

Predictors of treatment use among foster mothers in an attachment-based intervention program

Johanna Bick^{a*}, Mary Dozier^b and Shannon Moore^b

^a*Yale Child Study Center, Yale University, New Haven, USA;* ^b*Department of Psychology, University of Delaware, Newark, USA*

(Received 12 February 2010; final version received 19 November 2011)

The current study examined predictors of treatment use among 56 foster mothers who participated in an attachment-based intervention program for foster infants. Foster mothers' levels of treatment use were coded at early, middle, and late phases of the intervention program. Foster mothers' states of mind with regard to attachment predicted their understanding of the intervention session concepts. Specifically, autonomous foster mothers showed higher levels of understanding at the start of the intervention program, when compared with non-autonomous foster mothers. State of mind with regard to attachment also predicted foster mothers' levels of reflective functioning during the intervention sessions. Autonomous foster mothers showed higher levels of reflective functioning at early, middle, and late stages of the intervention program, when compared with non-autonomous foster mothers. The relevance of these findings for both treatment effectiveness and treatment delivery is discussed.

Keywords: state of mind with regard to attachment; attachment-based intervention; treatment-use; foster mothers and infants; reflective functioning

Introduction

Although the number of effective early intervention programs for foster parents and children has increased over the past two decades, less research has focused on the more nuanced questions regarding for whom and under what circumstances these treatments are effective (Hohmann & Shear, 2002; Kazdin & Weisz, 1998; Leslie et al., 2005). State of mind with regard to attachment has been found to be an important predictor of biological mothers' utilization of treatment programs for at-risk infants (Korfmacher, Adam, Ogawa, & Egeland, 1997). However, it is not clear whether similar associations might exist between foster mothers' state of mind with regard to attachment and their treatment use when participating in an intervention program for foster infants. To further research in this area, the current study examines whether foster parents' state of mind with regard to attachment, as measured with the Adult Attachment Interview, is predictive of their treatment use of an attachment-based intervention designed to improve foster parenting quality thereby promoting healthy foster infant development.

*Corresponding author. Email: johanna.bick@yale.edu

Infants in foster care

Infants are among the largest group of children to be placed in foster care (US Department of Health and Human Services: Administration for Children and Families, 2010). Furthermore, infants remain in foster care longer and experience more foster placements than all other children in the child welfare system (Wulczyn & Hislop, 2002). Due to their high rates of prenatal drug exposure, prematurity, and low birth weight, foster infants have been found to be at elevated risk for developing social-emotional problems and developmental delays (Chernoff, Combs-Ome, Risley-Curtiss, & Heisler, 1994; Hochstadt, Jaudes, Zimo, & Schachter, 1987; Schor, 1982; Simms, 1989; Simms & Horwitz, 1996; van den Dries, Juffer, van IJzendoorn, Bakermans-Kranenburg, 2009). Despite their removal from an unsafe environment, foster infants experience additional stressors, such as multiple disruptions in foster care placements and/or low quality care when they enter foster care. Therefore, the Attachment and Bio-behavioral Catch-up (ABC) intervention program was specifically developed to enhance the quality of care foster infants receive, with the aim of improving foster infants outcomes (Dozier & the Infant-Caregiver Lab, 2002). Given that individuals' treatment involvement, engagement, and use has implications for treatment efficacy, it seems important to examine the variability in foster parents' use of the ABC intervention. The current study investigates factors, such as foster parents' states of mind with regard to attachment, that may contribute to foster parents' engagement in the ABC intervention program.

Attachment representations and treatment use

An individual's state of mind with regard to attachment is assessed using the Adult Attachment Interview (Main, Kaplan, & Cassidy, 1985). Individuals who are coherent, valuing, open, and reflective in their verbal conceptualization of attachment-related experiences are classified as having an autonomous state of mind with regard to attachment. Individuals who devalue or minimize the importance of their attachment-related experiences are classified as having a dismissing state of mind with regard to attachment. Individuals who have difficulty staying on topic, become angrily involved, or become entangled in the subject matter when discussing attachment-related experiences are classified as having a preoccupied state of mind with regard to attachment. In addition to these classifications, individuals are classified as unresolved if they show a breakdown in their reasoning or discourse when discussing loss or trauma during the interview. When an unresolved classification is assigned, a secondary classification of autonomous, dismissing, or preoccupied is also assigned.

Attachment states of mind have long been associated with interaction styles in parent-child, peer, and romantic relationships (see for example Cohn, Cowan, Cowan, & Pearson, 1992; Cohn, Silver, Cowan, & Cowan, 1992; Crowell & Feldman, 1988; Fonagy, Steele, & Steele, 1991; van IJzendoorn, 1995; Ward & Carlson, 1995). Additionally, researchers have documented associations between attachment states of mind and relationships with treatment providers and patterns of treatment use. For example, Korfmacher et al. (1997) found that attachment state of mind was an important predictor of treatment use among high-risk birth mothers who participated in an attachment-based intervention program with their infants. During the program, mothers' attachment states of mind were associated with the quality of their participation in the sessions as well as the type of intervention

support that they received. Mothers with autonomous states of mind showed higher levels of commitment and compliance with the treatment program than mothers with dismissing states of mind. When compared with unresolved mothers, autonomous mothers showed higher levels of participation, fewer treatment roadblocks, and more positive relationships with treatment facilitators and other participants in a group setting.

