

**Mother-Child Interaction in Families With Internationally Adopted Children  
and Families With Biological Children at Age Two:  
Similarities and Differences**

Children's early interaction with parents or primary caregivers is fundamental to their ability to form secure attachment relationships, and the quality of these relationships is essential for emotional, social and cognitive development (e.g., Ainsworth & Bell, 1970; Barnett et al., & Cox, 2010; NICHD Early Child Care Case Research, 2001, 2006; Mills-Koonce et al., 2015). While the interaction with parents usually starts immediately after the child is born, there are circumstances when the opportunity to establish early parent-child interaction is restricted or even non-existent. Some children cannot be reared by their biological parents and will need to form attachment relationships with other caregivers. Empirical evidence suggests that adoption may constitute a beneficial alternative (Juffer & van IJzendoorn, 2007); however, it has been well-documented that both domestically placed and internationally placed children are at greater risk for developing adjustment difficulties compared to their nonadopted peers (Juffer & van IJzendoorn, 2005; Palacios & Brodzinsky, 2010; Sonuga-Barke et al., 2017; Smith et al., 2018).

Two historical research trends within psychological research on adoption have concentrated on descriptive studies of adoptee-nonadoptee differences in psychological and academic adjustment and on the possible recovery from a wide array of early adversity, while a third trend focuses on the underlying processes and factors operating in adopted persons and/or in adoptive families (Palacios & Brodzinsky, 2010). As highlighted by Palacios & Brodzinsky (2010), the main goal of this most current wave is to delineate the neurobiological, developmental, and relational factors involved in the experience of adoption. A particular focus is that of family and relational processes, including the analysis of interaction patterns in nonclinical families with and without adopted children (e.g., Rueter et al., 2009; Suwalsky et al., 2015). Nevertheless, empirical knowledge about how mother-child

interaction patterns in nonclinical adoptive families compare with those in biological families remains scarce. The present study compares the quality of mother-child interaction in nonclinical internationally adopted and biological dyads. This inquiry is in line with the call made by Palacios and Brodzinsky (2010) to further our understanding of children's adjustment to adoption by in-depth studies of the processes underlying adoptee-nonadoptee differences as well as the interaction processes within the adoptive family. In this context, our study constitutes a continuation of the first trend of research on adoption and contributes to the third and most current trend.

Four issues have been discussed as decisive for children's postadoption adjustment, namely, child age at the time of placement, country of origin, preadoption experiences (pre-, peri-, and postnatal), and social and emotional processes within the adoptive family (Palacios & Brodzinsky, 2010). Adverse effects of older age at the time of placement have been identified as a risk factor for children's postadoption and later adjustment and subsequent development (e.g., Gunnar et al., 2007; Juffer & Rosenboom, 1997; Juffer & van IJzendoorn, 2007; Rutter et al., 2010; Singer et al., 1985; van den Dries et al., 2009; van IJzendoorn et al., 2005). Nevertheless, the literature is not consistent in showing that older age at placement is a predictor of adjustment problems, independent of preadoption risk experiences, at least for internationally placed children (Palacios & Brodzinsky, 2010). Information about individual preadoption experiences of internationally placed children is often non-existent, making it almost impossible to link child outcomes to specific background factors. However, donor countries differ widely in prerequisites for pregnant women and their children. Differences concerning access to and quality of health and social services contribute to the varying starting points for adoptees with different geographic origins. There may also be variations among countries in adoption procedures. Drug/alcohol abuse, psychiatric illness or poverty are also common reasons for offering a child for adoption. Such conditions pose a

risk to the child through mechanisms such as increased genetic vulnerability, fetal exposure to toxic substances and early malnutrition (Julian, 2020). In addition, conditions in orphanages or other preadoption institutional care may be a part of preadoption experiences that also varies across countries of origin (e.g., Bakermans-Kranenburg et al., 2008; Cohen & Farnia, 2011; Groark et al., 2011; Palacios & Brodzinsky, 2010; Rutter et al., 2010, 2012; van IJzendoorn et al., 2007; van IJzendoorn & Juffer, 2006; van Londen et al., 2007). Since 2000, researchers have shown an increasing interest in these underlying conditions to clarify the vulnerability of internationally adopted children (Palacios & Brodzinsky, 2010).

Overall, the great variation in adopted children's adaptation to their new surroundings must be understood in light of their country of origin, as well as the duration and characteristics of their preadoption experiences (Pomerleau et al., 2005; Selman, 2012). Based on results from a study comparing adoptees from six different countries, Palacios et al., (2010) concluded that there are no systematic differences in growth and psychological development depending on country of origin. Rather, these scholars highlight the heterogeneity of circumstances both among and within countries and stress that crude generalizations about children adopted at a particular age or from a given country should be avoided (Palacios et al., 2010).

Adopted children thus vary greatly in their social, cognitive and emotional functioning. A majority of internationally adopted children have early experiences of separation and loss and inadequate experience with social interaction, which may seriously hamper their possibilities to establish well-functioning and supportive social relations with steady caregivers (van den Dries et al., 2009; van Londen et al., 2007). They may show unexpected reactions and challenging behaviors when interacting with their adoptive parents and may need much time to form an attachment bond and settle into their new families (Vorria et al., 2006). At the same time, the results from a meta-analysis on attachment in

adopted children (van den Dries et al., 2009) show that adopted children can indeed overcome early adversity and risks and form secure attachments as often as their normative counterparts, although less so for children who are adopted after their first birthday.

On their part, adoptive parents typically face different and more numerous challenges than biological parents. Adoptive parents constitute a resourceful group selected to parent nonbiological and often vulnerable children who most often have had a difficult start in life. As a rule, adoptive mothers and fathers are psychologically and somatically healthy, and they are highly motivated to become parents. Moreover, they are generally better educated and come from more privileged backgrounds than biological parents (e.g., Dalen, 2012; Dalen & Theie, 2014; Vinnerljung et al., 2010). Adoptive parents often complete a preparatory course in which they receive information about typical preadoption conditions and practical advice on how to handle possible transition reactions and enhance child development. In many ways, adoptive parents may be better prepared than biological parents to provide a stimulating surrounding and a supportive emotional climate for their children (Gunnar & Pollak, 2007; Mills-Koonce et al., 2015).

A vast literature shows that a warm and positive parenting style characterized by sensitivity and responsiveness is positively related to children's behavior and adaptation, whereas controlling, intrusive, and punitive parental behavior adversely affects developmental outcomes (e.g., Campbell et al., 1996; Shaw et al., 2000; Taraban et al., 2018). In particular, when parents are sensitively engaged in communication and play and offer stimulating interactive surroundings, children show better social, emotional, and cognitive development (Mills-Koonce et al., 2015). Parents of children adopted from conditions of deprivation need to provide even more sensitive and supportive care to make the children feel secure in their new families (Garvin et al., 2012).

The research describing mother-child interactions in adoptive families is scarce. A notable exception is the work by Suwalsky and colleagues (i.e., Suwalsky et al., 2008; Suwalsky et al., 2012; Suwalsky et al., 2015) in families with low-risk adopted children. In one study, Suwalsky et al. (2015) examined whether mothers and their 4-year-olds had developed a well-functioning relationship by focusing on the quality of child, maternal and dyadic interactions in low-risk adoptive (n=33) and biological (n=35) families. The dyads were observed while engaged in structured tasks designed to elicit a range of behavioral exchanges, including reading a story, working on a puzzle, and making a drawing. The results indicated that the quality of child, maternal, and dyadic behavior alike was poorer for adoptive than for nonadoptive dyads, and especially for those involving boys (Suwalsky et al., 2015). In particular, adoptive mothers were less sensitive, more intrusive, and exhibited poorer quality of instruction in the interactions compared to biological mothers. Moreover, compared to the nonadoptive children, adoptive children displayed less positive regard and sharing of happy feelings toward the mother; showed more anger, dislike, or hostility toward the mother; and showed greater unwillingness to take the mother's suggestions or comply with her requests. The less harmonious and well-functioning interactions in adoptive dyads were thus both reflected in the child's and the mother's behaviors (Suwalsky et al., 2015). While the study's small sample size was a limitation, the consistent differences in the mother-child interactions were noteworthy given the favorable and low-risk characteristics of the adoption sample. At the same time, there were no differences between adopted and nonadopted children in terms of their behavioral adjustment, self-esteem, intelligence, and adaptive behavior (Suwalsky et al., 2015). The dissimilarities between the adopted and the nonadopted families were therefore only related to the quality of the observed parent-child interaction patterns.

