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An examination of the communicative and linguistic abilities of children adopted from

Romanian orphanages

by

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Abstract

The communicative and linguistic abilities of children adopted from Romanian orphanages were examined during unstructured and structured mother-child interactions, as well as mothers' use of language with the children was examined. Although Romanian orphanage children displayed more insecure attachment patterns, lower intelligence scores, and more behavioral problems, they did not differ from Canadian born children or children adopted from Romanian orphanages at an earlier age on the types of utterances used during interactions and overall syntactic skills. Mothers of Romanian orphanage children used more command utterances during unstructured interactions, suggesting increased regulation of children's activity. A multiple regression analysis indicated less securely attached patterns, lower intelligence, increased behavioral problems, and increased attention difficulties predicted the increased use of commands by mothers. The results of this study suggest that Romanian orphanage children, adopted into healthier environments, display relatively age-appropriate language abilities.

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I would like to thank the following people for their encouragement, support, and guidance during the process of the writing of this thesis:

Dedication

I would like to dedicate this thesis to my daughter, Emily Quinn. For all the times you had to come into the lab and play, sit and color beside me, or hear Daddy say just a few more minutes on the computer.

TABLE OF CONTENTS

List of Tables

Introduction

In 1989, the overthrow of the Ceausescu communist regime in Romania led to the discovery of orphanages filled with approximately 65,000 young children under the age of 13 years (Ames, 1997). The conditions in these orphanages were appalling. Children received little physical and emotional contact, with estimates of caregiver-to-child ratios ranging from 10:1 for infants to as high as 20:1 for children over three years of age (Chisholm, Carter, Ames, & Morison, 1995). The orphanage children were also subjected to inadequate nutrition, and had numerous intestinal and respiratory infections (Johnson et al., 1992). As the information about these children spread around the world, persons from North America and Europe traveled to Romania to adopt children. Interviews with the adoptive parents indicated that approximately 15% of the children were judged to be physically healthy and developmentally normal at the time of adoption (Johnson et al., 1992). Most of the children had spent the majority of their lives in the orphanages prior to adoption and thus were exposed to an environment lacking the necessary qualities needed to achieve many developmental milestones in an age-appropriate timeline (Ames, 1997; Chisholm, 1998; Fisher, Ames, Chisholm, & Savoie, 1997; Rutter, 1998).

The adoption of children from Romanian orphanages has provided researchers with the opportunity to study the development of children raised in nutritionally and psychologically deprived environments. The adoptions also allow researchers an opportunity to examine whether the subsequent adoption into more healthy environments could aid in the children's recovery from the effects of their early deprivation. The purposes of the present study were to examine two aspects of communicative competence in Romanian orphanage children and their adoptive mothers, namely communicative intent and

turn-taking behaviors, to examine the development of linguistic skills in the adopted children, and also to explore the relationship between the children's communicative abilities and other areas of development (e.g., attachment, intelligence, and behavior).

Researchers studying the children adopted from Romanian orphanages have examined a variety of areas of development including attachment (Chisholm, 1998; Chisholm et al., 1995; O'Connor, Bredenkamp, & Rutter, 1999; O'Connor & Rutter, 2000), intelligence (Castle, Groothues, Bredenkamp, Beckett, O'Connor, & Rutter, 1999; Morison & Ellwood, 2000; O'Connor, Rutter, Beckett, Keaveney, & Kreppner, 2000) and behavior problems (Fisher et al., 1997; Marcovitch et al., 1997). The results of this research will be reviewed briefly in the following sections.

Attachment

The need to study attachment issues in the Romanian orphanage children is evident given the literature on the formation of attachment to a caregiver (e.g., Bowlby, 1988). According to Bowlby (1988), the formation of an attachment relationship to a caregiver is typically evident when the child is between 6 and 12 months of age. The children from Romanian orphanages provided an opportunity to examine attachment patterns since many of them were in the orphanages for a minimum of eight months (median adoptive age of 18.5 months) and during this time they received little or no contact with caregivers. For example, one study reported that children were left in their cribs for 20 out of 24 hours each day and received food from a propped-up bottle until they were 1.5 to 2 years of age (Fisher et al., 1997). Thus, the orphanage environment would have made it difficult for a child to form an attachment to a caregiver during the time in the orphanage. Researchers have been

interested in whether the adoptive environment could provide the children with an opportunity to form an attachment at a later age.

Chisholm (1998) examined security of attachment of Romanian orphanage (RO) children to their caregivers using the Preschool Assessment of Attachment measure (PAA; Crittenden, 1992) after a median time in adoptive homes of 39 months. Their attachment patterns were compared to those of a matched group of Canadian-born never-adopted children (CB group) and a group of Romanian children who were adopted from the orphanages before the age of four months (EA group). The results indicated that although some of the RO children were able to form a secure attachment pattern with their caregiver, significantly more RO children than CB or EA children displayed insecure attachment patterns. In addition, significantly more RO children displayed atypical insecure attachment patterns, including compulsive caregiving and defended/coercive patterns.

In another study of attachment with Romanian adoptees, O'Connor and Rutter (2000) found a positive relationship between the length of time spent in deprivation and the severity of attachment disorder behaviors reported by caregivers. In their sample, there was no difference in reports of severity of attachment disorder symptoms between early-adopted Romanian children and U.K.-born children adopted at a very young age; however, parents in these two groups reported significantly less severe symptoms than parents of a group of older-adopted Romanian children. The results of Chisholm (1998) and O'Connor and Rutter (2000) suggest that the extended period of neglect and social isolation that children experienced while in the Romanian orphanages was related to fewer secure attachment patterns, more insecure and atypical attachment patterns, and increased severity of symptoms associated with an attachment disorder.

<u>Intelligence</u>

Researchers have also examined the effects of the Romanian orphanages on children's cognitive abilities (Castle et al., 1999; Morison & Ellwood, 2000; Rutter, 1998). Previous research on institutionalized children who experienced early deprivation and maltreatment indicated a positive relationship between length of time in the institution and deficits in cognitive functioning (e.g., Dennis, 1973). A variety of complex factors, including inadequate nutrition, lack of social, physical and emotional interaction, length of time exposed to the factors, and amount of time in adoptive environment, can be related to an institutionalized child's deficient cognitive abilities (Coster & Cicchetti, 1993). The adoption of Romanian children provided an opportunity for researchers to examine the relationship between length of time in the Romanian orphanages and cognitive functioning, and also the potential for 'recovery' of cognitive abilities once in the adoptive environment.

In a study of cognitive abilities of the children adopted from Romanian orphanages (RO), Morison and Ellwood (2000) found that children from the orphanages exhibited lower levels of cognitive functioning than a matched group of Canadian-born children (CB). Further, the detrimental effects of the orphanage environment on cognitive functioning became more apparent for RO children adopted after their second birthday. Children's cognitive abilities were assessed using the Stanford-Binet Intelligence Scale IV at a median time of 39 months after adoption. The IQ scores of those Romanian children adopted before two years old (N = 35; mean age of 4.5 years at the time of testing) fell within the Low Average to Average Range and were significantly lower than the scores for age-matched CB children. The IQ scores of those children adopted after two years of age (N = 35; mean age of 7 years) fell within the Slow Learner to Mild Mental Retardation Range and were also

significantly lower than age-matched CB children. Analysis of the individual subtest scores showed a consistent weakness across all areas. Children who were adopted at an early age from Romania (i.e., did not spend time in the orphanages) scored significantly higher than RO children and significantly lower than CB children in all three domains (Verbal, Nonverbal, and Overall Cognitive Abilities). The results may indicate that factors not directly related to the orphanage experience may have impacted cognitive development (e.g., poor prenatal nutrition).

Regarding children's behaviors during the Stanford-Binet IV administration, Morison and Ellwood (2000) indicated that the Romanian orphanage children were significantly less task-oriented than the CB or EA children. The RO children were less attentive and more distractible, had higher activity levels, took over instead of being told what to do, would respond impulsively or else needed urging, were not persistent with their efforts, did not react realistically to failure (either pretended to be tired or else wanted to quit), were not eager to continue, and preferred to do easier tasks. These types of behaviors observed during a one-on-one testing situation may be indicative of RO children's behavior problems in a variety of situations, including mother-child interactions.

Rutter (1998) reported similar results when the cognitive functioning of adopted Romanian orphanage children at four years of age was compared to a sample of U.K.-born, early-adopted children. Children adopted early in life (i.e., before six months of age) achieved a mean IQ score within the Average range of functioning; however, the mean cognitive score dropped into the Low Average Range as children spent closer to two years in the orphanages prior to adoption.

The results of Morison and Ellwood (2000) and Rutter (1998) are consistent with previous findings regarding the cognitive abilities in children adopted from institutions (e.g., Dennis, 1973). There is a negative relationship between length of time in the Romanian orphanages and cognitive abilities measured approximately three years later. However, some of the difficulties can be related to non-orphanage factors (e.g., prenatal malnourishment), since the Romanian children without any time in the orphanages displayed some cognitive difficulties relative to Canadian children. The effects of institutionalization, particularly poor nutrition and lack of social and physical contact, on intellectual functioning appear to be long-term.

<div align="center">Behavior</div>

A third area of Romanian orphanage children's development that has been studied involves behavioral difficulties. One might expect that with inadequate caregiver-child and child-child interactions, Romanian orphanage children were afforded little opportunity to establish relationships and learn socially appropriate scripts for interacting with others. Thus, it may be expected that children raised in these conditions will exhibit more behavioral problems than children raised in non-deprived environments.

Fisher et al. (1997) examined the presence of behavioral difficulties in the Romanian orphanage children using the Child Behavioral Checklist/4-18 (CBCL/4-18). The CBCL/4-18 is a checklist that requires a parent to rate their child on a variety of problem items, which can be grouped into three problem scales; Internalizing (e.g., withdrawn behavior, somatic complaints, and anxious/depressed behaviors), Externalizing (e.g., delinquent and aggressive behavior), and Total Problems (Achenbach, 1991). Children were assessed after they had been in the adopted homes for a median time of 39 months, and their behavior ratings were

compared with never-adopted, Canadian-born children (CB) and Romanian children adopted before spending time in the orphanages (EA). Fisher et al found no significant differences between the three groups on Internalizing problems; however, the RO children scored significantly higher than the CB children on the Externalizing and Total Problems scales. The EA and RO children did not differ on the Total Problems scale, and CB and EA children did not differ significantly on any scores. There are also two scales that do not contribute to the Internalizing or Externalizing scales; the Thought Problems and Attention Problems scales. RO children scored significantly higher than the CB children on the Thought Problems scale and significantly higher than both the CB and EA children on the Attention Problems scale. Fisher et al.'s study indicates that the RO children's problem behaviors tend to be more Externalizing than Internalizing when compared to CB children, and the EA children's behavior ratings fell in between the two other groups. The results indicate that the RO children were rated by their parents as having more behavior problems directed outward towards other individuals, which can directly impact the RO children's ability to form relationships with siblings and peers.