The association between mothers' states of mind with regard to attachment and their treatment use in early intervention programs has been replicated in numerous studies. For example, Teti et al. (2008) found that biological mothers' attachment state of mind and socio-economic status interacted to predict their participation in an early intervention program. Furthermore, Korfmacher et al.'s (1997) investigation of biological mothers and infants participating in a preventative intervention program revealed that state of mind with regard to attachment was associated with mothers' levels of commitment to the program (Korfmacher et al., 1997; Korfmacher, Kitzman, & Olds, 1998). In both of these studies, mothers with autonomous states of mind showed more optimal levels of treatment use, when compared with mothers who were classified as non-autonomous.

Even in treatment programs not focused on improving mother–infant relationships, state of mind with regard to attachment has been found to predict treatment use. For example, in a study of adults with serious psychiatric disorders (Dozier, 1990), attachment organization, assessed from the Adult Attachment Interview using the Kobak Q-sort (Kobak, 1989), was associated with compliance with the treatment program. Further, in a prospective study of institutionalized adolescents, Zegers, Schuengel, van IJzendoorn, and Janssens (2008) found associations between ratings of the coherency of the clients' discourse (which is an indication of a clear, credible presentation of positive and negative experiences and autonomous classification) exhibited in the Adult Attachment Interview and the development of the relationship between the client and treatment provider. In both studies, scores indicative of an autonomous state of mind were associated with improved treatment involvement and engagement.

In sum, associations between attachment-related variables assessed through the Adult Attachment Interview and treatment use have been demonstrated across various studies. The current study attempts to extend this research in two unique ways. First, unlike previous studies that have focused on biological mother–infant samples, associations between attachment state of mind and treatment use were examined among a population of foster mothers who participated in an attachment-based intervention for their foster infants. Second, in contrast to previous studies' use of therapists' or clients' ratings of treatment use, coders who were blind to parents' state of mind classification assessed the degree to which foster mothers were involved in the program.

To assess foster mothers' variability in treatment use, the current study examined the extent to which foster mothers understood the treatment concepts and the extent to which they were insightful or reflective regarding their children's needs (which is referred to as reflective functioning). Because individuals with autonomous states of mind have been shown to be more receptive to attachment-related information and more reflective with regard to their own interpersonal experiences in the Adult Attachment Interview (George, Kaplan, & Main, 1996; Main & Goldwyn, 2000), the current research expected autonomous foster mothers in the current study to show a better understanding of treatment components throughout the attachment-related

intervention and to engage in more reflective functioning during early, middle, and late phases of the attachment-based intervention program when compared with non-autonomous foster mothers.

Method

Participants

Participants were 56 foster mother–infant dyads in the Mid-Atlantic region of the United States. Prior the current study, foster infants had been removed from their biological caregiver and placed in the home of a foster parent. As is customary for the foster care system in the United States, children in the current study were removed from their non-optimal or unsafe living conditions and placed into the home of a certified foster caregiver. Although infants and young children can also be placed with relatives or in “kinship care,” all foster parent–infant dyads in the current study were not-biologically related. As foster care is often a temporary solution until more permanent plans (i.e. placement with an adoptive family or reunification with one’s biological family) are made, at the time of the study the long term placement plans for children were unknown.

In the current study, foster parents were eligible to participate if they were caring for an infant who was less than 36 months of age when placed in their care. Upon receiving a referral from a case manager, each foster mother was first contacted by phone and given a general description of the intervention program. If she agreed to hear more about the project, a consent visit was conducted at her home. Upon enrolling in the study, foster mothers were assigned to the Attachment and Behavioral Catch-up intervention or a control intervention. As the focus of the current study was to understand predictors of treatment use among foster mothers in the attachment-based intervention, participants assigned to the control intervention were not included in the current study.

Foster mothers ranged in age from 24 to 66 years, with a mean age of 44 years ($SD = 9$ years). All foster parents were female. Forty-two percent of the foster mothers identified themselves as African American, 53% as White, and 5% described their race or ethnicity as biracial. Family income ranged from US\$10,000 to US\$100,000 with a median family income of US\$35,000. Sixteen percent of the foster mothers had not completed high school, 21% had completed high school, 46% had completed an associate’s degree or trade degree, 12% had completed college, and 5% had completed post-college graduate education. Infants ranged in age from 2 weeks to 31 months, with a mean age of 12 months ($SD = 7$ months). About half (55%) of the foster infants were girls ($n = 31$). Racial composition of the population of foster infants in this study included 62% African American, 28% White, and 10% biracial infants. Foster infants’ placement length at the start of the intervention program ranged from .6 to 29.7 months ($M = 4.0$ months, $SD = 4.29$ months).

