation, inhibitory control, DSE behaviors, and peer functioning outcomes.

Methods

Participants

Participants came from a sample of 211 children who met selection criteria for one of the three groups studied longitudinally (see below). Children were excluded from the sample if they exhibited facial features of prenatal alcohol exposure or were diagnosed with fetal alcohol spectrum disorder (FASD) by their pediatricians (10 children), received a diagnosis of autism spectrum disorder (1 child in the NA group), were involved in child protective services (1 child in NA group), or had a serious congenital medical concern (1 child in FC group). The remaining children were included if they attended kindergarten during the years that kindergarten data were collected. This excluded 16 children because of attrition from the study prior to the kindergarten

assessment, 10 because they were home schooled, and 10 because they did not attend kindergarten in time for these data to be collected. Of the remaining 162 children who were eligible for the kindergarten sample, 16 families declined to participate, leaving 146 eligible, participating children.

Demographic characteristics for each participant group are presented in Table 1. To be in the PI group (n = 64, 59.4% female), the children had to have been adopted from an institution (orphanage). Most (64.5%) had spent 80% or more of their lives in institutional care (range = 14% to 100%, median = 90%). A few (n = 12), however, had spent more than half of their pre-adoption lives in families (biological parents or relatives) prior to entering the institution (range for these 12 children = 55 – 86%, median = 72.5%). For 2 children information on total time in institutional care was unknown. Almost all (97%) had not spent any time in foster care, with two exceptions; one participant spent 11 months in foster care followed by 9 in institutional care, and another participant received 8 months each of foster then institutional care. PI participants originated from 12 countries, with the majority from Ethiopia (25%), Russia (18.8%), China (17.2%), India (7.8%), Haiti (6.3%), and Colombia (6.3%). Almost 30% of PI children were adopted from Russia, Europe, India, or Nepal, 25% were of SE Asian or Pacific Islander origin, 15.6% from Latin America/Caribbean, and 29.7% from Africa. Adoptive parents reported the race of PI participants as 35.9% Asian, 34.4% African/Black, 15.6% Caucasian, 6.3% Latin American or American Indian, 3.1% mixed race, and 4.7% other or unknown. Hispanic or Latino ethnicity was endorsed for 9.4% of participants in this group (4.7% unknown). With regards to the adoptive families of the PI

children, most (84.4%) primary parents had earned a 4-year college degree or higher and most households (74.2%) reported an annual income greater than $75,000 (missing = 2).

Two comparison groups were roughly matched in age to the PI children. The first comparison group controlled for international adoption, and consisted of children adopted from foster care overseas (FC; *n* = 40, 30% female). FC children were younger at adoption than PI children (range = 6.7 to 12.8 months), consistent with the fact that countries using foster care for wards of the state tend to release children for adoption earlier than those using institutional care. FC children had spent no more than 4 months in institutional care, with 37% having no institutional care history, and most (65%) having experienced less than one month of institutional care. Children had spent between 2 and 12 months in foster care (*M* = 7.6, *SD* = 1.9, median = 8.0). The proportion of pre-adoption life spent in foster care ranged from 43% to 100%, with most participants (80%) having spent more than 80% of their pre-adoption life in foster care. FC participants were adopted from South Korea (72.5%), Guatemala (25%), or China (2.5%). Seventy five percent were of SE Asian origin, and 25% of Latin American origin. Parents reported their children's race as 75% Asian, 22.5% Latin American or American Indian, and 2.5% other or unknown; 25% of children had an ethnic background reported as Hispanic or Latino. With regards to the adoptive parents of the FC children, at the time of study entry, most primary adoptive parents (82.5%) reported having earned a 4-year college degree or higher, and annual household income was reported by most (87.2%) to be greater than $75,000 (missing = 1).

The non-adopted children (NA; *n* = 42, 47.6% female) were children born and raised in their biological families in the Twin Cities area. The majority (97.6%) of NA

participants were not Hispanic or Latino. With regard to race, 88.1% of NA children were Caucasian; 4.8% were Asian, and 7.1% were reported to be biracial. Their parents were of roughly the same education and income as those who adopt internationally. Thus, 81% of primary parents reported having earned a 4-year college degree or higher, and 78% of respondents reported a household annual income greater than $75,000 (missing = 1).

Procedures

The participants included in the present analyses were part of a longitudinal study comprising six different assessments. PI children were tested 2, 8, 16 and 24 months post adoption, then again at age 5 years and in kindergarten. Children in the comparison groups were roughly matched in age to the PI children at the first assessment and then were tested at equivalent times.

The present report is based on data collected during four discrete assessments. These were the 2-month post-laboratory assessment, hereafter called Time 1 (T1), the 24-month post-adoption laboratory assessment (Time 2; T2), the age 5 years laboratory assessment (Time 3; T3), and kindergarten (Time 4; T4) (see Figure 1). The three laboratory sessions consisted of several different tasks for the parent and child and lasted approximately 1.5, 1.5, and 2.5 hours, respectively. T1 was scheduled to take place 2 weeks to 3 months post-adoption (M = 1.70 months, range 0.33 to 3.25, SD = 0.75) and at the age-matched time for FC and NA children [Note that 18 of the PI participants in the present sample were recruited *after* T1 (i.e., late entry; LE), thus they are missing data at T1]. The second assessment included in the present study, T2, took place 24 months post-adoption (M = 24.2, range 22.9 to 25.9, SD = .53) for PI children and again at the age-matched time for FC and NA children. T3 took place with the target age of 5 years for

participants; however, as some of the participants were 5 by the time of the 24-month post-adoption assessment, an additional criterion was that at least 6 months intervened between T2 and T3. The age range of children at the 5-year assessment was 5.0 to 5.9 years (M = 5.2). This assessment was designed to be at the cusp of kindergarten and to include a number of age-sensitive neurocognitive assessments. At T4, participants were visited in their kindergarten classrooms between October and June; trained coders recorded their observations during structured and unstructured class periods (see below for more information) and completed subjective rating scales of overall behaviors [note, 10 participants are missing observation data due to school refusal (n = 2) and the school being too far away (n = 8)]. At the same time, parents and teachers received questionnaires packets in the mail or completed questionnaires online (note, 1 participant is missing parent data and 2 additional participants are missing teacher data, due to questionnaires not being returned).

Measures

Peer Functioning. *Peer Relations Observation Inventory – Revised (PROI-R).* Behaviors were scored live with a modification of the National Institute of Child Health and Human Development (NICHD) Observational Rating Scales of Caregiving Environment (for a detailed description of scales and observational procedure, see Gunnar, Kryzer, van Ryzin, & Phillips, 2010; Kryzer, Kovan, Phillips, Domagall, & Gunnar, 2007). Originally designed for preschool use, the measure was adapted for use in the kindergarten classroom for the present project. This instrument examines the characteristics of the child's interactions and experiences in the school setting by observing the frequency of specific kinds of behavior directed towards the target child, as

well as specific behaviors displayed by the target child, during six blocks of twenty intervals (30 seconds per interval). The PROI-R allows observation during structured classroom instruction (60-100% of observed intervals) as well as unstructured free play or recess times (0 to 40% of observed intervals). At T4, trained coders visited children in their kindergarten classrooms and coded 1) the child's level of positive or neutral social integration (alone: *target child is not interacting with anyone or the interactions are negative;* low integration: *target child is on the fringes of interacting with peer(s) or adult(s);* high integration: *target child is clearly part of the social action and his/her presence is important for the continuation of the interaction),* 2) the proportion of intervals where the child was rejected, rebuffed, or ignored in his/her attempt to interact with peer(s), 3) the proportion of intervals where the child directed negative social actions to another child or group of children (e.g., relational, physical, or verbal aggression), and 4) the proportion of intervals where the child received negative social actions from a single child or group (see Appendix A for more detailed coding instructions). For the present analyses, the child's level of positive or neutral social integration was recoded into one scale variable encompassing social integration on a 1-3 scale, where 1 = alone, 2 = low integration, and 3 = high integration; i.e., the proportion of time spent in each category was multiplied by the 1-3 value assigned to the category.

Coders were initially trained to reliability on the PROI-R against a master coder (S. Mliner) in the University of Minnesota's laboratory preschool. Reliability was maintained by completing periodic reliability checks of coding pairs in the laboratory preschool. All variables showed acceptable inter-rater agreement (range = .5 – 1.0). One

scale (child rebuffed, rejected, or ignored) was excluded from analysis because it was so rarely observed (only 10 participants were ever coded on this item).

Observer rating scales. After completing the PROI-R, the same coders rated participants' behaviors on a 5-point Likert scale (*Never/Not true* to *Frequently/Very true*) using an adapted version of the Peers and Social Skills Questionnaire (OSLC, 1987-2007, see e.g., Kerr, Capaldi, Pears, & Owen, 2009). Subscales used in the present analyses assess 1) social status/acceptance (e.g., *is liked by classmates*, 2 items), 2) social skills (e.g., *plays well with others*, 7 items, including 3 prosocial items), 3) victimization (e.g., *teased in a hurtful way or ridiculed by his/her peers*, 3 items including relational, physical, and verbal dimensions), and 4) aggression (e.g., *child was relationally aggressive with peers with threats to acceptance, friendship, or group inclusion*, 3 items including relational, physical, and verbal). These subscales demonstrated acceptable internal consistency in the present sample, with Cronbach's $\alpha = .77$ for social status, .60 for victimization, .85 for social skills, and .67 for aggression.

Teacher and Parent HBQ. At T4, parents (this was the mother in 91.0% of cases) and kindergarten teachers completed the MacArthur Health and Behavior Questionnaire (HBQ; Boyce, et al., 2002; Essex, et al., 2002), version 1.0 for children aged 4 – 8 years. The present analyses use the HBQ subscales that assess 1) peer acceptance/rejection (mean of 8 items), 2) overt victimization (3 items), 3) prosocial behavior (20 items), 4) social withdrawal (9 items assessing asocial and socially inhibited behaviors), 5) overt aggression (4 items), and 6) relational aggression (6 items). Items were rated on a 4-point Likert scale (*Not at all like, Very little like, Somewhat like, Very much like*) for subscales 1-2 and on a 3-point Likert scale (*Rarely applies, Applies somewhat, Certainly applies* or

Never or not true, Sometimes or somewhat true, Often or very true) for subscales 3-6. In the present sample, parent subscales showed acceptable internal consistency, with Cronbach's α for peer acceptance = .89, victimization = .69, prosocial behavior = .89, social withdrawal = .76, overt aggression = .65, and relational aggression = .66. Most teacher-reported subscale demonstrated acceptable internal consistency, with Cronbach's α for peer acceptance = .82, prosocial behavior = .92, social withdrawal = .82, overt aggression = .76, relational aggression = .78. However, teacher-reported victimization showed poor internal consistency, Cronbach's α = .51, so this variable was excluded from further analysis.

Parenting Quality. An observational method for evaluating parenting quality was derived from A. Sroufe and colleagues (e.g., Roisman, Padrón, Sroufe, & Egeland, 2002). At T1, parent and child participated together in two ten-minute free and structured play/problem solving interactions. During the first interaction, parents were told to play with their child as they normally would at home; they were given a box with several different types of toys and left to play for 8 minutes. After 8 minutes, the experimenter knocked on the door to indicate to parents to initiate clean up. During the second interaction, parents were told to use a set of materials to work together with their child to create a picture scene with Play-doh. Again, a knock on the door after 8 minutes indicated to parents to initiate clean up. These interactions were videotaped and watched by trained coders, who rated parents' behaviors during free play, the structured play/problem solving task, and clean up to yield two scores for each participant. The first, supportive presence, reflects the extent to which the parent acted as a secure base, such as by helping the child feel comfortable with the task, and the extent of the parents'

involvement, including his/her attentiveness to the child and the task. The second score, structure and limit setting, reflects how adequately the parent attempted to establish his/her expectations for the child's behavior versus not communicating his/her expectations and not enforcing his/her agenda adequately. Both supportive presence and structure and limit setting are rated on a 1 to 7 scale, with a higher score indicating more supportive presence and better structure and limit setting (see Appendix B for more detailed scoring instructions). These scores are combined to yield an overall parenting quality variable (Cronbach's $\alpha = 72$). Initially, coders were trained to 80% agreement within one scale point using 10 videotapes. Reliability was maintained by having a pair of coders rate 20% of the cases and verifying agreement between informants.

Disinhibited Social Engagement. As reported in Lawler et al. (2014), an observational method for evaluating DSE behaviors was derived from Tizard and Rees (1975) in order to evaluate children's tendency to initiate interactions with an unfamiliar adult. At the beginning of each of the 2-, 8-, 16-, and 24-month post-adoption laboratory sessions, a scripted stranger interaction lasting 10 minutes was conducted. During this interaction, the parent and child were led into the testing room, where the child was given a picture book and told that the parent must complete some paperwork. The parent was present throughout the interaction but was discouraged from interacting with the child and especially from influencing the child's social behavior towards the stranger. The experimenter, who was an unfamiliar female adult, entered the room and greeted the parent then walked directly to a chair and sat down quietly with a clipboard. Thirty seconds later, the experimenter introduced herself to the child then immediately returned her attention to her clipboard. Following the introduction, the experimenter responded

briefly to the child if the child spoke to her but did not initiate any communication. One minute later, the experimenter offered the child some toys to play with, placed the toys in the middle of the room, and sat down on the floor near her chair. Again, the experimenter responded briefly to any initiations by the child but did not continue to interact. Four minutes later, the experimenter asked the child if he or she would like to play together, brought out additional toys, and attempted to engage the child in interactive play for the remainder of the interaction (4 minutes). This interaction was videotaped and later coded for social behaviors by reliable coders. Using the digital ProCoder program (Tapp, 2003), coders recorded verbal and nonverbal initiations by the child as well as proximity to and physical contact with the experimenter (see Lawler et al., 2014 for additional details re: coding scheme, see also Appendix A). Coders were blind to group status. Two coders reviewed 20% of the tapes to calculate interrater reliability, which produced average κs of 0.71 – 0.98. In addition, experimenters provided ratings of each child on measures of verbal and physical intimacy over the entire length of the session, using the same coding scale as the coders (see Appendix C).

In her 2014 manuscript, Lawler and colleagues explored the existence of an underlying factor structure for the variables measuring DSE, using behavioral codes and experimenter ratings from the interactions conducted during the 2- and 8-month post-adoption laboratory assessments. In her analyses, behavioral codes and experimenter ratings were square root transformed, 99.7% Winsorized, and grand mean centered before being entered into a principal components analysis (PCA) in order to reduce the data. The PCA solution returned two factors indexing a physical engagement dimension and a nonphysical social engagement dimension, with precisely the same variables defining

each of the factors at 2- and 8-months post adoption. Moreover, the same factor structure emerged at T2, based on a PCA conducted by the present author. According to Lawler et al. (2014), the nonphysical social dimension showed wide variation in NA children and increased over time with normative gains in social development, suggesting that it represents a typical form of sociability (e.g., normal temperamental disinhibition or extraversion). In contrast, displays of physical contact and intimacy (i.e., physical engagement behaviors) were rare in NA children and more frequent among international adoptees, suggesting that these displays represent a more atypical pattern of behavior. Given these findings, in the present study, the physical engagement dimension was selected to represent problematic DSE behaviors. A composite for physical engagement was calculated by averaging the variables identified by the PCA as loading most highly on the physical dimension: duration of touch, frequency of touch, coder and experimenter ratings of physical intimacy, latency to touch, and duration of proximity. This scale had high internal consistency at T4 ($\alpha = .88$).

Inhibitory Control. At T3, participants completed three different inhibitory control tasks during the laboratory session. In the dinky toys task, the child is shown a box full of small prizes. Although it is impossible to see all of the prizes clearly without riffling through the box, the child is told that he or she should look carefully and then describe his or her choice to the experimenter while keeping his or her hands in his or her lap. The experimenter rates the child on his or her ability to inhibit from reaching for or touching the toys using a 0 to 5 scale, where 0 describes the child whose hands never left his lap, and 5 describes the child who seemed unable to control his or her impulse to grab

or dig for toys. The task was administered five separate times over the course of the session, resulting in five scores.

The gift delay/disappointing gift task (Carlson & Wang, 2007; Kochanska, Murray, Jacques, Koenig, & Vandegeest, 1996) is designed to measure the child's capacity for inhibitory control as well as his or her ability to regulate feelings of disappointment or frustration. At the beginning of this task, the experimenter tells the child that as a special surprise for all of his or her hard work, he or she is going to get a prize. The experimenter tells the child that she has not had time to wrap the prize, and asks him or her to remain seated at a table without peeking while the prize is wrapped directly behind him or her for 60 seconds (wrap phase). Then, the experimenter tells the child that she forgot the bow in the other room and will ask the child to sit in his or her chair "without peeking" for an additional 3 minutes while the experimenter leaves the room (wait phase). The child's behavior is recorded on video throughout the task, and is later coded on a 0 to 5 scale for peeking behaviors (e.g., head turns, body turns, getting up out of the chair), where a 0 describes a child who does not peek, and a 5 describes a child who touches the bag or the toy. Behaviors are coded during both the wrap phase and the wait phase, resulting in two scores.

The third inhibitory control task was administered via computer. Children played a version of the Zoo Game (McDermott, 2005), a computerized go/no-go task designed for use with young children to measure inhibitory control. During this task, children are told a story about animals being released from their cages at the zoo, and are instructed to quickly press a button after seeing a photo of an animal to "catch" it (go trials). Children are explicitly instructed not to press the button when they see a picture of a monkey (no-

go trials), because the monkey is helping the children to catch the other animals. The game consists of 24 practice trials and 280 test trials, with 75% of these being go trials and the remaining 25% no-go trials. Following procedures outlined in He and colleagues (2010), response accuracy (i.e., percentage of correct responses) was calculated for go and no-go trials separately. Children who failed to achieve 50% overall accuracy on go trials were excluded from the present analyses (n = 2 PI children). Consistent with He et al. (2010), the percentage of correct no-go trials served as the index of inhibitory control. Seven participants (1 NA, 1 FC, 5 PI) were further excluded because the child could not complete the task due to fatigue, inattention, or low understanding of the task.

