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## The Effects of Early Institutionalization and Foster Care Intervention on Children's Social Behaviors at Age 8

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### Abstract

The present study compared the social behaviors of 8-year-old previously institutionalized Romanian children from the Bucharest Early Intervention Project (BEIP) in two groups: 1) children randomized to foster care homes (FCG), and 2) children randomized to care as usual (remaining in institutions) (CAUG). Children were observed interacting with an age and gender-matched unfamiliar, non-institutionalized peer from the community (NIG) during six interactive tasks, and their behavior was coded for speech reticence, social engagement, task orientation, social withdrawal, and conversational competence. Group comparisons revealed that FCG children were rated as significantly less reticent during a speech task than CAUG children. For CAUG children, longer time spent in institutional care was related to greater speech reticence and lower social engagement. Using an Actor-Partner Interdependence Model, CAUG children's behaviors, but not FCG, were found to influence the behavior of unfamiliar peers. These findings are the first to characterize institutionalized children's observed social behaviors towards new peers during middle childhood and highlight the positive effects of foster care intervention in the social domain.

### Keywords

Institutionalization; Social Behavior; Foster Care; Intervention

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A considerable amount of research has examined the effects of severe deprivation on infants and young children as a result of institutionalization (Bowlby, 1951; Nelson et al., 2007; Rutter & ERA Study Team, 1998; Yarrow, 1961). Within the social domain, studies have focused on characterizing attachment relationships formed with institutional (Dontas, Maratos, Fafoutis, & Karangelis, 1985), adoptive (O'Connor, Marvin, Rutter, Olrick, & Britner, 2003) or foster caregivers (Smyke, Zeanah, Fox, Nelson, & Guthrie, 2010). However, few studies have examined the potential consequences of early institutionalization (i.e., social deprivation) on children's later social development and behavior. The majority of

these studies have examined social interaction with a focus on social behavior directed towards adults (e.g., Chisholm, 1998; Rutter et al., 2007), therefore, little is known about the nature of institutionalized children's social interactions with other children. Specifically, the degree to which a history of institutional rearing influences children's ability to interact with unfamiliar peers, with whom they could potentially form a friendship, and the effects of early intervention, such as placement into a foster care home, on children's success in negotiating the peer domain remain relatively unknown.

In the present study, we sought to examine the nature children's social behaviors towards an age and gender-matched, unfamiliar peer in order to determine whether foster care intervention could remediate the potential negative effects of early institutional care on social development. We assessed children when they were 8 years old, an age when children are typically beginning to broaden their social skills and increasingly value peers and friendships (Rubin, Bukowski, & Parker, 2006). We compared the behavior of children in two groups: institutionalized children who were randomly assigned to foster care early in life and institutionalized children who received continued institutional care (only a small number had continuous institutional rearing). We observed children during interactions with an unfamiliar peer from the community with no previous institutional rearing experience. We were not only interested in examining the social behaviors of children in our sample, but also the dyadic nature of peer interaction. Specifically, we examined how the social behavior of children who had experienced institutional care might influence the social behavior of their non-institutionalized peers (community sample) during interactions. This allowed for a more comprehensive examination of the degree of social success (or failure) of children who had experienced severe social deprivation in that we assessed both action as well as reaction, or behavior elicited by those initial actions.

There have been a few studies conducted examining interactions with their peers in children who have experienced institutional rearing. Kaler and Freeman (1994) reported deficits in the peer relationships of preschool-aged Romanian children living in institutions compared to a community sample. Similar deficits in peer relationships have been found in primary-school aged samples (Roy, Rutter, & Pickles, 2004), as well as adolescents (Erol, Simsek, & Munir, 2010; Hodges & Tizard, 1989). Vorria and colleagues (Vorria, Rutter, Pickles, Wolkind, & Hobsbaum, 1998) reported caregivers and teachers ratings of 9-year-old institutionalized children's peer relationship quality to be significantly lower than that of a community sample. They also reported institutionalized children to be less engaged with their peers during observations of their behavior in the classroom and on the playground. Although these and other studies have reported social difficulties amongst institution-reared children and adolescents, researchers did not examine children's specific behaviors in order to understand potential reasons for the lack of friendships and social difficulties in their samples. Children may lack the skills necessary to form these types of relationships, or they may lack the interest to engage in them.