In another study examining Romanian adoptees' behavior, Marcovitch et al. (1997) measured the behavior difficulties of children between the ages of 3 and 5 years using the CBCL parental report. Marcovitch et al. found that children adopted from the orphanages at an average age of 28.3 months, after spending an average of 27.3 months in the orphanages, received higher ratings of Total Problem behaviors than children adopted before spending six months in the orphanages, but the two adoptive groups did not differ on the Internalizing or the Externalizing Scales. The results of this study indicate that the later adopted children displayed significantly more behavior problems than early adopted children, but they did not

have a preponderance towards either internalizing or externalizing types of problems. These results are consistent with studies by Fisher et al. (1997) in that children raised in the Romanian orphanages for longer periods of time are more likely to display some behavior problems than children who have not been subjected (or minimally exposed) to the depriving environments.

Summary

To summarize, the research indicates that children adopted from Romanian orphanages tend to display difficulties in multiple areas of development. Although the EA children displayed some cognitive difficulties compared to CB children, overall the general impoverishment of Romania had less effect on the attachment, intelligence, and behavior of children adopted during the first few months of their lives than children who spent at least 8 months (average time of 17.5 months) in the orphanages. The studies on Romanian orphanage children's attachment to caregivers, intelligence abilities, and behavior difficulties indicate that the conditions of the orphanages had a long-lasting effect on development that is still evident at a median adoptive time of 2-3 years.

Although researchers have examined many different areas of development in children adopted from the Romanian orphanages, little attention has been paid to the effects of deprivation and institutionalization on language development. An inability to attain age-appropriate social-emotional and cognitive development can be related to difficulty in acquiring adequate communication skills (Coster & Cicchetti, 1993). Given that there have been observed difficulties in some developmental areas studied with the Romanian orphanage children, it is important to examine if the orphanage experience could also have an impact on the acquisition of language and the use of language in social interactions.

Although little is known about the effects of the conditions in the Romanian

orphanages and subsequent adoption on children's development of communicative abilities,

there has been research on the language development of neglected and abused children that

have never been exposed to an institutional environment (e.g., Coster, Gersten, Beeghly, &

Cicchetti, 1989). The following section discusses research that has focused on how children

acquire communicative competence through interactions with their caregiver(s) and also the

effects of maltreatment on children's acquisition of communicative competence.

Acquisition of Communicative Competence

Becoming a mature language user entails knowledge about many levels of language,

including learning the basics of language (i.e., phonology, morphology, syntax, semantics),

as well as more sophisticated rules of language use (i.e., pragmatics) (Berko Gleason, 1997).

Knowledge about pragmatics encompasses the ability to express one's intentions, and in

particular, communicative competence involves the ability to express one's intentions in a

socially appropriate manner. The term communicative competence was described by

Hymes (1972) as the process by which "a normal child acquires knowledge of sentences, not

only as grammatical, but also as appropriate. He or she acquires abilities as to when to

speak, when not, and as to what to talk about with whom, when, where, in what manner" (p.

277). The development of competence comes from attitudes and values and is based on

social experiences of the child with others (Hymes, 1972). An adult who can speak to

his/her boss in an appropriate manner to express an intention, and then talk to a child in an

appropriate fashion is displaying communicative competence. Both situations require the

individual to express a desired intention, while selecting certain words, length of sentence,

politeness, and obeying rules of turn-taking (e.g., Bedrosian, Wanska, Sykes, Smith, &

Dalton, 1988) that are situation-appropriate.

Hoff-Ginsberg (1997) describes the process of acquiring communicative competence

as beginning during interactions between mothers and pre-linguistic infants and continually

developing throughout childhood. Nonverbal interactions that take place between mothers

and infants involve such components of communicative competence as turn-taking,

expression of one's intent for the purpose of achieving a goal, and modification of messages

for different goals. In addition, Hoff-Ginsberg describes preverbal interactions with

caregivers as a stronger facilitation of language development than actually hearing the

language. If children are raised in an environment that fails to provide children with early

interactions, then the development of language and acquisition of communicative

competence may be susceptible to delays and/or deviations.

Research into the acquisition of communicative competence abilities in young

language learners has explored the influence of interactions with the caregiver, and in

particular, how interactions can differ depending on whether the focus of the interaction is to

foster language development (Wanska & Bedrosian, 1986) or regulate behavior (Tulviste &

Raudsepp, 1997). Warren and McCloskey (1997) discuss the role of the caregiver in

teaching children social routines and social scripts. For example, parents teach children to

say "please" from an early age when wanting an adult to fulfill a need or want, and then

saying "thank you" when the need/want has been fulfilled. Parents continue teaching and

shaping the children in communicative abilities by saying, "Now what do you say?" when

the child fails to use the socially appropriate language. Warren and McCloskey view the

caregiver's role as facilitative in a child's acquisition of language; however, other studies

have indicated that the role may be to regulate the child's behavior in particular situations (e.g., Tulviste & Raudsepp, 1997).

When examining the communicative styles of mothers and children used during interactions, Wanska and Bedrosian (1986) found that the level of mothers' discourse was more sophisticated than that displayed by the children. The children (ages 2 years, 10 months through 6 years, 3 months) tended to initiate fantasy topics, while mothers initiated conversations about displacement topics (objects or events not present). The children initiated fantasy topics through informatives (statements that contain information about the acknowledged topic) and tended to maintain fantasy and displacement topics through responses, while the mothers initiated and maintained displacement topics mostly through requests. Through the use of requests by mothers to initiate and maintain displacement topics and the children's responses to the requests, the mothers were facilitating their children's development of a more sophisticated level of discourse. The mothers' facilitation of the children's abilities was through a process of 'request-response-acknowledgement'. This study by Wanska and Bedrosian highlights how mothers can use their own language abilities to foster children's development of language skills.

In another examination of mother-child interactions, Tulviste and Raudsepp (1997) examined how Estonian mothers used regulatory utterances with 2- and 4-year-old children during a puzzle-solving task and mealtime. They found that the mothers of the two-year olds more frequently regulated physical activity and attention than mothers of four-year olds, particularly during the puzzle-solving task. The mothers of two-year olds used imperatives (commands used to obtain something of desire) more frequently as the type of regulative utterance, but did not differ from the mothers of the four-year olds in the frequency of use of

declaratives (statements used to elicit the other's attention). The mothers of the four-year olds did not differ in their frequency and type of regulative utterances between puzzle-solving and mealtime interactions.

This study demonstrated that when these mothers are regulating the physical activity and attention of their children, they are more likely to do so during a puzzle-solving task using imperative utterances, especially in younger children. When children are four-years old, their mothers are equally likely to use the same frequency of regulative utterances across different situations. Hoff-Ginsberg (1997) describes the use of imperatives by mothers as a less sophisticated linguistic tool than declaratives when guiding a child who is attempting to achieve a goal during an interaction. One caution with interpreting the results of this study is that the two-year olds may have found the puzzle-solving task too difficult, requiring increased regulation of physical activity and attention by the mothers. However, it does highlight the necessity to study communicative interactions in different situations, and that younger children may require different amounts and type of regulative control from their caregiver. In other words, there is a relationship between a child's developmental level and the type, frequency and level of discourse used by caregivers during an interaction with a child.

Bedrosian, Wanska, Sykes, Smith, and Dalton (1988) examined turn-taking violations in mother-child interactions. They found that mothers of 34-75 month-old children tended to be less facilitative and more regulating of their children's turn-taking skills. In a 10 minute free-play interaction, mothers displayed significantly more internal overlaps than children (mother starts talking *during* the child's utterance), children displayed discontinuation as a repair mechanism significantly more (stopped talking to allow mother to

continue), and both mothers and children used informatives (statements that contain information about the acknowledged topic) one-half of the time and requests about one-third of the time as the intent of their overlaps. The mothers were more likely to interrupt the children in the middle of an utterance and less likely to yield to a child's attempt at an overlap. Through the use of informatives and requests as internal overlaps, the mothers were directing the children's attention, and verbal and physical activity. Since the overlaps were internal, rather than initial, it can be interpreted that the mothers' intent was to regulate, rather than facilitate.

Whether the role for the caregiver in a child's acquisition of communicative competence is regulating or facilitating may depend on the task at hand (e.g., Tulviste & Raudsepp, 1997), and the developmental level of the child (Coster & Cicchetti, 1993). However, the children in the above communicative abilities studies came from typical environments and represent an average progression of language acquisition without developmental interruptions. It is valuable to consider the role of caregivers in the development of maltreated children's communication skills, since children raised in an atypical environment experience delays in cognitive and social-emotional development that can lead to interruptions in language development (Coster & Cicchetti, 1993; Culp et al., 1991).

<div align="center">Maltreatment and Language Development</div>

The presence of language delays in children who have experienced maltreatment early in life has been well documented (McFadyen & Kitson, 1996). Children that have been raised by parents that are abusive and/or neglectful have delays in many areas of language development (Coster et al., 1989), although few studies have focused on children's

appropriate social use of language (Law & Conway, 1992). The relationship between being raised in a maltreating environment and language difficulties has also been shown in studies of adolescents subjected to early physical abuse (McFadyen & Kitson, 1996). Adolescents subjected to physical abuse (onset prior to age six years) displayed receptive and expressive delays, including specific language difficulties found in studies of young, maltreated children (e.g., Coster et al., 1989). Early exposure to maltreatment has been shown to be related to difficulties in age-appropriate language development, and these difficulties appear to still be present when assessed at a later age.

Coster et al. (1989) reported that 31-month-old maltreated toddlers, when compared to age-matched non-maltreated toddlers, displayed delayed expressive language abilities. In addition, they found that specific areas of functional communication were different from the non-maltreated toddlers. These aberrations in functional communication included increased repetitive speech, and decreased informative utterances, requests for information, references to persons or events outside of the here-and-now, talk about their own activity and internal states, utterances relevant to the ongoing dialogue, and length of sustained dialogue. Of particular interest, it was observed that the mothers' language did not differ between the maltreated and non-maltreated groups. That is, the mothers of maltreated children did not provide less contingent or elaborated communication than the mothers of non-maltreated children during the interactions.

