
PILOT STUDY OF THE EFFECTS OF RESPONSIVE TEACHING ON YOUNG ADOPTED CHILDREN AND THEIR PARENTS: A COMPARISON OF TWO LEVELS OF TREATMENT INTENSITY



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Abstract

Objective: The purpose of this pilot study was to examine the feasibility of a parent-mediated developmental intervention called Responsive Teaching at enhancing maternal responsiveness and addressing the development and social emotional functioning of young adopted children. *Methods:* Twenty eight parent-child dyads in which all children had been adopted and were under six years of age were randomly assigned to two treatment intensity groups: 3 and 6 months. Each group received weekly individual Responsive Teaching sessions in which parents were coached to use Responsive Interaction strategies to enhance their interactions with their children during daily routine activities.

Results: Mothers in both the 3 and 6 month intervention groups made significant increases in responsiveness, while their children made improvements in their development and social emotional functioning. Treatment group differences in children's development and social emotional functioning were not significant; but maternal responsiveness ratings at the 6 month observation were significantly higher for mothers in the 6 versus the 3 month group. Intervention effects were not associated with children's age or time living with parents, but international adoptees made greater improvements than domestic adoptees.

Conclusions. Responsive Teaching appears to be an effective intervention for encouraging parents to increase their responsive interactions with their young adopted children whether they receive 3 or 6 months of intervention services.

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Implications for Practice: Responsive Teaching is a relationship focused intervention that has the potential to help reduce the high incidence of developmental and social emotional problems commonly observed among young adopted children.

Key words: social emotional functioning; young adopted child; Responsive Teaching; responsive interaction strategies; mother responsiveness; international adoptees; domestic adoptees.

The development and social emotional functioning as well as academic performance of the majority of adopted children is comparable to their non-adoptive peers (Bimmel, Juffer, van IJzendoorn, Bakermans-Kranenburg, 2003; Stams, Juffer, van IJzendoorn & Hoksbergen, 2005; Keyes, Sharma, Elkins, Iacono & McGue, 2008). Nevertheless, adopted children are more likely than non-adoptive children to experience a number of developmental challenges including developmental delays, low IQ, deficits in communication (van IJzendoorn, Juffer & Poelhuis, 2005), as well as disorders in self-regulation and other social emotional conditions (Bramble, Radel, & Blumberg, 2007; Juffer & van IJzendoorn, 2005; Keyes, et. al., 2008). In addition, a disproportionately high percentage of adopted children receive special education (Welsh, Viana, Pettrill, Mathias, 2007) and mental health services (Sharma, et. al., 2008) and have low levels of academic achievement (van IJzendoorn, et.al., 2005). Although it is difficult to compare the prevalence of these problems among domestic and international adoptees, some maintain that the extremely adverse pre-adoption histories of many international adoptees place them at greater risk for these problems than domestic adoptees (e.g., Wiersbicki, 1993; Welsh, et. al., 2007).

Reasons for the developmental and social emotional problems associated with adoption

are complex. However, the most frequently cited reason is the difficulty that adopted children have in establishing a secure attachment with their parents (Howe, 2003; Handley-Derry, 1997; Marcovitch, Goldberg, Gold, Washington, Wasson, Krelwich, 1997; Juffer, Bakermans-Kranenburg, van IJzendoorn, 2005). Attachment problems have been attributed to a number of factors including the age children are adopted, the number of placements and disrupted attachment relationships children experience, the quality and consistency of care during pre-adoptive placements, as well as unresolved health issues, inadequate nutrition and prenatal exposure to drugs and alcohol (O'Connor & Rutter, 2000; Stams, et. al., 2000). In addition, the limited experience many adopted parents have raising children is thought to increase the stress they experience managing their adopted children's unique social-emotional behaviors, thus exacerbating their children's attachment challenges (Edelman & Connolly, 1986; Levy-Shiff, Goldschmidt & Har-Even, 1991).