The study by Suwalsky and colleagues (2015) adds to the limited literature on family functioning and on how mother-child interactions compare in nonclinical adopted and biological families. Nevertheless, the results are not necessarily valid for internationally adopted children and their families. In one of few studies comparing observations of mother-child interactions in internationally adopted ( $n=159$ ) and biological ( $n=30$ ) families with 7-year-olds, Stams et al., (2000) explored maternal sensitivity when solving a puzzle and making a drawing together with the child. Adoptive mothers showed lower levels of sensitive-responsive behavior toward their children (i.e., supportiveness, presence, hostility, intrusiveness, clarity of instructions, and sensitivity and timing) than biological mothers (Stams et al., 2000). Interestingly, previous analyses of the same sample at younger ages (Juffer & Rosenboom, 1997) indicated no differences in adoptive and biological mothers' sensitive-responsive behavior when the children were aged 6 and 12 months, suggesting a decline in adoptive mothers' sensitivity from early infancy to middle childhood. Again, the small number of included biological mother-child dyads constitutes an important limitation of the study. Moreover, this study also provided no information about child behavior during the interaction.

In addition to the limited research focusing on mother-child interaction in families with young children, a small handful of studies have focused on family interaction in adoptive and nonadoptive families with adolescents (e.g., Lansford et al., 2001; Rosnati et al., 2007; Rueter et al., 2009). These studies have overall revealed more similarities than differences in adoptive and nonadoptive family interaction, with exceptions including more maternal reported parent-child conflict in adoptive than in nonadoptive families (Rueter et al., 2009).

In sum, extant literature thus highlights a need for more knowledge about how interaction patterns compare in nonclinical adoptive and biological families to further the understanding of how families built by adoption support healthy child development. Existing

research is scarce and hampered by methodological shortcomings such as small sample size and a reliance on self-report. There is also a need to focus on children at various ages and developmental stages. The present study compares similarities and differences between behavioral interaction in adoptive and biological mothers and their two-year-olds by the use of direct observations in two large community samples. Our research question was as follows: To what extent do adoptive and biological mother-child dyads differ in their interactions on observable behavioral variables suggested by previous research as relevant? In particular, we focus on the quality of both child and maternal behavior, including maternal sensitivity/responsiveness, intrusiveness, detachment, cognitive stimulation, and positive regard for the child, as well as child positive mood, sustained attention, and engagement of the parent. Following results from previous research, and particularly those of Suwalsky et al. (2015), our hypotheses were as follows:

1. Adoptive mothers will show less sensitivity/responsiveness, more intrusiveness, more detachment, less cognitive stimulation, and less positive regard in interaction with their two-year-olds compared to biological mothers; and
2. Internationally adopted two-year-olds will show less positive mood, less sustained attention, and less engagement of the parent when interacting with their mothers compared to biological children.

## **Method**

### ***Participants***

#### *The adoptive sample*

The adoptive parent-child sample is part of a longitudinal study, *Internationally Adopted Children's Social Development* (IACSD; Dalen & Theie, 2012; 2014). The selection criteria

for children participating in the study were as follows: adopted from abroad to Norway during the period 2007-2009 and with an age of adoption below two years. The project was administered from the University of Oslo and included personal face-to-face contacts with adoptive parents. The area for selecting families therefore had to be restricted to families living not too far from the university (central parts of Eastern Norway). The families were first contacted by the Norwegian Directorate for Children, Youth and Family Affairs. A total of 178 families met the selection criteria, and 119 adopted children (52.1% girls and 47.9% boys) responded positively and were included in the present study, yielding a response rate of 68%. The participating children were adopted from the following countries: China (36%), South Korea (20%), South Africa (14%), Colombia (12%), and Ethiopia (11%), in addition to a small percentage from India, the Philippines, Peru, and Thailand (7%). Their age at adoption ranged from 3 to 23 months ( $M = 11.7$ ,  $SD = 5.3$ ). Out of the 119 participating adoptive mother-child dyads, video observations at age 24 months were available for 84 (45 girls [54%]). Reasons for which video observations were not available for certain participating families were that some families lived too far away for the study staff to make a visit (i.e., more than 200 km from the city of Oslo;  $n = 24$ ), technical difficulties ( $n = 9$ ), and declination to participate in the videotaped interactions ( $n = 1$ ). The adopted children had lived with their new families on average 12.7 months ( $SD = 5.2$  months) when the videotaped interactions took place. Comparisons between the 84 families with observational data and the 35 without showed no significant differences in the adopted children's gender, country of origin, or age at adoption or the mothers' age and educational level.

### *The biological sample*

The biological parent-child sample stems from the *Behavior Outlook Norwegian*

*Developmental Study* (BONDS), a longitudinal study of 1159 children's (51.8% boys) social



development starting at 6 months (for description, see Nærde et al., 2014). Recruitment took place through public child health clinics in five Norwegian municipalities from 2006 through 2008. Parents of 1931 eligible children who were approximately 5 months old and had at least one parent who could participate without a translator were informed about the study.

Altogether, 1465 (76%) agreed to be contacted, and 1159 (60% of those informed) agreed to participate. Although somewhat biased toward mothers with higher education, fewer immigrant parents, more firstborns, and fewer single mothers, the final sample was fairly representative of the Norwegian population. In the biological sample, mothers of 934 children (82% of 1092 children whose parents took part in the data collection at age 24 months) agreed to participate in the videotaped interactions. Due to poor technical quality or incomprehensible language, some recordings could not be rated. Therefore, the final sample of biological mother-child dyads for the current study included 887 mothers and their 2-year-olds (50.3% boys).

Descriptive statistics for both samples are shown in Table 1. Two-tailed independent *t*-tests showed a statistically significant difference between adoptive and biological mothers for age and education. On average, adoptive mothers were older ( $M = 41.5$ ,  $SD = 3.9$ ) than biological mothers ( $M = 32.6$ ,  $SD = 4.8$ );  $t(969) = -16.69$ ,  $p < .001$ . Adoptive mothers also had higher education (39.3% more than 4 years' university or university college education) than biological mothers (19% more than 4 years' university or university college education);  $t(956) = -4.12$ ,  $p < .001$ . Maternal age and education, as well as child gender, were accordingly included as covariates in the main analyses.

### ***Measures***

The data collection in IACSD (i.e., the adoptive sample) and BONDS (i.e., the biological sample) was conducted in equivalent ways with parallel procedures. At child age two, this

included identical videotaped structured interaction tasks with mothers and children, followed by a personal interview with the mother conducted by trained study staff. For the adoptive sample, the data collection took place in the participants' homes, whereas for the biological samples it mainly took place in study offices.

#### *Mother-child interaction tasks and procedures*

A variety of mother-child interaction tasks with varying degrees of structure were selected based on their capacity to elicit parent and child behaviors associated with child adjustment (e.g., Aspland & Gardner, 2003; Snyder, Stoolmiller et al., 2003). Altogether, 16 min of mother-child interaction were video-recorded, consisting of the following tasks: (a) free-play (4 min), (b) clean-up (2 min), (c) teaching (6 min), (d) inhibition (2 min), and (e) waiting without toys (2 min). For the present study, we utilized data from the unstructured free-play task (4 min) and the semistructured teaching task (6 min). In the free-play task, mothers were asked to play with their child as they liked with a given set of toys. In the teaching task, mothers were presented with a puzzle and a set of shape-sorting blocks and instructed to help the child as much as they found adequate for 3 min with each toy in the predefined order. The study staff, who left the room during the tasks, told the mothers when to switch from one toy to the other. The puzzle and the shape-sorter were meant to be somewhat difficult for most two-year-olds to manage without guidance. Prior to the interaction tasks, mothers were informed that they could choose to discontinue at any time.