Intellectual Functioning. At T3, child IQ was assessed using an abbreviated Stanford-Binet Intelligence Scales battery consisting of the Nonverbal Fluid Reasoning and Verbal Knowledge subtests. IQ was normally distributed across participants (M = 104.43, SD = 13.48).

Power Analysis

Power analyses were conducted using the program *G*Power* (Erdfelder, Faul, & Buchner, 1996) to determine the full range of true effects that the present research design had adequate (i.e., 80%) power to detect as statistically significant given sample size constraints when employing the traditional .05 criterion of statistical significance. First, for group differences in peer functioning, power analysis indicated that an effect size η_p^2 > .05 would be needed to detect a true effect. However, note that because the 3 groups are of unequal size and may not behave homogeneously, this estimate of power may be inflated. For moderation and mediation analyses, power analysis suggested that analyses may be underpowered to detect even relatively large effects. Thus, moderated mediation

analyses will be considered exploratory and, to this end, findings that are at the trend level with regards to significance (i.e., .05 - .10) will be noted and discussed.

Results

Composite Formation

Peer Relationship Measures. Descriptive statistics for the raw peer subscales, prior to data reduction, are shown in Table 2, and their intercorrelations are shown in Table 3. First, composites were created for the peer relationship measures based on conceptual groupings or constructs (i.e., acceptance, victimization, prosocial behavior, aggression, and social withdrawal). Raw variables were standardized within the sample before calculating the arithmetical average of the variables defining each construct (note, a minimum of 2 values was required). The peer acceptance composite included observer ratings of social status, observed social integration, and teacher and parent ratings of peer acceptance (Cronbach's $\alpha = .58$). The peer victimization composite was initially planned to incorporate observer and parent ratings of victimization as well as the proportion of observed intervals where the child received negative interactions (recall that the teacher victimization measure was omitted due to poor internal consistency) (Cronbach's $\alpha = .63$). The prosocial composite was computed using parent and teacher ratings of prosocial behavior (note that observer ratings of social skills were not included here since this subscale encompassed social skills more broadly versus focusing specifically on helping and sharing behaviors) (Cronbach's $\alpha = .46$). Fourth, an overall aggression composite was computed, including observer rating of aggression, the proportion of intervals where the child directed negative interactions, and parent and teacher ratings of relational and overt aggression (Cronbach's $\alpha = .74$). Two sub-composites were also attempted for

relational and overt aggression by combining teacher and parent reports; however, these subscales had very low internal consistencies (Cronbach's α = .30 and .34, respectively). Finally, a social withdrawal composite consisted of parent and teacher ratings of social withdrawal (Cronbach's α = .69).

Because the internal consistency of the conceptually driven scales was unacceptably low in many cases, an alternative, data driven approach was pursued. Exploratory factor analysis (EFA) was used to examine the underlying factor structure of the variables measuring peer relationship functioning. Although EFA and confirmatory factor analysis (CFA) share the goal of reproducing the observed relationships among a group of indicators with a smaller set of latent variables, EFA is uniquely defined as a data-driven approach and is appropriate when a priori knowledge about the number of latent factors and the pattern of relationships between the common factors and the indicators (i.e., the factor loadings) is lacking (Brown, 2006; Fabrigar, Wegener, MacCallum, & Strahan, 1999). Moreover, given the goal of identifying latent constructs as opposed to that of data reduction, EFA is considered more appropriate than principal components analysis (PCA; Fabrigar et al., 1999). Thus, EFA was selected. An EFA was conducted in SPSS using the principal factors method, which is free of distributional assumptions and thus appropriate when variables show departures from normality. An oblique rotation (*oblimin*) was selected because of expected intercorrelations between the factors. Initially, the number of factors was not specified. The first iteration of the EFA was applied to the 18 peer relationship variables (excluding teacher-reported victimization). This analysis returned five factors with eigenvalues larger than 1; however, the fifth factor had an eigenvalue of 1.05 and was only defined by one variable,

parent-rated prosocial behavior, so the EFA was repeated requesting no more than four factors. Four factors were obtained. For this model, the value of the determinant was greater than 0.00001, suggesting that multicollinearity was not a significant concern. The Kaiser-Meyer-Olkin measure of sampling adequacy was 0.69, which suggests that factor analysis is appropriate (Kaiser, 1974). Bartlett's test of sphericity was highly significant ($p < .0001$), suggesting that there are some relationships between the variables we hope to include in the analysis.

In the final model, the first factor was defined by observer ratings of social status, social skills, peer victimization, and aggression, and the proportion of observed intervals that the participant received and directed negative interactions with peers (i.e., ***observer*** factor = 6 variables; see Table 4 for factor loadings). The second factor was defined by teacher ratings of social withdrawal, parent ratings of social withdrawal, and observer-coded social integration (i.e., ***social withdrawal*** factor = 3 variables). The third factor was defined by parent ratings of overt aggression, peer victimization, peer acceptance, relational aggression, and prosocial behavior (i.e., ***parent*** factor = 5 variables) Finally, the fourth factor was defined by teacher ratings of overt aggression, prosocial behavior, relational aggression, and peer acceptance (i.e., ***teacher*** factor = 4 variables). These results highlight the contributions of each informant to the variance common to interrelated variables, suggesting why the underlying factor structure of the data was inadequately captured by the conceptual composites previously constructed. As a result, the data driven composites were selected for further analysis. Rather than using the factor scores generated by the EFA, which had high levels of missingness due to listwise deletion, four scales were constructed using the variables that loaded most highly

on each component. Variables with negative factor loadings were reverse scored then variables were standardized and averaged to create four data-driven composites (note that a minimum of two values was required to calculate the average; despite this difference with the factor scores, the calculated composites were all highly correlated with their respective factor scores, all *r*s > 0.96). These composites showed acceptable internal consistency (Cronbach's α = .88, .65, .69, and .74, respectively). All were substantially positively skewed and so were log transformed, resulting in acceptable values for skewness and kurtosis (i.e., skewness between -1 and 1, kurtosis between -3 and 3).

Inhibitory Control Measures. In order to examine the factor structure of the 8 inhibitory control measures (5 dinky toys trials, 2 gift delay scores, and no-go accuracy), an EFA was conducted using the maximum likelihood method in SPSS; maximum likelihood was selected because the inhibitory control variables were normally distributed. An oblique rotation (*oblimin*) was used. The EFA solution returned two factors with eigenvalues larger than 1 (determinant = .02, Kaiser-Meyer-Olkin measure of sampling adequacy = .82, Bartlett's test of sphericity $p < .05$). The goodness of fit test indicated that the two factor model fit the data well, chi square (df = 13) = 16.59, $p = .22$. The first factor was defined by the 5 Dinky Toys trials, and the second by the two gift delay scores (see Table 5). No-go accuracy did not show factor loadings greater than 0.2 on either factor. These results corroborate correlational results showing minimal correlations across inhibitory control tasks. Given these findings, combining all three tasks into one composite, as initially planned, was not appropriate. The dinky toys and gift delay tasks both showed acceptable internal consistencies across trials, whereas the go/no-go task only had one measure (No-go accuracy) and internal consistency could not

be assessed. Correlational analyses (see Table 6) were examined to see which of the dinky toys and gift delay showed more promising associations with the other study variables. Preliminary analyses were also conducted to examine group differences; gift delay scores, but not dinky toys scores, differed between groups and were correlated with some study variables. For this reason, only the gift delay scores were selected to create the inhibitory control composite. The two gift delay scores were standardized and averaged together, then the scale was reversed to facilitate ease of interpretation (i.e., higher score, better inhibitor control). Internal consistency for the resulting scale was acceptable (Cronbach's $\alpha = .62$).

Preliminary Analyses

Demographic differences between the groups were evaluated using one-way analysis of variance (ANOVA) or chi square tests, where appropriate. Results indicated that the proportion of male to female participants was significantly different across groups, $\chi^{2}(2, N = 146) = 8.51$, $p < .05$. There were proportionately more girls than boys in the PI group compared with the FC group. As expected given criteria for group inclusion, PI children had longer durations of institutional care, $F(1, 100) = 188.45$, $p < .001$, and FC children had longer durations of foster care, $F(1, 102) = 460.34$, $p < .001$. PI children were adopted later than FC children, $F(1, 102) = 39.56$, $p < .001$. PI and FC groups did not differ, however, in the number of major care settings they experienced prior to adoption. With regard to participant age at assessment, groups differed only at T2, $F(2, 141) = 15.02$, $p < .001$. FC children were older on average than PI or NA children. Parental education and annual household income did not differ across groups, $\chi^{2}(8, N = 146) = 6.84$, $p = .55$ and $\chi^{2}(16, N = 142) = 15.07$, $p = .52$, respectively.

Finally, after controlling for age and gender, groups significantly differed in IQ, $F(2, 128) = 4.29$, $p < .05$; NA children had significantly higher IQ than PI participants ($p < .05$; see Table 1 for group means). Thus, IQ was used as an initial covariate in all analyses.

Descriptive statistics and intercorrelations for all final study variables are shown in Table 6. Correlational analyses indicate fair agreement between the observer, parent, and teacher composites. Moreover, higher parenting quality was associated with lower ratings of peer difficulties on the teacher composite, fewer DSE behaviors, and higher gift delay performance. Higher ratings on the teacher composite were also associated with poorer gift delay performance. Next, three separate one-way analysis of covariance (ANCOVA) models were conducted to examine differences in group and gender on measures of inhibitory control, DSE, and parenting quality, after controlling for participant age and IQ. Results indicated a significant effect of group on gift delay performance, $F(2, 127) = 3.12$, $p < .05$, $\eta_p^2 = .05$; PI children performed more poorly than NA comparisons on the inhibitory control composite ($p < .05$), with FC children in the middle and not different from either group. There was also a significant gender difference in inhibitory control, $F(1, 127) = 6.55$, $p < .05$, $\eta_p^2 = .05$, with boys performing more poorly than girls. In addition, group significantly predicted DSE behavior, $F(2, 124) = 5.19$, $p < .01$, $\eta_p^2 = .08$, with PI children exhibiting significantly more DSE behaviors than NA children ($p < .01$). FC children were in the middle and not different from either group. There were no gender differences in DSE behaviors. Finally, groups did not differ in parenting quality.

Group Differences in Peer Relationship Functioning

To test the hypothesis that institutional care predicts problems with peer functioning, group differences in the composites created based on factor analytic results were examined. First, a Multivariate Analysis of Covariance (MANCOVA) was conducted with the observer, parent, and teacher composites as dependent variables and group (NA, FC, PI) and gender as factors. Given weak to moderate correlations (*r*s ~ .3) between the 3 composites, MANCOVA was appropriate. The Social Withdrawal composite was not included in this MANCOVA because it was not correlated with the other three composites. Initially, IQ and age at kindergarten were used as covariates. However, as neither was significantly related to the dependent variables, both covariates were excluded and a Multivariate Analysis of Variance (MANOVA) was conducted. The results indicated significant main effects of group (Hotelling's T (6, 254) = 2.87, $p < .05$, $\eta_p^2 = .06$) and gender (Hotelling's T (3, 128) = 3.37, $p < .05$, $\eta_p^2 = .07$). Univariate follow-up tests yielded main effects of group on the Observer and Teacher composites (Table 7). Bonferonni-corrected pairwise comparisons showed that PI children had significantly greater observer rated peer difficulties compared with NA children ($p < .05$; see Figure 2). Similarly, PI children were rated by teachers to experience significantly more peer difficulties compared with NA children ($p < .01$) and marginally more peer difficulties compared with FC children ($p < .10$; see Figure 3). In addition, univariate follow-up tests yielded a main effect of gender only on the Teacher composite (see Table 7). Teachers rated boys as having more peer difficulties than girls, $p < .01$ (see Figure 4). The interaction of group and gender was not significant for any of the three composites.

In order to examine group differences in the Social Withdrawal composite, a univariate analysis of covariance (ANCOVA) was conducted, with the same factors and

covariates as the initial MANCOVA. The only significant predictor to emerge was age at kindergarten, $F(1, 126) = 6.67$, $p < .05$. Older children were more socially withdrawn.

In sum, the only peer measures to show group differences were the teacher and observer measures of peer difficulties. Because subsequent analyses were conducted to better understand measures of peer functioning that differed by group, only these two variables were examined further.

Moderated Mediation

Procedures recommended by Preacher, Rucker and Hayes (2007) were followed to test the hypothesis that inhibitory control and DSE mediated the relationship between group (NA, FC, PI) and peer problems (observer and teacher composites). Moreover, the moderating roles of parenting quality and gender were considered. In particular, parenting quality was hypothesized to moderate the relationship between institutional care status and inhibitory control and DSE (i.e., the *a* path). Gender expected to moderate this relationship too, as well as the relationship between group and peer functioning (i.e., the *c* path) and between group and inhibitory control or DSE (i.e., the *b* path; see Figure 5 for theoretical model). All independent variables were standardized before analysis.

First, the relationship between group and each of the mediators was assessed in order to confirm a significant *a* path. Child's age at T4 and IQ at T3 were included as covariates. Parenting quality and gender were also included as potential moderators. Hierarchical linear regression was used. Thus, in the first model examining inhibitory control as a dependent variable, age, IQ, parenting, and gender were entered in the first step. Group was dummy coded with reference to the control group, creating two dummy variables (FC versus NA, PI versus NA). These were entered in the second step. The

interaction of parenting and group was entered in the third step, and the interaction of gender and group in the fourth step. Results are presented in Table 8. In the first step, parenting quality and gender significantly predicted gift delay performance, with higher parenting quality predicting better gift delay performance. Being female was also associated with better inhibitory control. The third step contributed to a marginally significant increase in R squared ($\Delta R^2 = 4.0\%$, $\Delta F = 2.62$, $p < .10$). In this step, parenting quality and gender remained significant predictors of gift delay performance. In addition, belonging to the PI group was associated with poorer inhibitory control compared with being in the NA group.

However, the main effects of PI status and parenting quality were qualified by a significant two-way interaction, demonstrating that parenting quality moderated the impact of institutional care (PI status) on inhibitory control. The interaction of PI status and gender was marginally significant ($\beta = .24$, $t = 1.74$, $p < .10$). To probe the first interaction, simple slopes were calculated following procedures outlined by Aiken and West (1991) to test whether PI status was associated with inhibitory control at high and low (±1 SD from the mean) levels of parenting quality. Simple slope analysis indicated that PI versus NA status was associated with poorer inhibitory control when paired with higher ($\beta = -.40$, $t = -2.38$, $p < .05$) but not lower parenting quality ($\beta = .04$, $t = .29$, $p = .78$). Visual inspection of Figure 6 indicates that, among children with lower quality parenting at T1, risk for poor gift delay performance was relatively high regardless of whether or not they spent time in an institution. In contrast, the best gift delay performance was evident among NA children who experienced higher quality parenting. Thus, parenting quality did not serve to buffer PI children; instead, PI children appeared

to be at high risk for inhibitory control problems regardless of the quality of parenting they received. To further clarify this effect, an alternative method of probing the two-way interactions was pursued by examining the effect of parenting within group. Regression analyses showed that parenting was a significant, positive predictor of gift delay performance for both NA (β = .42, t = 2.60, p < .05) and FC (β = .39, t = 2.09, p < .05) groups, but not for PI children (β = -.07, t = -.45, p = .66). Moreover, within the PI group, boys had poorer gift delay performance (β = -.38, t = -2.53, p < .05); gender did not predict inhibitory control performance among either NA or FC groups (ps > .37).

A second regression model was conducted examining the effect of group on the second mediator, DSE, with the same moderators and covariates as the previous model (see Table 8). The second step of this model contributed to a significant increase in R squared (ΔR^2 = 7.5%, ΔF = 4.70, p < .05). Thus, parenting quality was a marginally significant predictor of DSE, with higher parenting quality contributing to lower physical DSE behaviors. Moreover, PI status was associated with showing significantly more physical DSE behaviors at T2, as expected. Gender and parenting quality did not moderate this association.

Next, two regression models were conducted to examine whether the addition of DSE and gift delay performance reduced the effect of group on each of the two peer factors that exhibited group differences. In the first step, age, IQ, and gender were entered. Group was entered in the second step. In the third step, the interaction of gender with group was included. In the fourth and fifth steps, gift delay performance and DSE were entered, respectively. Finally, the interaction of gender with gift delay and gender with DSE were entered in the sixth step. Results are shown in Table 9.

Observer composite. In the prediction of observer rated peer problems, a significant effect of group emerged in the second step of the regression model (ΔR^2 = 5.0%, $\Delta F = 3.54$, $p < .05$). As demonstrated in the MANCOVA, PI children evidenced significantly more peer problems than NA children. Neither mediation nor moderation hypotheses were supported.

Teacher composite. The bottom right quadrant of Table 9 shows results of the moderated mediation analysis predicting teacher ratings of peer problems. In the first step, lower IQ and male gender were associated with more peer problems. In the second step, PI status significantly predicted more teacher-reported peer problems, replicating the results of the MANCOVA. In the fourth step, inhibitory control scores emerged as a marginally significant predictor of peer problems. In this step, the effect of PI status remained significant but decreased minimally in magnitude, suggesting partial mediation. Five thousand bootstrap resamples were used to generate 95% confidence intervals that estimated the size and significance of the indirect effect (Hayes, 2015). Given the absence of gender moderation in regression results, gender was included as a covariate but not as a moderator in this mediation test. The bootstrapped confidence interval for the indirect effect, $z = .01$, did not include 0, supporting the presence of mediation by inhibitory control performance.

Discussion

The successful navigation of peer relationships in childhood is an important precursor of later socioemotional adaptation, and problematic peer relationships predict difficulties in academic, psychiatric, social, and behavioral domains. The present study investigated peer relationship functioning among kindergarten-aged PI children compared

with children adopted from foster care and children born and raised in the US, using a multi-method, multi-informant approach.