Culp et al. (1991) examined the language development (both expressive and receptive) of children who were abused, neglected, and both abused and neglected. They found that while all three groups of pre-school aged children displayed some delays in language, the presence of neglect had the greatest effect on language development. In fact,

the neglected children displayed a 6-9 month delay in expressive and receptive language abilities, while abused/neglected and abused only children displayed 4-8 month and 0-2 month delays, respectively. The authors describe a neglectful environment as not providing socially-mediated learning experiences and thus resulting in potential linguistic delays. This is in contrast to abusive environments, in which children may still be exposed to elements of socially interactive learning experiences. The differences between neglect and abuse need to be carefully considered when studying language development in children, as the two environments can result in different outcomes in language difficulties: neglect appears to be the most detrimental, compared with abuse only and abuse/neglect, to a child's development of both receptive and expressive language.

Allen and Wasserman (1985) examined the patterns of mother-child interactions in order to identify a relationship between abusive mothers' behavioral patterns and their children's language competence. They found that abusive mothers tended to be more likely to ignore their children and are less likely to teach their children using verbal means. The mothers more often used nonverbal means to teach their children and provided approximately one-half the verbal production as non-abusive mothers. Assessment of children's language skills with the Bayley Mental Development Index (Bayley MDI) indicated children under 14 months of age displayed average abilities compared to matched, control children; however, children over 14 months of age scored significantly lower on the Bayley MDI than control children. The results of this study indicate that children raised in maltreating environments are more likely than non-maltreated children to display difficulties in language development, and the delays become more substantive as the children spend more time in the maltreating environment. In addition, this study suggests that the decreased

quality (e.g., ignoring children, less verbal interactions) of mother's behavioral patterns during interactions is related to the children's language delays.

In summary, it has been well documented that children subjected to early maltreatment are likely to display language delays on measures of communication skills. There is a positive relationship between the length of time children are subjected to maltreatment and the severity of language delays children display when assessed (Allen & Wasserman, 1985). However, most of the children assessed in these studies have remained in the maltreating environment, rather than being moved into more healthy environments, making it difficult for children to recover from the effects of the maltreatment. In addition, maltreated children with language delays are usually referred to professionals for severe behavioral problems and delays in multiple areas, and they typically come from families of lower socio-economic status (English, 1998; McFadyen & Kitson, 1996).

<div align="center">Research Questions</div>

Tomasello (1992) described the importance of communication as a social behavior, and argued that the acquisition of language is through social interactions with other human beings. The nonverbal and verbal interactions between caregivers and children provide the scaffolding for future language development (Hoff-Ginsberg, 1997). Children from Romania experienced little interaction with caregivers in the orphanages, and as a result were given little opportunity to learn communication skills. In addition, the children failed to achieve developmental milestones in multiple areas (e.g., attachment, intelligence, behavior management). Difficulties in other areas of development may be related to difficulties in the acquisition of communicative competence (Coster & Cicchetti, 1993). Most of the studies conducted with children adopted from the Romanian orphanages have

examined a variety of areas of development; however, none have examined the language development of the adopted children. It is important to consider language development in this population of children because they have demonstrated difficulties in many other areas of development that may impact language acquisition (e.g., Ames, 1997), and difficulties in language acquisition have been demonstrated in other groups of maltreated children (e.g., Coster & Cicchetti, 1993).

The purpose of this research was three-fold in its examination of language development in a previously neglected population. The first goal was to examine if there are long-term effects of institutionalization on the development of communicative competence of children from Romanian orphanages, given the relationship between child-caregiver interactions and language development (Warren & McCloskey, 1997). Communicative competence, the knowledge of language use in a socially appropriate manner, was explored by examining both communicative intent and turn-taking behaviors during mother-child interactions in both structured and unstructured interactions. The communicative intent (e.g., command, request, response) of each utterance produced by both mothers and children during interactions was examined. Turn-taking abilities were examined by coding multiple aspects of overlapping utterances (e.g., intent of overlap, repairs used following overlap) during the interactions. Given the children's early, long-term exposure to the depriving orphanage environment and their related developmental difficulties (e.g., attachment, intelligence, and behavior), it was predicted the children would use different types of communicative intent and increased turn-taking violations than non-adopted children of the same age.

The second goal was to assess the linguistic skills of Romanian orphanage children during mother-child interactions using a measure of syntactic skills. Although linguistic competence can be viewed as a sub-component of language development (Hoff-Ginsberg, 1997), it was examined as a related, and separate, construct of communicative competence. Since children adopted from Romanian orphanages have had less exposure to language as a result of deprivation, as well as displaying decreased overall levels of cognitive functioning, it was predicted that the Romanian orphanage children would have decreased linguistic skills relative to non-adopted children. The third goal of this research was to determine whether a relationship exists between the mothers' use of language during interactions and other areas of development (i.e., attachment, intelligence, behavior). That is, were children exhibiting attachment, cognitive and behavioral difficulties more likely to have mothers that use more regulative or facilitative utterances during interactions with their children? Given that Romanian orphanage children have fewer secure attachment patterns, lower cognitive skills and/or increased behavior problems, it was predicted that they would be more likely to have mothers using more regulative language (i.e., more commands, more questions) during interactions, particularly when the interaction are focused on an unstructured task (Coster & Cicchetti, 1993).

Methods

Participants

Three groups of children participated in this study, children who were adopted from Romanian orphanages (RO group; n = 18; 8 males and 10 females), Canadian-born children living with their birth families (CB group; n = 18; 8 males and 10 females), and children who were adopted from Romania prior to spending more than four months in an orphanage

(EA group; n = 11; 4 males and 7 females). The three groups of children were part of a larger sample of children who participated in a longitudinal study conducted by Ames and colleagues (1997). The three groups of children were matched for their age at interview, gender, number of children in the family, mother's education, father's education, mother's age, father's age, and family income (see Table 1). All children lived in British Columbia at the time of videotaping.

Romanian orphanage (RO) group.

The initial criterion for inclusion in the study was a minimum stay in a Romanian orphanage of 8 months prior to adoption into a Canadian home. Of the 46 children tested by Ames and colleagues (1997), 18 RO children were randomly selected for inclusion in this study. Their mean age of adoption from the orphanage was 15.8 months ($\underline{SD}$ = 4.9; range 8-28 months) and mean length of time children spent in the orphanage was 15.8 months ($\underline{SD}$ = 4.9; range 8-28 months). The mean age at adoption and the mean length of time in the institutions were significantly correlated ($\underline{r}$ = .99, $\underline{p}$ < .001), indicating that the majority of their lives were spent in the orphanages prior to being adopted into Canadian homes. At the time of videotaping, the RO children had lived in their adoptive homes for a mean of 3.2 years ($\underline{SD}$ = 0.4; range 2.2 - 3.8 years), with a mean age at interview of 4.5 years ($\underline{SD}$ = 0.03; range 4.5 - 4.6 years).

Canadian-born (CB) group.

Children in the CB group were never institutionalized and resided with their birth parents. Children selected for inclusion in this group were matched with the children of the RO and EA groups by age at interview and gender. The mean age at the interview was 4.5

Table 1

Demographic Characteristics of Matched Pairs of RO, CB, and EA Children

Variable	RO	CB	EA
n	18	18	11
Males	8 (44%) [a]	8 (44%)	4 (36%)
Females	10 (56%)	10 (56%)	7 (64%)
Time in institution (months)	15.8 (8-28) [b]	...	1.6 (0-4) *
Age at adoption (months)	15.8 (8-28)	...	2.7 (1-4) *
Time in adopted home (yrs)	3.2 (2.2-3.8)	...	4.3 (4.1-4.4) *
Age at interview (yrs)	4.5 (4.5-4.6)	4.5 (4.4-4.8)	4.5 (4.4-4.6)
Number of siblings	1.6 (0-8)	1.1 (0-2)	0.7 (0-3)
Mother's education (yrs)	13.2 (1.9) [c]	13.2 (1.6)	14.0 (2.5)
Father's education (yrs)	12.6 (3.1)	15.2 (3.7)	15.1 (3.1)
Mother's age (yrs)	33.6 (5.0)	34.1 (4.7)	37.0 (5.8)
Father's age (yrs)	36.0 (6.3)	37.3 (4.5)	37.7 (5.2)
Income	4.2 (2.0) [d]	5.1 (2.3)	4.4 (3.0)

[a] number (percent).

[b] mean (range).

[c] mean (SD).

[d] Income ratings based on a 9-point Likert scale rating by parents (5 is about $60 000/year).

* difference between the RO and EA groups were significant at $p < .001$

years (SD = 0.1; range 4.4 - 4.8 years). The two groups did not differ significantly on any of the demographic characteristics listed in Table 1.

Early-adopted (EA) group.

The children in the EA group were adopted from Romania prior to spending more than four months an orphanage (Ames, 1997). Children selected for this group were matched with the children in the RO and CB groups by age at interview and gender. The mean age at adoption for the EA children was 2.7 months (SD = 1.3; range 1-4 months), with a mean amount of time spent in an institution of 1.6 months (range 0-4 months). Their mean age of adoption and mean length of time in the orphanage were not significantly correlated (r = .20, p = .547), indicating that the EA children did not spend the majority of their lives prior to adoption living in an orphanage. At the time of interview, the EA children had lived in their adoptive homes for a mean period of 4.3 years (SD = 0.1; range 4.1 - 4.4 years), and their mean age at interview was 4.5 years (SD = 0.06; range 4.4 - 4.6 years). When the two adopted groups were compared, the EA group differed significantly from the RO group on mean age of adoption (t (26) = 8.62, p < .001), length of time in institution (t (26) = 9.27, p < .001), and time in adopted home (t (26) = 8.70, p < .001) (see Table 1), as was expected.

<div align="center">Measures</div>

Communicative Interactions.

Videotaping was conducted by two researchers from Simon Fraser University in Burnaby, B.C., Kim Chisholm and Sara J. Morison, as part of a larger research study on the children from Romanian orphanages. Mothers and their children were videotaped interacting during an unstructured play session (part of the *strange situation*; Ainsworth,

Blehar, Waters, & Wall, 1978) and a structured ring task in their respective homes. The unstructured interaction involved the mother and child playing with a basket of toys (age-appropriate and consistent for each dyad) for eight minutes. The mother left the room for three minutes when signaled by the camera operator (i.e., a cough) and the child remained in the room with the camera operator. The mother then returned to continue the freeplay interaction with the child for an additional three minutes. The structured interaction involved the mother teaching the child a ring task similar to the Tower of Hanoi problem and lasted approximately five minutes.