Attachment and Bio-behavioral Catch-up intervention: Three critical components

The Attachment and Bio-behavioral Catch-up intervention is a 10-session manualized intervention program designed to promote healthy relationships between foster mothers and foster infants. Intervention sessions are delivered individually in the foster caregivers’ home. The components of this intervention are based on

previous research highlighting three issues critical to foster mothers and infants. The first component of the intervention helps foster caregivers learn to re-interpret their infants' signals when foster infants display alienating behaviors. In particular, caregivers are helped to see that the infants in their care need nurturance, even though foster infants often behave in ways that fail to elicit nurturance (Stovall & Dozier, 2000; Stovall-McClough & Dozier, 2004).

The second component of the intervention helps foster caregivers to parent in ways that are characteristic of autonomous caregivers (i.e., by providing nurturance) even if it does not come naturally to them. This is especially important because, as demonstrated by previous research, foster infants develop disorganized attachments at disproportionately high rates if not cared for by autonomous caregivers (Dozier, Stovall, Albus, & Bates, 2001). Parent trainers work closely with foster parents to help them override their own issues that may interfere with providing nurturing care.

The third intervention component helps foster mothers parent in ways that promote bio-behavioral regulation among their foster infants. Parent trainers guide foster parents to follow their infants' lead (Barnard & Morisset, 1995), touch and hold their infants (Field et al., 2004; Field, Hernandez-Reif, Diego, Schanberg, & Kuhn, 2005), and allow the expression of negative emotions. These techniques have been found to be effective in reducing physiological, behavioral, and emotional dysregulation that is often observed among human and non-human infants who have experienced disruptions in care or maltreatment (Dozier et al., 2006; Levine & Stanton, 1990).

These intervention components are introduced through 10 sessions in the foster parents' homes. At the start of each session, parent trainers and foster parents discussed incidents that occurred over the past week that pertain to the intervention. During all 10 sessions, foster parents are videotaped while they interact with their infants. Some of these activities involve discussions of videos of parent-infant activities. Other times, foster parents and infants participate in structured interactions, designed to help foster parents practice intervention concepts. Often the last portion of a session is dedicated to providing fosters parent with "video-feedback" during which parent trainers and foster parents review the foster parents' responsiveness over the course of the session. Parent trainers praise foster parents for sensitive behavior and help foster parents reflect on times when they are less responsive to their infants' needs. Parent trainers also comment on the parent's behavior "in the moment," that is, times when the foster parent nurtures the child or follows the child's lead during the session.

Measures

State of mind with regard to attachment

The Adult Attachment Interview (AAI; George et al., 1996) is a semi-structured interview designed to assess an individuals' attachment state of mind. In the current study, the AAI was administered to foster mothers prior to the intervention program, by the parent trainer who was assigned to deliver the intervention sessions. During the interview, foster mothers were asked to describe their early childhood relationships with their primary caregivers, to recall incidents of distress, and to reflect upon how early experiences affected their adult personalities. A 2-way classification was used in analyses and contrasted autonomous foster mothers with

non-autonomous foster mothers. This dichotomy of attachment state of mind classification (rather than a 3-way or 4-way classification) was chosen in order to conserve power. The primary question of interest concerned the role of autonomous versus non-autonomous attachment state of mind, as examined in a previous study conducted by Dozier and colleagues (2001). Autonomous interviews were characterized by coherent discourse and valuing of attachment-related experiences. The non-autonomous category included those with dismissing and preoccupied and unresolved states of mind. Non-autonomous interviews lacked the coherence and consistency characteristic of autonomous interviews.

Adult Attachment Interviews were independently classified by coders who passed a reliability test with at least 85% agreement established by Main and Hesse. Transcripts that were considered difficult were coded by multiple coders and a consensus on the classification was reached. Twenty percent of the interviews for this study were double coded for inter-rater reliability. Agreement on these interviews reached 84%, $K = .68$, indicating substantial agreement. Attachment state of mind classifications have been found to be independent of verbal IQ, non-attachment-related autobiographical memory, and social disability (Bakermans-Kranenburg & van IJzendoorn, 1993). Adequate reliability and discriminant validity has also been established for the Adult Attachment Interview (Bakermans-Kranenburg & van IJzendoorn, 1993).

Treatment use variables

Foster parent treatment use was assessed during early (session 3), middle (session 6), and late (session 9) phases of the intervention program. These three sessions were coded by an expert graduate student coder and four trained research assistants. All coders passed a reliability test prior to coding for the current study. Treatment use variables were coded from video recorded sessions and each of the three sessions was rated by a different coder. Sessions ranged from 30 minutes to 1 hour. Treatment use was assessed by examining foster parents' understanding of treatment concepts and reflective functioning with regard to their own and their foster child's behavior at sessions 3, 6, and 9.