#### *Ratings of mother and child behaviors during the structured interactions*

The videotaped mother-child interactions were rated with global rating items extensively used in studies across multiple samples, including six scales for parenting behavior and four scales for child behavior (Owen et al., 2010). The global rating system was originally developed for

use in the NICHD Study of Early Child Care and Youth Development (SECCYD; NICHD Early Child Care Research Network, 1999). The following six parenting behaviors were rated across the two tasks: (1) *Sensitivity/responsiveness*, assessing how the parent monitors and responds to the child's behavior and signals, including social bids and expressions of positive or negative affect; (2) *Intrusiveness*, reflecting how the parent attempts to control the interaction and the child's behavior based on his/her own agenda rather than recognizing and respecting the child's experience; (3) *Detachment/disengagement*, capturing the degree to which the parent lacks emotional involvement and/or interest in and involvement with the child and his/her initiative or activities; (4) *Cognitive stimulation*, reflecting the degree to which the parent is striving to facilitate the child's learning; (5) *Positive regard for the child*, the expression of positive affect toward the child, such as warmth, physical affection, smiles, praise, enthusiasm and enjoyment; and (6) Markers of *negative regard for the child*, including disapproval, body or facial tenseness, negativity when correcting, abruptness, nonplayful teasing, and harshness.

In addition, the following four child behaviors were rated across the two tasks: (1) *Positive mood*, assessing the extent to which the child is satisfied and pleased based on markers such as smiles, laughter and enthusiastic body language; (2) *Negative mood*, which is the child's expressions of negative affect such as crying, fussing, frowns and tense body language; (3) *Sustained attention*, assessing the child's sustained involvement with objects (mainly quantitative) based on the duration of time spent involved with objects; and (4) *Engagement of parent*, reflecting the child's initiatives toward and sustained positive interaction with the parent.

Scores are based on both quantity and quality of observed parent and child behaviors and are rated on a 5-point Likert-type scale, with each point defined in relation to markers of the construct from 1 (*not at all characteristic*) to 5 (*very characteristic*). The ratings indicate

the degree to which behaviors pertinent to the high end of the scale for each construct characterized the parent-child interaction. Whereas the original version of this global rating system operated with a 4-point scale, the 5-point version utilized in the current study has been used in several studies addressing parenting sensitivity and child outcomes (e.g., Propper et al., 2007; Towe-Goodman et al., 2014).

For both the IACSD and the BONDS study, the observational rating system was implemented by one of its developers, who participated in the training and supervision of the coders. For the biological sample, five coders trained to meet reliability criteria performed the ratings, for whom the training included a series of guided practice sessions prior to the rating process (Haidet et al., 2009). This training was followed by biweekly meetings to monitor inter-rater reliability, which was based on double rating by two independent coders of 21% ( $n = 188$ ) of the videos randomly selected throughout the rating period. Coders were blind as to which videos were selected for double rating. As determined by intra-class correlations (ICC), inter-rater reliability coefficients ranged from .67 to .80 ( $m = .75$ ) in the free-play task and from .68 to .92 ( $m = .78$ ) in the teaching task.

For the adoptive sample, four coders trained to meet reliability criteria rated the videotaped interactions. The training of coders and the rating procedures were identical to those of the biological sample. To estimate inter-rater reliability, four coders rated 19 videos. ICCs ranged from .17 to .69 ( $m = .47$ ) in the free-play task and from .37 to .82 ( $m = .65$ ) in the teaching task. Previous work by Vonheim (2013) indicates that the variability of ratings in this subsample is low, which contributes to low reliability estimates in the presence of substantial agreement for single ratings. Further evidence for the degree of inter-rater reliability comes from additional ratings of nine videos completed by a trained coder from the team of the biological sample, which resulted in ICCs ranging from .40 to .93. (mean = .68) for the free-play task and from .60 to .89 (mean = .80) for the teaching task.

### *Covariates*

The following variables collected during the parental interview were included as covariates in the analyses: (a) child gender, coded as 1 (*boy*) and 2 (*girl*); (b) mothers' age; and (c) mothers' highest completed educational level on a scale from 1 (*9-year primary school or shorter*) to 5 (*more than 4 years' university or university college education*). Child age at adoption was not included as a covariate; there were no significant correlations between the adopted child's age at adoption and mothers' or children's observed behavior included in the main analyses for either of the two interaction tasks.

### *Analytic approach*

An initial inspection of the data revealed low variability and largely non-normal distributions for two rating variables: mothers' negative regard for the child and children's negative mood. These variables were accordingly excluded from further analyses. We performed two separate one-way, between-groups, multivariate analyses of covariance (MANCOVAs) to investigate similarities and differences in parent and child behaviors between adoptive and biological dyads during the two interaction tasks. Separate analyses were performed for the free-play and the teaching tasks, respectively, each with the following dependent variables: mothers' sensitivity, intrusiveness, detachment, cognitive stimulation, and positive regard for the child, as well as children's positive mood, sustained attention, and engagement of parent. This resulted in altogether 8 dependent variables for each MANCOVA, and a total of 11 when including the covariates. If significant results are obtained in the multivariate test of significance and further inspections in relation to each dependent variable are warranted, the alpha level should be set higher to reduce the chance of Type 1 error. A simple Bonferroni adjustment (Frame, 2015) suggests dividing the original alpha level ( $p = .05$ ) by the number

of separate analyses (i.e., 11), meaning that an adjusted alpha level of  $p = .005$  should be applied to the results for each of the included variables. Prior to the MANCOVAs, preliminary assumption testing of the data suggested no serious violations relating to normality, linearity, univariate and multivariate outliers, homogeneity of variance-covariance matrices, or multicollinearity. Levene's test of equality of error variances showed that some of the variables had a  $p$ -value less than .05, suggesting violation of the assumption of equality of variances. As a more conservative alpha level ( $p = .005$ ) was already set across all variables, this potential violation was not considered problematic (Field, 2013).

Multivariate analyses were preferred over univariate alternatives based on several considerations. First, the behavior ratings within each interaction procedure, free-play and teaching, were significantly correlated ( $r$  values in the .2 - .6 range across samples) and shared a common conceptual meaning as dyadic interactive behavior in each of the situations. Moreover, MANCOVA provides some control over the overall alpha level or type I error, whereas multiple univariate  $t$ -tests or ANOVA can inflate the operational alpha level. In addition, the multivariate analyses consider dependent variable inter-correlations and help identify which dependent variables produce the greatest group distinction. Less than 1.5% of the data were missing across all variables (see Table 1), and we chose to not perform any imputation of missing data points. Analyses were thus performed with listwise deletion of missing data for each analysis. That is, individuals with missing data on any variable were not included in each MANCOVA.

## Results

### *Between-group comparison in the free-play task*

Multivariate results from the one-way between-groups MANCOVA of the free-play task showed a statistically significant difference between the adoptive and the biological mother-

child dyads on the combined dependent variables after controlling for child gender and mother's age and educational level,  $F(8, 95) = 12.00, p < .001$ , Wilks'  $\Lambda = .908$ , partial  $\eta^2 = .09$ . According to Cohen (1988), a partial eta squared of .06 indicates a medium effect, and .14 indicates a large effect.

Univariate results from the MANCOVAs are shown in Table 2. When the dependent variables in the free-play task were considered separately, the results revealed statistically significant between-group differences of small effect size for mothers' intrusiveness ( $p < .001$ ; partial  $\eta^2 = .025$ ) and positive regard for the child ( $p < .001$ ; partial  $\eta^2 = .021$ ). Moreover, for mothers' stimulation of development, there was a between-groups difference bordering on the adjusted significance level ( $p = .005$ ; partial  $\eta^2 = .008$ ). For the remaining variables, there were no significant group differences between the adoptive and the biological mother-child dyads. An inspection of the mean scores indicated that the adoptive mothers acted more intrusively and stimulated their children's development more during free play than the biological mothers. Moreover, the biological mothers displayed more positive regard for their child than did the adoptive mothers. As regards child behaviors during the free play task, statistically significant differences of small effect size emerged between adopted and biological children for both positive mood ( $p < .001$ ; partial  $\eta^2 = .023$ ) and engagement of parent ( $p < .001$ ; partial  $\eta^2 = .013$ ). On average, biological children displayed higher levels of positive mood and engaged their mothers more during free play than did the adoptive children.