In general, early-emerging social skills and behaviors provide the foundation from which children learn to negotiate the social demands and social changes that occur across the transition to adolescence. Poor social skills can lead to social rejection or exclusion, which may lead adolescents to become involved with deviant or risk-taking behaviors (Erol et al.,

2010; Ollendick, Weist, Borden, & Greene, 1992). Furthermore, poor peer relationships in childhood are associated with difficult adjustment in adulthood (see Parker, Rubin, Erath, Wojslawowicz, & Buskirk, 2006, for a review). Therefore, researchers must consider the impact of the early rearing environment (e.g., social deprivation) and interventions on later social behaviors in order to understand how negative social outcomes can be avoided in at-risk populations. In addition, it is important to examine children's social behaviors in context, assessing the skills and behaviors themselves as well as the impact these behaviors have on others during social interactions.

In the present study we compared the social behavior of two groups of children: Children who had experienced institutional care and who were randomly assigned to care as usual (continued institutional care at the outset of the study [CAUG]) and children who had experienced institutional care and who were randomly assigned to foster care (created and supported by the project at the outset of the study [FCG]). We sought to answer three main questions: 1) *Does being placed in foster care have a positive impact on the social behavior during middle childhood of previously institutionalized children? In other words, was there a positive effect of the intervention?*; 2) *Does the amount of time spent in institutional care or foster care, or the age at which children are placed into foster care influence their social behavior at age 8?*; and 3) *How does the social behavior of children with a history of institutional rearing influence that of a never-institutionalized unfamiliar peer?*

Overall, we expected to observe that children who received foster care intervention (FCG) would be more socially competent than those children who were assigned to receive continued institutional care (CAUG). Longer time spent in institutional care was expected to negatively impact social behaviors. We also expected children with histories of institutional rearing to display social behaviors that negatively influenced their never-institutionalized partner's behavior during dyadic interaction.

## Method

### Participants

Participants were selected from 187 children who were less than 31 months of age and living in one of six institutions for young children in Bucharest, Romania, in April 2001 (for details on the sample see Zeanah et al., 2003). Screening for genetic syndromes, microcephaly and signs of FAS reduced this sample to 136 children who had spent at least half of their lives in institutions. At the baseline assessment prior to randomization, the children ranged in age from 6 to 31 months. An additional group of 72 children were recruited across the course of the study from pediatric clinics in communities throughout Bucharest to act as a control group (Never Institutionalized Group, NIG), and they were matched to the initial institutional group on sex and age. Half of the 136 institutionalized children were then randomly assigned to foster care (FCG) while the remaining sample of target children continued with care as usual in the institution in which they currently resided (CAUG). Details on the sample and follow-up through 54 months can be found in Nelson et al. (2007).

We maintained a non-interference policy regarding placements throughout the course of the study, meaning that all decisions regarding placement were made by local authorities. Therefore, many children who were in institutions at the beginning of the study were adopted, returned to their biological parents or placed in government foster care that didn't exist when the study began. At 8 years of age, 49 FCG children and 51 CAUG children remained in the study. An additional 100 never institutionalized children were also recruited and these 3 groups completed the “Social Behavior with an Unfamiliar Peer” Assessment, and were the subjects of the current reported analyses. Their current placement at the time of assessment as well as the details of the sample can be seen in Figure 1. The NIG children served as the matched unfamiliar peers during social dyad assessments.

Informed consent was signed by the local Commissioner for Child Protection for each participant living in his sector of Bucharest, as per Romanian law. Further assent for each procedure was obtained from each caregiver/parent who accompanied the child to the visit. The study was approved by the Institutional Review Boards of the University of Minnesota, Children's Hospital Boston, the University of Maryland, Tulane University, and Bucharest University (Zeanah et al., 2006).

## Measures and Procedures

**Care information**—At baseline (age 5 months to 31 months), information was collected from institution record review on child characteristics, including age at initial placement into foster care. FCG children's age at initial placement into foster care ranged from 7 to 35 months ( $M = 23.24$ ,  $SD = 7.28$ ). At 8 years of age, the percentage of time children had spent in institutional care was calculated for all children by dividing the number of days in care by current age in days. Also at 8 years of age, for FCG children only, the percentage of time children had spent in foster care<sup>1</sup> was calculated by dividing the number of days in foster care by current age in days.

**Social behavior with an unfamiliar peer**—Children's interactions with an age and gender-matched unfamiliar peer were assessed in the laboratory using six interactive tasks, presented in the following order: Tell Me, Lego, Puzzles, Jenga, Brainstorming, and Pacalici. In the Tell Me task children were asked to give each other a speech about themselves (2 minutes each). In the Lego and Puzzles tasks, children were asked to work together to first build a Lego structure and then put together a set of puzzles. The Jenga task consisted of a block-tower building game in which players take turns to remove a block from a tower and balance it on top, trying not to knock the tower down. In the Brainstorming task children were asked to discuss and list the top 3 things they both like to do for fun. The Pacalici task consisted of a competitive Romanian card game. Each task lasted approximately 5 minutes.