Understanding of concepts

Foster mothers' understanding was assessed by examining how well foster mothers comprehended the subject matter presented during the sessions. Coders were blind to the foster mothers' state of mind with regard to attachment. Foster mothers were rated high in understanding when they answered questions appropriately and came up with personal examples that pertained to their own children. For example, after watching a video clip of an infant who turned away from a parent when distressed, foster mothers were asked, "Why do you think this baby turned away?" and "What do you think he actually needed from his mother?" After a brief discussion, foster mothers were then asked, "Has your baby ever turned away from you in this manner?" and "What do you think you should do in response to your baby if he or she turns away when in need?" The degree to which foster mothers responded in a way that was consistent with the intervention components as well as provided examples that pertained to their relationship with their foster infants were coded on a scale of 1 (little to no understanding) to 5 (high understanding). To assess inter-rater

reliability, 20% of the sessions for this study were double coded by the “expert” coder and a certified research assistant. Adequate inter-rater reliability was found for the measure of foster mothers’ understanding of the intervention concepts. The averaged (intra-class correlation) ICC of each research assistant coder with the expert coder was .85, and ICCs ranged from .83 to .86.

Reflective function

Coders who were blind to foster mothers’ state of mind classification assessed foster mothers’ reflective functioning in sessions 3, 6, and 9 of the intervention program. The measure of reflective functioning used in this study was adapted from the original measure developed by Fonagy, Steele, Steele, Moran, and Higgitt (1991) to assess reflective functioning in the Adult Attachment Interview. Similar to the original measure, reflective functioning in this study was defined as the foster mothers’ ability to perceive and interpret (or reflect on) their own or their foster infants’ behaviors and experiences (such as feelings, beliefs, intentions, and desires) during the intervention sessions.

Foster mothers were rated as high in reflective functioning if their comments indicated that they perceived and understood their own and their foster infants’ behaviors or experiences in a highly authentic and personal way. For example, the following statement would be rated as high on the reflective functioning scale: “I think it is hard for me to praise and show excitement toward my foster baby because I never got that as a child” or “I think my baby needs me to pick her up, even when she turns away and acts like she doesn’t.”

The measure used for the current study differed from Fonagy et al.’s (1991) original measure in two ways. First, the current measure coded the reflective functioning of foster parents that was observed during video-recorded intervention sessions, whereas Fonagy et al.’s original measure coded reflective functioning from typed transcripts of Adult Attachment Interviews. Second, in contrast to the 10-point scale used in the original measure, the measure used in the current study was modified as a 5-point scale. Despite these differences, the criteria used to calculate reflective functioning were identical to those in the original measure. Similar to foster mothers’ levels of “understanding,” 20% of the sessions were double coded by the “expert” coder and a certified research assistant to assess inter-rater reliability for “reflective functioning” scores. Adequate inter-rater reliability was found for the foster mothers’ reflective functioning. The averaged ICC of each research assistant coder with the expert coder was .89; ICCs ranged from .83 to .94.

Data analytic plan

Data were analyzed using Hierarchical Linear Modeling (HLM 6.0; Raudenbush & Bryk, 2002). HLM allows for the examination of individual change in development over time by calculating estimates of within- and between-individual variation in repeated measure growth measurements. The dependent variables of this study included measurements of the foster mothers’ understanding and reflective functioning observed during intervention sessions. The primary independent variable of interest, or level-2 predictor, was foster mothers’ attachment states of mind (categorized as autonomous or non-autonomous). Second, preliminary analyses of the correlations between dependent variables and caregiver characteristics revealed

Table 1. Bivariate correlations of dependent variables with caregiver and child variables.

	Und 3	Und 6	Und 9	RF 3	RF 6	RF 9	CG Inc.	CG Edu.	CG Age	Child Age
Und 3	1	–	–	–	–	–	–	–	–	–
Und 6	.45**	1	–	–	–	–	–	–	–	–
Und 9	.55**	.06	1	–	–	–	–	–	–	–
RF 3	.25	.25	.25	1	–	–	–	–	–	–
RF 6	.30	.52**	.08	.51**	1	–	–	–	–	–
RF 9	.24	.21	.41**	.37*	.44**	1	–	–	–	–
CG Inc.	.24	.02	.09	.21	–.02	.17	1	–	–	–
CG Edu.	.34**	.32*	.32*	.16	.42**	.45**	.49**	1	–	–
CG age	.42**	.50**	.35*	.17	.28	.18	.03	.25	1	–
Child age	.02	.08	–.01	.01	–.11	–.15	–.15	–.11	–.01	1

* $p > .05$; ** $p > .01$.

Notes: Und 3 = caregivers' understanding at session 3; Und 6 = caregivers' understanding at session 6; Und 9 = caregiver's understanding at session 9; RF 3 = caregiver's reflective functioning at session 3; RF 6 = caregiver's reflective functioning at session 6; RF 9 = caregiver's reflective functioning at session 9; CG Inc. = caregiver's income; CG Edu. = caregiver's education; CG Age = caregiver's age.

significant associations with caregiver age and income (see Table 1). Therefore, caregiver age and income were entered in the model as covariates.

