

The Effects of Mother's Style of Interaction on Children's Engagement:
Implications for Using Responsive Interventions with Parents

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Running Head: Interaction Effects on Engagement

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Abstract

The purpose of this study is to examine the effects of mothers' style of interaction on children's interactive engagement. The study included a sample of 30 children from Korea, including chronologically age matched groups of children with disabilities (N =13) and children without disabilities (N =17). Parents were videotape recorded while playing with their children with a standard set of developmentally appropriate toys. These observations were coded with the Child Behavior Rating Scale to assess children's engagement and the Maternal Behavior Rating Scale to assess mother's style interaction. Comparisons of these two groups of children and mothers indicated significant differences both in the level of children's engagement and mothers' style of interacting. Children with disabilities were less actively engaged than children without disabilities. Mothers were less responsive and more directive while interacting with children with disabilities. Regression analyses indicated that maternal responsiveness was a significant predictor of children's engagement. These results are described in terms (a) factors that contribute to children's developmental growth and (b) the kinds of intervention objectives that should be targeted with responsive teaching strategies.

The Effects of Mother's Style of Interaction on Children's Engagement:

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For several years, there have been multiple reports from the child development literature indicating that children's rate of development is moderately correlated to their mothers' level of responsiveness (Beckwith & Cohen, 1989; Bornstein, 1989; Bornstein, Tamis-LeMonda, & Haynes, 1999; Bradley, 1989; Vereijken, Ricksen-Walraven & Kondo-Ikemura, 1997; Yoder & Warren, 1999).

These research findings are noteworthy because maternal responsiveness is one of the most consistent socio-environmental variables yet to be associated with children's cognitive, communication and social emotional functioning throughout the early childhood years (Spiker, Boyce & Boyce, 2002). For example, in an analysis of data from the Infant Health and Development Project (Infant Health and Development Program, 1990), a large multisite early intervention research project, Mahoney, Boyce, Fewell, Spiker and Wheeden (1998) reported that maternal responsiveness accounted for six times more of the variance in the developmental functioning of low birthweight children than did children's participation in an intensive (25 hour per week) high-quality preschool program. In addition, data from this same project indicated that measures of maternal responsiveness when children were 30 months of age continued to predict children's verbal IQ and reading scores up through eight years of age, even when the effects of children's verbal IQ at three years of age were partialled from this analysis (Fewell & Deutscher, 2002).

This information suggests that early intervention might be successful at promoting development by encouraging parents to become more responsive with their children, particularly since there is some evidence that mothers are not as responsive with children with disabilities as they are with typically developing children (Spiker, et al., 2002). Nonetheless, even though several

studies have demonstrated that children's development can be enhanced by encouraging parents to become more responsive, this notion has been treated with skepticism (McCollum & Hemmeter, 1997) and has yet to substantially influence early intervention practice.

One reason for this is that responsive interaction strategies run counter to the types of instructional strategies and objectives that are considered to be best practice in early intervention (Sandall, McLean & Smith, 2000). For the most part, developmental intervention has been conceptualized as a process of encouraging children to learn the higher level skills and behaviors which developmental assessment instruments indicate differentiate these children from typically functioning children. Early intervention goals or objectives are typically designed to encourage children to engage in behaviors they either do not know, or are resistant to doing on their own. Since by design children are unable to produce these behaviors on their own initiative, to teach these objectives parents and others must use some type of directive teaching procedure to provide the guidance and direction children need to produce them.

Responsive interaction strategies are not effective at teaching these types of intervention objectives. For example, in a recent language intervention study by Kaiser, Hemmeter, Ostrosky, Fischer, Yoder and Keefer (1996), parents were asked to use responsive interaction strategies to teach their children a list of specific words or phrases their children did not know. Even though responsive strategies were successful at accelerating children's language development, they were not effective at helping children learn their specific language intervention targets. While children's rate of language development nearly doubled in six months of intervention, they only learned to produce less than one targeted intervention objective for each month of service (Kaiser, et. al., 1996).

Parental responsiveness entails supporting and encouraging behaviors that children are already capable of doing (Mahoney & MacDonald, In Press, 2004). The more parents are

responsive with their children, the fewer opportunities they have to encourage children to perform behaviors they either do not want to do or cannot do on their own. As a result, it is not surprising that parents who are highly responsive may be relatively ineffective at getting their children to learn skills or behaviors that they can not do on their own.