Children's behavior was videotaped and coded by teams of Romanian research assistants who were blind to group assignment and trained by the second author. Training involved learning the coding scheme in English, and any misunderstandings were clarified by an in-

<sup>1</sup>This variable was calculated based on time spent in foster care specifically created for the larger study project, and the variable does not include time spent in foster care created by the government as the study progressed.

person training session as well as follow up email and phone correspondence. First, 5 tapes were coded jointly by each team as “practice” and were re-coded once the coding system was in place. Second, an additional 25 tapes (approximately 20%) were coded independently by the teams of coders to achieve reliability (intra-class correlations, or ICCs). The remaining dyads were coded individually until all were completed. All codes were divided by the duration or number of epochs in the relevant task to create proportion scores in order to control for variations in task length between dyads.

For Tell Me, the speech task, latency to speak (in seconds), duration of speech, duration of time given for each child's speech, and the number of experimenter prompts were coded. Average reliability (ICCs) across these codes was .94. All 3 scores were entered into a Principal Components Analysis, which found one factor, eigenvalue = 1.87 (average loadings of .79). Codes were standardized (z-scores), the duration proportion was reversed, and all were averaged to form a *Speech Reticence* composite ( $\alpha = .70$ ;  $M = -.01$ ,  $SD = .80$ ).

For Lego and Puzzles, both tasks in which children were asked to cooperate, behaviors were event-coded for each 30-second epoch. Codes included cooperation, independent work, off-task, on-looking, conversation, fidgeting, social referencing, positive affect, and negative affect. Behaviors were averaged together and analyzed in a Principal Components Analysis, which found two factors. The first factor had an eigenvalue of 2.66 (average loadings = .69) and consisted of Cooperation, Independent work, Conversation, and Positive Affect. Codes were standardized, Independent Work was reverse-scored, and all were averaged to form the Lego/Puzzles *Social Engagement* score ( $\alpha = .51$ ;  $M = .01$ ,  $SD = .71$ ). The second factor had an eigenvalue of 2.15 (average loadings = .58) and consisted of Off-task behavior, On-looking, Fidgeting, Social Referencing, and Negative Affect. Codes were standardized, reversed and averaged to form the Lego/Puzzles *Task Orientation* score in a social context ( $\alpha = .61$ ;  $M = .00$ ,  $SD = .59$ ). Average reliability (ICCs) across the two tasks and all codes was .93 for Social Engagement and .91 for Social Withdrawal.

For Jenga and Pacalici, both tasks in which children were asked to compete, behaviors were event-coded for each 30-second epoch. Codes included playing game, off-task, on-looking, cheating, conversation, social referencing, positive affect, negative affect, and activity level. Behaviors were averaged together and analyzed in a Principal Components Analysis, which found two factors. The first factor had an eigenvalue of 1.71 (average loadings = .64) and consisted of Social Referencing, Positive Affect, Conversation, and Activity Level. Codes were standardized and averaged to form the Jenga/Pacalici *Social Engagement* score ( $\alpha = .52$ ;  $M = -.01$ ,  $SD = .64$ ). The second factor had an eigenvalue of 3.47 (average loadings = .82) and consisted of Off-task behavior, Playing Game, On-looking, Cheating, and Negative Affect. Codes were standardized, Playing Game and Cheating were reverse-scored, and all were averaged to form the Jenga/Pacalici *Social Withdrawal* score ( $\alpha = .63$ ;  $M = .01$ ,  $SD = .83$ ). Reliability (ICCs) was .88 for Social Engagement and .93 for Social Withdrawal.

For Brainstorming, an open-ended discussion task, codes included Volume/Clarity of Voice, which was coded on a rating scale from 0 (child does not speak) to 4 (child speaks loudly and clearly), Arousal, which was coded on a rating scale from 1 (completely un-aroused: monotone voice and no body movement) to 4 (completely aroused: animated and

enthusiastic), and Conversation and Social Referencing, which were both coded as present/absent within each epoch. Behaviors were analyzed in a Principal Components Analysis, which found one factor, eigenvalue = 2.54 (average loadings = .79) and consisted of Volume/Clarity of Voice, Arousal, Conversation, and Social Referencing. Codes were standardized and averaged to form the *Conversational Competence* score ( $\alpha = .72$ ;  $M = -.02$ ,  $SD = .79$ ). Reliability (ICCs) was .88 for Conversational Competence.