#### *Between-group comparison in the teaching task*

For the included parent and child behaviors during the more structured teaching task, there was a statistically significant difference between the adoptive and biological dyads on the combined dependent variables after controlling for child gender and mother's age and

educational level,  $F(8, 94) = 10.66, p < .001$ , Wilks'  $\Lambda = .931$ , partial  $\eta^2 = .08$ . This indicates a medium-sized effect (Cohen, 1988).

The univariate results for the teaching task (see Table 2) showed statistical between-group differences of small effect size for mothers' positive regard for the child ( $p < .001$ ; partial  $\eta^2 = .027$ ). As in the free-play task, the mean scores indicated that biological mothers displayed more positive regard for their child than did the adoptive mothers during this task. For children's behaviors, statistically significant differences of small effect size emerged for positive mood ( $p < .001$ ; partial  $\eta^2 = .026$ ) and sustained attention ( $p < .001$ ; partial  $\eta^2 = .032$ ). An inspection of the mean scores revealed that biological children displayed higher levels of positive mood and showed more sustained attention during the teaching task than did the adopted children. For the remaining variables, there were no significant between-group differences.

Taken together, the MANCOVA results showed that there were significant medium-range group differences between the behaviors of adoptive and biological mother-child dyads during interaction at age 2 in an unstructured free-play task and a semistructured teaching task. When inspecting the univariate results for the separate dependent variables, a larger number of group differences emerged in the free-play task (5 out of 8 variables) than in the teaching task (3 out of 8 variables). Moreover, for both tasks, there were significant between-group differences for mother and child behaviors alike.

### **Discussion**

The main finding from the present study was that there were statistically significant overall multivariate differences of medium effect size between adoptive and biological mother-child dyads on both interaction tasks studied. Statistically significant univariate differences in outcome variables that contributed to the overall difference included both mother and child



observed behaviors but appeared only in certain areas and were of small effect size. Interestingly, there was no significant difference in adoptive and biological mothers' sensitive/responsive behavior toward their children during either the unstructured free play or the semistructured teaching situation. Among the significant differences in single-outcome variables that did appear were mothers' expression of positive regard toward their child. Biological mothers showed more positive regard both in the free-play and in the teaching situation. Furthermore, during the free-play situation, adoptive mothers displayed more intrusive behavior. As regards the children, there were some significant behavioral differences. Adopted children showed less positive mood and less engagement of the mother both during the free-play and teaching situation. Additionally, the adopted children showed a lesser degree of sustained attention during the teaching situation.

Adoption and birth are indeed very different routes to parenthood, creating special challenges for the establishment of secure and well-functioning mother-child relationships in families built by adoption. Our finding that adoptive and biological mothers were equally *sensitive/responsive* toward their children during the interactions was not in accordance with our hypothesis that biological mothers would be more sensitively engaged than would adoptive mothers. High ratings on the sensitivity/responsiveness dimension indicate that mothers are able to observe and respond to the child's bids and social expressions as well as to their signs of frustration, confusion, and negative affect and to generally provide emotional support to the child (SECCYD; NICHD Early Child Care Research Network, 1999). These parenting behaviors are characteristic of sensitive child-centered interaction (Mills-Koonce et al., 2015; Taraban et al., 2018) and have been shown to play an important role in establishing quality in parent-child interactions (Barnett et al., 2010; Mills-Koonce et al., 2015; Tamis-LeMonda et al., 2004). It is noteworthy that the adoptive mothers in the current study acted as sensitively and responsively toward their child as did biological mothers, even though the

latter had lived with their children from birth and thus were more familiar with their typical ways of reacting and behaving. In contrast, adoptive mothers and their children need to spend time together following the child's arrival to be able to tune into each other. As mentioned, the adopted children had lived with their new families on average 12.7 months when they participated in the interactions, compared with 24 months for the biological children. The early formation of the mother-child relationship in biological families naturally provides the mothers with an advantage in regard to establishing sensitive, warm and engaged parenting behavior. On the other hand, adoptive mothers are a selected group, most of whom have participated in preparatory courses to enable them to raise a vulnerable child. Our results suggest that adoptive mothers of two-year-olds succeed in monitoring and responding to their child's behaviors and signals during interactions despite having spent less time with their child than the biological mothers.

Our findings with regard to maternal sensitivity/responsiveness are in line with those of Juffer and Rosenboom (1997), who reported that adoptive and biological mothers showed the same level of sensitive-responsive behavior when solving a puzzle and making a drawing together with their child at ages 6 and 12 months. The follow-up of the same sample at age 7 years (Stams et al., 2000), however, indicated lower levels of sensitive-responsive behavior among adoptive than biological mothers, suggesting a decline in adoptive mothers' sensitivity across time. Moreover, the study by Suwalsky et al. (2015) comparing mother-child interactions at age 4 reported that adoptive mothers were less sensitive than biological mothers when reading a picture book, doing a puzzle, and drawing together with their child. The present study, which is the first to compare adoptive and biological mother-child interactions in the toddlerhood period, adds to this limited literature by suggesting that adoptive mothers are able to monitor and respond to the child's behavior and signals as well as are biological mothers. Overall, this finding suggests that adoptive mothers of low-risk

children seem to experience less challenges with parenting their children in sensitive and responsive manners in early than in middle childhood, but more research is needed in this field.

In agreement with our hypotheses, adoptive mothers expressed significantly less *positive regard* for the child during their interaction. In both the free-play and the teaching situation, adoptive mothers less often tended to smile at their child, display physical affection, praise the child, and show enjoyment of or enthusiasm for the child compared to biological mothers. Also in accordance with our hypotheses, the adoptive mothers were significantly more *intrusive* than the biological mothers were, albeit only in the free-play task. Such adult-centered interaction is characterized by trying to control rather than respect the child's perspective (SECCYD; NICHD Early Child Care Research Network, 1999). It is important to note that the two situations in which we observed mother-child behaviors in the current study are different in many ways. Whereas the unstructured free play setting allows the children – and the mothers – to play as they like based on their own initiatives and preferences, the teaching setting is quite structured in that the dyad has to focus on particular tasks. One would expect parents to be more directive and controlling in a teaching setting when trying to help the child to solve specific tasks (Ginsburg et al., 2006; Panfile et al., 2012). Indeed, the biological mothers were somewhat more intrusive than the adoptive mothers during the teaching task, although not significantly more so. In the study by Suwalsky et al. (2015), adoptive mothers acted generally more intrusively toward their four-year-olds than biological mothers during picture book reading, cooperative puzzle solving, and drawing. Nevertheless, the authors did not differentiate between the degrees of structure in the various tasks. Moreover, during the teaching setting, it is also likely that the mothers are generally more involved in *cognitive stimulating behavior* to facilitate the child's learning by providing verbal instructions while helping their child to solve the tasks. Whereas the biological mothers

exhibited this behavior, this was not the case for the adoptive mothers. Rather, the adoptive mothers engaged in significantly more cognitively stimulating behavior in the free-play situation compared to the biological mothers

The result that adoptive mothers displayed both more intrusive and more cognitively stimulating behavior in the free play situation might suggest that they found it challenging to handle this type of unstructured setting. Overall, internationally adopted two-year-olds have spent less time playing freely with toys than biological children, and adoptive mother-child dyads have also had fewer opportunities to play and interact. Indeed, our findings show that adopted children initiated and maintained interaction with their mothers less often during the free-play situation than did the biological children. Possibly, as a reaction to an indecisive and somewhat more passive child, the adoptive mothers initiated activities with the child and at the same time strived to facilitate the child's learning. The adoptive mothers may thus have handled the free-play situation more as a structured teaching situation and thereby appeared more intrusive and less child oriented as well as more cognitively stimulating. They possibly found the teaching setting, with its specific tasks, easier to handle. In contrast, biological mothers let their children play more freely and without much scaffolding during the free-play situation, thereby appearing less intrusive and less cognitively stimulating. Moreover, it might be that biological mothers also showed more positive regard for the child in this situation because they knew their children better, which gave them a better position to relax and let their children play in their own ways compared to the adoptive mothers.