As hypothesized, children who were adopted from psychosocially depriving institutions after the age of 17 months had more peer difficulties than never-institutionalized, non-adopted children. Because NA children came from homes similar to PI children's adoptive homes, these findings suggest that PI children's experiences prior to adoption are responsible for differences between the two groups. These results are consistent with some previous studies that demonstrate poorer social functioning among young PI children compared with family-reared controls and within-country adoptees (Ames, 1997; Fisher et al., 1997; Sonuga-Barke et al., 2010). Furthermore, by demonstrating that PI children scored more poorly than FC comparisons originating from biological families as PI adoptees, the present findings suggest, but do not prove, that prenatal conditions and/or birth complications cannot account for later social impairment. The present findings support the hypothesis that the peer difficulties previously documented in older children, adolescents, and adults (Hodges & Tizard, 1989; Merz & McCall, 2010; Raaska et al., 2012; Sonuga-Barke et al., 2010; Stams et al., 2000; Tieman et al., 2006; Tizard & Hodges, 1978) are also characteristic of young PI children's early social functioning.

In the present study, significant differences emerged between PI and comparison children on composites incorporating observers' and teachers' ratings, but not parents'. This was surprising, given that in previous studies adoptive parents have more often rated PI children as exhibiting elevated social problems than NA and earlier adopted youth (e.g., Fisher et al., 1997; Groza, 1996; Gunnar et al., 2007). However, in the majority of

those studies PI children were older than in the present study. It is possible that adoptive parents in the present study wished to portray their young children in an overly positive light, perhaps because they continued to expect significant recovery of function and were giving their children the benefit of the doubt given their early experiences. Discrepant ratings may also result from the fact that parents tend to see their children's peer behaviors in an entirely different context than teachers. Thus, parents may observe children interacting with siblings, other relatives, neighborhood peers, and the children of family friends, but are unlikely to be privy to classroom functioning. In contrast, although some teachers may be able to witness playground behaviors (e.g., if they are recess monitors), most teachers are unable to comment on peer behaviors and experiences that occur outside the classroom. This was also true of observers in the present study. The disconnect between classroom and extramural reports may be particularly pronounced in kindergarten, when parents have necessarily received fewer reports from teachers regarding their children's in-class experiences. Because relatively few studies have included both teacher and parent reports and most of these have collapsed across informants to create combined outcome measures, little is known about variations in PI children's peer functioning across settings. The present findings may indicate that extramural peer relationships (e.g., with neighbors, family friends, relatives) are an area of relative resilience for PI children. If this is confirmed in future research, it will be important to draw on these strengths to help promote better peer functioning in the classroom setting.

PI children also did not differ from FC or NA children on the social withdrawal composite, incorporating teachers', parents', and observers' perceptions of children's

tendency to withdraw from or remain isolated in social situations. This lack of group differences is somewhat surprising given previous findings that 2- to 3-year-old Romanian orphanage adoptees scored higher than Canadian born children on the social withdrawal scale of the CBCL (Fisher et al., 1997). Moreover, among PI children in Fisher and colleagues' sample, the most troublesome peer problems were avoidance of peer contact (12% of PI children) and becoming overwhelmed by peer attention (10% of PI children). Previous research had also emphasized social withdrawal as a correlate of institutional care (e.g., Goldfarb, 1943). However, in more recent research, a history of institutionalization (range = 1.5 to 58 months) was not associated with social withdrawal among early adolescent youth (Pitula et al., 2014). It may be that socially withdrawn behaviors are present when the PI child first enters the adoptive home then subside as the child acclimates to his or her adoptive environment and habituates to new peers. In fact, Fisher et al. (1997) had hypothesized that the adopted PI children in their study were wary of other children behaving unlike the PI children's orphanage peers, who had been passive, restrained, and quiet. The present findings suggest that, by kindergarten, PI children are no longer wary of their classmates or of peers they encounter outside of school.

With the exception of social withdrawal, factor analytic results suggested that composites that reflected the same informant's perceptions of peer functioning across a broad range of specific experiences and behaviors better represented the underlying data structure than composites that united various informants' perceptions of the same peer construct. Because conceptually based constructs demonstrated low internal consistencies and were a poor fit to the data's underlying structure, they were not examined further. As

a result, group differences in specific peer areas (i.e., rejection, victimization, prosocial behavior, relational and physical aggression) were not examined. It is possible that these specific problem areas will become more differentiated as children age and will then load onto separate factors based on problem area rather than informant. Regardless, it appears that, at least in kindergarten, ratings of peer problems may be more similar within informants than within specific problem areas. Cross- informant correlations were similar in this study to those reported in a meta-analysis of inter-rater agreement on measures of behavioral/emotional problems (Achenbach, McConaughy, & Howell, 1987). As suggested by the authors, relatively low associations between informants are likely to indicate that the target variables differ from one situation to the other. As discussed above, each informant in our study held a unique vantage point from which to consider children's peer functioning (i.e., home, repeated classroom interactions, or single day observation). These unique perspectives may offer distinct snapshots of children's abilities and experiences, and children may behave quite differently from one context to the next. For these reasons, informant-related variance may make greater contributions to the structure of the data than variance related to appreciable differences between specific behaviors.

Mediation hypotheses were only partially supported. Inhibitory control performance partially mediated the relationship between PI status and teacher-reported peer difficulties. Thus, a history of early institutional care between the ages of 1 year and 3 years was associated with delays in the ability to control inappropriate responses or behaviors, consistent with previous research suggesting poorer inhibitory control and/or executive functioning among PI children and adolescents (Ames, 1997; Bos, Fox,

Zeanah, & Nelson, 2009; Bruce et al., 2009; Hostinar et al., 2012; Merz & McCall, 2011; Merz et al., 2013; Pollak et al., 2010; Wiik et al., 2011). This study is the first to show that these deficits placed PI children at risk for increased peer difficulties in the classroom one year later. Social maladjustment associated with inhibitory control may arise through several different processes. For instance, children with poorer inhibitory control may be less likely to inhibit aggressive responses to perceived provocation, less likely to inhibit antisocial behaviors in favor of prosocial ones, more likely to invade peers' personal space, and more likely to behave in inattentive and dysregulated manners (Liew et al., 2004; Park et al., 2005; Schwartz, 2000; Shields & Cicchetti, 2001). These types of disinhibited peer behaviors are known to be aversive to peers, and are likely to result in victimization and rejection (Hanish et al., 2004; Schwartz et al., 1998; Schwartz, Proctor, & Chien, 2001). Results highlight the importance of emphasizing interventions to improve inhibitory control abilities before children enter kindergarten and become at risk for a constellation of peer difficulties (see below for a discussion of interventions).

In contrast with mediation results for teacher-rated peer outcomes, inhibitory control performance did not mediate the relationship between PI status and observer-rated peer measures. Given positive association between self-regulation and academic competence (e.g., Pears et al., 2010), it may be that successful inhibitory control is more central to teachers' views of children's social functioning than to observers'. On the other hand, the observer's presence in the classroom may have encouraged children to be on their best behavior, so that those difficulties most associated with self-regulation (i.e., aggression, prosocial behavior) were less apparent. In other words, it may be that teachers' repeated interactions with students provide them with a more comprehensive

assessment of their functioning, allowing for associations with other aspects of behavior (i.e., inhibitory control) to emerge.

As expected, PI children exhibited more DSE behaviors in early childhood compared to NA children, consistent with extant research (e.g., Bruce et al., 2009; Chisholm et al., 1995; MacLean, 2003). However, contrary to expectations, DSE behaviors did not mediate the relationship between early institutional care and later peer difficulties. Previous research had suggested a relationship between DSE and peer problems (Ames, 1997; Hodges & Tizard, 1989; O'Connor et al., 1999). However, because these previous associations were correlational, it is also possible that previously reported associations between DSE and social functioning reflected the impact of deprivation-specific problems on general, non-specific indexes of impairment (e.g., Sonuga-Barke et al., 2010). In the present study, we controlled for IQ and at least one other potential area of impairment (inhibitory control), allowing for an examination of the unique impact of DSE on later social functioning. The present findings make an important contribution to our understanding of the developmental significance of DSE behaviors. As DSE is assessed in the context of the child's interactions with unknown adult(s), the present findings suggest that DSE behaviors may remain specific to child-adult relationships and may not extend into the peer domain, even as children get older.

Moreover, despite previous research reporting associations between inhibitory control and DSE (Bruce et al., 2009; Pears et al., 2010; Roy et al., 2004), DSE was not prospectively associated with inhibitory control deficits in the current study (correlations rs < .15, ps > .05). The measure of DSE computed in the present study was somewhat unique in that we adopted a factor analytic approach, partialling out the aspects of DSE

that are common to both PI and NA children (i.e., nonphysical socially intrusive behaviors) and focusing on those aspects that are unique to children with a history of institutional care (i.e., atypical physically intrusive behaviors; Lawler et al., 2014). Previous research has typically grouped together behaviors from both dimensions (e.g., Bruce et al., 2009; O'Connor et al., 1999), thus confounding more typical aspects of DSE that reflect temperamental social approach with its more atypical components. It may be that associations previously reported reflected the influence of both social and nonsocial aspects of DSE. The more rare, physical DSE behaviors may be a relatively unique construct, not associated with self-regulator deficits but rather reflecting the activity of different systems also impacted by institutional care, such as social cognitive skills (e.g., Tarullo et al., 2007). Further research is needed to examine correlates of this relatively new measure of DSE.

We examined parenting quality approximately 2 months after adoption as a potential moderator of the relationship between institutional status and performance on measures of inhibitory control and DSE. Although parenting quality did interact with group status in the prediction of inhibitory control, the direction of the effect was not as expected. Thus, higher quality parenting was associated with better inhibitory control performance, but only among NA and FC youth. Among PI children, risk for inhibitory control deficits was equally high regardless of the quality of parenting received. In our sample, the mean score on the observational measure of parenting quality was approximately 5.5 out of a possible seven points; the lowest score obtained by any parent was three out of seven. This range of scores indicates that parents participating in our study were generally very supportive and attentive to their children's needs, and

effectively structured their child's activities, responding consistently and authoritatively to compliance problems. This is consistent with previous reports indicating that the quality of parenting provided by adoptive parents is exceptionally high (e.g., Brodzinsky & Pinderhughes, 2005).

Yet, the fact that PI children continue to show deficits in self-regulation even after years in their adoptive families suggests that supportive and nurturing parenting may not be enough to reverse the detrimental effects of early inconsistent caregiving. Similarly, because adoptive parents are already providing such excellent care, in contrast with interventions targeting foster parents (e.g., Dozier et al., 2012; Nelson et al., 2007), interventions directed at parents who adopt from institutions are unlikely to make a difference. Rather, interventions that primarily target children may have the highest likelihood of success, and the present findings suggest that it would be beneficial to select programs that can be implemented before the age of 6 years. Several classroom programs have shown promise in improving self-regulation skills among typically developing children, in particular CSRP Head Start and Tools of the Mind (see Diamond, 2012 for a review); both of these programs are indicated for use with children aged 3 to 6 years. Moreover, in a recent study of the effectiveness of group interventions for self-regulation in internationally adopted children aged 6 to 10 years (Lawler, 2014), children who participated in 12 sessions of mindfulness training or executive-function training activities saw improvements in several aspects of behavioral regulation. Further research is needed with larger samples to confirm which intervention programs will most benefit children who are at risk for inhibitory control deficits and consequently social difficulties due to their early adverse caregiving experiences.

Parenting quality did not moderate the association between group and DSE behaviors. However, this may not have been a fair test, as very few NA children displayed DSE behaviors. Moreover, close to 20 PI participants were missing parenting data, as they had not yet been recruited into the study. Thus, our ability to detect a significant moderation effect may have been limited by diminished sample size in this analysis combined with insufficient variability across groups.

Across the majority of the different indexes of functioning, FC children's performance was somewhere between that of NA and PI children; the only significant difference between PI and FC children emerged on the teacher composite of peer functioning. As suggested by Bruce et al., (2007), FC children are also likely to have experienced some degree of inconsistent care prior to adoption. Indeed, in the present study, PI and FC children had experienced a similar number of different care settings prior to adoption. At the same time, the fact that FC children were adopted earlier on average than PI children and did not significantly differ from NA children on any measure of functioning highlights the dramatic plasticity and recovery that is particularly characteristic of children adopted before the first year of life (van IJzendoorn & Juffer, 2006). Nevertheless, group sizes were relatively small in the present study, and it is possible that significant differences would have emerged between FC children and NA children given a larger sample.

Several gender differences emerged in the present study. First, boys evinced more peer difficulties than did girls according to teachers, but not parents or observers. Previous research with the HBQ has similarly reported poorer social adjustment among boys, regardless of early developmental history (Essex et al., 2002). On the other hand,

teachers in our study may have assigned greater weight than did parents and observers to behaviors reflecting compliance and attentiveness (Coie et al., 1990). Because these behaviors are typically more impaired in boys than girls (Carslon & Moses, 2001; Kochanska, Murray, & Coy, 1997; see below), boys may have received higher scores from teachers if they exhibited these behaviors regardless of their other behaviors or experiences. Similarly, certain behaviors may be more problematic and more easily noticed in a busy classroom, where teachers' capacities for observing discrete peer episodes are necessarily limited. For instance, displays of physical aggression are more likely to disrupt classroom activities and draw the teacher's notice compared with more covert peer rebuffs. Given that young boys are more likely to engage in rough and tumble play and physical displays of aggression (Card et al., 2008; Rose & Rudolph, 2006), teachers may more often notice boys' peer difficulties, leading to higher problem scores for boys.

Gender differences also emerged in self-regulation, with boys showing poorer inhibitory control than girls, regardless of institutional care history. The findings parallel previous research documenting that girls outperform boys on a range of measures of inhibitory control beginning in early childhood (Carslon & Moses, 2001; Kochanska et al., 1997). Moreover, after controlling for IQ, age, and parenting quality, gender appeared to moderate the impact of institutional status on inhibitory control, such that among PI children but not FC or NA children, boys demonstrated poorer inhibitory control than girls. Although this effect did not reach conventional levels of statistical significance, it is reminiscent of previous findings showing poorer outcomes for PI boys than girls (e.g., Bos et al., 2011; Stams et al., 2000). However, gender did not moderate the impact of

inhibitory control deficits on peer functioning, consistent with research showing that boys and girls with self-regulation difficulties (e.g., ADHD) show similar levels of social impairment (Gaub & Carlson, 1997; Greene et al., 2001). Impulsive behaviors appeared to be equally aversive when enacted by boys or girls.

Finally, contrary with previous findings among older children (Pitula et al., 2014; Raaska et al., 2012), gender did not moderate the impact of institutional history on peer difficulties. Several other studies have also failed to find increased problems among PI girls than boys (Gunnar et al., 2007; Juffer & van IJzendoorn, 2005). This may reflect the fact that many social behaviors are less differentiated among younger boys and girls, and that a number of gender differences, such as in the content of play, size of social group, and degree of prosocial behavior, emerge or become more consistent with age (see Rose & Rudolph, 2006 for a review). It is also possible that, given our relatively small sample size, we were simply underpowered to detect many gender moderation effects. Additional research with a larger sample is needed to better understand the emergence of gender differences in peer difficulties following institutional care.

Limitations

Although the present study was bolstered by several strengths, most notably its reliance on multiple informants and its prospective longitudinal design, there are several limitations worth noting. The first limitation concerns the use of duration of institutional or foster care as a proxy for measures of caregiving prior to adoption. Children's experiences are likely to differ within the same type of setting depending on qualities of the institution or family setting in which they are placed. Unfortunately, more detailed assessments of the quality of care prior to adoption were unavailable; adoptive parents

are rarely able to visit the institution and measures of physical health such as height and head circumference are poor predictors of recovery, making it very difficult to judge the degree of privation (Gunnar et al., 2000). It remains possible that variability in pre-adoption care within each of the adopted groups influenced the present results. Nevertheless, because careful consideration was given during recruitment to exclude children who had overlapping experiences (e.g., some time in foster care, some time in institutional care) and/or unknown durations of care in each setting, this variability should be limited to quantitative (e.g., more or less one on one time with orphanage workers) and not qualitative degrees of difference.

There are several potential limitations concerning the measurement of peer functioning. For example, although the intent was for observers to spend time viewing structured (60%) and unstructured (40%) classroom activities, many participants received no unstructured time in the entirety of the observation period. This occurred for different reasons, ranging from limits placed on the observer's time by teachers to a total absence of unstructured time in children's school day. Unfortunately, this means that observers (and teachers) may miss out on opportunities to observe salient peer behaviors, such as aggression, that are more likely to occur in free play settings were there is limited supervision and structure (Craig, Pepler, & Atlas, 2000; Coie & Dodge, 1988). Moreover, our assessment of peer functioning did not include measures of friendship, such as the number of reciprocal friendships or friendship quality, content, and closeness, which may be distinct from evaluations of how well one gets along in one's peer group (Hartup, 1996; Parker & Asher, 1987). In previous studies of PI children, there have been reports of shallow relationships and difficulties forming and maintain close friendships (Hodges

& Tizard, 1989), suggesting that this is an area worth investigating in more depth. Finally, although peer constructs were examined dimensionally and averaged together, previous research has demonstrated that considering the intersection of discrete peer variables can add to our understanding of children's adjustment (e.g., children who are aggressive and rejected versus submissive and rejected differ in academic outcomes; Wentzel & Asher, 1995). Given our focus on informant-based composites, this would not have been a profitable approach in the present study, but would be an interesting avenue for further research.

Moreover, because countries that use foster care for wards of the state differ from those providing institutional care, our FC children were not matched to PI children on ethnicity or country of origin. It is possible that participants' post-adoption functioning was influenced by their region of origin. For example, there is evidence that certain groups of adoptees are at greater behavioral risk because of more adverse prenatal care (Johnson, 2000). In addition, ethnic minority status has been shown to increase risk for peer victimization in a Finnish sample (Strohmeier, Karna, & Salmivalli, 2011). Unfortunately, the sample size in the present study was insufficient to allow for comparisons between birth regions or ethnicities.