**Verbal comprehension**—A trained psychologist assessed children's verbal comprehension abilities in the laboratory using the Wechsler Intelligence Scale for Children (WISC-IV; Wechsler, 2003). The WISC-IV uses 10 subtests to assess intellectual functioning in four domains: verbal comprehension, perceptual reasoning, working memory, and processing speed. In addition, a full-scale IQ composite score is calculated based on the 10 subtest scores, scaled for age. Only the verbal comprehension subscale was used in the present study.

### Data Analytic Plan

A series of analyses were conducted to examine the research questions outlined above. First, in order to examine the effects of the foster care intervention on children's social behaviors, the composites of FCG children's behavior during the six interactive tasks were compared to the composites of CAUG children's behavior using a series of one-way Analysis of Variances (ANOVAs). Second, in order to examine the effects of early experience on children's social behavior, the correlations between the amount of time children spent in institutional care and, for FCG children, the age at which they were placed into foster care and the total amount of time in foster care, and social behaviors were examined. Third, in order to examine the influence of previously institutionalized children's social behaviors on their peers (and vice versa), the Actor–Partner Interdependence Model (APIM; Kashy & Kenny, 1999; Kenny, 1996) was used. Whereas common statistical procedures assume the measurement of the dependent variable is independent for each individual, ignoring the dependence between partners can result in biased test statistics (Kenny, Kashy, & Bolger, 1998). One way of addressing the dependence within dyads would consider the dyad itself as the unit of analysis and combine scores across the individuals. However, APIM retains the individual measures, but treats them as nested within the dyad (Cook & Kenny, 2005). This approach allows for an examination of individual and dyadic factors, such as the separable influence of individual characteristics of specific partners' on their own, as well as their peers' behavior. Thus, the current analysis examines CAUG and FCG children's speech reticence during the first interactive task on their own and their peers' subsequent social behaviors during the remaining tasks. APIM tests the bidirectional effects of a person's characteristics on his or her own behavior (i.e., actor effect) and a peer's behavior (i.e., partner effect) in a dyadic context (Cook & Kenny, 2005). In other words, the influence of an individual on their own behavior is assessed while controlling for the influence the partner may have on that individual. Similarly, the influence of the partner on an individual's behavior is assessed while controlling for the influence that same individual may have on their own behavior. Furthermore, APIM allows for an interaction analysis whereby the actor or partner effects are moderated by dyad partner, such that the influence of an actor or partner effect is specific to one particular type of dyad member (e.g., CAUG/FCG vs. NIG).

As the nature of dyadic interactions is necessarily interdependent, considering the bidirectional aspect of social behavior in this manner is critical to furthering an understanding of children's influence on one another within peer interactions.

## Results

### CAUG and FCG Group Comparisons of Social Behavior towards an Unfamiliar Peer at Age 8

A series of univariate ANOVAs comparing the composite peer interaction scores of the CAUG versus the FCG children, while controlling for gender and verbal comprehension, revealed significant group differences for Speech Reticence. Children in the CAUG showed significantly higher levels of Speech Reticence than did FCG children,  $F(1,101) = 4.70, p = .03$ . The remaining tasks did not show significant group differences. Boys were rated as more conversationally competent on the Brainstorming task, more oriented towards the tasks during the cooperative tasks, and more socially withdrawn during the competitive tasks than were girls (all  $ps < .05$ ). Descriptive statistics by group are presented in Table 1.

### Effect of Cumulative Time Spent in Institutional Care on Social Behaviors at Age 8

Correlations between cumulative time spent in institutional care and social behaviors revealed that, for CAUG children, longer time spent living in an institution was related to greater Speech Reticence ( $r = .30, p = .03$ ) and less Social Engagement during the cooperative tasks at age 8 ( $r = -.41, p = .002$ ). There were no significant correlations for FCG children (all  $ps > .05$ ).

### Effect of Age of Placement into Foster Care on Social Behaviors at Age 8 for FCG

Correlations between age at placement into foster care and social outcomes were examined for the FCG only. Results revealed no significant correlations between age at placement into foster care and any of the peer interaction composite variables (all  $ps > .05$ ).

### Effects of Cumulative Time Spent in Foster Care on Social Behaviors at Age 8

Correlations between cumulative time spent in MacArthur foster care and social behaviors were examined for the FCG only. Results revealed no significant correlations between cumulative time spent in foster care and any of the peer interaction composite variables (all  $ps > .05$ ).