Syntactic Abilities.

Children's syntactic abilities were assessed using the Index of Productive Syntax (IPSyn; Scarborough, 1990). The IPSyn was completed by a coder with an undergraduate degree in linguistics using the printed transcripts from the videotaped interactions. The IPSyn is a measure of emergent syntactic production abilities and has been found to be sensitive to persistent differences between normal and language-delayed preschoolers. This measure is also sensitive to age-appropriate language changes in children and has good interscorer reliability ($r = .986$) (Scarborough, 1990). Since IPSyn scores are consistent across a range of composite mental abilities (Klein, Mervis, Bertrand, Hutchins, & Meyer, 1995), the IPSyn was a valid and reliable measure of the children's syntactic complexity. Children's syntactic skills were measured by 56 items on four subscales of the IPSyn; noun phrases (e.g., proper nouns, count nouns, modifiers, pronouns), verb phrases (e.g., verbs, prepositional phrases, adverbs, past tense modal, past tense auxiliary), questions/negations (e.g., intonationally marked question, simple negation, why, when, whose, which questions), and sentence structures (e.g., two-word combinations, subject-verb-object combinations,

conjunction, conjoined phrases, bitransitive predicate). For a complete list of all 56 items on the IPSyn, refer to the appendix found in Scarborough (1990).

Attachment.

Children's attachment security was assessed using the Preschool Assessment of Attachment (PAA; Crittenden, 1992). Children's behavior during a *strange situation* (Ainsworth et al., 1978) was coded using the PAA and children were categorized as secure (comfortable, reserved, reactive, other), insecure defended (defended inhibited, coercive, compliant), insecure coercive (threatening/disarming, punitive, helpless), insecure coercive/defended, and insecure other (see Chisholm, 1998). For purposes of maintaining statistical power during analysis, children were grouped according to the categories secure (comfortable, reserved, reactive, other), typical insecure (defended inhibited, threatening/disarming), and atypical insecure (caregiving, compliant, punitive, helpless, coercive/defended, other). Children categorized as displaying a secure attachment will play comfortably, happily exploring their new environment when in the presence of their caregiver. When the caregiver leaves, the child is distressed, but seeks contact upon the return of the caregiver (Myers, 1995). Securely attached children use their parents as a safe haven when distressed and also show a preference for their caregiver over a stranger. Insecurely attached children may be less likely to explore their environment, and may cling to their caregiver. When the caregiver leaves, insecurely attached children will cry loudly, and then may be indifferent or even hostile upon the caregiver's return. Ames (1997) describes children with atypical insecure attachment as displaying more extreme or even pathological levels of insecure attachment (i.e., Defended-caregiving pattern: child takes on responsibility for keeping an interaction going with a withdrawn or unresponsive parent).

<u>Intelligence</u>.

Children were administered the Stanford-Binet Intelligence Scale, 4th Edition (Stanford-Binet IV) as a measure of general intelligence (see Morison and Ellwood, 2000). The Stanford-Binet IV has excellent reliability (overall $r_\alpha = .97$) and is an appropriate measure for intelligence for children aged 2 to 18 years (Sattler, 1992). For the present study, children's scores were derived for the Composite Intelligence Quotient Score, which is an estimate of children's overall cognitive functioning.

<u>Behavior</u>.

Children's behavior was assessed using the Child-Behavior Checklist/4-18 (CBCL/4-18; Achenbach, 1991) and the Social Skills Rating System (SSRS; Gresham & Elliott, 1990). The CBCL/4-18 allowed the children's behavior to be rated by parents across a number of subscales, particularly on the Attention Problems subscale. The SSRS provided parental ratings on the Total Problem Behavior Scale, a measure of problem behaviors that might interfere with the development of positive social skills (comprised of externalizing, internalizing, and hyperactivity problems).

<div align="center">Procedure</div>

<u>Communicative Intent</u>.

The mothers' utterances were transcribed using Codes for the Human Analysis of Transcripts (CHAT) format (MacWinney & Snow, 1985). An utterance was defined as a word or group of words produced by one speaker that expressed a single idea. Each utterance was then coded for communicative intent using a coding scheme adapted from Coster et al (1989) and outlined below.

1. <u>Self-repetition:</u> Exact (word-for-word, or very similar) repetition of own prior communication, either spontaneous or in response to clarification request. (Example. C: "What dis mommy?". M: (no answer). C: "What dis mommy?").

2. <u>Other-repetition:</u> Exact (word-for-word, or very similar) repetition of other's utterance, in order to clarify. (Example. M: "How many times?". C: "Three Times". M: "Three Times?".).

3. <u>Exchange:</u> Utterances that accompany acts of giving and receiving objects. (Example. "oh here", "dis for you", "here").

4. <u>Informative:</u> Any declarative statement which contains information about the acknowledged topic to other participants and instructions on how to perform an action (but not commanded) (Example. "this train is neat", "You have to put the little ring on a big ring.").

5. <u>Command:</u> Statements given that command an action to be performed or attention given. (Example. "come over here", "look", "watch").

6. <u>Request:</u> Any statement containing a request for information/opinion, permission, action, confirmation, and clarification. May be direct or indirect. (Example. "Let's", "How about...", "Where is the toy?", "Can you get the object?", "What do you want to do?").

7. <u>Response:</u> A statement involving a yes/no response to a question, or answer supplied to a question asked.

8. <u>Nonverbal Reply or Acknowledgement:</u> A nonverbal response to a statement or question. (e.g., nodding, pointing) or nonverbal acknowledgement (e.g., smile, sigh). Includes laughing as a response to actions or statements.

9. <u>Verbal Acknowledgement:</u> Any verbal expression or remark recognizing the fact that the previous speaker has <u>said or done</u> something, but not a response supplied to a request or providing information about an object or action. Used to acknowledge the others' actions or statements like responses. (Example. "Oh", "Uh-huh", "OK", "Yeah").

10. <u>Discuss Self:</u> Self-utterances describing an act the individual is performing or has just performed or expresses emotions, intents, and other psychological states the individual (i.e., 'self-acknowledgement' or 'self-narrative'). (Example. "I did it", "makin' a house", "can't do it", "gotta go", "I don't like that".).

11. <u>Discuss others:</u> Statements that describe the psychological states (thoughts, feelings, actions) of others, including pretend animate beings, whether present or not. (Example. "Baby hungry", "he tired", "she left the room", "You love this toy").

12. <u>Uncodable/Unclassifiable:</u> Any statement in which the utterance is unclear or not understood, or cannot be categorized by a specific functional type, whether due to incompletion of utterance before it can be coded, or not included in coding scheme.

Each category of intent used for classifying utterances was mutually exclusive, each utterance was only coded once (i.e., no utterances were double coded), and repetitions of utterances were coded as such, rather than as the intent a second time. For mothers and children, in both unstructured and structured interactions, the total number of utterances in each intent category was obtained by adding the number of occurrences in each category. Utterances not directed toward the mother or child (i.e., mother talking to camera operator) were not coded for communicative intent.

<u>Turn-taking Behaviors</u>.

The unstructured and structured interactions between mothers and children were also coded for turn-taking behaviors. Transcripts of the mother-child interactions were marked for overlapping utterances (i.e., those utterances in which both mother and child speak simultaneously during any part of an utterance) according to the CHAT procedure. Each overlap was coded for the following factors: (1) who was doing the overlap, (2) type of overlap (i.e., internal or initial), (3) number of words during overlap, (4) repairs used following overlap, and (5) intent of overlapping utterance according to the criteria presented below (and adapted from Bedrosian et al. (1988)).

1. <u>General Characteristics of Overlap</u>: (a). **Temporal location of the overlap**: **Initial**: those overlaps involving double starts where both participants begin talking at the same time. **Internal**: those overlaps in which a participant starts talking during the other participant's utterance, whether successful or not in taking over the speaking turn; (b) **Mean number of overlaps**. The mean number of overlaps for each participant will be calculated; (c) **Mean number of words in overlaps**. The number of words in the overlap utterances will be calculated for each participant.

2. <u>Participant Involvement</u>: (a) For initial overlaps, the person talking prior to the overlap will be coded; (b) For internal overlaps, the participant interrupted will be coded.

3. <u>Communicative Intent of Overlap</u>: (a) **Prior to overlap**: utterance is coded for communicative intent; (b) **Overlap**: utterance is coded for communicative intent; (c) **Following overlaps**: utterance is coded for communicative intent.

4. <u>Following Overlap</u>: (a) **Maintain topic of overlap**: a participant maintains the topic of the overlap without reintroducing the overlapped utterance; (b) **Introduce new**

utterance: the overlap is ignored and a new utterance is started; (c) **Discontinuation of talking**: one participant stops talking to allow the other to continue talking; (d) **Reintroduction of utterance**: a participant reintroduces his/her overlapped utterance; (e) **Interruption markers**: a participant uses "excuse me" or other expressions indicating his/her awareness of the interruption.

Slightly different criteria were used to code for the person being overlapped for initial (i.e., both participants start talking at same time) and internal (i.e., one person interrupts others' utterance) overlaps. For initial overlaps, the person who was speaking prior to the overlap was coded as the overlapping speaker, while for internal overlaps the person that began speaking after the other person started was coded as the overlapping speaker. Overlaps that involved nonverbal communicative intent were not included as a turn-taking violation. Totals for each category of turn-taking were calculated for children and mothers, in both unstructured and structured interactions.

Syntactic Abilities.

Within each transcript, the first 100 successive, intelligible, non-repeating utterances produced by the children were used to measure syntactic skills with the IPSyn. The coder went through each transcript line by line and gave credit for each item as it was encountered. In order for children to get full credit (two points) for each of the 56 items on the IPSyn (e.g., proper nouns, past tense verbs), two exemplars of each item must have been demonstrated (see Scarborough (1990) for an appendix containing the coding manual). If only one exemplar is produced, then children were given partial credit (one credit) for that particular item. A total syntactic abilities score was calculated, with the highest possible score being 120. For children that produced fewer than 100 codable utterances, a table was

provided in Scarborough (1990) to estimate the IPSyn score the child would have obtained if a full 100 utterances had been available.

Attachment, Intelligence and Behavior.

In order to examine the children's development in these areas, their scores on the PAA, the Stanford-Binet IV, the CBCL/4-18, and the SSRS were obtained from Dr. Kim Chisholm. Scores for each child in these areas of development were pulled from the data set containing the whole sample of children and then entered into the current data set of the randomly selected sample of children being studied.