As a final caution to interpretation, statistical thresholds were not corrected for multiple comparisons and, although significant, effect sizes were generally small. In the case of moderated mediation, a relatively small sample size combined with ambitious analyses incorporating multiple covariates and predictors may have reduced our ability to detect significant findings. Future research would benefit from addressing this question within a larger sample.

Conclusions and Future Directions

Limitations notwithstanding, the current study provides further evidence that early experiences with inconsistent caregiving place children at risk for embarking on a developmental pathway characterized by social maladjustment. These findings highlight the important role of supportive and responsive infant-caregiver relationships in future socioemotional competence. Given some evidence that peer problems increase as PI children age (Sonuga-Barke et al., 2010, but see also MacLean, 2003), further research is needed to more fully describe the developmental course of social adjustment and related difficulties in children who have been exposed to psychosocially depriving caregiving. The present study provides an important first step by documenting the emergence of a broad range of social deficits as early as kindergarten.

Consistent with transactional models of risk (e.g., Cicchetti & Valentino, 2006), it is likely that early peer difficulties contribute to later peer problems via dynamic and reciprocal interactions across multiple systems (e.g., academic functioning, self-esteem, feelings of loneliness or sadness, stress, and associated alterations in physiological systems). For instance, children who are rejected by peers are more limited in their opportunities to learn critical social skills, such as cooperative problem solving and effective conflict management, which leads to more peer rejection, associations with unskilled/unpopular peers, socialization of deviant social skills, and so on (Hartup & Moore, 1990). For this reason, it is important to intervene as early as possible by targeting processes that are known to increase risk for early peer difficulties. Moreover, because younger children may be more forgiving with unskilled peers than are older

children (Hartup & Moore, 1990), early interventions have the potential to make a lasting impact, before children earn a negative reputation that will compound their lack of skills.

To this end, the present study provided some evidence for the role of inhibitory control as a mechanism by which early deprivation negatively impacts peer behaviors and experiences, suggesting important avenues for intervention. However, consistent with biosocial theories emphasizing the confluence of biological risk and social context (e.g., Boyce & Ellis, 2005), future research would also benefit from a focus on the biological underpinnings of the associations between early adverse care, inhibitory control deficits, and/or peer relationships. One promising biological system involves the hypothalamic-pituitary adrenal (HPA) axis and its primary product, cortisol. Chronic stress has been associated with alterations in the diurnal rhythm of cortisol (Gunnar & Quevedo, 2007), which in turn have been shown to predict difficulties with attention and behavior regulation (i.e., hyperactivity/impulsivity and ADHD) among PI children (Pitula, Mliner, Koss, & Gunnar, 2015). The chronic release of cortisol under conditions of prolonged stress is also known to influence the development of brain systems that perceive and respond to threat (e.g., prefrontal cortex, hippocampus, amygdala) (e.g., Avishai-Eliner, Brunson, Sandman, & Baram, 2002; Heim, Owens, Plotsky, & Nemeroff, 1997), including areas of the brain that are involved in self-regulation and social behavior (Adolphs, 2003). Indeed, social cognitive skills are known to be delayed in PI children (Parker & Nelson, 2005; Tarullo et al., 2007; Wismer Fries & Pollak, 2004), but the association between activity in "social" brain areas and the emergence of peer problems remains understudied.

Future research that considers the role of biological and cognitive systems in the link between institutional status and peer difficulties is expected to greatly advance our understanding of how psychosocial deprivation gets under the skin to influence peer functioning in the short and long term. This program of research has the potential to provide critical insight into the impact of early deprivation on the development of peer competence and may prove useful for designing interventions to improve the functioning of youth who begin their lives under conditions of deprivation and socioemotional neglect. By targeting key mechanisms early in life, such as by improving self-regulation and addressing the biological regulation of stress coping mechanisms, it may be possible to interfere with developmental pathways leading towards pervasive maladaptation, thereby reducing the need for costlier interventions and, ultimately, decreasing the burden of mental illness on children, families, and their communities.

Table 1

Participant Demographic Information

	Group		
	Post-institutionalized	Foster Care	Non-adopted
Sample size (*n*)	64 (59.4% female)	40 (30.0% female)	42 (47.6% female)
Age at adoption (Mean (SD))	25.0 months (5.2)	9.5 months (1.4)	--
Duration of institutional care (Mean (SD))	18.6 months (8.2)	.77 months (.93)	--
Different care settings (Mean (SD))	2.7 (1.4) Range = 1-11	2.7 (1.1) Range = 1-8	--
T1 age (Mean (SD))	26.3 months (4.8) Range = 19.0-36.4	33.1 months (4.4) Range = 20.8-37.4	27.9 months (5.8) Range = 18.6-36.9
T2 age (Mean (SD))	4.1 years (.44) Range = 3.4-5.0	4.7 years (.38) Range = 3.7-5.1	4.2 years (.47) Range = 3.5-5.0
T3 age (Mean (SD))	5.1 years (.14) Range = 4.9-5.5	5.3 years (.22) Range = 4.9-5.9	5.2 years (.16) Range = 5.0-5.6
T4 age (Mean (SD))	6.0 years (*SD* = .28) Range = 5.5-6.5	6.0 years (.30) Range = 5.6-6.9	5.9 years (.26) Range = 5.4-6.6
T4 child IQ (Mean (SD))	101.5 (12.4)	104.6 (12.2)	108.7 (15.1)
Household income (Median)	$100,001-125,000	$100,001-125,000	$75,001-100,000
Parental education (Median)	Bachelor's degree	Bachelor's degree	Bachelor's degree

Table 2
Descriptive Statistics for Peer Relationship Variables

	n	*Mean* (SD)	Range
Observer - rated			
Social status	138	3.54 (.60)	1.0 – 4.0
Victimization	138	.19 (.37)	.00 – 2.0
Social skills	138	3.45 (.54)	.83 – 4.0
Aggression	138	.17 (.39)	.00 – 2.67
Observer - coded			
Social integration	118	2.42 (.45)	1.0 – 3.0
Prop. received negative	138	.01 (.01)	.00 – .06
Prop. directed negative	138	.01 (.02)	.00 – .12
Teacher			
Peer acceptance	146	3.69 (.42)	2.0 – 4.0
Victimization	146	1.18 (.38)	1.0 – 3.0
Prosocial behavior	146	1.37 (.42)	.10 – 2.0
Overt aggression	146	.16 (.31)	.00 – 1.75
Relational aggression	146	.13 (.25)	.00 – 1.17
Social withdrawal	146	.25 (.29)	.00 – 1.58
Parent			
Peer acceptance	144	3.62 (.47)	1.13 – 4.0
Victimization	144	1.37 (.48)	1.0 – 3.0
Prosocial behavior	143	1.37 (.35)	.20 – 2.0
Overt aggression	143	.27 (.28)	.00 – 1.25
Relational aggression	143	.19 (.25)	.00 – 1.0
Social withdrawal	143	.40 (.33)	.00 – 1.58

Table 3

Correlations among Peer Relationship Variables

	1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.	15.	16.	17.	18.
1. Social status, O																		
2. Victimization,	**-.66**																	
3. Social skills, O	**.73**	**-.39**																
4. Aggression, O	**-.47**	**.55**	**-.43**															
5. Social integ., O	**.29**	-.12	**.45**	.05														
6. Prop. receive	**-.55**	**.64**	**-.39**	**.52**	-.08													
7. Prop. directed	**-.47**	**.47**	**-.45**	**.89**	.02	**.61**												
8. Peer accept, T	**.20**	-.14	**.29**	**-.19**	**.27**	-.06	-.14											
9. Victimization,	-.07	.06	-.08	.02	-.04	.04	.02	**-.26**										
10. Prosocial beh,	**.23**	**-.19**	**.21**	**-.25**	.14	**-.17**	**-.25**	**.50**	**-.19**									
11. Overt agg, T	**-.25**	**.32**	**-.19**	**.41**	-.02	**.23**	**.43**	**-.50**	.15	**-.52**								
12. Relational	-.05	.02	-.03	**.19**	-.01	**.17**	**.25**	-.14	.09	**-.28**	**-.55**							
13. Social w/d, T	-.08	.02	**-.30**	-.12	**-.31**	-.08	-.09	**-.35**	.04	**-.18**	.09	-.15						
14. Peer accept, P	**.34**	**-.21**	**.34**	**-.35**	.15	-.12	**-.33**	**.46**	**-.19**	**.28**	**-.34**	-.08	**-.26**					
15. Victimization,	-.08	**.22**	-.08	**.36**	.07	**.22**	**.37**	**-.18**	.03	-.14	**.30**	.04	-.03	**-.50**				
16. Prosocial beh,	.08	**-.20**	.09	-.12	.15	-.05	-.11	**.24**	**-.20**	**.30**	**-.26**	-.02	-.01	**.40**	**-.19**			
17. Overt agg, P	-.08	**.22**	**-.18**	**.39**	.12	**.19**	**.38**	-.11	**.18**	-.16	**.21**	.06	-.05	**-.33**	**.42**	**-.32**		

18. Rel agg, P	.02	.07	-.06	.15	.05	.13	**.19**	.10	.05	-.08	.12	**.18**	-.08	-.15	**.26**	-.06	**.39**	
19. Social w/d, P	.04	-.04	**-.19**	-.14	**-.31**	-.06	-.06	**-.20**	.04	-.10	-.01	-.16	**.53**	**-.30**	.10	-.15	.13	.03

Note. Bolding indicates a significant correlation, p < .05. O = observer, T = teacher, P = parent

Table 4

Exploratory Factor Analysis Results for Peer Measures: Pattern Matrix

	Components			
	Observer	Social w/d	Parent	Teacher
Social status, O	**-.88**			
Prop. received neg., O	**.71**			
Social skills, O	**-.70**	.39		
Victimization, O	**.70**			
Prop. directed neg., O	**.64**	.21	.35	
Aggression, O	**.64**	.23	.35	
Social w/d, T		**-.67**		
Social w/d, P		**-.65**		
Social integration, O	-.23	**.49**	.24	
Overt agg, P			**.70**	
Victimization, P			**.63**	
Peer accept, P		.43	**-.47**	
Relational agg, P			**.40**	
Prosocial beh, P		.22	**-.29**	
Overt agg, T				**-.87**
Prosocial beh, T				**.58**
Relational agg, T		.26		**-.57**
Peer accept, T		.44		**.55**

Note. Factor loadings < 0.2 are not shown. O = observer, P = parent, T = teacher.

Table 5

Exploratory Factor Analysis for Inhibitory Control Measures: Pattern Matrix

	Components	
	Dinky toys	Gift delay
Dinky toys round 1	**.69**	-.04
Dinky toys round 2	**.85**	-.02
Dinky toys round 3	**.89**	-.02
Dinky toys round 4	**.92**	.07
Dinky toys round 5	**.77**	.05
Gift delay: wrap phase	.20	**1.01**
Gift delay: wait phase	.01	**.46**
No-go accuracy	.10	-.18

Table 6

Descriptive Statistics and Intercorrelations among Study Variables

	1.	2.	3.	4.	5.	6.	7.	8.
1. Observer factor	--							
2. Social withdrawal factor	.04	--						
3. Parent factor	**.38**	.10	--					
4. Teacher factor	**.34**	.15	**.36**	--				
5. Parenting quality	-.13	.05	-.05	**-.18**	--			
6. DSE physical	.02	-.14	.10	.00	**-.19**	--		
7. Dinky toys mean	.18	.14	.11	.10	.04	.07	--	
8. Gift delay mean	.01	-.05	.00	**.24**	**-.20**	.14	.00	--
Mean	.00	-.05	.01	.00	5.61	-.58	1.26	2.10
Standard deviation	.79	.77	.68	.75	.91	3.20	1.33	1.19
N	138	145	144	146	124	141	144	144

Note. Correlations and descriptive statistics are shown for composite variables prior to transformation or standardization. Recall that peer composites are based on standardized subscales. Here, higher gift delay and dinky toys scores = *poorer* inhibitory control.

Table 7
F-Tests for Univariate Follow-Up Tests to MANOVA

Effect	Measure	df_1, df_2	*MS*	*F*
Group	Observer	2, 130	.11	4.05*
	Parent	2, 130	.01	.60
	Teacher	2, 130	.13	6.06**
Gender	Observer	1, 130	.05	1.89
	Parent	1, 130	.04	2.12
	Teacher	1, 130	.22	9.76**

Note. All outcome variables were transformed prior to analysis.

** $p < .01$, * $p < .05$

Table 8

Regression Models for Moderated Mediation Step 1, Effect of Group on Mediators

Step		Dependent variable					
		Gift delay mean			DSE physical		
		β	*t*-Value	ΔR^2	β	*t*-Value	ΔR^2
1	T4 age	.13	1.45	.09*	.02	.19	.04
	T3 IQ	-.01	-.08		-.04	-.44	
	T1 parenting quality	.19*	2.12		-.19†	-1.96	
	Gender	-.21*	-2.26		-.01	-.07	
2	Group = FC	-.10	-.89	.03	.17	1.58	.08*
	Group = PI	-.23*	-2.04		.34**	3.07	
3	T1 parenting x group FC	-.04	-.27	.04†	-.01	-.07	.00
	T1 parenting x group PI	-.29*	-2.01		-.01	-.05	
4	Gender x group FC	-.03	-.22		.05	.72	
	Gender x group PI	-.24†	-1.74	.03	.06	.68	.00

Note. Group was dummy coded, resulting in two dummy variables, FC = foster care, PI = post institutionalized. Gender = -1 female, 1 male. All predictor variables were standardized prior to analyses. Gift delay scores were reversed prior to analysis, so that higher scores correspond to better performance. ** $p < .01$, * $p < .05$, † $p < .10$

Table 9.

Regression Analyses for Moderated Mediation Step 2, Indirect Effect of Group on Observer and Teacher Composites

Step		Dependent variable					
		Observer composite			Teacher composite		
		β	*t*-Value	ΔR^2	β	*t*-Value	ΔR^2
1	T4 age	-.05	-.546	.02	-.07	-.79	.07*
	T3 IQ	-.09	-.99		-.19*	-2.16	
	Gender	.11	1.28		.17†	1.96	
2	Group = FC	.16	1.52	.05*	.11	1.14	.06*
	Group = PI	.28**	2.66		.31**	3.04	
3	Gender x group FC	.03	.26	.00	.01	.09	.00
	Gender x group PI	.10	.72		-.05	-.40	
4	T3 gift delay mean	.09	1.03	.01	-.16†	-1.83	.02†
5	T2 DSE physical	-.03	-.38	.00	-.09	-1.08	.01
6	Gender x gift delay mean	-.06	-.65	.01	-.08	-.89	.01
	Gender x DSE physical	.06	.67		.05	.57	

Note. Group was dummy coded, resulting in two dummy variables, FC = foster care, PI = post institutionalized. Gender = -1 female, 1 male. All predictor variables were standardized prior to analyses. Gift delay scores were reversed prior to analysis, so that higher scores = better performance.

** $p < .01$, * $p < .05$, † $p < .10$

Figure 1. Flowchart depicting timing of each session and measures obtained. T = time. DSE = disinhibited social engagement.

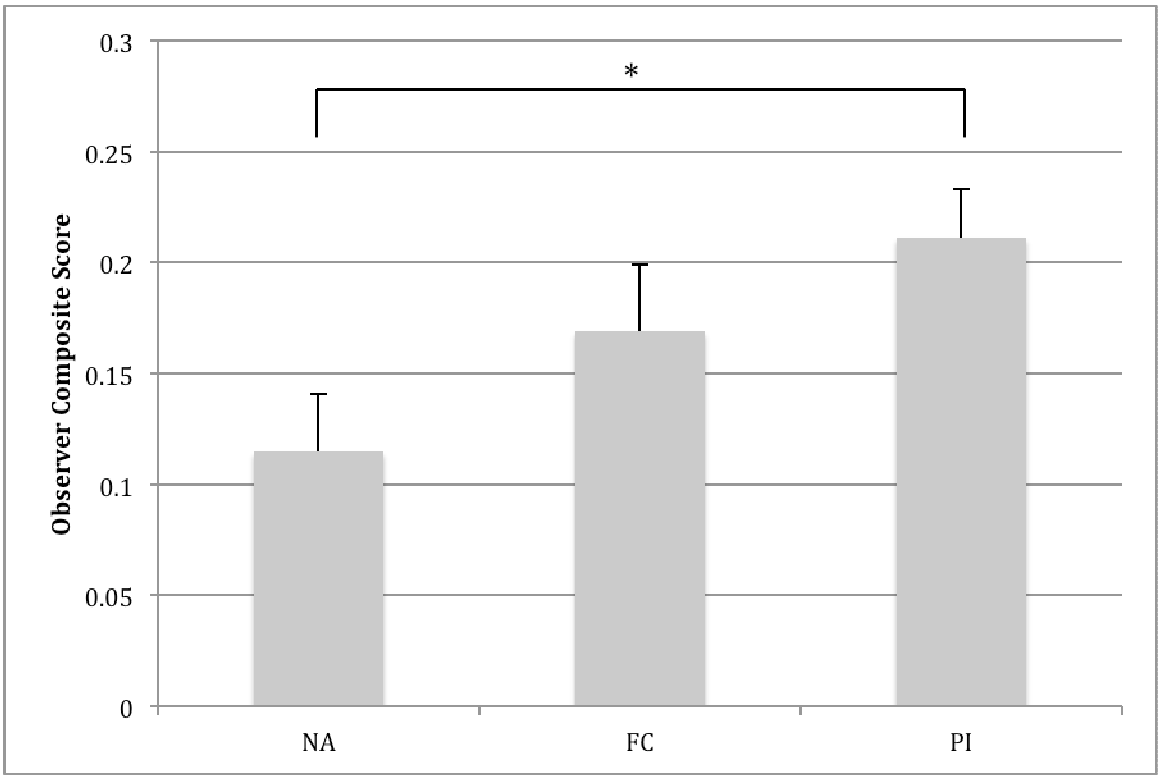

Figure 2. Group differences in observer rated peer difficulties for non-adopted (NA), foster care (FC) and post institutionalized (PI) children.