For responsive interaction to become a more useful and acceptable early intervention strategy, it is necessary to have a better understanding of the mechanisms through which it influences developmental learning. While responsiveness may not promote development by helping children learn discrete targeted skills, an alternative explanation is that responsiveness promotes the types of engagement behaviors that constructivist theories consider to be core processes for learning and development.

For example, Piaget's theory of cognitive development (Piaget, 1963) suggests that children's awareness, insight and newly formed cognitive schema evolve from the information children gain both about their own behavior and their immediate world as they explore, manipulate and problem solve with objects and people. Similarly, communication theories of language development emphasize the role that children's attempts to convey their intentions and observations play in language development (Bates, Benigni, Bretherton, Camaioni, & Volterra, 1979; Bornstein, et al., 1999; Bruner, 1975; 1983). This occurs through interactions such as joint activity or cooperation, joint attention as well as children's nonverbal attempts to convey their intentions (intentional behavior). These theories view developmental learning to be more dependent upon children's voluntary involvement in social interaction than upon the specific activity or information to which children are exposed. So long as children are actively engaged, they have the potential to learn meaningful developmental information from each activity or interaction they have throughout their day.

Consistent with the notion that engagement is a critical developmental learning process, de Kruif and McWilliam (1999) reported that measures of children's engagement in preschool classrooms were correlated to their level of development. While these correlational data do not indicate the direction of the relationship between these variables, one viable interpretation is that engagement plays a causal role in children's developmental learning.

In the parent-child interaction research literature there has been some interest in examining how parents' style of interaction affects aspects of children's engagement such as their initiation or play (Feldman & Greenbaum, 1997; Kochanska, 1997, Kochanska, Forman & Coy, 1999; Tamis-LeMonda, Bornstein, Baumwell, Melstein Damast, 1996). However, this literature has been more concerned with the effects of parent-child interaction on the quality of parents' relationships with their children (e.g., attachment) and on children's global development. For the most part, this literature has not attempted to examine the notion that parents' contribute to developmental learning primarily by encouraging children's engagement in social and nonsocial activities, even though this would be compatible with constructivist theories of learning and development.

If engagement is critical to children's developmental learning, then children with developmental disabilities would not only differ from their peers in terms of what they know or are able to do, but also in terms of their level of engagement. If the developmental effects of maternal responsiveness are mediated through its impact on children's engagement, then the degree to which these children are actively engaged in interactions is not only related to their biological or innate capabilities for developmental growth but also to the manner that their primary caregivers interact with them.

In this study we compare the interactive engagement of children with disabilities to a chronologically aged matched group of children who do not have disabilities. We were interested

in determining how these two groups of children differed in terms of their engagement, as well as in the way their mothers interacted with them. We hypothesized that children without disabilities would have higher levels of engagement than children with disabilities, and that children's engagement would be related to the extent to which their parents interacted responsively with them.

Method

Participants

Thirteen mother-child dyads that had children with disabilities and seventeen mother-child dyads with typically developing children participated in this study. Children with disabilities came from a special educational institute and children without disabilities came from an educational institute located in urban areas of Korea. All children were living at home with their parents. Subjects were recruited by their children's teachers. The researcher (Kim) informed parents about the purpose and procedures of the study and obtained their consent to participate.

Each of the children with disabilities had been diagnosed with Mental Retardation or Developmental Disorders by their pediatric psychiatrist or clinical psychologist. They also met the DSM-IV (APA, 1994) criteria for either Pervasive Developmental Disorders (10), Mental Retardation (1), or Motor Skills Disorder (2). The children were an average of 4.4 years old and were functioning at developmental levels that were 2-3 years lower than expected for their chronological ages. Their mean developmental age on the Korean Vineland Social Maturity Scale was 2.7 years.

Table 1 displays demographic characteristics of the children and their mothers. There were no significant differences between the two groups, except for the educational level of the mothers.

<Table 1 about here>

Instruments

All scales were based upon Korean translations of English language versions of the following instruments. The scoring criteria were based upon the procedures developed for English version of the instrument.

Child Development.

The Vineland Social Maturity Scale was used to assess the developmental functioning of the children with disabilities. The Korean Vineland Social Maturity Scale (Choi & Kim, 1998) was based on the 1965-edition of Doll's Vineland Social Maturity Scale. This test was re-standardized with representative samples of 1,980 Korean subjects from birth to thirty years of age and have. The Korean version of this scale consists of 117 items that assess children's self-help, self-direction, locomotion, occupation, communication and social relations functioning. By employing the Thomson method of calculating average age norms for items $\{M=A+1-(\sum\%/100)\}$, the items of the scale were arranged in an order of normal average age progression.