Reliability Coding

Communicative Intent.

In order to establish inter-rater reliability for the communicative intent coding, 20% of the utterances in each mother-child interaction was randomly selected and coded from the videotapes by one of two secondary coders blind to the hypotheses of the study. Percent agreement between the primary and secondary coders was calculated by dividing the number of agreed upon utterances by the sum of the agreed + disagreed utterances and multiplied by 100 (Sattler, 1992). The overall percent agreement between the primary and secondary coders was 96.7% (SD = 2.4, range: 90.5% – 100%).

Turn-Taking Behaviors.

In order to establish inter-rater reliability for the coding of the turn-taking behaviors, 20% of the turn-taking violations in each mother-child interaction were randomly selected and coded from the transcripts by a second coder blind to the hypotheses of the study. The overall percent agreement between the primary and secondary coder was calculated by dividing the total number of agreed upon overlaps (i.e., contains the coding of initial and

internal overlaps, number of words during overlaps, types of repairs used following overlaps, and the intent of the overlapping utterances) by the sum of the agreed + disagreed overlaps. Overall percent agreement between the primary and secondary coders was 96.4% ($\underline{SD} = 4.6$, range: 83.3% – 100%).

Syntactic Abilities.

To assess the inter-rater reliability of the IPSyn, a second coder blind to the study hypotheses randomly selected 20% of the transcribed interactions and coded them. Reliability of the IPSyn coding was calculated by correlating the results of the two coders. The overall Pearson correlation between the two raters was $\underline{r}$ (9) = 0.87, which was statistically significant ($\underline{p}$ = .003).

Results

Demographics

Demographic characteristics of the children in each of the three groups are presented in Table 1. T-tests were conducted to compare the two adopted groups (RO and EA) on time in institution, age of adoption, and time in adopted home in order to establish the difference between these two groups. RO children spent significantly more time in an institution than EA children ($\underline{t}$ (26) = 9.27, $\underline{p}$ < .001), RO children were adopted at a later age than EA children ($\underline{t}$ (26) = 8.62, $\underline{p}$ < .001), and had spent less time in their adoptive homes than EA children ($\underline{t}$ (26) = 8.70, $\underline{p}$ < .001) (see Table 1 for means and ranges). Controlling these demographic variables allowed for an examination of the children's development compared to what would be expected on a trajectory of normal development. Although the difference in time in adoptive homes between the RO and EA children could be perceived as a

confounding variable, this difference was inevitable as children were compared when they were the same chronological age.

One-way analyses of variance (ANOVA) were used to compare all three groups (RO, CB, and EA) on the remaining demographic variables presented in Table 1. Children in all three groups did not differ on age at interview, F (2, 44) = 0.80, p = .457, number of other children in the house, F (2, 44) = 1.44, p = .249, mother's education, F (2, 44) = 0.74, p = .485, father's education, F (2, 44) = 2.99, p = .061, mother's age, F (2, 44) = 1.65, p = .205, father's age, F (2, 44) = 0.38, p = .687, or family income, F (2, 44) = 0.60, p = .553. Thus, any differences found in children's or mothers' use of language, or in areas of development can be attributed to differences in time spent in a depriving orphanage environment, rather than differences in demographics.

<center>Communicative Abilities</center>

<u>Communicative Intent</u>.

Although each interaction was approximately the same length of time, there was the possibility of slight variance in the time each dyad interacted or the amount of utterances produced. In order to account for differences in the number of utterances spoken, the frequency of occurrence of each type of communicative intent was converted into a percentage of total utterances spoken by dividing the number of times each category of communicative intent was coded by the total utterances spoken, and then multiplying by 100. Comparison of the data involved separate analyses for unstructured and structured interactions for both mothers and children.

Rather than performing an omnibus ANOVA on 12 categories, groups were compared using one-way ANOVAs for each category of communicative intent. Comparison

of the data involved separate analyses for unstructured and structured interactions on the mothers' and children's utterances, with alpha level set at .05 for each one-way ANOVA performed. Protected t-tests were conducted to follow-up any significant main effects, with an alpha level set at .05. In addition, the Bartlett-Box test of homogeneity was used to analyze any violations of normality. The one-way analyses of variance that violated the assumption of homogeneity of variance (analyzed using the Bartlett-Box test of homogeneity of variance) were analyzed using the nonparametric Kruskal-Wallis one-way ANOVA (alpha = .05), and followed up using Mann-Whitney U-tests (alpha = .05).

Unstructured interactions. The results of the comparison of the different types of communicative intent during the unstructured interactions are presented in Tables 2 and 3. For the mothers, a significant main effect of group was found for the percentage of commands given ($\underline{F}$ (2,43) = 5.62, $\underline{p}$ = .007) and this analysis did not violate homogeneity of variance, $\underline{F}$ (2, 3790) = 2.56, $\underline{p}$ = .070 (Table 2). Planned follow-up t-tests indicated the mothers of the RO group gave significantly more commands than the mothers of the CB group, $\underline{t}$ (44) = 3.26, $\underline{p}$ < .01, and the EA group, $\underline{t}$ (44) = 2.18, $\underline{p}$ < .05. There was no significant difference in the number of commands given by mothers in the CB group and the EA group, $\underline{t}$ (44) = 0.72, $\underline{p}$ > .20. There was also a significant main effect of group for the percentage of other-repetition utterances produced by the mothers using Kruskal-Wallis, χ^2 (2) = 1.83, p = .028, as this analysis violated assumption of normality with ANOVA, $\underline{F}$ (2, 3790) = 3.51, $\underline{p}$ = .030. Mann-Whitney U-tests indicated that there was no significant difference between the mothers of RO children and mothers of CB children, $\underline{U}$ = 114.0, $\underline{p}$ = .13, or between the mothers of the RO children and the mothers of the EA children, $\underline{U}$ = 66.0, p = .14. However, the mothers of the EA children produced significantly more other-

Table 2

Percentage of Each Type of Utterance Produced by Mothers in Unstructured Interactions

Category of Intent	RO	CB	EA	F	χ^2
Self-repetition	1.9 (1.3) [a]	1.2 (1.5)	2.3 (1.6)	2.02 [b]	—— [c]
Other-repetition	4.8 (4.8)	3.2 (2.6)	5.7 (2.7)	—— ^	7.17 *
Exchange	0.6 (1.2)	0.5 (0.8)	0.7 (1.0)	0.19	——
Informative	12.7 (4.4)	15.3 (6.9)	14.3 (6.0)	0.85	——
Command	10.5 (5.5)	5.7 (3.1)	6.9 (4.7)	5.62 **	——
Request	33.5 (7.3)	32.1 (8.3)	31.2 (4.5)	0.39	——
Response	5.5 (3.9)	4.2 (3.0)	3.3 (1.7)	—— ^	2.21
Non-Verbal	1.1 (0.8)	2.7 (2.7)	1.4 (1.2)	—— ^	5.83
Acknowledgement	19.1 (7.9)	20.2 (7.6)	20.9 (4.5)	0.21	——
Discuss Self	7.3 (5.2)	8.5 (3.6)	8.8 (5.2)	0.47	——
Discuss Others	2.1 (2.3)	5.4 (9.1)	2.3 (1.0)	----- ^	2.52
Total Utterances	59.4 (6.1)	56.3 (11.5)	62.3 (8.9)	—— ^	3.26

[a] mean percentage (SD)

[b] F (2,43) from One-Way ANOVA

[c] χ^2 One-Way ANOVA using Kruskal-Wallis (nonparametric)

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

^ violated assumption of homogeneity of variance (Bartlett-Box F(2, 3790))

Table 3

Percentage of Each Type of Utterance Produced by Children in Unstructured Interactions

Category of Intent	RO	CB	EA	F	χ^2
Self-repetition	2.8 (2.5) [a]	2.8 (2.4)	2.2 (2.3)	0.29 [b]	—— [c]
Other-repetition	2.5 (1.8)	1.0 (1.9)	2.1 (1.5)	3.08	——
Exchange	0.3 (0.4)	0.3 (0.6)	0.7 (0.8)	—— ^	2.71
Informative	11.2 (6.8)	13.7 (7.7)	11.8 (6.4)	0.68	——
Command	6.4 (5.1)	4.8 (4.2)	4.1 (2.3)	—— ^	1.16
Request	15.8 (7.9)	12.4 (7.6)	12.3 (6.3)	1.17	——
Response	22.3 (8.0)	18.2 (11.4)	17.3 (8.3)	1.21	——
Non-Verbal	3.3 (3.5)	5.1 (12.0)	4.3 (2.7)	—— ^	4.96
Acknowledgement	6.9 (3.4)	6.7 (5.5)	8.7 (3.7)	0.79	——
Discuss Self	21.9 (8.2)	24.5 (11.3)	26.0 (9.4)	0.72	——
Discuss Others	1.5 (2.0)	5.9 (14.7)	3.4 (4.2)	—— ^	1.72
Total Utterances	40.6 (5.1)	43.7 (11.5)	37.7 (8.9)	—— ^	3.26

[a] mean percentage (SD)

[b] F (2,43) from One-Way ANOVA

[c] χ^2 One-Way ANOVA using Kruskal-Wallis (nonparametric)

** $p < .01$

^ violated assumption of homogeneity of variance (Bartlett-Box $F(2, 3790)$)

repetition utterances than the mothers of the CB children, $\underline{U}$ = 42.5, $\underline{p}$ = .01. There were no
other significant main effects of group for the other types of utterances produced by the
mothers. For the children, there were no significant main effects of group (see Table 3).
Therefore, during the unstructured interactions, mothers of RO children differed from
mothers of CB and EA children in their increased use of commands, with no difference
between the groups of mothers of CB children and mothers of EA children in the amount of
commands produced. In addition, mothers of EA children repeated their children's
utterances significantly more than mothers of CB children, but both mothers of EA and CB
children did not differ significantly from mothers of RO children. The results also indicate
that children in the RO, CB, and EA groups do not differ from each other in the types of
utterances produced during an unstructured interaction with their mothers.