The proposed model was analyzed:

Level 1 (*within individual*): $Treatment\ use_{ti} = \Pi_{0i} + \Pi_{1i}\ session_{ti} + e_{ti}$

Level 2 (*between individual*): $\Pi_0 = \beta_{00} + \beta_{01}(\text{attachment state of mind}) + \beta_{02}(\text{income}) + \beta_{03}(\text{caregiver age}) + r_{0i}$
 $\Pi_1 = \beta_{10} + \beta_{11}(\text{attachment state of mind}) + \beta_{12}(\text{income}) + \beta_{13}(\text{caregiver age}) + r_{1i}$

Results

Predictors of understanding of treatment

Sixty-four percent ($n = 36$) of the foster mothers were classified as having autonomous attachment states of mind and 36% ($n = 20$) were classified as having non-autonomous attachment states of mind (with 25% classified as dismissing and 11% classified as unresolved). Of the six foster mothers who were classified as unresolved, five of them had primary autonomous classifications and one of them had a secondary non-autonomous (dismissing) classification. Past research studies have tended to include unresolved/autonomous classifications with non-autonomous caregivers. Therefore, the same approach was used in the current study.

When controlling for caregiver income and caregiver age, attachment state of mind predicted the intercept estimates of understanding at the start of the intervention ($\beta_{01} = .77, t(51) = 3.756, p < .01$) middle ($\beta_{01} = .54, t(51) = 4.284, p < .01$), and late ($\beta_{01} = .27, t(51) = 2.049, p < .05$) phases of the intervention. Additionally, attachment state of mind emerged as a significant predictor of the slope estimates of understanding ($\beta_{01} = -.09, t(51) = -2.015, p < .05$). Therefore, foster mothers with non-autonomous states of mind with regard to attachment showed significantly lower levels of understanding of intervention components at the start of the

intervention, and steeper rates of change when compared with autonomous foster mothers (see Figure 1).

Predictors of reflective functioning

When controlling for caregiver education and age, foster mothers with autonomous states of mind were rated as showing higher levels of reflective functioning at the start of the intervention program when compared with non-autonomous foster mothers ($\beta_{01} = .83$, $t(51) = 2.316$, $p < .05$). Reflective functioning scores continued to be significantly higher among autonomous foster mothers, when compared with non-autonomous foster mothers at middle ($\beta_{01} = .79$, $t(51) = 2.84$, $p < .05$) and late ($\beta_{01} = .83$, $t(51) = 2.203$, $p < .05$) stages of the intervention. The rate at which reflective functioning scores changed across the intervention was not significantly different for non-autonomous foster mothers when compared with autonomous foster mothers, however. Reflective functioning increased across the intervention sessions ($\beta_{01} = .12$, $t(51) = 2.063$, $p = .044$) for both autonomous and non-autonomous caregivers (Figure 2).

Discussion

In the current study, differences in treatment use emerged for autonomous and non-autonomous foster mothers. First, foster mothers with non-autonomous states of mind received lower scores in their understanding of treatment components at the start of the program, when compared with autonomous foster mothers. However, non-autonomous foster mothers showed higher rates of change in their understanding of the treatment material across the intervention program when compared with autonomous foster mothers. Secondly, foster mothers with autonomous states of mind were found to show consistently higher levels of reflective functioning across intervention sessions, when compared with foster mothers with non-autonomous states of mind, but reflective functioning scores increased across the intervention for both autonomous and non-autonomous

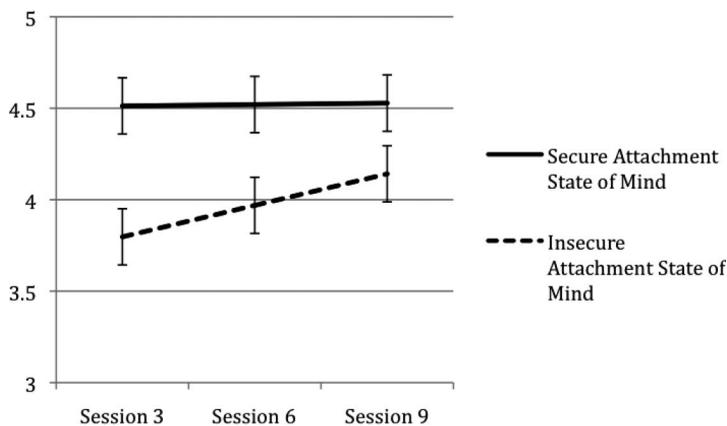


Figure 1. Foster mothers' state of mind related to understanding in three intervention sessions.

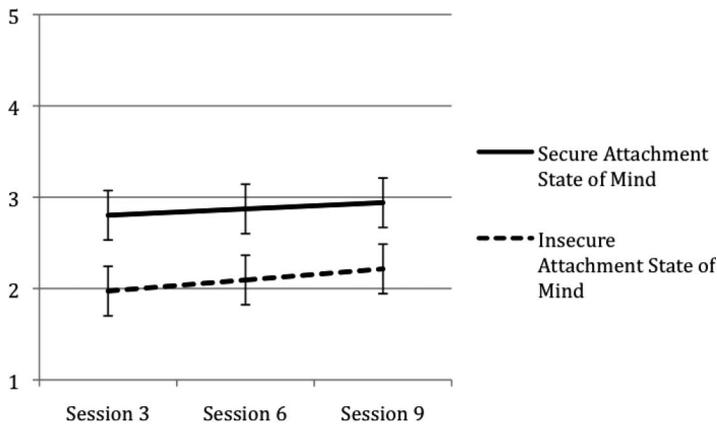


Figure 2. Foster mothers' state of mind related to reflective functioning in three intervention sessions.

foster mothers. Together, these findings add to the understanding of associations between state of mind with regard to attachment and foster parents' variability in treatment use. Whereas past research on this topic has focused on biological mothers and infants (Korfmacher et al., 1997; Teti et al., 2008), the current findings provide evidence that associations between attachment state of mind and treatment use extends to a sample of non-biologically related foster mothers and infants.