### Effects of Social Behavior of CAUG and FCG Children on Never-Institutionalized Peers

APIM analyses (Kashy & Kenny, 1999; Kenny, 1996) were used to examine whether characteristics (i.e., Speech Reticence) of CAUG and FCG children influenced the social behaviors (i.e., Conversational Competence, Social Engagement, Task Orientation, and Social Withdrawal) of peers without institutional experience (NIG) and vice versa. The Speech Reticence composite was chosen as the predictor because it was coded from the very first interactive task that the children engaged in during the assessment. The APIM model was selected to account for the interdependence in the dyadic social interaction data. Furthermore, this model allowed us to simultaneously examine the independent influence of

a child's social reticence on their own, and their peer's, social behavior. That is, APIM analyses test an actor main effect (e.g., the effect of children's characteristics on their own behavior) and a partner main effect (e.g., the effect of children's characteristics on their peer's behavior), while controlling for the effects of the other actor or partner effect.

Specifically, as each child in the dyad was distinguishable based on their group membership (i.e., CAUG/FCG vs. NIG), actor and partner interactions were also examined by including group membership (Effect coding: CAUG/FCG = 1; NIG = -1) in the model. Thus, APIM analyses were conducted separately by type of dyad partner (CAUG/FCG): One analysis examined dyads with children in the CAUG interacting with children in the NIG (CAUG-NIG) and another analysis examined dyads composed of children in the FCG interacting with children in the NIG (FCG-NIG). Interaction effects then allowed us to examine whether Social Reticence influenced children's own social behaviors (i.e., actor effects) and/or their peer's social behaviors (i.e., partner effects), depending on their group status (i.e., CAUG/FCG vs. NIG). APIM models were tested with multi-level modeling in SPSS 18.0 software, using Restricted Maximum Likelihood estimation. Actor and partner main and interaction effects were examined using the interaction approach and significant interactions were followed-up using the two-intercept approach to test the simple slopes separately for each group (Kenny & Kashy, 2010; Kenny, Kashy, & Cook, 2006). Social Reticence was grand mean-centered prior to analysis. See Table 3 for results from all APIM analyses.

**Conversational competence**—The first APIM analysis examined the relation between Social Reticence (SR) and Conversational Competence. Results showed an actor main effect for CAUG-NIG dyads,  $b = -.50$ ,  $SE = .12$ ,  $t(54.11) = -3.98$ ,  $p < .001$ ). Specifically, when children displayed greater SR, they themselves displayed less Conversational Competence<sup>2</sup>, regardless of group membership. There were no significant partner main or interaction effects for CAUG-NIG dyads. Results also showed a significant actor interaction effect for FCG-NIG dyads,  $b = -.29$ ,  $SE = .13$ ,  $t(72.10) = -2.15$ ,  $p = .04$ . Follow-up analyses indicated that the relation between SR and Conversational Competence did not reach significance for either FCG ( $b = .33$ ,  $SE = .21$ ,  $t(49) = 1.60$ ,  $p = .12$ ) and NIG ( $b = -.25$ ,  $SE = .15$ ,  $t(49) = -1.59$ ,  $p = .12$ ) groups. The simple slopes for both groups were not significantly different from zero; however, the slopes for each group were significantly different from one another. Specifically, as children displayed greater SR, Conversational Competence decreased for FCG children and increased for NIG children. These findings suggest that SR influences social competence differently for each group. There were no significant actor or partner main effects or a partner interaction effect for FCG-NIG dyads, all  $p$ 's  $> .05$ .

**Social engagement**—The next APIM analyses tested the influence of SR on children's Social Engagement during the cooperative and competitive tasks. For Social Engagement during the cooperative tasks, there was a significant actor main effect for CAUG-NIG dyads, such that when children displayed greater SR, they themselves also displayed less Social Engagement,  $b = -.28$ ,  $SE = .08$ ,  $t(55) = -3.33$ ,  $p = .002$ . There was also a significant partner

<sup>2</sup>Negative estimates can also be interpreted in the opposite direction: Less Speech reticence, leads to increased displays of Social Competence, Social Engagement, and Social Withdrawal.



main effect for CAUG-NIG dyads, showing that when children displayed greater SR, their peers displayed less Social Engagement,  $b = -.18$ ,  $SE = .09$ ,  $t(51.68) = -1.99$ ,  $p = .05$ . There were no actor or partner main or interaction effects of SR on Social Engagement during the cooperative tasks for the FCG-NIG dyads ( $ps > .05$ ).