Structured interactions. The results of the analysis of communicative intent during
the structured interactions are presented in Tables 4 and 5. For the mothers, there was a
significant main effect of group for the percentage of self-repetitions using Kruskal-Wallis,
χ^2 (2) = 9.86, p = .007, as this analysis violated assumption of homogeneity of variance using
ANOVA, $\underline{F}$ (2, 3790) = 4.28, $\underline{p}$ = .014 (see Table 4). Mann-Whitney follow-up U-tests
indicated that the mothers of the CB children were significantly lower than both the mothers
of the RO children, $\underline{U}$ = 79.5, $\underline{p}$ = .007, and the mothers of the EA children, $\underline{U}$ = 38.0, $\underline{p}$ =
.009. However, the mothers of the RO and the mothers of the EA children did not differ
significantly from each other, $\underline{U}$ = 79.0, $\underline{p}$ = .60. There was also a significant main effect of
group for the total amount of utterances produced by mothers, $\underline{F}$ (2,43) = 3.34, $\underline{p}$ = .045, and
this did not violate assumption of heterogeneity of variance, $\underline{F}$ (2, 3790) = 2.47, $\underline{p}$ = .085.
Follow-up analysis indicated that there was no significant difference between the mothers of

Table 4

Percentage of Each Type of Utterance Produced by Mothers in Structured Interactions

Category of Intent	RO	CB	EA	F	χ^2
Self-repetition	2.9 (2.9)[a]	0.8 (1.4)	2.7 (1.7)	——[b] ^	9.86 [c] **
Other-repetition	1.4 (1.6)	1.3 (1.7)	2.6 (2.2)	2.06	——
Exchange	0.0 (0.0)	0.0 (0.0)	0.0 (0.0)	0.00	——
Informative	22.4 (9.0)	23.5 (8.9)	26.8 (7.7)	0.86	——
Command	12.6 (6.7)	10.2 (7.4)	8.7 (2.8)	—— ^	3.00
Request	28.2 (11.0)	28.4 (11.2)	27.9 (4.2)	—— ^	0.04
Response	1.8 (1.4)	2.0 (2.3)	1.2 (1.5)	0.61	——
Non-Verbal	2.0 (2.6)	1.5 (1.8)	2.3 (2.5)	0.42	——
Acknowledgement	18.1 (6.9)	21.7 (7.2)	19.8 (6.8)	1.24	——
Discuss Self	8.5 (11.3)	9.3 (7.4)	5.6 (4.9)	—— ^	1.89
Discuss Others	1.6 (2.6)	1.2 (1.5)	1.1 (2.0)	0.31	——
Total Utterances	71.6 (10.9)	79.4 (6.3)	76.0 (9.6)	3.34 *	——

[a] mean percentage (SD)

[b] F (2,43) from One-Way ANOVA

[c] χ^2 One-Way ANOVA using Kruskal-Wallis (nonparametric)

* p < .05; ** p < .01

^ violated assumption of homogeneity of variance (Bartlett-Box F(2, 3790))

Table 5

Percentage of Each Type of Utterance Produced by Children in Structured Interactions

Category of Intent	RO	CB	EA	F	χ^2
Self-repetition	1.4 (2.1)[a]	2.3 (4.1)	1.6 (3.0)	—— [b]^	0.11 [c]
Other-repetition	1.4 (2.4)	1.0 (2.0)	4.5 (6.0)	—— ^	4.36
Exchange	0.2 (0.7)	0.2 (0.7)	0.0 (0.0)	0.28	——
Informative	5.7 (6.5)	6.0 (7.8)	14.4 (9.7)	4.75 *	——
Command	2.0 (2.9)	1.1 (2.1)	1.8 (2.9)	0.50	——
Request	15.1 (10.1)	11.4 (10.3)	12.0 (3.7)	—— ^	1.13
Response	24.1 (12.4)	27.6 (1.6)	19.7 (14.4)	0.93	——
Non-Verbal	11.0 (13.4)	17.2 (25.9)	15.0 (9.0)	—— ^	2.48
Acknowledgement	16.8 (8.9)	12.3 (11.7)	12.3 (8.5)	1.11	——
Discuss Self	21.2 (12.5)	18.2 (14.3)	15.2 (7.4)	0.78	——
Discuss Others	0.0 (0.0)	0.3 (1.0)	0.0 (0.0)	----- ^	1.56
Total Utterances	28.4 (10.9)	20.6 (6.3)	24.0 (9.6)	3.34 *	——

[a] mean percentage (SD)

[b] F (2,43) from One-Way ANOVA

[c] χ^2 One-Way ANOVA using Kruskal-Wallis (nonparametric)

* $p < .05$

^ violated assumption of homogeneity of variance (Bartlett-Box $F(2, 3790)$)

EA children and RO children, t (44) = 1.27, p > .05, or between the mothers of EA children and mothers of CB children, t (44) = 0.98, p > .05; however, the mothers of RO children contributed significantly less total utterances than the mothers of CB children, t (44) = 2.58, p < .05.

For the children, there was a significant main effect of group for the percentage of informative utterances produced by the children, F (2,43) = 4.75, p = .014, and this did not violate the assumption of heterogeneity of variance, F (2, 3790) = 0.97, p = .381. Follow-up analysis indicated the EA children produced significantly more informative utterances than RO children, t (44) = 2.93, p < .05, and CB children, t (44) = 2.82, p < .05; however, there was no significant difference between the RO children and CB children (t (44) = 0.12, p > .05). There were also a significant main effect of group for the total amount of utterances produced by mothers, F (2,43) = 3.34, p = .045, and this did not violate assumption of normality, F (2, 3790) = 2.47, p = .085 (see Table 5). Follow-up analysis indicated that there was no significant difference between the EA children and RO children, t (44) = 1.27, p > .05, or between EA children and CB children, t (44) = 0.98, p > .05; however, the RO children contributed significantly more total utterances than the CB children, t (44) = 2.58, p < .05. These results indicate that the mothers of the adoptive children (RO and EA) are producing more self-repetition utterances than the mothers of CB children. In addition, mothers of RO children are contributing significantly fewer utterances to the total interaction during the ring task than mothers of CB and mothers of EA children. For the children, EA children produced significantly more informative utterances than RO and CB children during the ring task. In addition, the RO children contributed significantly more utterances to the total interaction during the ring task than CB and EA children.

Turn-taking Behaviors.

Groups were compared using one-way ANOVAs for each mutually exclusive category of overlaps. In order to correct for differences in the number of utterances produced (and hence the different number of overlaps possible), the frequency of each type of overlap category was converted into a percentage of total utterances spoken by dividing the number of each turn-taking category by the total utterances spoken, and then multiplying by 100. Comparison of the data involved separate analyses for unstructured and structured interactions for both mothers and children. For each one-way ANOVA performed, an alpha level of .05 was set. Alpha level was set at .05 for planned t-tests conducted to follow-up any significant main effects. The one-way analyses of variance that violated the assumption of heterogeneity of variance (analyzed using Bartlett-Box test of heterogeneity of variance) were analyzed using the nonparametric Kruskal-Wallis one-way ANOVA (alpha = .05) and followed up using Mann-Whitney U-tests (alpha = .05).

Unstructured interactions. The results of the analysis of turn-taking behaviors during the unstructured interactions are presented in Table 6. For the mothers, there was no significant main effect of group for the percentage of initial overlaps, F (2, 44) = 1.01, p = .372. There was also no significant main effect of group for internal overlaps, F (2, 44) = 1.05, p = .360. Thus, these results indicate that the mothers of the RO children produced similar numbers of initial and internal overlaps during the unstructured interactions as mothers of the CB and EA children.

For the children, there was no main effect of group for percentage of initial overlaps, F (2, 44) = .08, p = .919; however, there was a significant main effect of group for the number of internal overlaps, χ^2 (2) = 9.04, p = .01, when analyzed using Kruskal-Wallis one-

Table 6

Mother's and Children's Use of Overlaps During Both Unstructured and Structured
Interactions

Overlap	RO	CB	EA
	Unstructured		
Mothers			
Initial	2.1 (1.8) [a]	1.4 (1.4)	1.5 (1.2)
Internal	1.9 (1.7)	1.4 (1.2)	2.3 (1.9)
Children			
Initial	1.6 (1.5)	1.4 (1.6)	1.4 (1.3)
Internal	1.8 (1.8)	1.2 (1.1)	3.7 (2.2) *
	Structured		
Mothers			
Initial	1.4 (1.5)	1.4 (1.8)	0.8 (1.1)
Internal	0.8 (1.5)	0.4 (0.9)	1.7 (1.9) *
Children			
Initial	0.3 (0.7)	0.5 (1.5)	0.4 (1.0)
Internal	1.8 (3.6)	3.7 (7.1)	2.7 (3.9)

[a] Percentage of overlapped utterances based on total utterances spoken (SD)

* p < .05

way ANOVA, as this analysis violated assumption of heterogeneity of variance, F (2, 3790) = 3.2, p = .04. Mann Whitney U-tests indicated that the children in the EA group displayed significantly more internal overlaps than the children in the RO group, U = 47, p .02, and children in the CB group, U = 34, p = .003. Children in the RO group and the children in the CB group did not differ significantly in the number of internal overlaps, U = 146.5, p = .62. The most frequent communicative intent expressed by the EA children in their internal overlaps (average times EA children produced each type of utterance in internal overlap, as a percent of the total internal overlaps coded) was self-discussion (35% of the time). Regarding repairs following the increased internal overlaps, EA children were more likely to keep talking and finish their overlapping utterance (44% of the time), whereas mothers of EA children were more likely to begin a brand new utterance (37% of the time) after being overlapped.

The results of the analysis of turn-taking behaviors indicate there were no differences between the mothers in their use of initial and internal overlaps with their children during the unstructured interaction. Also, there were no differences between the groups of children in their use of initial overlaps; however, the children in the EA group were using more internal overlaps than the children in the RO and CB groups. In addition, EA children were more likely to finish their overlapping utterance, while mothers of EA children were more likely to begin a new utterance after being overlapped by their children.

Structured interactions. Results of the analysis of overlaps during the unstructured interactions are presented in Table 6. For the mothers, there was no significant main effect of group for the number of initial overlaps, F (2, 44) = 0.60, p = .554. There was a main effect of group for the number of internal overlaps produced by mothers during the

structured interactions using the Kruskal-Wallis one-way ANOVA, χ^2 (2) = 8.58, $\underline{p}$ = .014

(violated the assumption of heterogeneity of variance, $\underline{F}$ (2, 3790) = 3.68, $\underline{p}$ = .026). Mann-

Whitney U-tests indicated that the mothers of EA children produced significantly more

internal overlaps during the structured interaction than mothers of RO children, $\underline{U}$ = 55.5, $\underline{p}$

= .038, and mothers of CB children, $\underline{U}$ = 46.5, $\underline{p}$ = .0068. The most frequent intent of

mothers of EA children's internal overlaps (average times mothers of EA children produced

each type of utterance in internal overlap, as a percent of the total internal overlaps coded)

was to provide information (57% of the time). Regarding repairs following the increased

internal overlaps, mothers of EA children were more likely to keep talking and finish their

overlapping utterance (78% of the time), whereas EA children were more likely to stop their

overlapped utterance (41.7 % of the time) and yield to the mother's overlapping utterance.