The differences in autonomous and non-autonomous foster mothers' initial understanding scores are consistent with previous research and theory. Likely due to their greater accessibility to attachment memories and ease in discussing attachment-related experiences, foster mothers with autonomous states of mind with regard to attachment showed greater understanding of attachment-related intervention components at early phases of the intervention, when compared with non-autonomous foster mothers. Despite having significantly lower starting values, the current research found it promising that non-autonomous foster mothers showed greater rates of increase (i.e. more positive slopes) in their understanding across the intervention sessions, when compared with autonomous foster mothers. Therefore, non-autonomous foster mothers appear to "catch-up" to the levels of understanding of autonomous mothers as the intervention sessions progress. Whereas autonomous foster mothers maintained their high understanding scores (as indicated by their almost flat slope of $-.002$) from early to late phases of the intervention, non-autonomous foster mothers, in contrast, appeared to start lower but show greater gains across sessions, as indicated by their more positive slope. However, when interpreting these findings, it is important to note that the high initial levels of the treatment process variables among autonomous foster mothers made it less likely that autonomous foster mothers' understanding scores could improve over time (i.e. a ceiling effect), which may have contributed to their flatter slopes.

It is interesting to consider factors that may contribute to the gains in understanding scores among non-autonomous foster mothers. Although non-autonomous foster mothers may have struggled with concepts initially, the later sessions provided

ongoing opportunities for the parent trainers to help non-autonomous foster mothers understand the need for sensitive, nurturing care for foster infants. Given that parent trainers were aware of the state of mind classification of their client prior to starting the treatment program, it is plausible that parent trainers worked differently with non-autonomous foster mothers, when compared with autonomous foster mothers, by challenging their resistance and avoidance of attachment-related material. Perhaps these data reflect parent trainers' success in helping clients recognize and change maladaptive behavioral patterns regarding relationships, which Bowlby emphasized as critical for treatment change (Bowlby, 1988). Specifically, the positive change in non-autonomous foster caregivers scores may have come about through parent trainers' efforts to "gently challenge" the non-autonomous individual's automatic behavioral patterns exhibited in relationships with the goal of encouraging a more autonomous perspective, which has been described as critical in previous studies (Dozier & Tyrell, 1998). Therefore, the gains observed among non-autonomous fosters may highlight the parent trainers' success in tailoring the intervention program sessions in a way that promoted positive outcomes with non-autonomous clients.

In the current study, both autonomous and non-autonomous foster mothers' reflective functioning scores increased across the intervention program. Across the intervention sessions, autonomous foster mothers showed higher reflective functioning scores when compared with non-autonomous foster mothers. Past explorations of reflective functioning have indicated inverse associations between mothers' reflective functioning and the amount of disruptions in mother-infant communication (a predictor of insecure and disorganized infant attachment; Grienberger, Kelly, & Slade, 2005). Reflective functioning has also been found to mediate the association between infant and adult attachment classifications (Slade, Grienberger, Bernbach, Levy, & Locker, 2005). Therefore, the current research found the increase in reflective functioning scores to be exciting. However, two important caveats must be made when interpreting these findings. First, it is not possible to conclude that the attachment-based intervention was responsible for foster mothers' increase in reflective functioning across sessions, because this work did not analyze them within the context of the larger randomized clinical trial. Second, the clinical significance of the changes in foster mothers' reflective functioning remains unknown. Although possible that increased reflective functioning correlates with improved parenting and child outcomes, it is also possible that increased reflective functioning merely represents an improvement in the foster mothers' abilities to discuss attachment related issues in the current study. Alternatively, it is also worth exploring whether the content of their reflective thoughts is associated with treatment effectiveness, as reflective functioning concerning one's parenting skills toward one's children (but not concerning not one's early attachment experiences) has been found to predict treatment effectiveness (Toth, Rogosch, & Cicchetti, 2008). Based on these caveats, the current research interprets the increase in reflective functioning scores in the current study as interesting, but descriptive.