Despite the high rate of attachment problems among adopted children, it is unlikely that all of their developmental challenges can be attributed to attachment. Given the rates of attachment problems reported for adopted children (e.g., Juffer, et. al., 2005; Howe, 2003) compared to their incidence of developmental and social-emotional prob-

lems (Keyes, et. al., 2008), many adopted children undoubtedly develop appropriate attachments yet still manifest developmental delays or social-emotional challenges. Such problems may be associated with the inherent characteristics of these children both with respect to their capacity for developmental growth as well as their temperament style and other challenging social behaviors (c.f., Wierzbicki, 1993). Yet numerous studies of nonadoptive children suggest that even when parent-child attachments are not problematic, children's development and social emotional functioning are not simply a reflection of their inherent vulnerabilities, but are also affected by the degree to which their parents engage in highly responsive interactions with them (Mahoney & Nam, 2011). For example, while disabilities such as Down syndrome or autism severely impact the communication skills of these children, the level of communication competence these children acquire is greatly influenced by their parents' level of responsiveness (Mahoney, 1988; Siller & Sigman, 2002; 2008).

Early interventions that have been designed to either address adopted children's social emotional challenges or prevent such problems from occurring have tended to focus on enhancing maternal sensitivity (i.e., responsiveness) to promote secure attachment. Results from these interventions have generally been favorable at enhancing maternal sensitivity and children's attachment (Bakermans-Kranenburg, van IJzendoorn, & Juffer, 2003), and some have reported improvements in children's play and social competence as well (van IJzendoorn, Bakermans-Kranenburg, Juffer, 2005). Most of

these interventions have been brief, presumably because research suggests that shorter interventions are more effective than longer ones (van IJzendoorn, et. al, 2005). In addition, most attachment interventions have been conducted with children who are in their first year of life, raising the question about their effectiveness with older children (van den Dries, Juffer, van IJzendoorn, Bakermans-Kranenburg, 2009).

While attachment-based interventions offer a promising method for addressing some of the social emotional problems of adopted children, their focus on attachment as the major target of intervention may not be appealing to parents who are not challenged by relationship or attachment problems even though they may be concerned about their children's development and risks for future problems. However, these parents may be more enthusiastic about interventions which either focus on the child development issues that are of concern to them and/or emphasize preventing their children from acquiring such problems.

The purpose of this study is to evaluate the feasibility of a general developmental intervention called Responsive Teaching [RT (Mahoney & MacDonald, 2007)] as a means of enhancing the quality of parent-child relationships as well as addressing the developmental and social emotional issues that adoptive children are experiencing. RT is a parent mediated intervention designed to enhance children's cognitive, communication and social emotional functioning. Similar to attachment based interventions RT encourages parents to engage in highly responsive interactions. This occurs by coaching parents to use Responsive Interaction (RI) strategies

during play and other routine activities with their children. RI strategies are suggestions that help parents modify their interactive behavior such that it reflects each of five components of responsive interaction: Contingency – “Respond immediately to little behaviors”; Reciprocity – “Take one turn and wait”; Affect – “Interact for fun”; Match – “Do what my child can do”; and Non-Directiveness – “Follow my child’s lead”.

One of the major features of RT is that RI strategies are not used to change parents’ interactive style, but rather to help their children increase their use of the pivotal developmental behaviors which are purported to be the foundations for developmental learning. Thus, to address parents’ concerns about their children’s cognitive development, RT may encourage parents’ use of RI strategies to promote their children’s “social play”, “exploration”, or “practice”. If parents’ concern is communication, RI strategies may be recommended to promote children’s “joint attention” or “intentionality”. For social emotional concerns, parents might be asked to use RI strategies to promote their children’s “trust”, “cooperation” or “self-regulation”. By emphasizing that the purpose of intervention is to change the child as versus the parents, RT attempts to reduce implications that parents are to blame for their children’s problems.

Four studies have been reported with children with developmental delays or disabilities which support the effectiveness of RT (Mahoney & Perales, 2003; 2005; Karaaslan, Diken & Mahoney, 2013; Karaaslan & Mahoney, 2013). The children who participated in these studies ranged from six months to almost five years. In each of these studies, RT

was conducted during individualized parent-child sessions either once or twice a week for periods ranging from 4 to 12 months. Results from all studies indicated that RT resulted in significant improvements in mothers’ responsiveness; three reported improvements in children’s cognitive and communication development (Mahoney & Perales, 2005; Karaaslan, et. al., 2013; Karaaslan & Mahoney, 2013); and two reported social emotional improvements (Mahoney & Perales, 2003; 2005). In general, the age children began receiving RT did not affect intervention outcomes. In addition, intervention effectiveness was not associated with children’s diagnoses, although social emotional improvements were observed primarily for children experiencing problems in this domain (Mahoney & Perales, 2003; 2005).