As regards the *children's behavior* during the interaction with their mothers, our hypothesis that internationally adopted two-year-olds would show less positive mood was supported. The biological children displayed significantly more *positive mood* than the adopted children in both the free-play and the teaching task, thus appearing generally more satisfied and pleased, and showing more smiles, laughter and enthusiastic body language. It is

reasonable to expect that adopted children are more anxious and insecure in such an unfamiliar setting and that these feelings may influence their mood. Our findings are in line with those of Suwalsky et al. (2015), who reported that adopted four-year-olds showed less positive regard and sharing of happy feelings toward their mother during the parent-child interaction than did biological four-year-olds. Also in line with our hypotheses and as previously mentioned, there were significant differences with regard to the children's *engagement of their mother*, but only during the free play task. The biological children initiated and maintained positive interaction with their mother more often when they were playing freely together than the adopted children and communicated more positive regard and affect. Indeed, this finding corresponds with our finding that biological mothers let their children play more freely and without much scaffolding during this task, thus enabling the children to take initiative and more actively engage their mother. Given that the adoptive mothers appeared more intrusive during the free play situation, possibly as a reaction to their child being less proactive, the dynamic in these dyads was different and seemingly driven more by the mother's initiatives. Adoptive parents have often waited long for their child to arrive, and the preadoption process tends to be stressful (Suwalsky et al., 2012).

Consequently, adoptive mothers may experience anxiety and be generally more protective of their children than biological parents (Suwalsky et al., 2008). Adoptive parents often monitor their children differently by fostering a kind of dependency, which may explain some of the differences in the early behavioral interaction between adoptive and biological mothers evident in the present study (Suwalsky et al., 2012).

The findings of overall fewer signs of mother-child affection in the adoptive than in the biological dyads may suggest that stable attachment bonds between adoptive mothers and their children are not fully developed at age two. The transition phase when children strive to adapt to their new family takes time and effort, and the children might feel confused and

unhappy in situations where they do not know what to do or what is expected of them (Stams et al., 2002). Such confusion can easily lead to passivity when interacting with their adoptive parents (Groark et al., 2011; MacLean, 2003). At the same time, our finding that adopted children showed less positive mood during the interactions than did the biological children mirrors that of Suwalsky et al. (2015) in a sample of four-year-olds who had lived with their new parents for more than 3 years. Thus, this difference might not only be a matter of time and adaptation. Last, one could expect that the children's age at adoption would influence their behaviors and reactions. However, there were no differences in any parenting or child behaviors during the interactions based on adoption age.

The hypothesis that adopted children would show less *sustained attention* during the interaction than would biological children was partly supported. In the teaching situation, adopted children displayed a lesser degree of sustained attention toward objects and lower ability to focus their attention on one thing at time. As mentioned, the teaching tasks (i.e., puzzle and shape sorter) were set up to be too difficult for most two-year-olds to manage without any guidance. Furthermore, these tasks require the children to stay concentrated and focused for a certain period; thus, they might generally be too challenging for the adopted children. A child low on sustained attention may appear bored, distracted, distressed, or aimless. These behaviors, which may also be described as hyperactive, are fairly prevalent among internationally adopted children (Dalen, 2001; Dalen & Theie, 2019; McGuinness & Pallansch, 2000; Lindblad et al., 2009; Rutter et al. 2012). Hyperactive behaviors are linked both with unfavorable preadoption conditions and with genetic dispositions (Julian, 2013; Rutter et al., 2012) and often interfere with the ability to stay focused and concentrated for longer periods of time (Dalen, 2012; Raleigh & Kao, 2013; van IJzendoorn et al., 2005).

### ***Strengths and limitations***

The biological sample was large and representative of children born in Norway at the time of recruitment (Nærde et al., 2014). The adopted sample was also reasonably large and representative of children adopted from abroad in Norway at age two or younger in the period 2007-2009. The utilized data gave adequate statistical power for detecting not only large group differences, which is uncommon for studies based on video observations. The data collection for both samples included observations of structured mother-child interactions with the exact same standardized setup and tasks, and the interactions were rated according to a previously established rating system assessing mother and child behaviors with high theoretical and empirical relevance for the current study.

The less than perfect interrater reliability for some of the global-rating outcome variables constitutes one important limitation of the present study. Interrater reliability must be seen in context with the difficulty of the rating task, which is greater with global ratings that involve a larger degree of rater judgment and require processing of more information bits to arrive at a rating. Like other studies that employed similar rating systems (e.g., NICHD ECCRN, 1999), the interrater reliability of our ratings was overall substantial, but rater variance remained a nonnegligible source of variation. Because our main results did not correct for unreliability of ratings, larger group differences might possibly have been found with a hypothetical higher interrater reliability.

Further limitations of the study mostly relate to the adoptive sample. All children were adopted from a limited number of countries before two years of age, and none had any confirmed special needs; thus, the sample was low risk. Furthermore, it has to be taken into consideration that adoptive parents in Norway constitute a selected group that has been especially prepared for child adoption. In addition, the adoptive sample was relatively small compared to the biological sample, and adoptive mothers were also on average older and had higher education than the biological mothers. Although maternal age and education were

included as covariates in our main analyses, the possibility remains that other unmeasured differences between the adoptive and biological mothers might contribute to the observed group differences. Future studies may want to rule out possible confounding factors based on parent differences and use matching for several background variables or common inclusion criteria for biological and adoptive parents. At the same time, such procedures may bring with them additional considerations. For example, a group of biological parents matching adoptive parents for age and education might be little representative of biological parents in general. Moreover, all parents in the current study were mothers; thus, the results from the current study may not necessarily apply to fathers.

The setting for the mother-child interactions differed between the two samples in that most biological dyads were filmed in offices provided by the study, while adoptive dyads were filmed primarily at home. Many of the adopted children had lived with their new families for a limited time, and the mothers were reluctant to expose them to an unfamiliar office that could make them anxious and insecure. It is difficult to know whether the dissimilar setup influenced our results. If anything, one might speculate that the hypothetical effect of such a difference would be in the direction of adoptive mothers and children feeling more secure during the interactions. To the extent that felt security would influence parent and child behavior during the interaction, the difference in settings might have contributed to lesser group differences.

### *Implications for practice*

While group-level results from population samples such as the current cannot directly inform interventions, the current results may imply some directions for exploring or developing points of interventions with adoptive parents and families. To the degree that our overall finding of fewer signs of mother-child affection in adoptive dyads suggests undeveloped



attachment bonds, this seems to support interventions already implemented in some locations, including a video-feedback program in the Netherlands aimed at enhancing attachment security in adopted children by providing parent training in positive parenting and sensitive discipline strategies (Juffer et al., 2008). Our finding of lower video-observed sustained attention in adoptive children supports previous findings based on other data sources and points in the direction of interventions to support parents in managing challenges in the communication and relationship with their children related to attention problems and in supporting children's development of attention skills. Adoptive parents' confidence in handling unstructured settings might be another suggested point for intervention if, as we speculated, such settings pose a specific challenge.

### *Conclusions*

While the overall pattern of observed mother-child interaction differed between adoptive and biological mother-child dyads, only a subset of single observed behaviors contributed to the overall differences. With modest dissimilarity, adoptive mothers displayed less positive regard across both tasks, and during free play, they were more intrusive than the biological mothers but also stimulated their children's cognitive development more. Likely interconnected, since interaction is a two-way process, the adopted children showed overall less positive mood, engaged their mothers less during free play, and displayed less sustained attention during the teaching task than did the biological children. Nevertheless, the adoptive mothers in our sample were just as sensitively engaged with their child and similarly responsive to their child's signals and needs as the biological mothers, despite the later establishment of the mother-child relationships and the children's preadoption experiences. This result must be considered propitious based on evidence from comprehensive research connecting sensitive parenting behaviors during early interaction to children's favorable

social and emotional development. Notably, in our study, the children's age at adoption was not connected to either mothers' or children's observed behaviors during the interaction tasks. However, factors we did not investigate, such as children's preadoption experiences or country of origin, may have affected the mother-child interaction. More research is warranted that compares direct observations of parent-child interaction patterns in nonclinical adoptive and biological families across different developmental stages and how the quality of this interaction relates to the children's subsequent functioning and development. Future research should aim at including fathers, as well as mothers, in adoptive as well as in biological families when investigating parent-child interaction and its impact on child adjustment.