In sum, the current study illustrates factors that predict treatment use among foster mothers. The authors are particularly excited about the potential implications of these results for treatment providers. Specifically, a clinician's awareness of a client's state of mind classification may be useful when conceptualizing how to work with different clients. Instead of a "one-size-fits-all" treatment approach, these results suggest it may be helpful to conceptualize and deliver an intervention based

on a client's attachment state of mind and related interpersonal strategies. The authors also feel that the results from this study point to many interesting future directions for related research. For example, future studies could explore whether foster parents' understanding and reflective functioning levels are maintained at post-intervention time points. It will also be important to examine whether these aspects of treatment use predict maternal and child behavioral outcomes. Addressing such questions could lead to a better understanding of the mechanisms by which treatments are effective. Although much work lies ahead, these results, suggesting that foster parents' state of mind predicts differences in the foster mothers' treatment use, are an important step in understanding how to maximize the success of treatment programs designed to promote positive maternal behavior and child outcomes among foster parents and infants.

Acknowledgements

This work was supported by National Institute of Mental Health Grants R01MH084135, R01MH052135, and R01MH074374, to the second author. We acknowledge the support of the parent trainers, and the Delaware Division of Family Services and the caseworkers, foster families, and children involved in this project.

References

- Bakermans-Kranenburg, M.J., & van IJzendoorn, M.H. (1993). A psychometric study of the adult attachment interview: Reliability and discriminant validity. *Developmental Psychology, 29*, 870–879.
- Barnard, K.E., & Morisset, C.E. (1995). Preventive health and developmental care for children: Relationships as a primary factor in service delivery with at risk populations. In H.E. Fitzgerald, B.M. Lester, & B. Zuckerman (Eds.), *Children of poverty; Research, health and policy issues* (pp. 167–195). New York, NY: Garland Publishing.
- Bowlby, J. (1988). *A secure base: Parent–child attachment and healthy human development*. New York, NY: Basic Books.
- Chernoff, R., Combs-Ome, T., Risley-Curtiss, C., & Heisler, A. (1994). Assessing the health status of children entering foster care. *Pediatrics, 93*, 594–601.
- Cohn, D.A., Cowan, P.A., Cowan, C.P., & Pearson, J. (1992). Mothers' and fathers' working models of childhood attachment relationships, parenting styles, and child behavior. *Development and Psychopathology, 4*(3), 417–431.
- Cohn, D.A., Silver, D.H., Cowan, C.P., & Cowan, P.A. (1992). Working models of childhood attachment and couple relationships. *Journal of Family Issues. Special Issue: Intergenerational Relationships, 13*(4), 432–449.
- Crowell, J.A., & Feldman, S.S. (1988). Mothers' internal models of relationships and children's behavioral and developmental status: A study of mother–child interaction. *Child Development, 59*(5), 1273–1285.
- Dozier, M. (1990). Attachment organization and treatment use for adults with serious psychopathological disorders. *Development and Psychopathology, 2*, 47–60.
- Dozier, M., & the Infant–Caregiver Lab. (2002). *The Attachment and Bio-behavioral Catch-up intervention: A training manual for foster parents*. Unpublished manual, University of Delaware, Newark.
- Dozier, M., & Tyrell, C. (1998). The role of attachment in therapeutic relationships. In J.A. Simpson & W.S. Rholes (Eds.), *Attachment theory and close relationships* (pp. 221–248). New York, NY: Guilford Press.
- Dozier, M., Manni, M., Gordon, M.K., Peloso, E., Gunnar, M.R., Stovall-McClough, K.C., et al. (2006). Foster children's diurnal production of cortisol: An exploratory study. *Child Maltreatment, 11*, 189–197.
- Dozier, M., Stovall, K.C., Albus, K.E., & Bates, B. (2001). Attachment for infants in foster care: The role of caregiver state of mind. *Child Development, 72*, 1467–1477.