In this study, adopted children and their parents were randomly assigned to one of two RT treatment intensity groups: three or six months. Each of these groups was scheduled to receive one RT session each week. The purpose was to determine whether these different levels of treatment intensity would be associated with changes in parents’ style of interaction and psychosocial functioning, as well as children’s development and social emotional functioning. In addition, we were interested in exploring how intervention effects would be associated with the children’s age, time with their parents, and status as a domestic or international adoptee.

Methods

Sample

This study was approved by the Institutional Review Board of Case Reserve Western University. Subjects were recruited through program flyers that were distributed to medical clinics and social agencies that provided services to adopted children and their families. These flyers described the project as a “preventive intervention” and did not require that parents had concerns about their children’s current development or social emotional functioning. A total of 35 parent-child dyads signed an approved subject consent form to participate, and the final sample consisted of 28 dyads. Subjects excluded from

the final sample either discontinued participation (n=4) or failed to complete follow-up assessments (N=3). The demographic characteristics of subjects excluded from the study were not significantly different from those of the final sample.

As indicated on Table 1, the average age for mothers was 41.2 years and 45.7 years for fathers. The majority were married (90%) and white, non-Hispanic (90%). Sixty eight percent of the mothers were college graduates and 71.5% were working either full or part time. Families had an average of 2.6 children and most (78.5%) had annual incomes greater than \$60,000.

Table 1. Demographic characteristics of parents and children

Variable	3 Month (n= 14)		6 month (n=14)		Statistics
	%	M (SD)	%	M (SD)	
<u>Characteristics of Parents</u>					
Age mother		41.9 (4.6)		40.5 (5.2)	0.53 ^a
Age Father		43.0 (4.2)		48.4 (16.9)	1.15 ^a
Number of Other Children		2.1 (2.6)		1.1 (1.4)	1.38
Marital Status (% Married)	93%		86%		
Race					3.36 ^b
White (Non-Hispanic)	79%		100%		
Black	21%				
Education					1.08 ^b
High School	7%		0%		
Post-Secondary	29%		29%		
College Graduate	64%		71%		
Mother Employment					3.61 ^b
Full-Time	14%		29%		
Part-Time	57%		43%		
Family Income					1.18 ^b
\$20-40,000	7%		7%		
\$40- 60,000	21%		7%		
Over \$60,000	71%		86%		

Characteristics of Children

Age at Intervention Onset		32.2 (16.1)	37.8 (16.9)	0.80 ^a
Age at Adoption		14.4 (13.2)	11.6 (12.6)	0.32 ^a
Gender (% Males)	21%		43%	1.44 ^a
% International Adoption	64%		71%	0.15 ^a
% Resided in Orphanage	57%		57%	0.00 ^a
% Foster care	33%		67%	1.05 ^b
Race				8.48 ^b
White (Non-Hispanic)	36%		36%	
African American	29%		0	
Hispanic	0		29%	
Asian	29%		21%	
Other	7%		14%	

^a ANOVA; ^b Chi Square

Children's mean age was 35 months at the start of intervention and 32% were boys. On average children were adopted at 13 months and had lived with their parents for 22 months. The children were racially diverse, including Caucasian (36%), African-American (14.5%), Hispanic (14.5%) and Asian (25%). Sixty seven percent were international adoptees and 57% had resided in orphanages.

A trickle process randomization procedure was used to assign subjects to treatment intensity groups. The only significant group difference (See Table 1) was children's race: the three-month group included more African-American and the six-month group more Hispanic children. At the onset of intervention treatment groups did not differ in terms of mothers' interactive style (Table 2), parenting stress (Table 3), as well as children's development (Table 4) and social emotional functioning (Table 5).

Procedures

Subjects received weekly parent-child intervention sessions based upon the RT curriculum (Mahoney & MacDonald, 2007)

for either 3 or 6 months. Sessions were conducted by RT certified interventionists and were provided either in family's homes or at a center based facility. Each session lasted approximately 60 minutes.

RT is organized around 16 pivotal behaviors that are used to enhance children's cognitive, communication and social emotional functioning (see www.Responsiveteaching.org for a more detailed description). During each session interventionists discussed the pivotal behaviors that were the objectives for the child; introduced one or two RI strategies to promote these behaviors; demonstrated the strategies; coached parents in their use the strategies; and developed a plan for parent follow through.