* $p < .05$

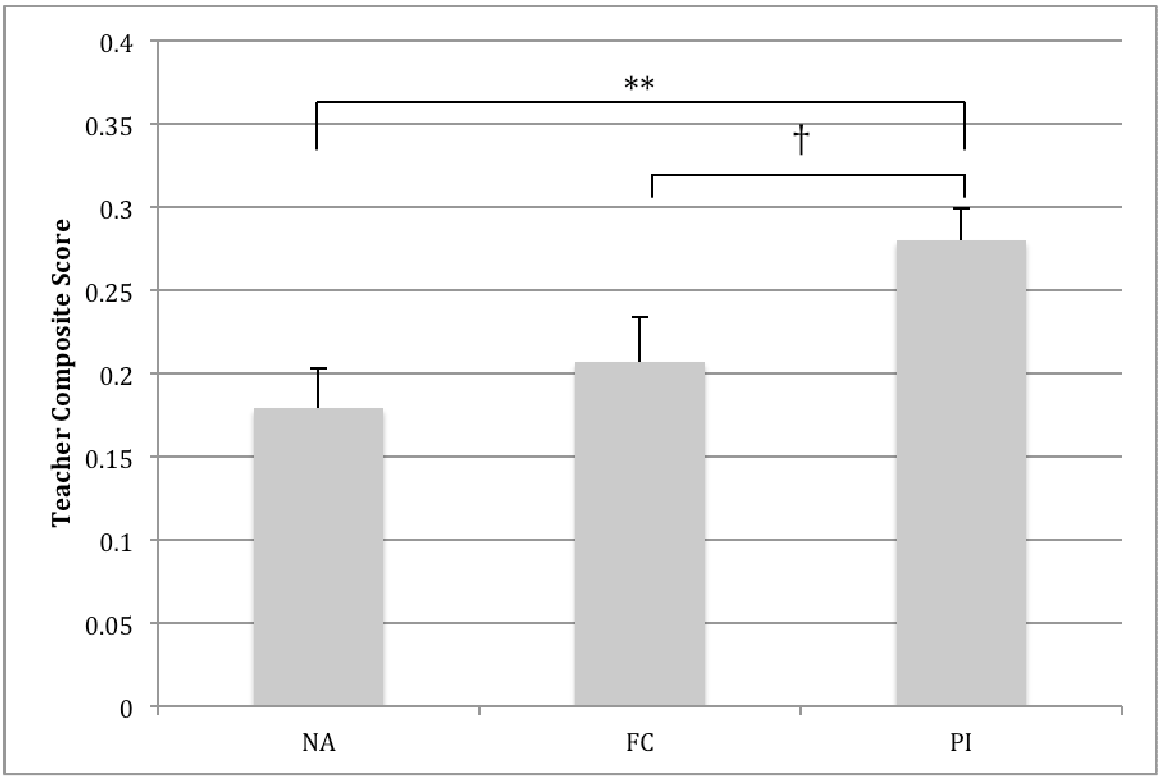

Figure 3. Group differences in teacher rated peer difficulties for non-adopted (NA), foster care (FC) and post institutionalized (PI) children.

** $p < .01$, † $p < .10$

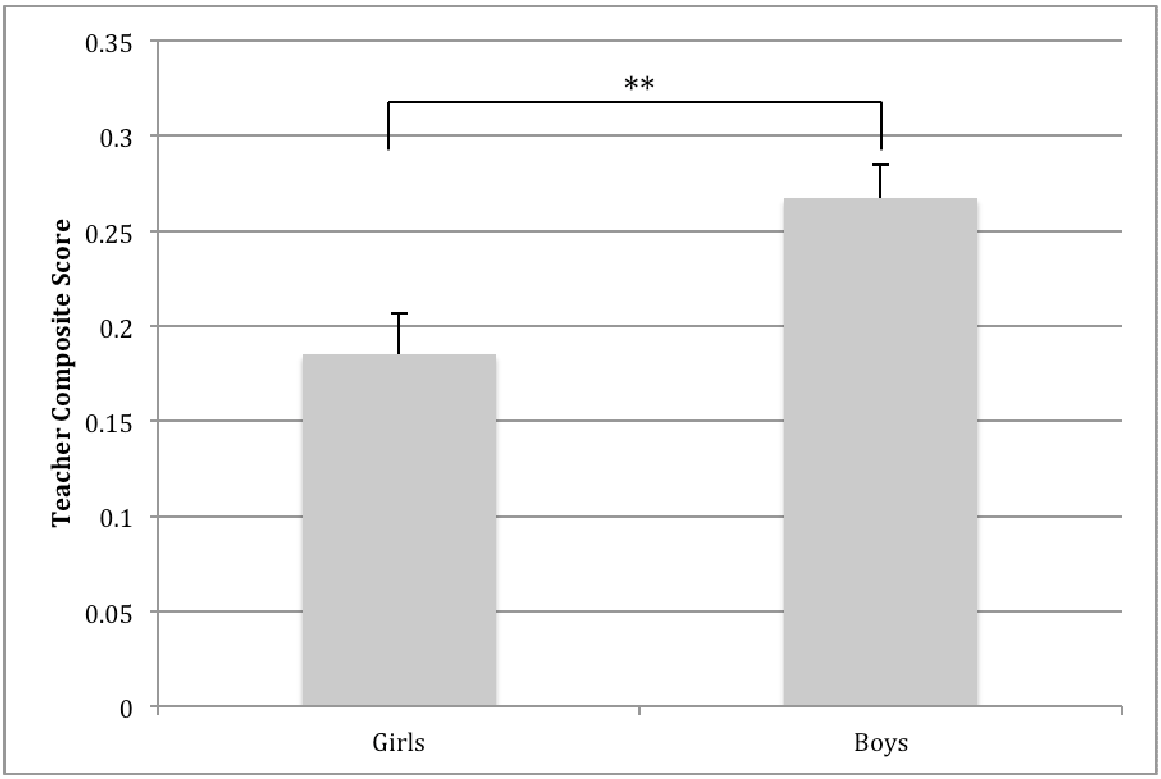

Figure 4. Gender differences in teacher ratings of peer difficulties. Mean scores for girls and boys are shown.

** $p < .01$

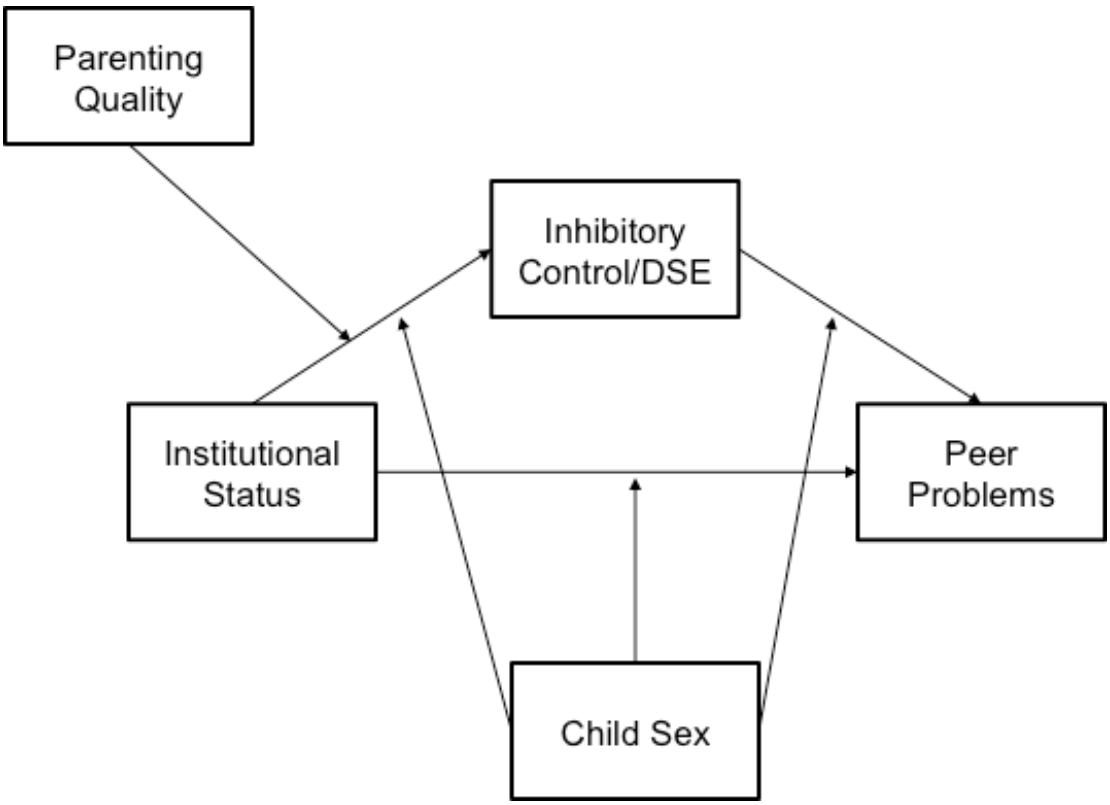

Figure 5. Theoretical model of moderated mediation hypotheses. DSE = disinhibited social engagement. Covariates included in the model are child age at kindergarten and child IQ.

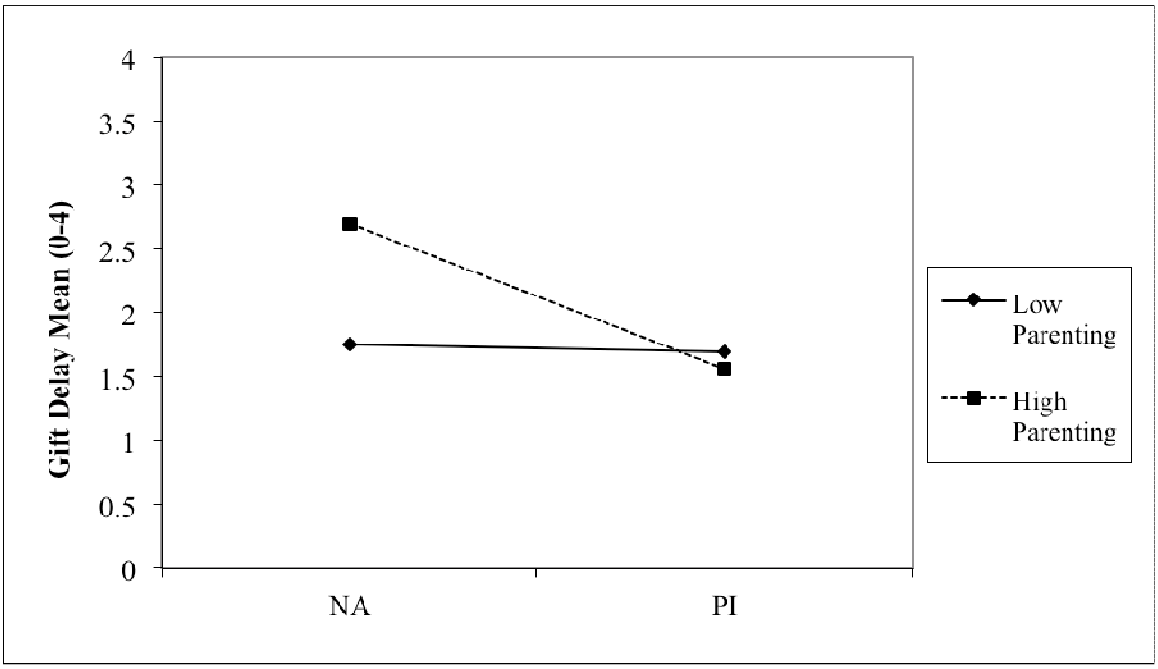

Figure 6. The two-way interaction between parenting quality and group status in predicting gift delay performance. Associations with gift delay scores are shown at low (-1 SD) and high (+1 SD) levels of parenting. NA = non-adopted, PI = post institutionalized.

References

Aiken, L. S., & West, S. G. (1991). Multiple regression: Testing and interpreting interactions. Newbury Park, CA: Sage.

Achenbach, T. M., McConaughy, S. H., & Howell, C. T. (1987). Child/adolescent behavioral and emotional problems: implications of cross-informant correlations for situational specificity. *Psychological Bulletin*, *101*(2), 213–232. doi:10.1037/0033-2909.101.2.213

Adolphs, R. (2003). Cognitive neuroscience of human social behaviour. *Nature Reviews Neuroscience*, *4*(3), 165-178.

Ames, E. (1997). *The development of Romanian orphanage children adopted to Canada* (Final Report to the National Welfare Grants Program: Human Resources Development Canada). Burnaby, Canada: Simon Fraser University.

Avishai-Eliner, S., Brunson, K. L., Sandman, C. A., Baram, T. Z. (2002). Stressed-out, or in (utero)? *Trends in Neurosciences, 25*, 518-524, doi:10.1016/S0166-2236(02)02241-5.

Bakermans-Kranenburg, M. J., Steele, H., Zeanah, C. H., Muhamedrahimov, R. J., Vorria, P., Dobrova-Krol, N. A., ... & Gunnar, M. R. (2011). III. Attachment and emotional development in institutional care: characteristics and catch up. *Monographs of the Society for Research in Child Development*, *76*, 62-91.

Barcons, N., Abrines, N., Brun, C., Sartini, C., Fumadó, V., & Marre, D. (2012). Social relationships in children from intercountry adoption. *Children and Youth Services Review*, *34*, 955-961.

Bernath, M. S., & Feshbach, N. D. (1995). Children's trust: Theory, assessment, development, and research directions. *Applied and Preventive Psychology, 4*, 1–19. doi:10.1016/S0962-1849(05)80048-4

Bernier, A., Carlson, S. M., & Whipple, N. (2010). From external regulation to self-regulation: Early parenting precursors of young children's executive functioning. *Child Development*, *81*(1), 326-339.

Bimmel, N., Juffer, F., van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2003). Problem behavior of internationally adopted adolescents: A review and meta-analysis. *Harvard Review of Psychiatry*, *11*(2), 64–77. doi:10.1080/10673220303955

Boivin, M., Hymel, S., & Bukowski, W. M. (1995). The roles of social withdrawal, peer rejection, and victimization by peers in predicting loneliness and depressed mood in childhood. *Development and Psychopathology, 7*, 765-785.

Bos, K. J., Fox, N., Zeanah, C. H., & Nelson, C. A. (2009). Effects of early psychosocial deprivation on the development of memory and executive function. *Frontiers in Behavioral Neuroscience*, *3*.

Bowlby, J. (1980). *Attachment and loss: Vol 3. Loss, sadness, and depression.* New York: Basic Books.

Boyce, W. T., & Ellis, B. J. (2005). Biological sensitivity to context: I. An evolutionary-developmental theory of the origins and functions of stress reactivity.

Development and Psychopathology, *17*, 271-301.doi:10.1017/S0954579405050145

Boyce, W. T., Essex, M. J., Woodward, H. R., Measelle, J. F., Ablow, J. C., Kupfer, D. J., et al. (2002). The confluence of mental, physical, social, and academic difficulties in middle childhood. Exploring the "headwaters" of early life morbidities. *Journal of the American Academy of Child and Adolescent Psychiatry, 41*, 580-587.

Brace, N., Kemp, R., & Snelgar, R. (2006). *SPSS for Psychologists: A Guide to Data Analysis Using SPSS for Windows.* Mahwah, NJ: L. Erlbaum Associates.

Brodzinsky, D., & Pinderhughes, E. (2005). Parenting and child development in adoptive families. In M. H. Bornstein (Ed.), *Handbook of parenting*, Vol. 1, (pp. 279-313).

Brodzinsky, D. M., Schechter, D. E., Braff, A. M., & Singer, L. M. (1984). Psychological and academic adjustment in adopted children. *Journal of Consulting and Clinical Psychology*, *52*, 582–590. doi:10.1037/0022-006X.52.4.582

Bruce, J., Tarullo, A. R., & Gunnar, M. R. (2009). Disinhibited social behavior among internationally adopted children. *Development and Psychopathology, 21*, 157-171. doi: S0954579409000108 [pii]10.1017/S0954579409000108

Brown, T. A. (2006). *Confirmatory Factor Analysis for Applied Research*. New York, NY: Guilford Press.

Card, N. A., Stucky, B. D., Sawalani, G. M., & Little, T. D. (2008). Direct and indirect aggression during childhood and adolescence: A meta-analytic review of gender differences, intercorrelations, and relations to maladjustment. *Child Development, 79*, 1185–1229. doi:10.1111/j.1467-8624.2008.01184.x

Carlson, S. M., & Wang, T. S. (2007). Inhibitory control and emotion regulation in preschool children. *Cognitive Development*, *22*, 489-510.

Chisholm, K. (1998). A three year follow-up of attachment and indiscriminate friendliness in children adopted from Romanian orphanages. *Child Development*, *69*, 1092–1106. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/9768488

Chisholm, K., Carter, M. C., Ames, E. W., & Morison, S. J. (1995). Attachment security and indiscriminately friendly behavior in children adopted from Romanian orphanages. *Development and Psychopathology*, *7*, 283-294. doi:10.1017/S0954579400006507

Cicchetti, D. (1984). The emergence of developmental psychopathology. *Child Development, 55,* 1-7.

Cicchetti, D., & Rogosch, F. A. (1996). Equifinality and multifinality in developmental psychopathology. *Development and Psychopathology*, *8*, 597-600.

Cicchetti, D., & Valentino, K. (2006). *An ecological-transactional perspective on child maltreatment: Failure of the average expectable environment and its influence on child development.* In D. Cicchetti, & D. J. Cohen (Eds.), Developmental Psychopathology (Vol. 3, 2nd ed., pp. 129–201). New York: Wiley.

Coie, J. D., & Dodge, K. A. (1988). Multiple sources of data on social behavior and social status in the school: A cross-age comparison. *Child Development*, 815-829.

Coie, J. D., Dodge, K. A., & Kupersmidt, J. B. (1990). Peer group behavior and social status. In S. R. Asher & J. D. Coie (Eds.), *Peer rejection in childhood* (pp. 17-59). New York: Cambridge University Press.