For the competitive tasks, there was a significant actor main effect showing greater SR was associated with less Social Engagement for CAUG-NIG dyads,  $b = -.15$ ,  $SE = .08$ ,  $t(70.61) = -1.96$ ,  $p = .05$ . There was also a significant partner interaction effect for CAUG-NIG dyads,  $b = .18$ ,  $SE = .09$ ,  $t(56.76) = 2.03$ ,  $p = .05$ . Follow-up analyses indicated that when CAUG children displayed greater SR, their NIG peers displayed less Social Engagement,  $b = -.18$ ,  $SE = .07$ ,  $t(46) = -2.46$ ,  $p = .02$ . However, there was no reciprocal influence of NIG children's display of SR on CAUG children's Social Engagement,  $b = .18$ ,  $SE = .16$ ,  $t(46) = 1.12$ ,  $p = .27$ . For the FCG-NIG dyads, there were no actor or partner main or interaction effects of SR on Social Engagement during the competitive tasks, all  $p$ 's  $> .05$ .

**Task Orientation**—The next APIM analyses examined the influence of SR on children's Task Orientation during the cooperative tasks. There was a significant partner main effect for CAU-NIG dyads during the cooperative tasks. Specifically, when children from either group displayed greater SR, their peers displayed greater Task Orientation,  $b = .19$ ,  $SE = .09$ ,  $t(61.76) = 2.16$ ,  $p = .04$ . However, there were no actor main or interaction effects of SR on Task Orientation during the cooperative tasks for CAU-NIG dyads,  $ps > .05$ . In addition, there were no actor or partner main or interaction effects of SR on Task Orientation during the cooperative tasks for the FCG-NIG dyads, all  $p$ 's  $> .05$ .

**Social Withdrawal**—The final APIM analyses examined the influence of SR on children's Social Withdrawal during the competitive tasks. There were no significant actor or partner main or interaction effects of SR on Social Withdrawal during the competitive tasks for CAU-NIG or FCG-NIG dyads, all  $ps > .05$ .

## Discussion

This is, to our knowledge, the first study of its kind to present systematic, observational data on social behavior in a sample of children with a history of institutional care during middle childhood and examine the effects of a foster care intervention. We found a positive intervention effect, with foster care children being rated as less inhibited during the speech task than children randomly assigned to receive continued institutional care. CAUG children's behavior could indicate an overall lack of confidence in initiating and maintaining positive social interactions with an unfamiliar peer. This effect held even after controlling for verbal skills as measured by the WISC. Indeed while group differences on this task could have been driven by the poor verbal skills seen in the CAUG (see Fox, Almas, Degnan, Nelson, & Zeanah, 2011) an intervention effect emerged despite the inclusion of verbal comprehension in the model predicting speech reticence. This speaks to the positive effects of foster care intervention on improving children's social skills when first encountering an unfamiliar peer.

Children's behavior towards an unfamiliar peer does not appear to be influenced by the age at which they were first placed into foster care, nor the cumulative amount of time spent in foster care, in the FCG. These findings differ from some previous research from the BEIP showing timing effects, including studies examining IQ and attachment (e.g., Nelson et al., 2007; Smyke et al., 2010), for example, but they are consistent with other BEIP results examining psychiatric symptomatology and disorders (e.g., Zeanah et al., 2009) and structural brain imaging results (Sheridan, Fox, Zeanah, McLaughlin, & Nelson, 2012). The positive effects of the foster care intervention may come from providing children an opportunity to form an attachment relationship to a primary caregiver and through meeting and getting to know biological children in their foster family or other foster children received into that family. The provision of these opportunities seems to matter more than the timing or duration. For CAUG children, cumulative time spent in institutional care was related to poorer social behaviors. This lends support to the notion that it is not early experience that was critical but rather cumulative experience across childhood that provides children with opportunities to hone their social skills and competencies or, in the case of the CAUG, deprives them of such opportunities.

The analyses using APIM further differentiated children's dyadic social behaviors. In general, CAUG children's behavior somewhat had an impact on the behavior of their NIG partners, but not vice versa. Specifically, CAUG children's reticent behavior during the first task (giving a speech about yourself) was related to lower social engagement from their NIG partners during the competitive tasks and somewhat during the cooperative tasks. It may be that children's reticence during the first task, which involved taking longer to begin their speech, needing prompting from the experimenter to continue, and saying little about themselves (as indicated by a shorter speaking time) made them appear less attractive as a playmate overall and, in turn, led their peers to engage with them less during subsequent tasks. One difference between the cooperative and competitive task contexts emerged in relation to the CAUG children's responses to a reticent NIG partner: during the cooperative tasks the CAUG were less engaged, while in the competitive tasks they were not. This difference in behavior across contexts may reflect a lack of social awareness on the part of the CAUG in that their desires to engage in a competitive game may have limited their ability to thoughtfully match the engagement level of their peer.

In addition, CAUG, FCG, and NIG children's reticent behavior during the initial task was related to their own behavior on subsequent tasks. Hence, performance across these tasks was a function not only of prior experience but also possibly of the child's individual personality.