### References

Ainsworth, M. S., & Bell, S. M. (1970). Attachment, exploration, and separation: Illustrated by the behavior of non-year-olds in a Strange Situation. *Child Development, 41*(1), 49-67.

Aspland, H., & Gardner, F. (2003). Observational measures of parent-child interaction: An introductory review. *Child and Adolescent Mental Health, 8*(3), 136-143.  
<https://doi.org/10.1111/1475-3588.00061>

Bakermans-Kranenburg, M. J., Van IJzendoorn, M. H., & Juffer, F. (2008). Earlier is better: A meta-analysis of 70 years of intervention improving cognitive development in institutionalized children. *Monographs of the Society for Research in Child Development, 73*(3), 279-293. <https://doi.org/10.1111/j.1540-5834.2008.00498.x>

Barnett, M. A., Shanahan, L., Deng, M., Haskett, M. E., & Cox, M. J. (2010). Independent and interactive contributions of parenting behaviors and beliefs in the prediction of early childhood behavior problems. *Parenting: Science and Practice, 10*(1), 43-59.  
<https://doi.org/10.1080/15295190903014604>

Campbell, S. B., Pierce, E. W., Moore, G., Marakovitz, S., & Newby, K. (1996). Boys' externalizing problems at elementary school age: Pathways from early behavior problems, maternal control, and family stress. *Development and Psychopathology, 8*(4), 701-719. <https://doi.org/10.1017/S0954579400007379>

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Erlbaum.

Cohen, N. J., & Farnia, F. (2011). Social-emotional adjustment and attachment in children adopted from China: Processes and predictors of change. *International Journal of Behavioral Development, 35*(1), 67-77. <https://doi.org/10.1177/0165025410371602>

Dalen, M. (2001). School performances among internationally adopted children in Norway. *Adoption Quarterly, 5*(2), 39-58. [https://doi.org/10.1300/J145v05n02\\_03](https://doi.org/10.1300/J145v05n02_03)

- Dalen, M. (2012). Cognitive competence, academic achievement, and educational attainment among intercountry adoptees: Research outcomes from the Nordic countries. In J. L. Gibbons & K. S. Rotabi (Eds.), *Intercountry adoption: Policy, practices, and outcomes* (pp. 187–199). Routledge. <https://doi.org/10.4324/9781315252117>
- Dalen, M., & Theie, S. (2012). Internationally adopted children from non-European countries: General development during the first two years in the adoptive family. *Scientific World Journal*, 2012, Article 375436. <https://doi.org/10.1100/2012/375436>
- Dalen, M., & Theie, S. (2014). Similarities and differences between internationally adopted and non-adopted children in their toddler years: Outcomes from a longitudinal study. *American Journal of Orthopsychiatry*, 84(4), 397–408. <https://doi.org/10.1037/ort0000010>
- Dalen, M., & Theie, S. (2019). Academic achievement among adopted and nonadopted children in early school years. *Adoption Quarterly*, 22(3), 199–218. <https://doi.org/10.1080/10926755.2019.1627448>
- Field, A. (2013). *Discovering statistics using IBM SPSS Statistics*. Sage.
- Frame, A. (2015). Are per-family Type I error rates relevant in social and behavioral science? *Journal of Modern Applied Statistical Methods*, 14(1), 12–23. <https://doi.org/10.22237/jmasm/1430453040>
- Garvin, M. C., Tarullo, A. R., Van Ryzin, M., & Gunnar, M. R. (2012). Postadoption parenting and socioemotional development in postinstitutionalized children. *Development and psychopathology*, 24(1), 35–48. <https://doi.org/10.1017/S0954579411000642>
- Ginsburg, G. S., Grover, R. L., Cord, J. J., Ialongo, N. (2006). Observational measures of parenting in anxious and nonanxious mothers: Does type of task matter? *Journal of*

*Clinical Child & Adolescent Psychology*, 35(2), 323–328.

[https://doi.org/10.1207/s15374424jccp3502\\_16](https://doi.org/10.1207/s15374424jccp3502_16)

Groark, C. J., McCall, R. B., Fish, L. & The Whole Child International Evaluation Team (2011). Characteristics of environments, caregivers, and children in three Central American orphanages. *Infant Mental Health Journal*, 32(2), 232-250.

<https://doi.org/10.1002/imhj.20292>

Gunnar, M., & Pollak, S.D. (2007). Supporting parents so that they can support their internationally-adopted children: The larger challenge lurking behind the fatality statistics. *Child Maltreatment*, 12(4), 381-382.

<https://doi.org/10.1177/1077559507306719>

Gunnar, M. R., van Dulmen, M. H., & The International Adoption Project Team (2007).

Behavior problems in post institutionalized internationally adopted children.

*Development and Psychopathology*, 19(1), 129–148.

<https://doi.org/10.1017/S0954579407070071>

Haidet, K. K., Tate, J., Divirgilio-Thomas, D., Kolanowski, A., & Happ, M. B. (2009).

Methods to improve reliability of video-recorded behavioral data. *Research in*

*Nursing & Health*, 32(4), 465-474. <https://doi.org/10.1002/nur.20334>

Juffer, F., & Rosenboom, L. G. (1997). Infant-mother attachment of internationally adopted children in the Netherlands. *International Journal of Behavioral Development*, 20(1),

93-107. <https://doi.org/10.1080/016502597385469>

Juffer, F., Bakermans-Kranenburg, M. J., & van IJzendoorn, M. H. (2008). *Promoting positive parenting: An attachment-based intervention*. Psychology Press.

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

*Association*, 293(20), 2501 – 2515. doi :10.1001/jama.293.20.2501

- Juffer, F., & Van IJzendoorn, M. H. (2007). Adoptees do not lack self-esteem: A meta-analysis of studies on self-esteem of transracial, international, and domestic adoptees. *Psychological bulletin*, *133*(6), 1067-1083. <https://doi.org/10.1037/0033-2909.133.6.1067>
- Julian, M. M. (2013). Age at adoption from institutional care as a window into the lasting effects of early experiences. *Clinical Child and Family Psychology Review*, *16*, 101-145. <https://doi.org/10.1007/s10567-013-0130-6>
- Julian, M. M. (2020). Post-institutionalized adopted children. Effects of prolonged institutionalization at an older age. In G. M. Wrobel, E. Helder, & E. Marr (Eds.), *The Routledge handbook of adoption* (pp. 176-187). Routledge.
- Lansford J. E., Ceballo, R., Abbey A., & Stewart, A. J. (2001). Does family structure matter? A comparison of adoptive, two-parent biological, single-mother, stepfather, and stepmother households. *Journal of Marriage and Family*, *63*(3), 840–851. <https://doi.org/10.1111/j.1741-3737.2001.00840.x>
- Lindblad, F., Dalen, M., Rasmussen, F., Vinnerljung, B., & Hjern, A. (2009). School performance of international adoptees better than expected from cognitive test results. *European Child & Adolescent Psychiatry*, *18*, 301–308. <https://doi.org/10.1007/s00787-008-0731-7>
- MacLean, K. (2003). The impact of institutionalization on child development. *Development and Psychopathology*, *15*(4), 853-884. <https://doi.org/10.1017/S0954579403000415>
- McGuinness, T. M., & Pallansch, L. (2000). Competence of children adopted from the former Soviet Union. *Family Relations*, *49*(4), 457-464. <https://doi.org/10.1111/j.1741-3729.2000.00457.x>
- Mills-Koonce, W. R., Willoughby, M. T., Zvara, B., Barnett, M., Gustafsson, H., Cox, M. J., & the Family Life Project Key Investigators (2015). Mothers' and fathers' sensitivity

and children's cognitive development in low-income, rural families. *Journal of Applied Developmental Psychology*, 38(May-June), 1-10.