Data Collection

Parent-child observations were collected at baseline, 3 and 6 months. All other child and family assessments were collected at baseline and 12 months. Because some children were older than 42 months at pre- assessment, two different tests were used to assess developmental ages (DA): the Bayley Scales of Infant

Development and the Battelle Developmental Inventory. DAs were converted to ratio developmental quotients (e.g. DA/CA x 100).

The Bayley Scales of Infant Development, 2nd Edition (Bayley, 1993) were used to assess children less than 42 months. The Bayley is considered to be one of the best measures of early general development. Average interrater reliabilities are .88, and test-retest reliabilities exceed .90. Predictive validity studies indicate that 2-year old Bayley scores are highly associated with preschool IQ scores.

The Battelle Developmental Inventory (Newborg, Stock, Wnek, Guidbaldi, & Svinicki, 1984) was used to assess children who were 42 months or older. The Battelle is an individually administered assessment for children up to 8 years of age. It measures five developmental domains: personal-social, adaptive, motor, communication, and cognition. It was standardized on a nationally representative sample of children and has high test-retest and interrater reliability. Battelle developmental quotients are highly correlated with the Bayley developmental indices ($r_s = .81$ to $.90$) (Newborg, et. al., 1984).

The Vineland Adaptive Behavior Scale, 2nd Edition (Sparrow, Cicchetti & Balla, 2005) was also used to assess children's communication. This parent report instrument yields estimates of children's functioning across four domains: Communication; Daily Living; Socialization; and Adaptive Behavior. Correlations between the Vineland and other adaptive behavior and intelligence tests range from .40 to .70 (Sparrow, et. al., 2005).

Two scales were used to assess children's social emotional functioning: the Child

Behavior Checklist (1½-5) (CBCL) and

the Temperament and Atypical Behavior Scale (TABS).

The Child Behavior Checklist for ages 1.5 to 5 years [CBCL/1.5-5 (Achenbach & Rescorla, 2000)] is a revision of the 1992 checklist for children age 2-3 years [CBCL/2-3 (Achenbach, 1992)] and was normed on a national sample of children. It yields three normative subscales scores: Internalizing, Externalizing, and Total Problems.

The Temperament and Atypical Behavior Scale (TABS) assesses problem behaviors of children between one to six years of age. This parent respondent instrument assesses four factors: Detached, Hypersensitivity/activity, Under-reactive, and Dysregulated. The corrected split-half reliability for the TABS is .95 for children with disabilities.

Children and mothers were video recorded playing together for seven-minutes with a standard set of developmentally appropriate toys. Mothers' style of interaction was rated from these videotapes with the Maternal Behavior Rating Scale (MBRS) (Mahoney, Powell, & Finger, 1986; Mahoney, 1992). The MBRS is a twelve item scale that assesses four interactive dimensions: Responsiveness, Affect, Achievement Orientation, and Defectiveness'. Research indicates that the MBRS assesses parenting characteristics associated with children's development; that ratings on the scale are stable over time for parents not involved in parenting interventions (Mahoney & Bella, 1998); and that it is sensitive to interactive changes promoted through parent mediated interventions (Mahoney & Powell, 1988; Mahoney, Boyce, Fewell, Spiker, & Wheeden, 1998).

The Parenting Stress Inventory-Short Form [PSI (Abidin, 1995 - 3rd Ed.)] was ad-

ministered to assess the psychological status of mothers. The PSI is a 36 item self-report questionnaire that has three subscales (parental distress, dysfunctional parent-child interaction and difficult child) and a Total Stress Index. Internal consistency for the Total Stress Index is .91, and for the subscales are: (a) .87 for Parental Distress; (b) .80 for Dysfunctional Parent-Child Interaction; and (c) .85 for Difficult Child (Abidin, 1995).

Responsive Teaching Intervention Service Logs were used to document the services that each family received. After each intervention session, service providers completed logs indicating: (a) the strategies discussed during each intervention session; (b) Intervention Topics; (c) follow-up activities mothers were asked to implement at home; and (d) mothers' follow-through with suggestions from the previous week.

Coding and Reliability of the Maternal Behavior Rating Scale.

Each mother-child video was coded independently by raters who had received 40 hours of training and had attained 80% agreement within one point on a five-point Likert scale. Pre- and post- intervention observations were

coded at the same time to avoid rating drift. Observations were randomly sorted so that pre- and post- observations were counterbalanced and were not coded consecutively for any dyad. A second rater coded 20% of all observations to assess reliability. Interrater reliability as estimated with the Spearman correlation was .81. Raters attained 72% exact agreement and 99% agreement within one scale point.