Collishaw, S., Maughan, B., & Pickles, A. (1998). Infant adoption: Psychosocial outcomes in adulthood. *Social Psychiatry and Psychiatric Epidemiology*, *33*, 57–65. doi:10.1007/s001270050023

Colvert, E., Rutter, M., Beckett, C., Castle, J., Groothues, C., Hawkins, A., et al. (2008). Emotional difficulties in early adolescence following severe early deprivation: Findings from the English and Romanian adoptees study. *Development and Psychopathology , 20*, 547-567.

Craig, W. M., Pepler, D., & Atlas, R. (2000). Observations of bullying in the playground and in the classroom. *School Psychology International*, *21*(1), 22-36.

Crick, N. R. (1996). The role of overt aggression, relational aggression, and prosocial behavior in the prediction of children's future social adjustment. *Child Development, 67,* 2317–2327.

Crick, N. R., & Bigbee, M. A. (1998). Relational and overt forms of peer victimization: A multiinformant approach. *Journal of Consulting and Clinical Psychology , 66*, 337-347.

Crick, N. R., Casas, J. F., & Mosher, M. (1997). Relational and overt aggression in preschool. *Developmental Psychology, 33*, 579-578. doi:10.1037/0012-1649.33.4.579

Crick, N. R., & Grotpeter, J. K. (1995). Relational aggression, gender, and social-psychological adjustment. *Child Development, 66* (3), 710-722.

Crick, N.R., & Grotpeter, J.K. (1996). Children's treatment by peers: Victims of relational and overt aggression. *Development and Psychopathology, 8, 367-380.*

Cullerton-Sen, C., Cassidy, A.R., Murray-Close, D., Cicchetti, D., Crick, N.R., & Rogosch, F.A. (2008). Childhood maltreatment and the development of relational and physical aggression: The importance of a gender-informed approach. *Child Development, 79*, 1736-1751.

Cullerton-Sen, C., & Crick, N. R. (2005). Understanding the effects of physical and relational victimization: The utility of multiple perspectives in predicting social-emotional adjustment. *School Psychology Review*, *34*, 147–160.

Diamond, A. (2012). Activities and programs that improve children's executive functions. *Current Directions in Psychological Science*, *21*(5), 335–341. doi:10.1177/0963721412453722

Dozier, M., Peloso, E., Lindhiem, O., Gordon, M. K., Manni, M., Sepulveda, S., … Levine, S. (2006). Developing evidence based interventions for foster children: An example of a randomized clinical trial with infants and toddlers. *Journal of Social Issues*, *62*(4), 767–785. doi:10.1111/j.1540-4560.2006.00486.

Dozier, M., Zeanah, C. H., Wallin, A. R., & Shauffer, C. (2012). Institutional care for young children: Review of literature and policy implications. *Social Issues and Policy Review*, *6*(1), 1–25. doi:10.1111/j.1751-2409.2011.01033.x

Egan, S. K., & Perry, D. G. (1998). Does low self-regard invite victimization? *Developmental Psychology , 34* (2), 299-309.

Eisenberg, N., Valiente, C., Fabes, R. A., Smith, C. L., Reiser, M., Shepard, S. A., … Cumberland, A. J. (2003). The relations of effortful control and ego control to children's resiliency and social functioning. *Developmental Psychology*, *39*, 761–776. DOI: 10.1037/0012-1649.39.4.761

Erdfelder, E., Faul, F., & Buchner, A. (1996). GPOWER: A general power analysis program. *Behavior Research Methods, Instruments, & Computers*, *28*(1), 1-11.

Essex, M. J., Boyce, T. W., Heim Goldstein, L., Armstrong, J. M., Kraemer, H. C., Kupfer, D. J., et al. (2002). The confluence of mental, physical, social, and academic difficulties in middle childhood. II: Developing the MacArthur Health and Behavior Questionnaire. *Journal of the American Academy of Child and Adolescent Psychiatry, 41*, 588-603.

Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods*, *4*(3), 272–299. doi:10.1037/1082-989X.4.3.272

Fisher, L., Ames, E. W., Chisholm, K., & Savoie, L. (1997). Problems reported by parents of Romanian orphans adopted to British Columbia. *International Journal of Behavioral Development, 20,* 67-82.

Gaub, M., & Carlson, C. L. (1997). Gender differences in ADHD: a meta-analysis and critical review. *Journal of the American Academy of Child & Adolescent Psychiatry*, *36*, 1036-1045.

Glennen, S., & Bright, B. J. (2005). Five years later: Language in school-age internationally adopted children. *Seminars in Speech and Language*, *26*, 86–101. doi:10.1055/s-2005-864219

Goldfarb, W. (1943). The effects of early institutional care on adolescent personality. *The Journal of Experimental Educational*, 106-129.

Greene, R. W., Biederman, J., Faraone, S. V, Monuteaux, M. C., Mick, E., DuPre, E. P., … Goring, J. C. (2001). Social impairment in girls with ADHD: Patterns, gender comparisons, and correlates. *Journal of the American Academy of Child and Adolescent Psychiatry*, *40*(6), 704–710. doi:10.1097/00004583-200106000-00016

Groza, V. (1999). Institutionalization, behavior, and international adoption. *Journal of Immigrant Health*, *1*, 133–143. doi:10.1023/A:1022060902280

Groze, V., & Ileana, D. (1996). A follow-up study of adopted children from Romania. *Child and Adolescent Social Work Journal, 13*, 541-565.

Gunnar, M.R. (2001). *Effects of Early Deprivation: Findings from Orphanage-Reared Infants and Children.* In Nelson and Luciana (Eds.), Handbook of Developmental Cognitive Neuroscience, USA: MIT.

Gunnar, M. R., Bruce, J., & Grotevant, H. D. (2000). International adoption of institutionally reared children: Research and policy. *Development and Psychopathology*, *12*, 677–693. doi:10.1017/S0954579400004077

Gunnar, M. R., Kryzer, E., van Ryzin, M. J., & Phillips, D. A. (2010). The rise in cortisol in family day care: Associations with aspects of care quality, child behavior, and child sex. *Child Development*, *81*(3), 851-869.

Gunnar, M., & Quevedo, K. (2007). The neurobiology of stress and development. *Annual Review of Psychology*, 58, 145–73. doi:10.1146/annurev.psych.58.110405.085605

Gunnar, M. R., van Dulmen, M. H., & International Adoption Project Team (2007). Behavior problems in postinstitutionalized internationally adopted children. *Development and Psychopathology, 19*, 129-148.

Hanish, L. D., Eisenberg, N., Fabes, R. A., Spinrad, T. L., Ryan, P., & Schmidt, S. (2004). The expression and regulation of negative emotions: Risk factors for young children's peer victimization. *Development and Psychopathology*, *16*, 335-353. doi:10.1017/S0954579404044542

Hartup, W. W., & Moore, S. G. (1990). Early peer relations: Developmental significance and prognostic implications. *Early Childhood Research Quarterly*, *5*, 1–17. doi:10.1016/0885-2006(90)90002-I

Hawk, B., & McCall, R. (2011). Specific extreme behaviors of postinstitutionalized Russian adoptees. *Developmental Psychology, 47*, 732-738.

Hawker, D. S., & Boulton, M. J. (2000). Twenty years' research on peer victimization and psychosocial maladjustment: A meta-analytic review of cross-sectional studies. *Journal of Child Psychology and Psychiatry, 41*, 441-455.

Hay, D. F., Payne, A., & Chadwick, A. (2004). Peer relations in childhood. *Journal of Child Psychology and Psychiatry*, *45*, 84-108.

Hayes, A. F. (2015). An index and test of linear moderated mediation. *Multivariate Behavioral Research, 50*, 1-22.

He, J., Degnan, K. A., McDermott, J. M., Henderson, H. A., Hane, A. A., Xu, Q., & Fox, N. A. (2010). Anger and approach motivation in infancy: Relations to early childhood inhibitory control and behavior problems. *Infancy*, *15*(3), 246–269. doi:10.1111/j.1532-7078.2009.00017.x

Heim, C., Owens, M. J., Plotsky, P. M., & Nemeroff, C. B. (1997). The role of early adverse life events in the etiology of depression and posttraumatic stress disorder. Focus on corticotropin-releasing factor. *Annals of the New York Academy of Sciences*, *821,* 194-207. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/9238204

Hodges, J., & Tizard, B. (1989). Social and family relationships of ex-institutional adolescents. *Journal of Child Psychology and Psychiatry, 30*, 77-97.

Hofer, M. A. (2006). Psychobiological roots of early attachment. *Current Directions in Psychological Science, 15*(2), 84–88. doi:10.1111/j.0963-7214.2006.00412.x

Hoglund, W. L. (2007). School functioning in early adolescence: Gender-linked responses to peer victimization. *Journal of Educational Psychology*, *99*, 683-699. doi:10.1037/0022-0663.99.4.683

Hostinar, C. E., Stellern, S. A., Schaefer, C., Carlson, S. M., & Gunnar, M. R. (2012). Associations between early life adversity and executive function in children adopted internationally from orphanages. *Proceedings of the National Academy of Sciences*, *109*, 17208-17212.

Jaffari-Bimmel, N., Juffer, F., van Ijzendoorn, M. H., Bakermans-Kranenburg, M. J., & Mooijaart, A. (2006). Social development from infancy to adolescence: Longitudinal and concurrent factors in an adoption sample. *Developmental Psychology*, *42*(6), 1143–1153. doi:10.1037/0012-1649.42.6.1143

Johnson, D. E. (2000). Long-term medical issues in international adoptees. *Pediatric Annals, 29*, 234-241.

Juffer, F., Bakermans-Kranenburg, M. J., & van IJzendoorn, M. H. (2005). The importance of parenting in the development of disorganized attachment: Evidence from a preventive intervention study in adoptive families. *Journal of Child Psychology and Psychiatry*, *46*, 263-274.

Juffer, F., Stams, G. J. M., & van IJzendoorn, M. H. (2004). Adopted children's problem behavior is significantly related to their ego resiliency, ego control, and sociometric status. *Journal of Child Psychology and Psychiatry, 4*, 697–706.

Juffer, F., & van IJzendoorn, M. H. (2005). Behavior problems and mental health referrals of international adoptees: A meta-analysis. *Journal of the American Medical Association, 293*, 2501-2515.

Julian, M. M. (2010). *Social skills in post-institutional adopted children.* (Unpublished master's thesis). University of Pittsburgh, Pittsburgh, USA.

Karreman, A., de Haas, S., van Tuijl, C., van Aken, M. G., & Deković, M. (2010). Relations among temperament, parenting and problem behavior in young children. *Infant Behavior & Development*, *33*, 39–49. DOI: 10.1016/j.infbeh.2009.10.008

Kerr, D. C. R., Capaldi, D. M., Pears, K. C., & Owen, L. D. (2009). A prospective three generational study of fathers' constructive parenting: influences from family of origin, adolescent adjustment, and offspring temperament. *Developmental Psychology*, *45*(5), 1257–1275. doi:10.1037/a0015863

Kim, J., & Cicchetti, D. (2006). Longitudinal trajectories of self-system processes and depressive symptoms among maltreated and nonmaltreated children. *Child Development*, *77*, 624–39. doi:10.1111/j.1467-8624.2006.00894.x

Kochanska, G., Murray, K., & Coy, K. C. (1997). Inhibitory control as a contributor to conscience in childhood: From toddler to early school age. *Child Development*, *68*(2), 263-277.

Kochanska, G., Murray, K., Jacques, T. Y., Koenig, A. L., & Vandegeest, K. A. (1996). Inhibitory control in young children and its role in emerging internalization. *Child Development*, *67*, 490-507.

Kryzer, E. M., Kovan, N., Phillips, D. A., Domagall, L. A., & Gunnar, M. R. (2007). Toddlers' and preschoolers' experience in family day care: Age differences and behavioral correlates. *Early Childhood Research Quarterly*, *22*(4), 451-466.

Landry, S. H., Smith, K. E., & Swank, P. R. (2006). Responsive parenting: Establishing early foundations for social, communication, and independent problem-solving skills. *Developmental Psychology*, *42*(4), 627–42. DOI: 10.1037/0012-1649.42.4.627

Lawler, J. M., Hostinar, C. E., Mliner, S. B., & Gunnar, M. R. (2014). Disinhibited social engagement in postinstitutionalized children: Differentiating normal from atypical behavior. *Development and Psychopathology, 26*, 451–464. DOI: 10.1017/S0954579414000054

Lezak, M. (1995). *Neuropsychological assessment* (3rd ed.). New York: Oxford University Press.

Lengua, L. J., Honorado, E., & Bush, N. R. (2007). Contextual risk and parenting as predictors of effortful control and social competence in preschool children. *Journal of Applied Developmental Psychology*, *28*, 40–55. DOI: 10.1016/j.appdev.2006.10.001

Liew, J., Eisenberg, N., & Reiser, M. (2004). Preschoolers' effortful control and negative emotionality, immediate reactions to disappointment, and quality of social functioning. *Journal of Experimental Child Psychology*, *89*(4), 298-319.

MacLean, K. (2003). The impact of institutionalization on child development. *Development and Psychopathology, 15,* 853-884.

McDermott, J. M. (2005). *The zoo game*. College Park, MD: University of Maryland.

McNelles, L. R., & Connolly, J. A. (1999). Intimacy between adolescent friends: Age and gender differences in intimate affect and intimate behaviors. *Journal of Research on Adolescence*, *9*, 143-159.

Merz, E. C., & McCall, R. B. (2010). Behavior problems in children adopted from psychosocially depriving institutions. *Journal of Abnormal Child Psychology, 38*, 459-470.

Merz, E. C., & McCall, R. B. (2011). Parent ratings of executive functioning in children adopted from psychosocially depriving institutions. *Journal of Child Psychology and Psychiatry*, *52*, 537-546.

Merz, E. C., McCall, R. B., & Groza, V. (2013). Parent-reported executive functioning in postinstitutionalized children: A follow-up study. *Journal of Clinical Child & Adolescent Psychology*, *42*, 726-733.

Muhamedrahimov, R. J., Agarkova, V. V., Vershnina, E. A., Palmov, O. I., Nikiforova, N. V., McCall, R. B., & Groark, C. J. (2014). Behavior problems in children transferred from a socioemotionally depriving institution to St. Petersburg (Russian Federation) families. *Infant Mental Health Journal*, *35*, 111–122. doi:10.1002/imhj.

Murray-Close, D., Ostrov, J. M., & Crick, N. R. (2007). A short-term longitudinal study of growth of relational aggression during middle childhood: Associations with gender, friendship intimacy, and internalizing problems. *Development and Psychopathology, 19,* 187–203. doi:10.1017/S0954579407070101

Nansel, T. R., Overpeck, M., Pilla, R. S., Ruan, W. J., Simons-Morton, B., & Scheidt, P. (2001). Bullying behaviors among US youth: Prevalence and association with psychosocial adjustment. *JAMA Journal of the American Medical Association , 285*, 2094-2100.

Nelson, C. A., Zeanah, C. H., Fox, N. A, Marshall, P. J., Smyke, A. T., & Guthrie, D. (2007). Intervention Project, Science, *318*, 1937–1940.

O'Connor, T. G., Bredenkamp, D., Rutter, M., & English and Romanian Adoptees (ERA) Study Team. (1999). Attachment disturbances and disorders in children exposed to early severe deprivation. *Infant Mental Health Journal, 20*, 10-29.

O'Connor, T. G., Marvin, R. S., Rutter, M., Olrick, J. T., Britner, P. A., & English and Romanian Adoptees Study Team (2003). Child-parent attachment following early institutional deprivation, *Development and Psychopathology, 15*, 19–38.

Ostrov, J. M., & Godleski, S. A. (2010). Toward an integrated gender-linked model of

aggression subtypes in early and middle childhood. *Psychological Review*, *117*, 233-242. doi: 10.1037/a0018070

Parker, J. G., & Asher, S. R. (1987). Peer relations and later personal adjustment: are low-accepted children at risk? *Psychological Bulletin*, *102*, 357–389. doi:10.1037/0033-2909.102.3.357

Parker, S. W., & Nelson, C. A. (2005). The impact of early institutional rearing on the ability to discriminate facial expressions of emotion: An event-related potential study. *Child Development, 76*, 54-72.

Pears, K. C., Bruce, J., Fisher, P. A., & Kim, H. K. (2010). Indiscriminate friendliness in maltreated foster children. *Child Maltreatment*, *15*(1), 64–75. doi:10.1177/1077559509337891

Pears, K. C., Fisher, P. A., Bruce, J., Kim, H. K., & Yoerger, K. (2010). Early elementary school adjustment of maltreated children in foster care: the roles of inhibitory control and caregiver involvement. *Child Development*, *81*(5), 1550–64. doi:10.1111/j.1467-8624.2010.01491.x

Petit, G. S., Bates, J. E., & Dodge, K. A. (1997). Supportive parenting, ecological context, and children's adjustment: A seven-year longitudinal study. *Child Development, 68,* 908-923.

Pepler, D. J., & Craig, W. M. (1998). Assessing Children's Peer Relationships. *Child Psychology & Psychiatry Review, 3*, 176–182.

Pitula, C. E., Mliner, S. B., Koss, K. J., & Gunnar, M. R. (2015, March). *Early Cortisol Dysregulation Predicts Attention and Behavior Regulation in Kindergarten Among Internationally Adopted Youth.* Poster presented at the Society for Research on Child Development Biennial Meeting, Philadelphia, PA.

Pitula, C. E., Thomas, K. M., Armstrong, J. M., Essex, M. J., Crick, N. R., & Gunnar, M. R. (2014). Peer victimization and internalizing symptoms among post-institutionalized, internationally adopted youth. *Journal of Abnormal Child Psychology*. doi:10.1007/s10802-014-9855-z

Pollak, S. D., Nelson, C. A., Schlaak, M. F., Roeber, B. J., Wewerka, S. S., Wiik, K. L., et al. (2010). Neurodevelopmental effects of early deprivation in postinstitutionalized children. *Child Development, 81*, 224-236.