Taken together, these findings have important implications for the social development of children receiving institutional care. We found that these children were less socially competent and more reticent during initial interactions with an unfamiliar peer, which led their NIG peer to engage with them less during subsequent interactions. These reactions from peers may have negative consequences for CAUG children since less interaction with peers provides fewer opportunities for them to practice their social skills and learn new ones, therefore limiting their abilities to become more socially competent over time (Parker, Rubin, Erath, Wojslawowicz, & Buskirk, 2006). In addition, when the behavior of CAUG

children leads their peers to be less socially engaged towards them, they risk social rejection, and subsequent feelings of loneliness, and depression (Parker & Asher, 1993; Pedersen, Vitaro, Barker, & Borge, 2007; Vernberg, 1990).

In comparison, children who received the foster care intervention (FCG) displayed less social reticence than their CAUG peers. Their behavior did not negatively influence the behavior of the NIG children with whom they were paired with during interactions. These results show the value of foster care intervention in remediating the negative effects of early psychosocial deprivation and preventing early experiences from negatively influencing their interpersonal interactions.

We also found that both CAUG and NIG children responded to a partner who had been reticent during the speech task with greater task orientation during the cooperative tasks that immediately followed. Children may have considered their peer less socially competent and, in turn, turned their attention to completing the puzzle or building the Lego structure as a way of avoiding engaging with the less attractive playmate. This result shows the impact of a child's behavior on subsequent social interaction and experiences and highlights the value of assessing both actions and reactions in order to understand children's social strengths and weaknesses.

The present study is the first to provide an observational assessment of institutionalized children's social behaviors during middle childhood and examine these in the context of foster care intervention. It is important to note that because the NIG children participated as unfamiliar peers during dyadic interactions, we were not able to directly compare their behavior to that of the CAUG or FCG children using group comparisons. Therefore, although we found that FCG children were more socially competent during certain tasks than the CAUG children, we are unsure of how either group's behaviors compare to never-institutionalized children. However, in a recent paper we reported that teachers rated FCG children as significantly more socially skilled at age 8 than CAUG children, and no different than their never-institutionalized peers (Almas et al, 2012). It is possible that FCG children's behavior would not be considered significantly different from their NIG peers in the present context as well. The fact that we did not find any negative effects of FCG children's behavior on NIG children's behavior in the APIM analyses lends partial support to this idea.

It is also important to re-emphasize that, because the larger study project maintained strict non-interference policy, children were free to change placements over the course of the study. As a consequence, many of the children did not remain in their original placements at 8 years of age. It is possible that these changes in rearing context may have impacted the children's social behavior and skills in positive or negative ways, depending on the frequency and type of changes experienced by each child. For example, if a child moved from a foster care home with siblings back to the home of their biological parents who do not have other children, that child may lose out on the opportunity to learn from and practice social skills with siblings. For purposes of the present study we used an intent-to-treat approach in order to examine the effects of foster care intervention on social behavior. However, it would be valuable for future research to examine how changes in placement impacts children's development in the social domain.

The present study shows the positive effect of foster care intervention on remediating some of the negative consequences of institutional care on children's social development, as children in our sample who received foster care were more socially successful than their peers who received continued institutional care. In addition, our data show how children who did not receive foster care may negatively influence the nature of a dyadic interaction through their own behaviors. These results highlight the need for researchers to understand mechanisms that act to remediate the negative effects of institutionalization on children's social skills and behaviors during early childhood, so that children are adequately prepared to meet the increasing social demands of adolescence.

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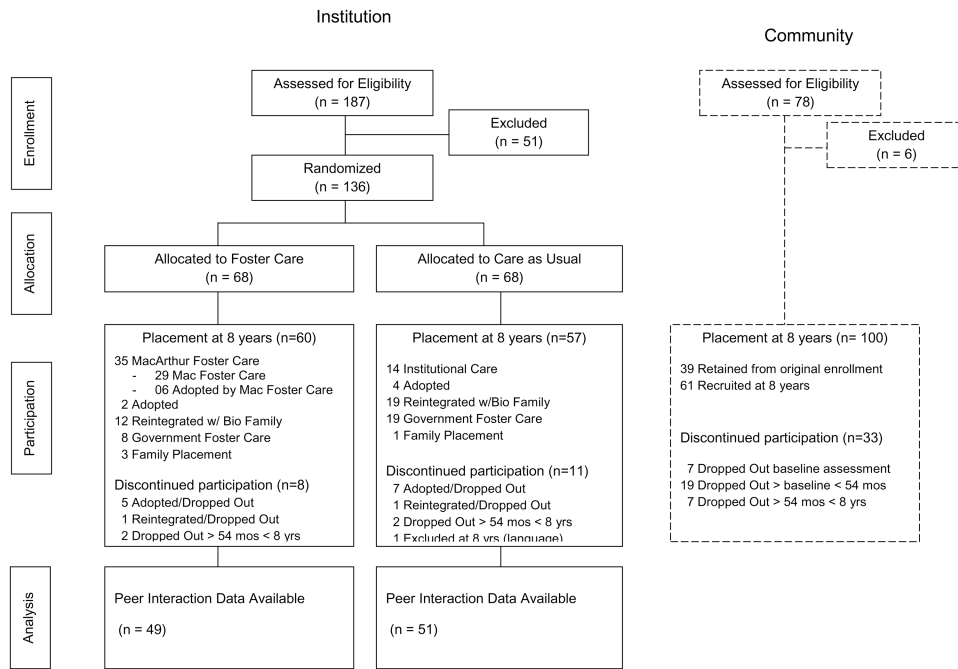