Results: Comparisons of Treatment Groups

For the following Treatment Group comparisons, a repeated measures multivariate analysis of variance (MANOVA) was used to examine the effects of Time (Intervention) and Time x Groups to compare intervention changes for the two groups. ANOVAs were used to explore these effects for individual scales or subscales.

Intervention Effects on Mothers' Interactive Style. MBRS ratings from baseline, 3 and 6 months are presented in Table 2. At the beginning of intervention, mothers had average ratings on MBRS subscales that clustered near the midpoint.

Table 2. Intervention Changes in Mother's Style of Interaction

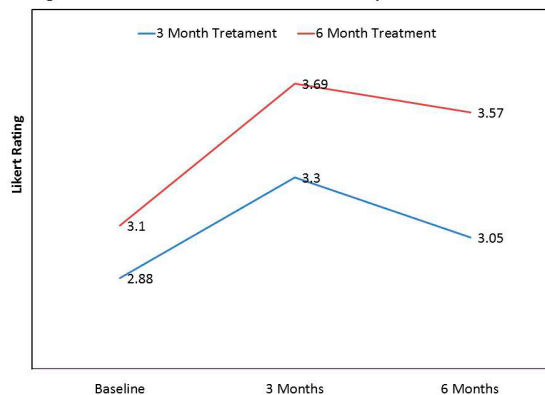
Variables	3 Month Group						6 Month Group						F (Time)	F (Time X Treatment)	Partial Eta ²
	Pre		3		6		Pre		3		6				
	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD			
<u>Maternal Behavior Rating Scale</u>													2.51*	0.49	.42
Responsive ^a	2.9	0.5	3.3	0.7	3.0	0.5	3.1	0.7	3.7	0.6	3.6	0.7	6.21**	0.55	.19
Affect ^a	2.9	0.3	3.0	0.5	2.9	0.5	2.9	0.4	3.2	0.3	3.1	0.5	1.65	0.34	.06
Achievement/ Directive ^a	2.9	0.5	2.7	0.3	2.6	0.4	2.7	0.5	2.5	0.3	2.5	0.4	2.44	0.30	.09

^a MBRS Subscales: *p<0.05, **p<0.01

Results for the MANOVA were significant for Time ($p < .05$) but not for Time x Groups ($p > .05$). Univariate analyses indicated that the effects of Time were significant for responsiveness ($p < .01$) but not the other two subscales. Eta square indicated that the effect size for responsiveness was in the large range. *Post hoc* comparisons indicated that for both groups responsiveness was significantly greater at 3 months than at baseline ($t = 4.01, p < .001$) while differences between responsiveness at baseline and 6 months were not significant ($t = 1.95, p > .05$).

A between subjects ANOVA was used to further explore group differences in responsiveness at 3 and 6 months, controlling responsiveness at baseline. Results indicated that group differences were not significant at 3 months ($F = 1.62, p > .05$) but were significant at 6 months ($F = 6.03, p < .05$). As depicted on Figure 1, responsiveness declined from three to six months for mothers in the 3 month group but remained stable for the 6 month group.

Figure 1. Intervention Effects on Maternal Responsiveness



Intervention Effects on Mother's Psychological Status. Table 3 presents Parenting Stress Index scores. While mean total stress scores were within the normal range for both groups at baseline and 12 months, 22% of the sample had clinically significant scores at baseline and only 9% had clinical scores at the 12 month follow-up. Results from the MANOVA indicated that the effects for Time and Time X Group were not significant ($ps > .05$). However, univariate analyses indicated significant Time effects on two subscales, parental distress and dysfunctional parent-child interaction, as well as for total stress ($ps < .05$) indicating decreases in parenting stress.

Table 3. Intervention changes in mothers' psychosocial functioning

Variables	3 Month				6 Months				F Time	F Time X Treatment	Partial Eta ² Time
	Pre		Post		Pre		Post				
	M	SD	M	SD	M	SD	M	SD			
<u>Parenting Stress Index-PSI</u>									2.01	1.32	.24
Distress	24.7	7.0	21.0	4.2	24.8	8.2	23.4	4.8	4.07*	0.86	.16
PC	20.8	8.0	17.2	4.8	22.4	6.9	20.1	6.2	6.41*	0.30	.23
Diff child	24.6	8.8	24.7	7.1	30.9	6.7	27.3	8.3	1.53	1.57	.07
Total Stress	70.1	21.8	62.8	12.8	78.1	16.1	70.8	16.7	5.41*	0.01	.21
<u>CES-D</u>	9.2	8.5	6.6	2.9	11.5	8.5	8.5	5.0	2.96	0.12	.13