<https://doi.org/10.1016/j.appdev.2015.01.001>

NICHD Early Child Care Research Network. (1999). Child care and mother-child interaction in the first three years of life. *Developmental Psychology*, 35(6), 1399-1413.

<https://doi.org/10.1037/0012-1649.35.6.1399>

NICHD Early Child Care Research Network (2001). Before Head Start: Income and ethnicity, family characteristics, child care experiences, and child development. *Early Education and Development*, 12(4), 545-576.

[https://doi.org/10.1207/s15566935eed1204\\_4](https://doi.org/10.1207/s15566935eed1204_4)

NIHCD Early Child Care Research Network (2006). Infant-mother attachment classification: Risk and protection in relation to changing maternal caregiving quality over time.

*Developmental Psychology*, 42(1), 38-58. <https://doi.org/10.1037/0012-1649.42.1.38>

Nærde, A., Janson, H., & Ogden, T. (2014). BONDS (The Behavior Outlook Norwegian Developmental Study): A prospective longitudinal study of early development of social competence and behavior problems [Online report.] Oslo, Norway: The Norwegian Center for Child Behavioral Development.

<https://www.barnssosialeutvikling.no/getfile.php/1310142->

[1415102340/Filer/nubu.no/Intranett/Dokumenter/Rapporter/Report%20Naerde%20et%20al%20BONDS%20A%20prospective%20longitudinal%20study.pdf](https://www.barnssosialeutvikling.no/getfile.php/1310142-1415102340/Filer/nubu.no/Intranett/Dokumenter/Rapporter/Report%20Naerde%20et%20al%20BONDS%20A%20prospective%20longitudinal%20study.pdf)

Owen, M. T., Amos, M., Bondurant, A. L., Caughy, M., Hazanizadeh, N., Hurst, J., Villa, (2010). *Qualitative ratings for parent-child interaction ages 2-4 years*. Unpublished manuscript for the Dallas Preschool Readiness Project. Dallas, TX, United States: The University of Texas at Dallas.

- Palacios, J., & Brodzinsky, D. (2010). Review: Adoption research: Trends, topics, outcomes. *International journal of Behavioral Development* 34(3), 270-284.  
<https://doi.org/10.1177/0165025410362837>
- Palacios, J., Román, M., & Camacho, C. (2011). Growth and development in internationally adopted children: Extent and timing of recovery after early adversity. *Child: Care, Health and Development*, 37(2), 282-288. <https://doi.org/10.1111/j.1365-2214.2010.01142.x>
- Panfile, T. M., Laible, D. J., Eye, J. L. (2012). Conflict frequency within mother–child dyads across contexts: Links with attachment security and gender. *Early Childhood Research Quarterly*, 27(1), 147– 155. <https://doi.org/10.1016/j.ecresq.2011.06.001>
- Pomerleau, A., Malcuit, G., Chicoine, J. F., Seguin, R., Belhumeur, C., Germain, P., Amyot, I., & Jéliu, G. (2005). Health status, cognitive and motor development of young children adopted from China, East Asia, and Russia across the first 6 months after adoption. *International Journal of Behavioral Development*, 29(5), 445-457.  
<https://doi.org/10.1177/01650250500206257>
- Propper, C., Willoughby, M., Halpern, C. T., Carbone, M. A., & Cox, M. (2007). Parenting quality, DRD4, and the prediction of externalizing and internalizing behaviors in early childhood. *Developmental Psychobiology*, 49(6), 619-632.  
<https://doi.org/10.1002/dev.20249>
- Raleigh, E., & Kao, G. (2013). Is there a (transracial) adoption achievement gap? A national longitudinal analysis of adopted children’s educational performance. *Children and Youth Services Review*, 35(1), 142–150.  
<https://doi.org/10.1016/j.chilyouth.2012.09.019>



- Rueter, M. A., Keyes, M. A., Iacono, W. G., & McGue, M. (2009). Family interactions in adoptive compared to nonadoptive families. *Journal of Family Psychology, 23*(1), 58–66. <https://doi.org/10.1037/a0014091>
- Rosnati R, Iafrate R, Scabini E. (2007). Parent–adolescent communication in foster, inter-country adoptive, and biological Italian families: Gender and generational differences. *International Journal of Psychology; 42*(1), 36–45. <https://doi.org/10.1080/00207590500412128>
- Rutter, M., Beckett, C., Castle, J., Colvert, E., Kreppner, J., Metha, M., Stevens, S., & Sonuga-Barke, E. (2012). Effects of profound early institutional deprivation: An overview of findings from a UK longitudinal study of Romanian adoptees. In G. M. Wrobel & B. Neil (Eds.), *International advances in adoption research for practice* (pp. 147–167). Wiley-Blackwell. <https://doi.org/10.1002/9780470741276.ch7>
- Rutter, M., Sonuga-Barke, E. J., Beckett, C., Castle, J., Kreppner, J., Kumsta, R., ... Gunnar, M. R. (2010). *Deprivation-specific psychological patterns: Effects of institutional deprivation. Monographs of the Society for Research in Child Development, 75*(1). <https://www.jstor.org/stable/40608153>
- Selman, P. (2012). The rise and fall of intercountry adoption in the 21st century: Global trends from 2001 to 2010. In J. L. Gibbons & K. S. Rotabi (eds.), *Intercountry adoption: Policy, practices, and outcomes* (pp. 7-27). Routledge. <https://doi.org/10.4324/9781315252117>
- Shaw, D. S., Bell, R. Q., & Gilliom, M. A. (2000). A truly early starter model of antisocial behavior revisited. *Clinical Child and Family Psychology Review, 3*, 155-173. <https://doi.org/10.1023/A:1009599208790>

- Singer, L. M., Brodzinsky, D. M., Ramsay, D., Steir, M., & Waters, E. (1985). Mother-infant attachment in adoptive families. *Child Development, 56*(6) 1543-1551.  
<https://doi.org/10.2307/1130473>
- Smith, C., Cossette, L., Melançon, F., Beauvais-Dubois, C., Smolla, N., Gagnon-Oosterwaal, N., ... Bégin, J. (2018). Behavior problems in adolescence among international adoptees, pre-adoption adversity, and parenting stress. *Journal of Applied Developmental Psychology, 57*(July-August), 53-61.  
<https://doi.org/10.1016/j.appdev.2018.04.005>
- Snyder, J., Stoolmiller, M., Wilson, M., & Yamamoto, M. (2003). Child anger regulation, parental responses to children's anger displays, and early child antisocial behavior. *Social Development, 12*, 335-360. <https://doi.org/10.1111/1467-9507.00237>
- Sonuga-Barke, E. J. S, Kennedy, M., Kumsta, R., Knights, N, Golm, D., Rutter, M., ... .Kreppner, J. (2017). Child-to-adult neurodevelopmental and mental health trajectories after early life deprivation: The young adult follow-up of the longitudinal English and Romanian Adoptees study. *Lancet, 389*(10078), 1539-1548.  
[https://doi.org/10.1016/S0140-6736\(17\)30045-4](https://doi.org/10.1016/S0140-6736(17)30045-4)
- Stams, G. J., Juffer, F., Rispens, J, & Hoksbergen, R. A. C. (2000). The development and adjustment of 7-year-old children adopted in infancy. *Journal of Child Psychology and Psychiatry, 41*(8), 1025-1037. <https://doi.org/10.1111/1469-7610.00690>
- Stams, G. J. M., Juffer, F., & van IJzendoorn, M. H. (2002). Maternal sensitivity, infant attachment and temperament in early childhood predict adjustment in middle childhood: The case of adopted children and their biologically unrelated parents. *Developmental Psychology, 38*(5), 806-821. <https://doi.org/10.1037/0012-1649.38.5.806>