- Field, T., Hernandez-Reif, M., Diego, M., Feijo, L., Vera, Y., & Gil, K. (2004). Massage therapy by parents improves early growth and development. *Infant Behavior & Development, 27*, 435–442.
- Field, T., Hernandez-Reif, M., Diego, M., Schanberg, S., & Kuhn, C. (2005). Cortisol decreases and serotonin and dopamine increase following massage therapy. *International Journal of Neuroscience, 115*, 1397–1413.
- Fonagy, P., Steele, H., & Steele, M. (1991). Maternal representations of attachment during pregnancy predict the organization of infant–mother attachment at one year of age. *Child Development, 62*(5), 891–905.
- Fonagy, P., Steele, M., Steele, H., Moran, G.S., & Higgitt, A. (1991). The capacity for understanding mental states: The reflective self in parent and child and its significance for security of attachment. *Infant Mental Health Journal, 12*(3), 201–218.
- George, C., Kaplan, N., & Main, M. (1996). *Attachment Interview for Adults* (3rd ed.). Unpublished manuscript, University of California, Berkeley.
- Grienberger, J., Kelly, K., & Slade, A. (2005). Maternal reflective functioning, mother–infant affective communication, and infant attachment: Exploring the link between mental states and observed caregiving behavior in the intergenerational transmission of attachment. *Attachment & Human Development, 7*(3), 299–311.
- Hochstadt, N.J., Jaudes, P.K., Zimo, D.A., & Schachter, J. (1987). The medical and psychosocial needs of children entering foster care. *Child Abuse & Neglect, 11*, 53–62.
- Hohmann, A.A., & Shear, M.K. (2002). Community-based intervention research: Coping with the “noise” of real life in study design. *American Journal of Psychiatry, 159*(2), 201–207.
- Kazdin, A.E., & Weisz, J.R. (1998). Identifying and developing empirically supported child and adolescent treatments. *Journal of Consulting and Clinical Psychology, 66*(1), 19–36.
- Kobak, R.R. (1989). *The Attachment Interview Q-Set*. Unpublished document, University of Delaware.
- Korfmacher, J., Adam, E., Ogawa, J., & Egeland, B. (1997). Adult Attachment: Implications for the therapeutic process in a home visitation intervention. *Applied Developmental Science, 1*, 43–52.
- Korfmacher, J., Kitzman, H., & Olds, D. (1998). Intervention processes as predictors of outcomes in a preventive home-visit program. *Journal of Community Psychology, 26*, 49–64.
- Leslie, L.K., Gordon, J.N., Lambros, K., Premji, K., Peoples, J., & Gist, K. (2005). Addressing the developmental and mental health needs of young children in foster care. *Journal of Developmental & Behavioral Pediatrics, 26*, 140–151.
- Levine, S., & Stanton, M.E. (1990). The hormonal consequences of mother–infant contact. In K. Barnard & T.B. Brazelton (Eds.), *Touch: The foundation of experience* (pp. 165–194). Madison, CT: International Universities Press.
- Main, M., & Goldwyn, R. (2000). *Adult Attachment classification system*. Unpublished document, University of California, Berkeley.
- Main, M., Kaplan, N., & Cassidy, J. (1985). Security in infancy, childhood, and adulthood: A move to the level of representation. *Monographs of the Society for Research in Child Development, 50*, 66–104.
- Raudenbush, S., & Bryk, A. (2002). *Hierarchical linear models: Applications and data analysis methods (Advanced Quantitative Techniques in the Social Sciences)* (2nd ed.). Newbury Park, CA: Sage.
- Schor, E.L. (1982). The foster care system and health status of foster children. *Pediatrics, 69*, 521–528.
- Simms, M. (1989). The foster care clinic: A community program to identify treatment needs of children in foster care. *Developmental and Behavioral Pediatrics, 10*, 121–128.
- Simms, M.D., & Horwitz, S.M. (1996). Foster home environments: A preliminary report. *Journal of Developmental & Behavioral Pediatrics, 17*, 170–175.
- Slade, A., Grienberger, J., Bernbach, E., Levy, D., & Locker, A. (2005). Maternal reflective functioning, attachment, and the transmission gap: A preliminary study. *Attachment & Human Development, 7*(3), 283–298.
- Stovall, K.C., & Dozier, M. (2000). The development of attachment in new relationships. Single subject analyses for ten foster infants. *Development and Psychopathology, 12*, 133–156.

- Stovall-McClough, K.C., & Dozier, M. (2004). Forming attachments in foster care: Infant attachment behaviors during the first 2 months of placement. *Development and Psychopathology, 16*, 253–271.
- Teti, D.M., Killeen, L.A., Candelaria, M., Miller, W., Hess, C.R., & O'Connell, M. (2008). Adult attachment, parental commitment to early intervention, and developmental outcomes in an African American sample. In H. Steele & M. Steele (Eds.), *Clinical applications of the adult attachment interview* (pp. 126–153). New York, NY: Guilford Press.
- Toth, S.L., Rogosch, F.A., & Cicchetti, D. (2008). Attachment-theory-informed intervention and reflective functioning in depressed mothers. In H. Steele & M. Steele (Eds.), *Clinical applications of the adult attachment interview* (pp. 154–172). New York, NY: Guilford Press.
- US Department of Health and Human Services: Administration for Children and Families. (2010). *Child Maltreatment, 2008*. Washington, DC: US Department of Health and Human Services.
- van den Dries, L., Juffer, F., van IJzendoorn, M., & Bakermans-Kranenburg, M. (2009). Fostering security? A meta-analysis of attachment in adopted children. *Children and Youth Services Review, 31*(3), 410–421.
- van IJzendoorn, M. (1995). Adult attachment representations, parental responsiveness, and infant attachment: A meta-analysis on the predictive validity of the adult attachment interview. *Psychological Bulletin, 117*(3), 387–403.
- Ward, M.J., & Carlson, E.A. (1995). Associations among adult attachment representations, maternal sensitivity, and infant–mother attachment in a sample of adolescent mothers. *Child Development, 66*(1), 69–79.
- Wulczyn, F., & Hislop, K. (2002). Babies in foster care: The numbers call for attention. *Zero to Three, (22)*4, 14–15.
- Zegers, M.A.M., Schuengel, C., van IJzendoorn, M.H., & Janssens, J.M.A.M. (2008). Attachment and problem behavior of adolescents during residential treatment. *Attachment & Human Development, 10*, 91–103.

Copyright of Attachment & Human Development is the property of Routledge and its content may not be copied or emailed to multiple sites or posted to a listserv without the copyright holder's express written permission. However, users may print, download, or email articles for individual use.