* $P < 0.05$; ** $P < 0.01$, *** $P < 0.001$

Intervention Effects on Child Development. Table 4 reports pre- post scores on both Bayley/Battelle Developmental Quotients (DQ) and the Vineland Adaptive Behavior Scales. On both scales children were in the low average range at baseline and increased to the average range at the 12 month observation. Twenty one percent of the children had Bayley/Battelle Developmental Quotients that were 75 or lower at baseline and only 5% had scores in this range at the at 12 months. Similar percentages of children had DQs t 75 or lower at baseline and 12 months on the Vineland.

Analyses of Bayley/Battelle DQs indicated a significant effect for Time ($p < .01$) indicating that 12 month DQs were greater than baseline DQs. However, the Time X Treatment effect ($p > .05$) was not significant. Analyses of the Vineland also indicated significant effects for Time ($p < .01$) but not Time X Treatment ($p > .05$). Univariate analysis indicated that communication, daily living and adaptive behavior DQs were higher at 12 months than at baseline ($ps < .01$). Eta squares for both instruments indicated large effect sizes for intervention changes over time.

Table 4. Intervention Changes in Child Development

Variables	3 Month		6 Months				F (Time)	F (Time X Treatment)	Partial Eta ²		
	M	SD	M	SD	M	SD					
Developmental Quotient ^a	93.4	14.1	101.4	12.8	89.8	20.2	96.8	19.9	7.71**	0.34	.28
Vineland Adaptive Behavior Scale									3.82*	0.46	.40
Communication	84.4	13.5	99.8	14.7	85.6	19.5	92.5	15.8	13.71***	1.81	.35
Daily Living	80.5	9.6	89.3	14.1	77.2	15.0	83.5	10.5	12.32**	0.20	.32
Social	84.2	10.9	88.9	8.7	81.9	14.9	86.4	11.8	2.25	0.72	.08
Adaptive behavior	79.9	10.9	92.7	13.8	78.4	17.1	85.2	14.0	10.68**	0.98	.29

^a Ratio Developmental Quotient computed from Bayley or Battelle developmental ages;

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$

Intervention Effects on Children's Social Emotional Functioning. Table 5 presents pre-post measures of children's social emotional functioning both for the CBCL and the TABS. Average scores on both instruments were within the normal range for both instruments at baseline and 12 months. However, while 21% of the children had Total TABS scores

that were in the clinical range at baseline, only 8% had clinical scores at 12 months.

The overall MANOVA for the CBCL yielded significant effects for Time ($p < .001$) but not for Time X Treatment ($p > .05$). Univariate analyses indicated that 12 month scores were significantly lower on each of three subtests ($ps < .001$). Intervention effect

sizes were in the large range on all measures, indicating substantial improvement in social-emotional functioning.

Results for the TABS paralleled those for the CBCL. The overall MANOVA indicated a significant effect for Time ($p < .01$) but not Time X Treatment ($p > .05$). However, univariate analyses indicated that Time effects

were significant for only two of the four subscales: Hypersensitivity/Activity ($p < .001$) and Dysregulation ($p < .05$). Pre- post differences were also significant for the Total TABS score ($p < .001$). Intervention effect sizes on the TABS were in the moderate range.

Factors Associated with RT Intervention Effects

Table 5. Intervention Changes in Children's Social Emotional Functioning

Variables	3 Months				6 Months				F Time	F Time X Treatment	Partial Eta ² Time
	Pre		Post		Pre		Post				
	M	SD	M	SD	M	SD	M	SD			
<u>CBCL</u> ^a									14.40***	1.39	.64
Internalizing	49.9	12.4	43.5	11.6	55.4	10.0	46.4	9.5	46.24***	1.25	.64
Externalizing	52.7	10.6	44.6	11.6	54.9	9.4	48.7	6.7	21.54***	0.39	.45
Total Problems	52.4	11.4	44.1	11.4	56.1	9.7	48.0	7.4	32.92***	0.01	.56
<u>TABS</u> ^b									5.63**	1.03	.61
Detach	39.1	21.9	45.6	16.3	41.6	16.3	45.9	16.0	2.56	0.11	.10
Hypersensitivity	42.8	16.0	48.0	11.7	37.3	11.9	50.9	7.2	14.66***	2.95	.40
Underreactive	47.6	12.1	50.8	10.6	49.5	7.6	53.1	3.3	2.96	0.01	.12
Dysregulation	42.6	16.4	47.3	11.7	41.5	15.4	51.2	5.3	6.97*	0.84	.24
TABS Total	84.3	28.0	95.0	19.9	79.7	22.1	99.2	16.6	13.05***	1.09	.37