Preacher, K. J., & Hayes, A. F. (2004). SPSS and SAS procedures for estimating indirect effects in simple mediation models. *Behavior Research Methods, Instruments, & Computers, 36*, 717-731.

Preacher, K. J., Rucker, D. D., & Hayes, A. F. (2007). Addressing moderated mediation hypotheses: Theory, methods, and prescriptions. *Multivariate Behavioral Research, 42,* 185-227.

Prinstein, M. J., Boergers, J., & Vernberg, E. M. (2001). Overt and relational aggression in adolescents: Social-psychological adjustment of aggressors and victims. *Journal of Clinical Child Psychology, 30,* 37–41.

Putallaz, M., Grimes, C. L., Foster, K. J., Kupersmidt, J. B., Coie, J. D., & Dearing, K. (2007). Overt and relational aggression and victimization: multiple perspectives within the school setting. *Journal of School Psychology*, *45*, 523-547. doi:10.1016/j.jsp.2007.05.003

Raaska, H., Lapinleimu, H., Sinkkonen, J., Salmivalli, C., Matomäki, J., Mäkipää, S., et al. (2012). Experiences of school bullying among internationally adopted children: Results from the Finnish Adoption (FINADO) Study. *Child Psychiatry and Human Development, 43*, 592-611.

Reijntjes, A., Kamphuis, J. H., Prinzie, P., & Telch, M. J. (2010). Peer victimization and internalizing problems in children: A meta-analysis of longitudinal studies. *Child Abuse & Neglect, 34,* 244–252. doi:10.1016/j.chiabu.2009.07.009

Roisman, G. L., Padrón, E., Sroufe, L. A., & Egeland, B. (2002). Earned-secure attachment status in retrospect and prospect. *Child Development*, *73*(4), 1204–19. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/12146743

Rose, A. J., & Rudolph, K. D. (2006). A review of sex differences in peer relationship processes: Potential trade-offs for the emotional and behavioral development of girls and boys. *Psychological Bulletin*, *132*(1), 98–131. doi:10.1037/0033-2909.132.1.98

Roy, P., Rutter, M., & Pickles, A. (2004). Institutional care: associations between overactivity and lack of selectivity in social relationships. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *45*(4), 866–73. doi:10.1111/j.1469-7610.2004.00278.x

Rubin, K. H., Bukowski, W. M., & Parker, J. G. (2007). Peer interactions, relationships, and groups. *Handbook of Child Psychology*.

Rutter, M. L., Kreppner, J. M., & O'Connor, T. G. (2001). Specificity and heterogeneity in children's responses to profound institutional privation. *British Journal of Psychiatry , 179*, 97-103.

Schneider, B. H., Atkinson, L., & Tardif, C. (2001). Child-parent attachment and children's peer relations: A quantitative review. *Developmental Psychology*, *37,* 86-100. doi:10.1037/0012-1649.37.1.86

Schwartz, D. (2000). Subtypes of victims and aggressors in children's peer groups. *Journal of Abnormal Child Psychology, 28*(2), 181–192.

Schwartz, D., Dodge, K. A., Coie, J. D., Hubbard, J. A., Cillessen, A. H., Lemerise, E. A., & Bateman, H. (1998). Social-cognitive and behavioral correlates of aggression and victimization in boys' play groups. *Journal of Abnormal Child Psychology*, *26*, 431-40. Retrieved from http://www.ncbi.nlm.nih.gov/pubmed/9915650

Schwartz, D., Proctor, L. J., & Chien, D. H. (2001). The aggressive victim of bullying. In J. Juvonen & S. Graham (Eds.), *Peer harassment in school: The plight of the vulnerable and victimized* (pp. 147-174). New York, NY: The Guilford Press. 147-174.

Shields, A., & Cicchetti, D. (2001). Parental Maltreatment and Emotion Dysregulation as Risk Factors for Bullying and Victimization in Middle Childhood. *Journal of Clinical Child Psychology, 30,* 349-363.

Shin, Y., & Kim, H. Y. (2008). Peer victimization in Korean preschool children: The effects of child characteristics, parenting behaviours and teacher-child relationships. *School Psychology International*, *29*(5), 590–605. DOI: 10.1177/0143034308099203

Smyke, A. T., Dumitrescu, A., & Zeanah, C. H. (2002). Attachment disturbances in young children. I: The continuum of caretaking casualty. *Journal of the American Academy of Child & Adolescent Psychiatry*, *41*, 972-982.

Sonuga-Barke, E. J., Schlotz, W., & Kreppner, J. (2010). Differentiating developmental trajectories for conduct, emotion, and peer problems following early deprivation. *Monographs of the Society for Research in Child Development , 75*, 102-124.

Sroufe, L. A. (1979). The coherence of individual development: Early care, attachment, and subsequent developmental issues. *American Psychologist, 34,* 834-841.

Sroufe, L. A. (2000). Early relationships and the development of children. *Infant Mental Health Journal*, *21*, 67–74.

Sroufe, L. A, & Rutter, M. (1984). The domain of developmental psychopathology. *Child Development*, *55*, 17–29. doi:10.2307/1129832

Stams, G. J., Juffer, F., Rispens, J., & Hoksbergen, R. A. (2000). The development and adjustment of 7-year-old children adopted in infancy. *Journal of Child Psychology and Psychiatry, and Allied Disciplines*, *41*, 1025–37.

Stams, G. J. M., Juffer, F., & van IJzendoorn, M. H. (2002). Maternal sensitivity, infant attachment, and temperament in early childhood predict adjustment in middle childhood: The case of adopted children and their biologically unrelated parents. *Developmental Psychology*, *38*(5), 806–821. doi:10.1037//0012-1649.38.5.806

Steinberg, L., & Morris, A. S. (2001). Adolescent development. *Annual Review of Psychology*, *52*, 83-110.

Strohmeier, D., Karna, A., & Salmivalli, C. (2011). Personal and interpersonal risk factors for peer victimization in immigrant youth in Finland. *Developmental Psychology, 47*, 248-258.

Tan, T. X., & Camras, L. A. (2011). Social skills of adopted Chinese girls at home and in school: Parent and teacher ratings. *Children and Youth Services Review*, *33*, 1813–1821. doi:10.1016/j.childyouth.2011.05.006

Tan, T. X., & Marfo, K. (2006). Parental ratings of behavioral adjustment in two samples of adopted Chinese girls: Age-related versus socio-emotional correlates and predictors. *Journal of Applied Developmental Psychology*, *27*, 14–30. doi:10.1016/j.appdev.2005.12.004

Tapp, J. (2003). Procoder for digital video [Computer software]. Nashville, TN: Vanderbilt Kennedy Center.

Tarullo, A. R., Bruce, J., & Gunnar, M. R. (2007). False belief and emotion understanding in post-institutionalized children. *Social Development , 16*, 57-78.

Tieman, W., van der Ende, J., & Verhulst, F. C. (2006). Social functioning of young adult intercountry adoptees compared to nonadoptees. *Social Psychiatry and Psychiatric Epidemiology*, *41*, 68–74. doi:10.1007/s00127-005-0995-x

Tizard, B., & Hodges, J. (1978). The effect of early institutional rearing on the development of eight year old children. *Journal of Child Psychology and Psychiatry, 19*, 99-118.

Tizard, B., & Rees, J. (1975). The effect of early institutional rearing on the behaviour problems and affectional relationships of four-year-old children. *Journal of Child Psychology and Psychiatry*, *16*(1), 61-73.

Van den Dries, L., Juffer, F., van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2009). Fostering security? A meta-analysis of attachment in adopted children. *Children and Youth Services Review*, *31*, 410–421. doi:10.1016/j.childyouth.2008.09.008

Van IJzendoorn, M. H., & Juffer, F. (2006). The Emanuel Miller Memorial Lecture 2006: Adoption as intervention. Meta-analytic evidence for massive catch-up and plasticity in physical, socio-emotional, and cognitive development. *Journal of Child Psychology and Psychiatry*, *47*(12), 1228-1245.

Veenstra, R., Lindenberg, S., Oldehinkel, A. J., De Winter, A. F., Verhulst, F. C., & Ormel, J. (2005). Bullying and victimization in elementary schools: A comparison of bullies, victims, bully/victims, and uninvolved preadolescents. *Developmental Psychology , 41* (4), 672-682.

Verhulst, F. C. (2000). Internationally adopted children: The Dutch longitudinal adoption study. *Adoption Quarterly*, *4*, 45–65. doi:10.1300/J145v04n01

West, S. G., Finch, J. F., & Curran, P. J. (1995). Structural equation models with non-normal variables: Problems and remedies. In R. Hoyle (Ed.), *Structural Equation Modeling: Concepts, Issues and Applications* (pp. 56-75). Newbury Park, CA: Sage.

Waters, E., & Sroufe, L. A. (1983). Social competence as a developmental construct. *Developmental Review*, *3*, 79–97. doi:10.1016/0273-2297(83)90010-2

Warford, L. (2002). *Peer relationships of Romanian orphans 10 years after adoption to Canada: A longitudinal study.* (Unpublished master's thesis). Simon Fraser University, Burnaby, Canada.

Wentzel, K. R., & Asher, S. R. (1995). The academic lives of neglected, rejected, popular, and controversial children. *Child Development*, *66*(3), 754-763.

Wiik, K. L., Loman, M. M., Van Ryzin, M. J., Armstrong, J. M., Essex, M. J., Pollak, S. D., & Gunnar, M. R. (2011). Behavioral and emotional symptoms of post-institutionalized children in middle childhood. *Journal of Child Psychology and Psychiatry*, *52*, 56–63. doi:10.1111/j.1469-7610.2010.02294.x

Wismer Fries, A. B., & Pollak, S. D. (2004). Emotion understanding in post-institutionalized Eastern European children. *Development and Psychopathology, 16*, 355-369.

Appendix A

Peer Relations Observation Inventory – Revised (PROI-R)

Level of Positive/Neutral Social Integration

The goal of scoring the target child's level of social integration in interactions is to get a sense of how well integrated the child is with other in a positive/neutral way during times when interacting with other children/adult(s) seems to be some part of the child's agenda. Only score "Level of Positive/Neutral Social Integration" for those interactions that are positive/neutral in nature. If the target child is alone or if the interaction is negative in nature, do not score low or high. For every interval, score the predominant level for each 30-second interval. Interactions with other children and with teachers or other adults should be taken into consideration when determining the child's level of positive/neutral social integration. If the target child is only interacting with the teacher, code Adult-only. If the target child has interactions with both children and adults, or only with other children, choose between the Low or High codes. In structured situations like teacher lecture or assigned small group activities where the teacher is leading or facilitating the group, NA should be coded because the teacher is influencing or directing the amount of interaction and integration possible.

Not Applicable: Teacher-led group or Negative interaction
The teacher is structuring the group interactions and therefore placing restraints on the social integration: teacher-led discussion/lecture or teacher-facilitated small groups would be coded here. Also code Not Applicable if the interaction is negative for the majority of the interval (negative interaction section should be scored).

Alone
The teacher is not structuring the activity, but the target child is not involved in a positive/neutral social interaction with either another child or adult. The child is either not interacting with anyone or the interactions are negative. The target child may be nearby other children, and might even be using the same toys or resources, but is not acknowledged or spoken to. If the teacher has instructed the child to work alone, do NOT code here (code Not Applicable). Whenever a child's activity is solitary play, transition, watching/wandering/unoccupied, or onlooker their integration level should be scored as Alone.

Adult-only
The target child is talking to or working with an adult in a 1:1 interaction. It may be initiated by the adult or by the target child. Even if other children are present, the interaction appears closed between the adult and the target child and the other children are not part of the interaction.

Low level of social integration
The target child is on the fringes of interacting with another child/ren and/or adults. His/her behavior and/or presence is intermittently acknowledged, sometimes in an off-hand way. There is no sense that the child is being excluded, but also no sense that he/she is an integral part of what is going on with the other child/ren. This can be scored if all the children are engaged in the same activity, such as puzzles, building blocks, or working with clay, and it is clear that the child is a part of this group, but there is little interaction between the target child and other children in the group. One key to this is whether the target child might get up and leave without another child/ren's level of social interaction changing much. If you think that there would be little or no change, then low is the right score. Be sure to pay attention to transitions between parallel or group play and solitary play, as this would directly affect their integration levels. The teacher or other adults may be part of the interaction, but there must be at least one peer present to be scored Low. If the teacher is leading or facilitating the group during a structured time, NA should be coded because the teacher is influencing or directing the amount of interaction and integration possible.

High level of social integration
The target child is clearly part of the social action and there is clear evidence that the target child is important for the continuation of the interaction. The children may be engaged in cooperative play working together to make something and playing an important role. They may be engaged in pretend play where the target child has an important, active role (i.e., not the one who is gone most of the time or who must sleep or watch the others most of the time). The children may be talking together (perhaps while putting together puzzles) in which case the target child is clearly an important part of the "conversation." Note that conversations among young children may not seem as connected as with older children. It is less important to judge whether the children are providing responses that follow from what the other has said, and more important to judge whether the child pay attention to what they are each saying. So, "I went to McDonald's yesterday" followed by "My mommy has a red dress" could reflect highly integrated interaction if the two children seem to believe that they are both having the same conversation and are fully engaged with one another. The teacher or other adults may be part of the interaction, but there must be at least one peer present to be scored High. If the teacher is leading or facilitating the group during a structured time, NA should be coded because the teacher is influencing or directing the amount of interaction and integration possible.

<u>Child's Negative Interactions with Other Child/ren</u>

A negative interaction is coded when the target child is involved in a negative (unfriendly) overture with another child or a group of children. A negative interaction, or aggressive act, involves a behavior that is intended to hurt or harm another child. This may include mild hostile remarks and put downs to another child. Simply saying "no" to another child's request would not warrant a code here. An aggressive act can present

itself as relational aggression, physical aggression, or verbal aggression. We will not code separately for these types of aggression, but you will need to be alert to all types.

- Relational aggression involves behaviors that harm others through damage (or the threat of damage) to relationships or feelings of acceptance, friendship, or group inclusion. These acts include: giving someone the 'silent treatment' to punish them or get your own way; using social exclusion as a form of retaliation; or threatening to end a friendship unless someone complies with a request. Examples include: exclusion from group/activity, gossip, secrets, and directly or indirectly ignoring peers.

- Physical aggression includes harm through damage (or threat of damage) to another's physical well-being. These behaviors include acts such as hitting, shoving, kicking, or threatening to beat up another child unless he/she does what the child wants. Examples include: hitting, slapping, pushing, taking toys, and threats of physical aggression (i.e. "I will pinch you if you don't give me that toy").

- Verbal aggression includes teasing, taunting, or making fun of another child. Verbal aggression can also include a child tattling on another, only when the intent is to get the other child in trouble, not when the intent is safety or to "keep the peace" amongst his/her peers.

None
There was no negative interaction between the target child and another child/ren or adult(s).

Rejected/rebuffed/or ignored in attempt
The target child makes an attempt at interacting with another child/ren and is unsuccessful. The other party does not reciprocate the child's intent to interact. This may be done in a quiet manner, as the child's request may simply be ignored, or it may be highly visible, ("no, we don't want to play with you!"). You may see examples of this code in non-verbal contexts as well, as in a group of children rearranging their play circle to block the target child's approach.

Directs negative social action
The target child directs a negative social action to another child or group of children. These actions can occur in the context of trying to enter a group or in the midst of an on-going social interaction. The target child can initiate the negative interaction or he/she may direct a negative action at a child in response to something the other child has done (e.g., after having received a negative social action). What's important is that the target child, and not another child/ren take the action and has intent to harm. There does not need to be a response from the other child/ren in order for this category to be coded. A child receiving a negative interaction may not respond the way the director of the action

intended, but the interaction should still be coded here. For example, if the target child pushes or yells at another child and that child ignores or laughs at the target child's attempt to hurt, harm or bother him, still code the interaction here.

Receives other negative social action
The target child is the recipient of a negative social action, as described above, by either a single child or a group of children. If the child is the recipient of being rejected/rebuffed/or ignored, do not code here—code under that specific category. The target child does not need to respond directly to the negative social action in order for it to be coded. What's important is that another child/ren take the action and have the intent to harm the target child.

Appendix B

Parenting Quality Coding

1. Supportive Presence

Major Criteria:

1) Secure Base – helping the child feel comfortable with the task
2) Mother Involvement – attentiveness to child and task

Subcriteria: (components of major criteria)

a) Focusing the child on the task when needed
b) Tuning the child in to reinforcing aspects of the task as needed
c) Mood setting for a problem solving situation as needed
d) Sharing in the joy of the task, play when appropriate
e) Encouraging and supporting his/her efforts
f) Physical presence when needed
g) Anticipating frustration and taking action to help the situation
h) Mother staying calm
i) Contingent Responsiveness

Secure Base for Exploration

This concept is directly related to the ethological concept of the caretaker's providing a secure base from which the infant can explore his/her environment. In this case, however, the concept is carried forward in time to the mother-toddler dyad.

The subcriteria, which are of major importance in scoring "secure base", include the following: staying calm, mood setting, tuning, physical presence, and anticipating frustration. Encouraging and supporting efforts and helping the child achieve a sense of solving the problem him/herself are important as well. A mother provides a secure base for her child by setting a calm and confident tone for the free-play, clean-up, and problem-solving task. She is comfortable in the situation and therefore projects a sense of confidence in a positive outcome. She accomplishes this two ways, by remaining calm, and by mood-setting. The mother approaches the play, clean-up, and problem-solving task with obvious interest, or better yet, with enthusiasm. In the clean-up and problem-solving task, she makes certain that the child realizes there is a job to be completed. She indicates to the child that working on the problem can be rewarding. These aspects of secure base serve to motivate and reassure the child of a positive experience and outcome.