- Suwalsky, J. T. D., Cote, L. R., Bornstein, M. H., Hendricks, C., Haynes, Q. M., & Bakeman, R., (2012). Mother-infant socioemotional contingent responding in families by adoption and birth. *Infant Behavior and Development*, *35*(3), 499-508.  
<https://doi.org/10.1016/j.infbeh.2012.04.006>
- Suwalsky, J. T. D, Hendricks, C., & Bornstein, M. H. (2008). Families by adoption and Birth: II. Mother-infant cognitive interactions. *Adoption Quarterly*, *11*(2), 126-151.  
<https://doi.org/10.1080/10926750802374967>
- Suwalsky, J. T. D., Padilla, C. M., Yuen, C. X., Parnam-Horn, E., Bradley, A. L., Putnick, D. L., & Bornstein, M. H. (2015). Adoptive and nonadoptive mother-child behavioral interaction: A comparative study at 4 years of age. *Adoption Quarterly*, *18*(3), 196-216. <https://doi.org/10.1080/10926755.2015.1013592>
- Tamis-LeMonda, C. S., Shannon, J. D., Cabrera, N. J., & Lamb, M. E. (2004). Fathers and mothers at play with their 2- and 3-year-olds: Contributions to language and cognitive development. *Child Development*, *75*(6), 1806-1820.  
<https://doi.org/10.1111/j.1467-8624.2004.00818.x>
- Taraban, L., Shaw, D. S., Leve, L., Natsuaki, M., Ganiban, J. M., Reiss, D., & Neiderhiser, J. M. (2018). Parental depression, overreactive parenting, and early childhood externalizing problems: Moderation by social support. *Child Development*, *90*(4), 468 - 485. <https://doi.org/10.1111/cdev.13027>
- Towe-Goodman, N. R., Willoughby, M., Blair, C., Gustafsson, H. C., Mills-Koonce, W. R., Cox, M. J., & The Family Life Project Key Investigators (2014). Fathers' sensitive parenting and the development of early executive functioning. *Journal of Family Psychology*, *28*(6), 867-876. <https://doi.org/10.1037/a0038128>
- van den Dries, L., Juffer, F., van IJzendoorn, M. H., & Bakermans-Kranenburg, M. J. (2009). Fostering security? A meta-analysis of attachment in adopted children. *Children and*

*Youth Services Review*, 31(3), 410-421.

<https://doi.org/10.1016/j.childyouth.2008.09.008>

van IJzendoorn, M. H., Bakermans-Kranenburg, M., & Juffer, F. (2007). Plasticity of growth in height, weight, and head circumference: Meta-analytic evidence of massive catch-up after international adoption. *Journal of Developmental & Behavioral Pediatrics*, 28(4), 334-343. <https://doi.org/10.1097/DBP.0b013e31811320aa>

van IJzendoorn, M. H., & Juffer, F. (2006). The Emanuel Miller Memorial Lecture 2006: Adoption as intervention. Meta-analytic evidence for massive catch-up and plasticity in physical, socio-emotional, and cognitive development. *Journal of Child Psychology and Psychiatry*, 47(12), 1228-1245. <https://doi.org/10.1111/j.1469-7610.2006.01675.x>

van IJzendoorn, M. H., Juffer, F., & Poelhuis, C. W. K. (2005). Adoption and cognitive development: A meta-analytic comparison of adopted and nonadopted children's IQ and school performance. *Psychological Bulletin*, 131(2), 301-316. <https://doi.org/10.1037/0033-2909.131.2.301>

van Londen, M. W., Juffer, F., & van IJzendoorn, M. H. (2007). Attachment, cognitive, and motor development in adopted children: Short-term outcomes after international adoption. *Journal of Pediatric Psychology*, 32(10), 1249-1258. <https://doi.org/10.1093/jpepsy/jsm062>

Vinnerljung, B., Lindblad, F., Hjern, A., Rasmussen, F., & Dalen, M. (2010). School performance at age 16 among international adoptees: A Swedish national cohort study. *International Social Work*, 53(4), 443-456. <https://doi.org/10.1177/0020872809360037>

Vonheim, K. (2013). *Tidlig samspill i familier med utenlandsadopterte barn [Early interactions in families with internationally adopted children]*. [Doctoral

dissertation, University of Oslo, Department of Psychology.] Oslo, Norway:

University of Oslo. <http://urn.nb.no/URN:NBN:no-39671>

Vorria, P., Papaligoura, Z., Kopakaki, M., Dunn, J., van IJzendoorn, M. H. (2006). The development of adopted children after institutional care: A follow-up study. *Journal of Child Psychology and Psychiatry*, 47(12), 1246–1253.  
<https://doi.org/10.1111/j.1469-7610.2006.01666.x>

Table 1

*Descriptive Statistics for All Variables Included in the Analyses*

Variables	Adoptive dyads			Biological dyads		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Child gender (boys)	85	45.9%	-	887	50.3%	-
Mother's age	85	41.5*	3.94	886	32.6	4.77
Mother's education	84	4.0*	1.06	881	3.42	1.22
<b>Free-play task</b>						
<b>Mother</b>						
Sensitivity	84	3.49	0.74	887	3.48	0.75
Intrusiveness	84	2.11	0.90	887	1.70	0.75
Detachment	84	1.52	0.77	887	1.82	0.79
Cognitive stimulation	84	3.19	0.74	887	2.88	0.67
Positive regard	84	3.04	0.82	887	3.36	0.68
<b>Child</b>						
Positive mood	84	2.38	0.66	887	2.83	0.79
Sustained attention	84	3.36	0.69	887	3.50	0.70
Engagement of parent	84	3.37	0.70	887	3.58	0.75
<b>Teaching task</b>						
<b>Mother</b>						
Sensitivity	83	3.60	0.81	879	3.47	0.79
Intrusiveness	84	1.83	0.90	879	2.05	0.87
Detachment	84	1.37	0.69	879	1.52	0.73
Cognitive stimulation	84	3.17	0.84	879	3.13	0.76
Positive regard	84	3.38	0.75	879	3.64	0.64
<b>Child</b>						
Positive mood	84	2.25	0.71	879	2.64	0.71
Sustained attention	84	3.52	0.98	879	4.04	0.87
Engagement of parent	84	3.18	0.86	879	3.28	0.71

Note. \*Statistically significantly different ( $p < .001$ ) from biological dyads by independent-samples two-tailed  $t$ -test.

RUNNING HEAD: MOTHER-CHILD INTERACTION

Table 2

*Group Differences in Mother and Child Behaviors During Free Play and Teaching Tasks*

Variables	Free play task							Teaching task						
	Adoptive dyads		Biological dyads					Adoptive dyads		Biological dyads				
	n = 83		n = 881					n = 82		n = 873				
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>	$\eta^2p$	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>F</i>	<i>p</i>	$\eta^2p$
<b>Mother</b>														
Sensitivity	3.49	0.74	3.48	0.75	1.53	.216	.002	3.60	0.81	3.47	0.79	0.35	.553	.000
Intrusiveness	2.11	0.90	1.69	0.75	<b>24.67</b>	<b>&lt;.001</b>	<b>.025</b>	1.83	0.90	2.05	0.87	0.57	.452	.001
Detachment	1.52	0.76	1.82	0.79	3.42	.065	.004	1.37	0.69	1.52	0.74	0.06	.809	.000
Cognitive stimulation	3.19	0.74	2.88	0.67	<b>7.96</b>	<b>.005</b>	<b>.008</b>	3.17	0.84	3.13	0.76	1.22	.269	.001
Positive regard	3.04	0.82	3.36	0.68	<b>20.58</b>	<b>&lt;.001</b>	<b>.021</b>	3.38	0.75	3.64	0.63	<b>26.82</b>	<b>&lt;.001</b>	<b>.027</b>
<b>Child</b>														
Positive mood	2.40	0.64	2.83	0.79	<b>22.59</b>	<b>&lt;.001</b>	<b>.023</b>	2.24	0.71	2.64	0.71	<b>25.25</b>	<b>&lt;.001</b>	<b>.026</b>
Sustained attention	3.36	0.69	3.50	0.70	5.39	.020	.006	3.52	0.98	4.03	0.87	<b>31.08</b>	<b>&lt;.001</b>	<b>.032</b>
Engagement of parent	3.37	0.69	3.58	0.75	<b>12.62</b>	<b>&lt;.001</b>	<b>.013</b>	3.18	0.86	3.28	0.71	4.99	.026	.005

Note: Bonferroni adjusted alpha level:  $p < .005$ . Alpha level not adjusted in table. Statistically significant differences in **bold**. Covariates in all analyses: child gender, mother's age, mother's education.