^a Child Behavior Checklist; ^b Temperament and Atypical Behavior Scale: * $P < 0.05$; ** $P < 0.01$, *** $P < 0.001$

Two sets of hierarchical regression analyses were used to explore factors associated with intervention outcomes. The first set explored the effects of children's age at adoption and the amount of time they lived with their adoptive parents; while the second set explored how children's status as a domestic versus international adoptee was associated with intervention outcomes. Both sets of analyses were conducted for each of the dependent variables reported in the previous section. For each regression model the dependent

variable (e.g., Time 2 Outcome) was examined with a hierarchical regression model. The first step included the Outcome at Time 1. The second set included the variables of interest: age at adoption and time with parents for the first set of analyses; international vs. domestic adoptee for the second set of analysis.

Results from the first set of analyses indicated that neither children's age at adoption nor time with adoptive parents was associated with any of the dependent variables. The

one exception was that Vineland Communication DQs at Time 2 were negatively associated with the amount of time children lived with their adoptive parents (Beta = -.36; $t = 2.04, p < .05$).

The second set of analyses indicated that intervention changes on most variables, including mothers' interaction style, parenting stress, and children's social emotional functioning as assessed both by the TABS

and CBCL were unrelated to children's status as an international or domestic adoptee. However as reported on Table 6 international adoptees made greater developmental improvements on the Bayley/Battelle and Vineland than domestic adoptees. This effect was significant for every developmental measure with the exception of the Vineland Daily Living Scale.

Table 6. Relationship of domestic versus international adoption status to child development outcomes

Dependent Variable	Model	Beta	T Value	Significance	R ²	R ² Change
Developmental Quotient T2 ^a	Developmental Quotient T1	.730	4.77	.000	.53**	.08
	Adoption Status	.343	2.52	.021	.61**	
Vineland Communication T2 ^b	Vineland Communication T1	.539	3.27	.003	.21**	.20
	Adoption Status ¹	.408	2.77	.011	.41**	
Vineland Social T2 ^b	Vineland Social T1	.487	4.81	.009	.21**	.06
	Adoption Status ¹	.299	2.91	.007	.27**	
Vineland Daily Living T2 ^b	Vineland Daily Living T1	.598	3.80	.001	.33**	.06
	Adoption Status ¹	.283	1.88	.072	.39**	
Vineland Adaptive Behavior T2 ^b	Vineland Adaptive Behavior T1	.510	3.02	.006	.23**	.24
	Adoption Status ¹	.453	3.04	.005	.47***	

^a Bayley/Battelle Ratio Developmental Quotients; ^b Vineland Developmental Quotients; ¹Adoption Status: 1= Domestic, 2= International * $p < .1$; ** $p < .05$; *** $p < .01$

Discussion

This pilot investigation was designed to assess the feasibility of Responsive Teaching as developmental intervention for young adopted children and their parents. Because there was no control group, the degree to which the intervention outcomes were greater than might have occurred with parents and children who received no intervention services cannot be determined. However, the results generally paralleled those reported from more rigorous evaluations of RT with other populations of parents and young children. Most notable were improvements in mothers' responsiveness as well as children's development and social emotional functioning, each of which resulted in large effect sizes similar to what has been reported in previous RT evaluations. In addition there was a small decrease in parenting stress which had not been reported in previous studies.

This study was designed to explore three issues that have practical implications for providing early interventions services to young adopted children and families. In particular, we examined how factors such as treatment intensity as well as the age of children at the onset of intervention and/or the amount of time they had lived with their parents might affect intervention outcomes.

We had expected that intervention outcomes would be greater for parents and children who participated longer in intervention. Yet, similar to findings from the attachment based intervention literature (van IJzendoorn, et. al., 2005) nearly all intervention effects appeared to be as robust for low versus high treatment intensity groups. The one exception was intervention changes in responsive-

ness. Although both groups made comparable improvements in responsiveness which plateaued at the three-month observation, low treatment intensity mothers decreased their responsiveness from three to six months while high- treatment intensity mothers maintained their level of responsiveness.