There was no significant difference between the mothers of RO and mothers of EA children,

$\underline{U}$ = 131.5, $\underline{p}$ = .22, in the number of internal overlaps produced. These results indicated that

during the structured interactions, there was no significant difference between the groups of

mothers on the amount of initial overlaps during structured interactions. However, mothers

of EA children produced significantly more internal overlaps than mothers of RO and

mothers of EA children.

For the children, there was no significant main effect of group for the number of

initial overlaps, χ^2 (2) = 0.22, $\underline{p}$ = .89 (violated assumption of homogeneity of variance, $\underline{F}$ (2,

3790) = 3.75, $\underline{p}$ = .024), or internal overlaps, χ^2 (2) = 0.27, $\underline{p}$ = .875 (violated assumption of

homogeneity of variance, $\underline{F}$ (2, 3790) = 4.51, $\underline{p}$ = .011). The results indicate that during the

structured task, there were no differences in the amount of initial or internal overlaps

displayed by the children in the three groups and no differences between mothers of the three

groups of children on the amount of initial overlaps. Mothers of EA children displayed more internal overlaps during the structured interaction, consisting mostly of informative utterances, and were more likely to finish their overlapping utterance while EA children were more likely to yield to their mother's overlaps and stop talking.

Linguistic Abilities

Children's scores on the IPSyn are presented in Table 7. A one-way ANOVA indicated there was no significant main effect of group, F (2,43) = 0.20, p = .821, and this analysis did not violate the assumption of homogeneity of variance, F (2, 3790) = 2.68, p = .069. Thus, there were no differences in syntactic skills amongst RO children, the CB children, and the EA children measured during the interactions.

Developmental Variables

Scores on the attachment, intelligence, and behavior variables for children in all three groups are presented in Table 7. Although the sample of children was taken to be representative of the larger group, comparative analyses of variables were conducted to ensure the sample of children was representative of the larger sample drawn from Ames (1997). Chi-square analyses and one-way ANOVAs were used to compare the three groups of children on each of the variables, with planned t-tests used to follow-up any significant main effects.

Attachment.

A 3 x 3 chi-square analysis indicated that the number of secure, insecure and atypical insecure children varied significantly across groups (χ^2 (4) = 21.22, p = .016) (see Table 7). First, the majority of children in the CB (66.7%) and EA (81.8%) groups were classified as securely attached, compared with 33% in the RO group. Second, 38.9% of RO, 33.3% of

Table 7

Developmental Variables of Matched Pairs of RO, CB, and EA Children

Variable	RO	CB	EA
Index of Productive Syntax (IPSyn)[a]	71.9 (7.6)	74.3 (12.7)	73.0 (13.8)
	77-84[b]	61-92	72-84
PAA[c]			
Secure	6 (33.3)	12 (66.7)	9 (81.8) *
Insecure	7 (38.9)	6 (33.3)	2 (18.2)
Atypical Insecure	5 (27.8)	0 (0.0)	0 (0.0)
Stanford-Binet IV Full IQ	90.2 (12.9)	108.9 (9.9)	100.0 (12.2) ***
CBCL Attention Problems Subscale	4.9 (4.0)	2.0 (2.1)	1.8 (1.2) *
CBCL Internalizing Problems Scale	5.4 (5.6)	4.5 (3.7)	2.3 (2.4)
CBCL Externalizing Problems Scale	14.8 (10)	9.5 (5.5)	8.3 (4.6)
CBCL Total Problems	37.2 (23.9)	24.1 (12.4)	16.2 (7.0) *
SSRS Internalizing Problems Scale	1.7 (1.4)	1.1 (1.1)	0.8 (0.8)
SSRS Externalizing Problems Scale	5.6 (2.7)	4.0 (2.3)	4.0 (1.8)
SSRS Total Problems	7.3 (3.4)	5.1 (3.1)	4.8 (1.6)

[a] mean (SD); $F (2, 43)$

[b] ranges for scores on the IPSyn

[c] number of children (percentage); $\chi^2 (4) = 12.217$

* $p < .05$; *** $p < .001$

CB, and 18.2% of EA children were classified as having typical insecure attachments. Finally, 27.8% of RO and 0% of CB and EA children were classified as having atypical insecure attachments. These results indicate that RO children display less secure and more typical and atypical insecure attachment patterns and are consistent with results from the larger sample of children (see Chisholm, 1998).

<u>Intelligence</u>.

When the three groups of children were compared on the Stanford-Binet IV (see Table 7), there was a significant main effect of group on the Composite IQ score, $F (2, 43) =$ 11.1, $p < .001$. Children in the RO group scored significantly lower than children in both the CB group, $t (43) = 4.77$, $p < .001$, and the EA group, $t (43) = 2.18$, $p < .05$. There was no significant difference between children in the CB and EA groups, $t (43) = 1.96$, $p > .05$. It is important to note that mean scores from all three groups of children fell within the Average Range of cognitive abilities. These results indicate that RO children score lower on measures of cognitive abilities (but within Average Range) than CB or EA children and are consistent with the results from the analysis of the larger sample (see Morison & Ellwood, 2000).

<u>Behavior</u>.

On the CBCL/4-18, there was a main effect of group on the Attention Problems Subscale, $F (2,43) = 5.12$, $p = .011$ (see Table 7). The RO group was rated as having significantly more attention problems than the CB group, $t (39) = 2.77$, $p < .01$, and the EA group, $t (39) = 2.56$, $p < .02$. The CB and EA groups did not differ significantly from one another, $t (39) = 0.18$, $p > .20$. There were no significant differences among all 3 groups on internalizing, $F (2,43) = 1.48$, $p = .241$, or externalizing, $F (2,43) = 2.93$, $p = .065$, scales;

however, there was a significant difference between groups on Total Problems, F (2,43) = 4.79, p = .014. Planned t-tests indicated that the RO group scored significantly higher than both the CB group, t (39) = 2.11, p < .05, and the EA group, t (39) = 2.90, p < .01, on number of problems reported, but there was no difference between CB and EA groups, t (39) = 1.06, p > .05. On the SSRS (see Table 7), there was no main effect of group on the Total Problems scale, F (2,43) = 3.03, p = .060, Externalizing, F (2,43) = 2.24, p = .120, or Internalizing Scales, F (2,43) = 2.16, p = .128. These results are consistent with the results of the whole sample of children (see Ames, 1997).

Relations Between Developmental Variables and Mothers' Use of Commands

Significant differences were found between groups when analyzing the frequency of commands used by mothers during the unstructured interactions. In the following analysis, it was important to examine whether there were characteristics of the children that were related to the mothers' increased use of regulative language during the interactions. Regression analysis permitted an examination between mothers' use of commands and children's characteristics, and was conducted on the entire sample of children.

A standard multiple regression analysis was conducted between the percentage of command utterances produced by mothers during the unstructured interaction as the dependent variable, and children's attachment classification (Secure, Typical Insecure, and Atypical Insecure), Stanford-Binet IV overall intelligence scores, CBCL/4-18 attention problems ratings, and SSRS Total Behavior problems ratings as the independent variables. Because the type of language used by caregivers with their children (i.e., more regulative) is related to the context of an interaction (Coster & Cicchetti, 1993), it is predicted that mothers of children experiencing difficulties with social interactions due to insecure attachment,

lower cognitive skills and/or behavior problems will use more commands during an unstructured interaction.

In order to test this prediction, variables from Table 7 were selected based on the presence of significant group differences. Therefore, children's attachment scores on the PAA, overall intelligence scores on the Stanford-Binet IV, and children's behavior ratings on the CBCL/4-18 Attention Problems Subscale were selected. In addition, children's Total Problems Scale scores on the CBCL/4-18 had significant group differences, but it was not chosen for the regression because it encompasses the Attention Problems Subscale and would include ratings already in the regression analysis. Therefore, the SSRS Total Problems Scale scores were included as an overall measure of behavior, as the group differences were only marginally non-significant (F (2,40) = 3.03, p = .06).

Table 8 lists the zero-order correlations between variables included in the regression analysis. The percentage of command utterances produced by the mothers in the unstructured interaction increased significantly with more insecure attachments (r (41) = .397, p = .003) (categorical variable, 1 = secure; 2 = typical insecure; 3 = atypical insecure), increased with higher ratings of problem behaviors on the SSRS Total Behavior problems scale (r (41) = .302, p = .024), and increased with lower scores of general intelligence on the Stanford-Binet IV Intelligence Test (r (41) = -.363, p = .007). There was no direct relationship between percentage of commands given by the mothers in the unstructured interaction and ratings on the CBCL/4-18 Attention Problems subscale (r (41) = .087, p = .292); however, the CBCL/4-18 Attention Problems scores were significantly related to measure of attachment (r (41) = .397, p = .003), the SSRS Total Problems scale (r (41) = .758, p < .001), and the Stanford-Binet IV (r (41) = -.578, p < .001). The measure of

Table 8

Zero Order Correlations for the Standard Multiple Regression Analysis of the Predictors
Attachment, Intelligence, Attention Problems, and Total Behavior Problems on the Criterion,
Commands Used by Mothers

Variable	1	2	3	4	5
1. Commands	-	.397 (.003) [a]	.302 (.024)	-.363 (.007)	.087 (.292)
2. Attachment		-	.283 (.033)	-.442 (.001)	.396 (.005)
3. SSRS Total			-	-.449 (.001)	.758 (<.001)
4. Stanford-Binet IV IQ				-	-.578 (<.001)
5. CBCL Attention Subscale					-

[a] r value (p value)

Attention Problems was not directly related to the frequency of commands given by mothers; however, it was related to measures of attachment, intelligence and behavior. That is, it is likely that the Attention Problems Subscale score has a suppressor effect on the regression equation (Pedhazur, 1997).