Figure 1. Children's placement status

**Table 1**  
**Means and standard deviations for social behaviors**

	CAUG		FCG	
	Males	Females	Males	Females
Speech Reticence	.31(1.12)	.10 (.73)	-.12 (.62)	-.28 (.49)
LP Social Engagement	-.26 (.72)	.16 (.76)	.03 (.52)	.14 (.73)
LP Task Orientation	-.18 (.82)	.21 (.44)	-.15 (.74)	.12 (.36)
JP Social Engagement	.15 (.67)	-.16 (.64)	.10 (.44)	-.04 (.75)
JP Social Withdrawal	.28 (1.05)	-.15 (.30)	-.04 (.40)	-.08 (.39)
Conversational Competence	.05 (.94)	-.32 (.84)	.30 (.39)	-.05 (.74)

Note: Standard deviations indicated in parentheses.

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Table 2

## Inter-correlations between peer interaction composite measures

	2.	3.	4.	5.	6.
1. Speech Reticence	-.42**	.03	-.19*	-.02	-.38**
2. LP Social Engagement	--	-.01	.30**	-.09	.39**
3. LP Task Orientation		--	.03	-.14	-.19
4. JP Social Engagement			--	.46**	.52**
5. JP Social Withdrawal				--	.14
6. Conversational Competence					--

Note:

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



**Table 3**  
**Results of APIM Analyses Examining the Effect of Speech Reticence on Observed Social Behavior**

	CAUG-NIG Dyads			FCG-NIG Dyads		
	<i>b</i>	<i>SE</i>	<i>t</i>	<i>b</i>	<i>SE</i>	<i>t</i>
<b>Social Competence</b>						
Actor Main Effect	-.50	.12	-3.98**	.04	.12	.34
Actor Interaction Effect	.09	.13	0.72	-.29	.13	-2.15*
Partner Main Effect	-.14	.12	-1.14	-.01	.13	-.07
Partner Interaction Effect	-.03	.12	-0.27	.17	.14	1.23
<b>Social Engagement (Competitive tasks)</b>						
Actor Main Effect	-.15	.08	-1.96 <sup>f</sup>	-.05	.11	-.44
Actor Interaction Effect	-.05	.08	-.57	-.05	.12	-.43
Partner Main Effect	-.00	.09	-.04	-.06	.12	-.47
Partner Interaction Effect	.18	.09	2.03*	.01	.14	.08
<b>Social Engagement (Cooperative tasks)</b>						
Actor Main Effect	-.28	.08	-3.33**	-.15	.13	-1.2
Actor Interaction Effect	-.07	.09	-.84	-.29	.15	-1.92
Partner Main Effect	-.18	.09	-1.99 <sup>f</sup>	-.09	.13	-.69
Partner Interaction Effect	.11	.10	1.19	.10	.15	.70
<b>Social Withdrawal (Competitive tasks)</b>						
Actor Main Effect	-.06	.10	-.60	-.13	.12	-1.11
Actor Interaction Effect	.03	.10	.33	.14	.13	1.08
Partner Main Effect	-.15	.13	-1.15	.03	.11	.30
Partner Interaction Effect	-.17	.13	-1.27	-.18	.12	-1.41
<b>Task Orientation (Cooperative tasks)</b>						
Actor Main Effect	.08	.08	1.09	.02	.11	.17
Actor Interaction Effect	-.07	.08	-.88	.02	.12	.15
Partner Main Effect	.19	.09	2.16*	.06	.12	.49
Partner Interaction Effect	.09	.09	1.04	-.06	.13	-.44

Note:

90°  $d_1$   
;50°> $d_1$   
\*  
;10°< $d_1$   
\*\*

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