While the child is working, the mother lets her child know that she is with him/her by encouraging his/her efforts, reassuring any doubts, and by her calm, warm, and

positive affect and manner. She lets her child know that she is available for help either verbally or by her physical presence. She moves closer to the child when the child gets stuck or shows signs of frustration (e.g., hesitating, demonstrating off-task behavior, incorporating repetitive actions, whining, pounding, shrugging, approaching the mother, etc.). She may move closer by leaning forward in her chair, sitting on the floor closer to the tool and her child, or by intervening physically with demonstration, if necessary. She is quick to anticipate or read the child's signs of mounting frustration, and consequently, quick to respond, thereby letting the child know that she is with him/her in the experiment.

A mother who receives a 'minimal' secure base is less clearly available to the child when help or encouragement is called for. She is less able to help the child feel safe in the unfamiliar situation and with the demands of the tasks. She may help, but repeatedly refuses bids from the child. She may be very slow in moving closer to the child when the child becomes intimidated by the task, and may seem unaware that the child is becoming frustrated. The mother may not encourage or reassure the child when the child's motivation declines, or when frustration builds. It may not be clear whether she believes she can help the child solve the problem.

A mother who receives a 'no' on secure base is unavailable to the child due to her own level of frustration, inability to remain calm, her passivity, or her inability to understand the child's level of capabilities. The mother may become angry and frustrated with the child, offering no indication to the child that it is possible to reach a solution, or that it is safe to explore. The mother may demand the child perform above his/her age level and expect the child to work on his/her own without encouragement.

Mother's Involvement: attentiveness to the child and the task

This criterion involves more than observation of the child by the mother. A mother who receives a 'yes' on this criterion not only attends carefully to her child's behaviors, emotional states and progress, but also is emotionally involved and responsive to the child.

The important subcriteria of involvement are**:** encouraging and supporting efforts, physical presence, anticipating frustration, and focusing and sharing joy. The mother watches her child working or playing with interest and investment, as she may lean forward or approach for better observation and involvement (physical presence). She is aware of the fluctuating emotional states and responds contingently to the child's affective expression. She encourages and supports the child's efforts by responding positively when the child smiles or completes a part of the task. She becomes concerned when the child shows signs of difficulty with the task, and anticipates and/or reacts quickly to signs of frustration by assisting or increasing her level of involvement. She focuses the child if he/she loses interest through frustration and strays from the task. When the child demonstrates excitement or joy in working hard at the task at hand, the mother responds with joy by being happy with and for her child. In general, her emotional responses are contingent upon and appropriate to the child's progress and states.

The mother who receives a 'minimal' rating is interested but less actively

involved with her child and his/her activities. The mother may appear somewhat passive or lethargic in her responsiveness to the child's cues. She does not seem disinterested or actively withholding with her child.

The mother who receives a 'no' is disinterested, aloof, or cold with her child. Although she may be invested in ensuring that the child solves the problem, her investment lies in the performance rather than a shared experience. She does not respond to the child's negative emotional states as signs of frustration, and may even become more demanding or withdrawn as the child's frustration increases. Or, the mother is so passive and lethargic that she is unresponsive to the child's emotional and behavioral cues. She does not seem actively disinterested, but instead seems to lack energy or motivation to be involved.

7- This mother meets all criteria and subcriteria. Mother skillfully provides support throughout the session. She sets up the situation from the beginning as one in which she is confident of the child's efforts. She is genuinely interested in and attentive to the needs of the child. If the child is having difficulty, she finds ways to structure the problem to reward some sort of success by the child and encourage whatever solution the child can make. Mother not only is emotionally supportive but continuously reinforces the child's success.

6- This mother technically meets all criteria (if applicable) but is not quite able to give the child all the support required. It may be the case that the mother is lacking slightly in emotional involvement or that she may be either a bit over supportive, indicating a lack of authenticity, or over-controlling. All subcriteria are met at least satisfactorily; however, one or two might be minimally met.

5- Mother provides good support, reassurance and confidence in the child's ability, but she falters in this at times when the child especially could use more support. Or, mother is universally supportive, but gives no evidence of modulation to the child's needs. For a rating of 5, one major criterion may be minimally met. "Secure base" must be at least marginally met, as it can never receive a 'no' on this scale point. There may be slight doubt about two or three subcriteria, or one or two subcriteria may not be met as long as they do not prevent the major criteria from being at least minimally met.

.

4- This mother is not non-supportive, but the degree of support is not obvious or striking. She may lean closer as the child shows small signs of frustration and praise the child's efforts to show that she is available and supportive, but inconsistency in this style makes her support unreliable or unavailable at crucial times in the session. It may that one major criterion is not met while the other is adequately fulfilled, or one major criterion and one subcriterion

are not met, or four subcriteria are not met resulting in one marginally met major criteria.

3- Mother gives some support, but it is sporadic and poorly timed to the child's needs. The consistency of this support is uneven so as to make the mother unreliable as a supportive presence. She does have some relative strengths and may be able to fulfill 2-4 subcriteria. It may also be the case that one major criterion is minimal and at least four subcriteria are not met.

2- Most subcriteria and both major criteria are not met. The mother's support is relatively absent or is not well timed, although there is no distinct negative quality characterizing the interaction. The mother could not be characterized as "angry" or "cold" towards the child, but she shows very few or no strengths.

1- All criteria and subcriteria are not met, or there is a distinct negative quality to the interaction. The mother reacts to the child's performance by becoming angry, hostile, cold, and/or totally unavailable.

2. Structure and Limit Setting

This scale reflects how adequately the mother attempted to establish her expectations for the child's behavior versus not communicating her expectations and not enforcing her agenda adequately. Scoring mother's behavior here depends on whether the child was compliant or not compliant to mother's attempts to set limits.

A. If the child was noncompliant to mother's agenda, a mother high on structure would increase her efforts to set limits **before** the child's behavior became totally unacceptable and prompted a high magnitude response. Limit-setting, which is tentative and pleading (instead of authoritative) or awkward and ineffective in style, would be cause to lower a mother's score substantially. Additionally, a mother who sets strong limits which are inconsistent and sporadic in the absence of other structuring cues would get a low score even though her occasional limit-setting was done forcefully.

B. If the child is compliant, a mother's limit-setting must be judged by her ability to structure the situation with her agenda. A mother may do so in a variety of styles and may or may not be sensitive and responsive to the child's interests. The criterion is whether she can establish structure in the session that reflects the purposes of the session and an agenda for the child's behavior. Conversely, a mother who is hesitant to establish leadership and retreats from difficulties with the child (perhaps using persuasion or distraction to get compliance in ways that suggest **lack** of leadership in the relationship) would get a lower score.

Thus, whether or not the child is compliant, the issue underlying this scale is whether the mother is in charge, or willing to take charge as necessary, to accomplish the tasks. Within this criterion, mothers may, by a variety of styles, accomplish their leadership (and may even **decide** with a very noncompliant child **not** to continue trying to force the

child to perform some task), but the sense of mother providing structure and setting necessary limits should be present consistently during the session to get a high score.

1 = Mother fails to communicate her expectations for the child except in minimal ways and shows no effective leadership. Thus, mother makes very few demands on child's behavior and seems powerless to affect the child's agenda.

2 = Mother exerts some leadership but without consistency. Thus, few of her efforts have much effect on the child and she reacts to the child's agenda more than she tries to communicate her agenda for the child. Her attempts to influence the child are sporadic and convey a sense of powerlessness over the child even before the child has been noncompliant to direct control efforts.

3 = Mother does a fairly adequate job of establishing basic limits for the child and trying to get the child to do the tasks. Yet, she shows very little ability to make her agenda operational. She may collapse in her demands and revert to pleading with the child ("Won't you please do this?") when the child is noncompliant and generally shows great inconsistency in her approach and a lack of control techniques in this session. She readily lets the child have control, and her structuring behaviors lose by failure to follow through on her expectations.

4 = Mother establishes reasonable structure for the child during much of the session and seems to have some leadership in the session. She shows some ability to insist on her structuring of the situation, but her behavior shows inconsistency across tasks and at critical points when the child has begun to deviate unreasonably from her schedule.

5 = Mother establishes her agenda adequately in the session and makes authoritative efforts to have the child follow it. Despite a few lapses in leadership, the mother provides adequate structure to keep her agenda before the child. If the child is noncompliant, the mother tries more vigorously to establish her expectations, but the timing or style of these efforts may be somewhat inadequate to maintain the sense of her leadership.

6 = Mother establishes her agenda in the session and is authoritative and consistent in her leadership efforts. If the child is noncompliant, she more strongly reiterates her expectations, maintaining her sense of command and continuing to structure the situation instead of relinquishing control to the child. This mother has only minor instances in which she seems not to be in charge and aware of the flow of events and able to respond to the child's needs for more structure of limits. Thus, this mother seems effectively to be in control although not necessarily always exercising control.

7 = This mother meets all the criteria of this scale. She establishes a structure for the session in which her goals will be accomplished, she responds consistently and authoritatively to compliance problems, and she maintains adequate leadership and discipline to be in charge of events (even if the child is noncompliant, the mother could retain leadership of the session by the way she handles this issue). The mother may be strict or gentle, intrusive or respectful of the child's autonomy, but achieves this level of structure and limit setting.

(**Note**: Code ineffective but persistent limit setting techniques as moderate (3, 4, 5), showing that limits are applied but mother is not good at it. Thus, a 5 is a good score for a mother who strongly keeps her agenda before the child, but without the necessary skills for effective leadership (e.g., little flexibility in techniques, poor timing in responding to deviation, but done with authority)).

Appendix C

Disinhibited Social Engagement (DSE) Observational Qualitative Coding Scheme

Response to Experimenter Greeting:
This scale captures the child's **initial** reaction to the Experimenter's introduction "Hi, Johnny, I'm Sue" (note this is not the introduction to the parent, which occurs right after the door is opened. It is the introduction to the child, ~30 seconds later).

0	**Ignores** There is absolutely **no** positive nonverbal or verbal response to the introduction. Note that a wary child may stare at the experimenter, but this is not to be considered a positive non-verbal response.
1	**Orients to experimenter** Child looks toward the experimenter in response to the introduction, and smiles or otherwise positively and non-verbally acknowledges the introduction. But child does not approach the E and does not attempt more than this brief acknowledgement.
2	**Brief response to experimenter** Child gives a one-word response to the introduction (i.e., "Hi."). Or child leans towards, takes one or two steps towards, or shows the experimenter something.
3	**Lengthy response to experimenter** Child gives lengthy response following the introduction without pause. Child speaks with or approaches close to the experimenter or engages in prolonged showing of things to the experimenter.

NOTE: if child has begun to respond to the E before the E has a chance to introduce herself, give the code you would have given, had this level of interaction been occasioned by the introduction.

Response to Toy Invitation:
This scale captures the child's reaction to the presentation of the toys "Johnny, I have some toys here, do you want to see?" It includes both the initial reaction and the child's behavior throughout all of phase 3.

0	**Ignores or declines and never plays with toys** Child ignores or declines the invitation to play and never plays with the toys during Phase 3.
1	**Ignores or declines but does approach or play with toys without E** Child ignores or declines the invitation and never accepts playing with E and toys. **But**, child manages to get a toy or two to play with while shutting the E out. This child either moves toys over near mom and turns back on or face away from E, or this child corrals some toys to play with while sitting closer to E but otherwise ignoring and shutting E out. The level of play with toys is not important, this child may even simply approach or touch the toys but does so while ignoring or avoiding E.
2	**Eventually plays with E & toys** Child initially ignores or declines the invitation to play, but then eventually plays with the toys in a way that includes acceptance of the E before the end of Phase 3. To get this score, the child must not seem to be ignoring the E or shutting the E out. Playing with

	the toys must seem like an acceptance of the E and her toys, though it takes a while.
3	**Plays with E & toys** Child accepts the invitation, but approaches slowly or cautiously. Once playing the child shows acceptance of E and the toys on a higher level than a "2". This means the child does not seem to be avoiding looking at the E, although the child may still seem slightly unsure of E.
4	**Accepts and plays immediately** Child nonverbally or verbally accepts the invitation to play and plays immediately (e.g., helps get toys out, plays with first toy put out). This child plays with the toys, but does not actively try to get the E to play with him/her. This can be scored if the child's response is delayed due to their needing to complete some task that they were already doing when the play invitation was made, but once involved the child acts like a "4".
5	**Accepts and plays immediately; Engages E** Child accepts and plays immediately, focusing not only on the toys, but actively attempts to engage the E in the toy play. When E does not respond, the child may become unsure and begin acting like a 4.
6	**Accepts and plays immediately; Needs E** Child accepts and plays immediately, actively tries to get E to play, and when E responds minimally, child keeps up and intensifies his/her bids.

Response to Play Invitation:
This scale captures the child's response to the invitation to play together "Johnny, I have some more toys here, do you want to play together?" It includes both the initial reaction and the child's behavior throughout all of phase 4.

0	**Ignores or declines** Child ignores or declines invitation.
1	**Accepts with encouragement** Child accepts invitation with encouragement (i.e., "It's really fun."). Child may spend most of this period watching the E play with the toys or engaging in parallel play with the E. Throughout, though, the sense is the child would be happier if the E wasn't there. Quality of toy play may be lower during this period than when the E was sitting quietly.
2	**Accepts; more interest in toys than E** Child accepts invitation immediately. Child responds avidly to E's play initiations, but otherwise seems more interested in the toys than in playing WITH the E and the toys.
3	**Accepts; equal interest in toys & E** Child accepts invitation immediately, responds to E's play initiations and makes play initiations to the E, handing her toys, sharing her experiences with the E verbally and non-verbally. However, the overall sense is that the toys are as important as playing with the E.
4	**Accepts; more interest in E than toys** Child accepts invitation immediately, responds to and initiates interactions with the E. Keeps E responding throughout the together play time. The strong sense is that while the toys are interesting, playing with the E is the child's bigger goal.

Verbal Intimacy **(0-5)**: This scale assesses the child's level of intimacy in verbal or preverbal communication with the experimenter. Score the highest achieved throughout the DSA task.

0	**None** The child did not communicate with the experimenter at all. There were no verbalizations or preverbal communications to the experimenter.
1	**Only verbal or preverbal responses** There were only brief responses to the experimenter's questions (i.e., a one-sentence logical response). Also include preverbal responses, such as looking at what the E is talking about or pointing to.
2	**Initiated basic communication** The child initiated communication on a basic level verbally or preverbally. Child's verbalizations and/or preverbal communications were designed to initiate or maintain interactions with the experimenter beyond a response to a response to a direct question. However, all initiations involved events within the room. They did not involve divulging of information about the child or his/her family, except for the child's name or showing off of a pretty shirt or something as a way of starting a conversation.
3	**Shared some personal information** Child's verbal interactions with the E involved sharing of personal information, but not of the particularly intimate type. The child may have talked about school, the fact they have a dog, or that they were going to McDonalds on the way home. The child didn't ask intimate questions of the E. If the child asked personal information of the E, this information seemed to be a way of entering a topic the child wanted to talk about: "Do you have a dog? I have a dog…"
4	**Shared intimate information or asked personal questions** Child's verbal interactions with the E involved sharing of intimate information beyond the usual public kind. This child might have told the E that she wet her bed last night, that her mom and dad had a fight, that her baby brother pooped in the bath tub, and so on. Even if the child didn't divulge this level of intimate information, score a 4 if the child asked the E questions about her personal life, like "Do you have a dog?" (Unless this is just to introduce a topic the child wants to talk about). Many questions may have followed about the E. The child may not even have stopped to hear the E's answer. However, the child's questions were not of the embarrassing kind.
5	**Shared highly intimate information or asked very personal questions** Child's verbal interactions with the E involve sharing of personal information and/or requests for personal information of the type typically not asked of strangers: "Are you married?"; "Do you have a boyfriend?"; "Are you having a baby?" If at any point the child asks to come home with the E, visit the E's house, or meet the E's boyfriend, parents, etc., score the a 5 regardless of the content of the other vocalizations. If the child only invites the E to his/her house or to join them at McDonalds, then base scoring on other aspects of his/her communication with the E, although in this instance the child would not score below a 3.

Physical Intimacy **(0-5):** This scale assesses the child's level of intimacy in physical contact with the experimenter. Score the highest achieved throughout the DSA task.

0	**None** Child did not physically contact the experimenters. There was no physical contact between the E and child, except for that which happened by chance or is required to get a task done.
1	**Physical contact as a tool**

	Physical contact between E and child occurred, but it was as if the E was a tool or a piece of the furniture. Child may have used E as a support in getting to a toy or pushed E's hand to get her to do something.
2	**Initiated low-level physical contact** Physical contact between E and child occurred and was initiated by child. Child may have leaned against the E while playing, when it was unnecessary. The sense here is not that E was furniture, but that the contact was pleasant to the child. Contact was pretty low level, though, and tended to involve child's hand, back, leg or arm. There was no evidence of the child initiating contact that would have brought more "intimate" parts of their body into contact with the E.
3	**Initiated physical contact on a familiar-level** Physical contact between the E and child occurred, was initiated by the child and involved contact of the child's bottom, chest, or face with the E's body. Sitting in the E's lap, or leaning of the torso and face against the E's side/arm counts here. This behavior might seem appropriate if the E were the child's teacher or a friend of the family with whom the child is very familiar.
4	**Initiated intimate physical contact** Physical contact between the E and child occurred, was initiated by the child, and involved active attempts to snuggle and to get E to respond. This behavior would seem appropriate if the E were the child's mother, child care provider, close grandparent or aunt/uncle, or someone who is in the circle of "loved ones."
5	**Initiated physical contact that invaded the E's privacy** Physical contact between the E and the child occurred, was initiated by the child, and invaded the E's privacy. This may have involved playing with the E's face or earrings in a way that required the child to bring his/her face within an inch or so of the E's face. Touching intimate parts of the E's body (i.e. breasts, bottom) would certainly count here. Also counting would be lifting of the child's clothing so that the child's skin touched the E or if the child rubbed his/her chest, bottom, etc. against the E even if skin was not exposed. This level of physical contact would be odd even with the parent if the child is beyond toddlerhood and with other "loved ones" even for a toddler. It has a sense of being sexually provocative.