Examination of the regression equation (see Table 9) indicates that the four factors (attachment, social skills, intelligence, and attention problems) accounted for 37% of the variance, r (36) = .613, R^2 = .376, in the percentage of mothers' commands during the unstructured interactions. The amount of variance accounted for was statistically significant, F (4,36) = 5.43, p = .002, and the adjusted R^2 was 30.7%. The semipartial correlation for attachment was 0.366, R^2 = .134, F (4,36) = 5.58, p = .024, and accounted for a significant amount of unique variance in mother's commands. The semipartial correlation for SSRS Total Problems scale was 0.420, R^2 = .177, F (4,36) = 7.70, p = .009, and accounted for a significant amount of unique variance in mother's commands. The semipartial correlation for intelligence was -0.325, R^2 = .106, F (4,36) = 4.24, p = .047, and accounted for a significant amount of unique variance in mother's commands. The semipartial correlation for CBCL Attention Problems scale was -.450, R^2 = .203, F (4,36) = 9.15, p = .005, and accounted for a significant amount of variance in mother's commands.

Given that the CBCL Attention problems scale was not significantly correlated on its own with the percentage of mothers' commands, but accounted for significant amount of variance when the other correlations were taken into consideration, there was an increased likelihood that the CBCL Attention problems measure was acting as a suppressor variable of some of the shared variance in the PAA Attachment ratings, Stanford-Binet IV measures of cognitive functioning, and Behavior ratings on the SSRS Total Problems scale. That is,

Table 9

<u>Summary of Standard Multiple Regression Analysis for Variables Predicting Mothers' Use</u>

<u>of Commands (N = 47)</u>

Variable	<u>B</u>	<u>SE</u> B	β
Attachment	2.52	1.07	0.35 *
Stanford-Binet IV (Overall IQ)	-0.12	0.06	-0.35 *
SSRS Total Behavior Problems	0.87	0.31	0.56 **
CBCL/4-18 Attention Problems Subscale	-1.02	0.34	-0.68 **

<u>Note.</u> R^2 = .38; Adjusted R^2 = .31 (p < .01).

* p < .05; ** p < .01

inclusion of the Attention Problems Subscale in the regression analysis removes excess variance from the other measures involved in the prediction of mothers' use of commands (Horst, 1966; Pedhazur, 1997). In summary, the more atypical insecure attachments, the lower the cognitive functioning of the child, and the increased total child behavior problems, the more likely a mother was to use command utterances during an unstructured play interaction.

Discussion

The purpose of the present study was to examine the long-term effects of a deprived orphanage experience on children's language abilities, and whether subsequent adoption into more healthy environments could aid in the recovery of children's language skills. In particular, children's communicative and linguistic competence was examined during mother-child interactions (both unstructured and structured), as well as the relationship between language skills and other areas of development (e.g., attachment, intelligence, behavior). Mother-child interactions were transcribed and coded for the types of utterances used by mothers and children. These transcripts were also used to assess the syntactic skills of the children. Scores for children's attachment, intelligence, and behavior reports were obtained and their relationship to language was examined using a multiple regression analysis.

The results of the study indicate that few differences emerged in the analysis of the children's language skills. The only differences that did emerge were as follows: (1) RO children contributed more utterances to the total interaction with mothers during the ring task, (2) the EA children showed an increased tendency to use more internal overlaps compared to children in the CB or RO groups, and (3) EA children produces more

informative utterances during the structured interactions compared to children in the CB or RO groups. There were no differences amongst the groups on the measure of syntactic skills.

The decreased percentage of utterances contributed by mothers of RO children and increased percentage of utterances produced by RO children during the structured interaction are perhaps further explained by looking briefly at the number (rather than percentage) of utterances. The mothers of RO children are contributing a similar number of utterances as the other groups of mothers, but the RO children are producing more utterances than the other groups of children. That is, the increased number of utterances produced by the children is reflected as an increased contribution by the RO children and a decreased contribution by the mothers of RO children. Thus, the RO children might be somewhat more talkative overall than the other groups of children, but this did not transfer into any differences in the categories of intent measured.

It is difficult to understand why the EA children would have interrupted their mothers' utterances more during the freeplay interactions, although the actual frequency of internal overlaps for all of the groups was very low. Even though statistical differences were found, the actual frequency of occurrence was only 3.7 % for the EA group and was 1.8% and 1.2% for the RO and CB groups, respectively. In addition, the number of children in the EA group was smaller than the other groups, and it would be important to examine if these results remain consistent with a larger sample of children.

Regarding the increased production of informatives produced by the EA children during the rings task, this might have reflected the EA children copying their mothers' style of teaching the ring task. That is, the EA children might have been using the similar

teaching skills displayed by their mothers as a means of indicating to their mothers that they had learned the ring task. This might also explain the EA children's mothers' increased production of informative internal overlaps during the ring task as a means of correcting or reinforcing the children's performance on the ring task.

Thus, the children adopted from Romanian orphanages did not differ from the Canadian born children on syntactic skills and types of utterances used, suggesting these particular language abilities are relatively developmentally appropriate. These findings are particularly compelling as they demonstrate that children who were displaying difficulties in multiple areas of development did not display difficulties with the various aspects of their language assessed in the present study. It is difficult to determine if the orphanage children's language skills were not affected by their early deprivation, or if the adoptive homes provided an environment optimal for the recovery of language skills affected by the deprivation. Although studies have demonstrated that children displayed many difficulties when first adopted from the orphanages (Ames, 1997; Morison & Ellwood, 2000; O'Connor & Rutter, 2000), there has been no documentation of whether the children displayed deficits in their language skills and if this changed over a period of time.

The issue of whether children's language skills were unaffected by the orphanage experience or benefited from adoption is difficult to dissociate. It is possible that adoption into homes at a mean age of 15.8 months may have been early enough in the children's language development to overcome severe deficits. Similarly, during their time in the orphanage, the children may have been exposed to some amount of language by the caregivers, although it may have been minimal. If the children remained in the orphanages for longer periods of time, they might not have demonstrated intact language skills after

spending time in an adoptive home. Children adopted from the orphanages came into environments that provided stimulation, age-appropriate toys, books, and interactions with siblings, which may have fostered children's language development and the appropriate use of the language during social interactions.

Analysis of the mother's utterances during interactions indicated few differences between the groups of mothers in the types of utterances produced and the frequency of overlapped utterances. One reliable difference did emerge in the analysis of the mothers' types of utterances produced. Mothers of the RO children used more command utterances to guide their children's attention and physical activities during the freeplay interactions than mothers of the CB and EA children. This finding suggests the mothers of the RO children were using more regulative language with their children. A subsequent regression analysis with the whole sample indicated that mothers of children with less secure attachments, decreased levels of cognitive functioning, and increased reports of total behavior difficulties were more likely to use regulative utterances during the unstructured interactions. The increased frequency of regulative utterances produced by children displaying difficulties in some areas of development suggests that mothers adapted their language use to the developmental needs of their children. This finding indicates that children's difficulties in attachment (Chisholm, 1998), intelligence (Morison & Ellwood, 2000) and behavior (Fisher et al., 1997), as a result of their experience in the orphanages, influenced the types of utterances mothers chose to use during unstructured interactions.

When comparing the results of this study to other studies involving children exposed to maltreatment, the RO children do not demonstrate similar, long-term language deficits (e.g., Coster et al., 1989). It is possible that the RO children might not have long-term

language difficulties because they were removed from the orphanage at an early age and adopted into a healthy environment for an average of just over 3 years. Children who are maltreated and remain in the maltreating environment (Coster et al., 1989) are not provided the same opportunities to develop language as children who are placed into more healthy environments. These results highlight the importance of the caregiver's role (Huttenlocher, 1998) and a stimulating environment in children's development and recovery of language skills.

Why would children exposed to the depriving orphanage environment have greater difficulties with attachment to caregivers, lowered cognitive functioning, and increased parental report of behavioral difficulties, but display relatively age-apropriate language abilities? A possible explanation is that the critical period of development of communicative competence for these children was much later than for other areas of development. For example, Bowlby (1988) indicated sensitive period for the formation of attachment to be between 6 and 12 months of age, thereby making it increasingly difficult to form a secure attachment pattern to a caregiver at a later age. However, the acquisition of social use of language doesn't begin to emerge until after children are 12 months of age (Hoff-Ginsberg, 1997). Experiences in the orphanages might have occurred at an early enough age to result in difficulties with many areas of development; however, they may not have as much of an impact on language development.

However, it is premature to conclude that the RO children's language abilities remain unaffected by the orphanage experience for the following reasons. First, the measure of communicative competence used in this research might not have been sensitive enough to distinguish certain deficits in language development. For example, previous research

examining emotional characteristics of children's language has shown a relationship between insecure attachment patterns and less-developed communicative behaviors (i.e., more negative language) in maltreated 2-year-olds (Gersten, Coster, Schneider-Rosen, Carlson, & Cicchetti, 1986). Thus, a next step would be to assess if children's language skills are relatively intact on other language measures. Second, caution should be used when interpreting the results of the measure of syntactic abilities. The IPSyn only provides a rough estimation, rather than detailed information of mastery, of children's production of syntactic rules (Scarborough, 1990). Children from the orphanages might have obtained basic knowledge about language use, but could show deficits relative to the CB children when more complex syntactic production is examined. In addition, the IPSyn is a measure of syntactic production, and does not assess children's syntactic comprehension. This limits the conclusions about children's syntactic skills to only including their syntactic production, and in a very limited interaction with their mothers.

These findings represent the first examination of children's language abilities after early exposure to depriving orphanages and subsequent adoption into Canadian homes. The results also suggest many areas for future research. First, it would be advantageous to examine more sophisticated aspects of language use (e.g., displacement topics, fantasy topics) to ascertain if children's language skills are intact across a wide variety of language measures after exposure to similar environments. Second, it would also be advantageous to further assess children's syntactic abilities to reflect both comprehension and production. In addition, an analysis of the syntactic errors produced by children might highlight possible differences in syntactic skills and be a more sensitive means of examining deficits in language development. Third, being able to measure children's language abilities after

leaving a depriving environment and then after exposure to a healthier environment could help to answer the question of children's language being more resilient to deprivation, or more likely to recover than other areas of development. Finally, continued research with these children will be able to determine if these results obtained are consistent with a larger sample of children, if the results differ when children interact with their fathers (Kornhaber & Marcos, 2000) or other caregivers, if language abilities are stable over a longer period of time in the adoptive homes, whether other areas of development stabilize over time (e.g., Le Mare, Vaughan, Warford, & Fernyhough, 2001) and the long term outcome of language skills.

In summary, children adopted from Romanian orphanages demonstrate relatively age-appropriate specific language skills 36 months after adoption, although there are still some difficulties observed in attachment, intelligence and behavior. Mothers of the adoptive children use language that is more regulative when interactions have less structure, but their language is sensitive to the developmental needs of their children.

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