In so far as maternal responsiveness is causally related to children's development, it was surprising that group differences in responsiveness did not affect children's developmental outcomes. Perhaps, the drift in responsiveness for low treatment intensity mothers is a factor that has long-term as versus short term implications. Although short term attachment interventions have produced changes in parenting sensitivity that have sustained from 12 to 18 months, long-term follow-up studies have reported that these early effects do not sustain over time (van IJzendoorn, et. al., 2005). Thus while low treatment intensity interventions may produce short-term child outcomes that are comparable to those observed in more intensive interventions as reported in this study, more intensive, or longer term, interventions may reinforce mothers' responsiveness thus having a greater probability of enhanced child effects over time.

In addition, while attachment based interventions have been reported to be less effective for children younger than 12 months versus older children (van den Dries, et. al., 2009), no age effects were observed in this study. This failure to find age effects may be associated with the fact that our sample consisted predominately of children older than 12 months of age as well as the fact that measures of attachment which may be highly sensitive

to age effects were not used as outcome measures. Nonetheless, the child intervention effects observed in this study were quite robust and clinically significant, mitigating concerns about age effects that were not identified in this study.

We had expected that the less time children lived with their parents the less likely their parents would have developed habitual patterns of interacting with them. As a result, we reasoned that parents of newly adopted children regardless of their children's age would be more amenable to suggestions to modify their style of interaction than parents who had lived longer with their children. However, we found no evidence to support this. RT appeared to be as effective with parents of newly adopted children as with parents whose children who had live with them for even more than two years.

Finally, we had expected that international adoptees would benefit more from participation in the intervention than adopted children. This had been reported in previous attachment based intervention studies (Klein-Velderman, Bakermans-Kranenburg, Juffer, & van IJzendoorn, 2006) and was thought to be associated with international adoptees having more negative emotions (Belsky, 2005). Although international adoptees made greater developmental improvements than domestic adoptees in this study, the lack of group differences in children's social emotional functioning suggests that this had little to do with international adoptees having more negative emotions than domestic adoptees. Rather this effect appeared to be associated with the fact that although group differences in communication skills were not significant at the

onset of intervention, many of the international adoptees in this sample had been recently adopted and had limited English skills at the onset of intervention. This may have accounted for their making greater progress in their communication development than domestic adoptees, and may have also contributed their advantages on other developmental assessments as well.

In conclusion, results from this study suggest that RT is a feasible intervention both for promoting maternal responsiveness as well as enhancing the development and social emotional functioning of young adopted children. However, because of the quasi-experimental research design as well as the small sample used for this evaluation, results from this study can only be interpreted as "promising" and clearly do not support the efficacy of RT. Nonetheless, because results observed in this study were robust and clinically significant as well as similar to findings from more rigorous evaluations of RT, there is a strong need to examine how these results would hold up with more rigorous research designs that include larger and more diverse samples of parents and adopted children.

Both the high and low intensity treatment models that were evaluated in this study were more intense than typically provided in attachment-based interventions. Yet, the finding that the three month intervention was nearly as effective as the six month intervention has major practical implications, especially since public funding for post-adoption services is limited. However, on a more cautionary note, results indicating that parents who received 3 versus 6 months of intervention began to decline in responsiveness 3 months after their

intervention was completed is a concern that needs to be addressed. Given the likelihood that parental responsiveness is the main factor affecting children's development and social emotional functioning, this finding points to the need of RT, and perhaps other attachment-based interventions, to develop mechanisms for reinforcing parental responsiveness after intervention services have ended.

Finally, the widespread use of intervention models in community based practice is partly dependent upon the capacity of these models to address the needs of the populations of parents and children that are typically encountered. Children can be adopted at any age, not just under 12 months of age; many parents do not seek developmental services until long after they have adopted their child; and most agencies serve a mix of domestic and international adoptees. Results from this analysis indicated that none of these factors were associated with intervention outcomes for parents or children. In addition, as also occurs in practice, several of the children in this study had developmental, social emotional and quite possibly attachment problems at the onset of intervention, but none of these conditions appeared to influence the effectiveness of this intervention. In general, the results from this pilot investigation underscore the viability of RT as community based option for providing developmental service to preschool adoptees of all ages and ability levels regardless of the amount of time they have lived with their parents and whether they are international or domestic adoptees.

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