Children's Engagement.

To assess children's engagement, we videotaped 10 minute observations of children playing with their mothers with a set of developmentally appropriate toys. Mothers were instructed to play with their children as they normally do, using only the toys provided. Toys included a xylophone, picture books, picture cards, a toy used in playing house, a toy car, wooden puzzles, a stacking ring, nesting block, and wooden dominos.

We assessed children's engagement from these videotapes using the Child Behavior Rating Scale (Mahoney & Wheeden, 1998). This scale consists of seven global child engagement items: Interest, Attention to Activity, Persistence, Initiation, Affect, Joint Attention, and Cooperation. The items on this scale were adapted from scales reported previously by Meisels and colleagues (Meisels, Plunkett, Roloff, Pasick, & Stiefel, 1986) and Egeland and Sroufe (1981) and reflect

many of the behaviors that are thought to be core developmental learning processes. The behaviors measured by this scale differentiate children's interactions with teachers during instruction and free play and are sensitive to the effects of teachers' style of interaction on children (Mahoney & Wheeden, 1998). The Korean CBRS (Kim, Sung, & Hyun, 2000) was translated and revalidated by this researcher (Kim). Cronbach's Alpha was .88 and the KMO was .73.

Maternal Interactive Behavior.

Mothers' style of interaction was assessed from the videotaped observation of mother-child play described above. Videotaped observations were coded with the Maternal Behavior Rating Scale (MBRS) (Mahoney, 1999). The MBRS assesses 12 items and 4 dimension of parenting style: Responsiveness, Affect, Achievement Orientation and Directiveness. For the Korean MBRS (Kim, et al., 2000), Cronbach's Alpha was .89 and Kaiser-Meyer-Olkin (KMO) was .86.

Reliability

Videotaped observations were coded by two raters. Each had masters' degrees in developmental psychology and received approximately 30 hours of training until they had attained interrater agreement of 90% on each of the two scales. Reliability was computed based upon interrater agreement for all of the observations used for the final study. Interrater agreement was coded according to the formula $\{[\text{agreements} / \text{agreement} + \text{disagreements}] \times 100\}$. For the CBRS overall interrater agreement was 83.3% with ranging from 71.4% to 100% for individual scale items For the MBRS the average interrater agreement was 85.5%, ranging from 66.7% to 100%. .

Results

Children's Engagement

A Multivariate Analysis of Variance (MANOVA) was computed to compare the level of engagement of the two groups of children as measured by the CBRS. As indicated on Table 2, results from the MANOVA showed a significant group difference ($p < .05$). Children without

disabilities had higher scores on all seven CBRS items, although only four of the items were significant: Attention to activity [$F(1,28)=5.42, P<.05$], Persistence [$F(1,28)=7.51, P<.05$], Joint Attention [$F(1,28)=6.16, P<.05$], and Cooperation [$F(1,28)=5.54, P<.05$].

<Table 2 about here>

Maternal Interactive Behavior

A MANOVA was also computed to compare the interactive style of the two groups of mothers as measured by the MBRS. Results from this analysis indicated significant group differences ($p<.01$) (See Table 3). Univariate analyses of variance indicated significant group differences for three of the MBRS factors; Responsiveness [$F(1,27)=7.26, p<.05$], Affect [$F(1,27)=5.51, p<.05$], and Directiveness [$F(1,27)=4.51, p<.05$]. In general mothers of children without disabilities had higher scores on all MBRS factors than mothers of children with disabilities.

< Table 2 about here >

Relationship Between Children's Engagement and Mothers' Interactive Style

Bivariate correlations were conducted to examine the relationships of the four MBRS factors, children's disability, age and sex; as well as mothers' education to a global index of children's engagement. The global index of children's engagement was the mean of the 7 items on the Child Behavior Rating Scales. Results indicated that children's engagement was significantly correlated with maternal responsiveness ($r=.55, p<.01$), affect ($r=.51, p<.01$) and children's disability ($r=-.40, p<.05$) but with none of the other measures. These findings indicated that high levels of child engagement were associated with maternal responsiveness and affect as well as children not having disabilities.

Hierarchical multiple regressions were used to examine the relative contribution of responsiveness, affect and children's disability to children's global engagement. Results from this

analysis, presented in Table 4, indicated that both maternal responsiveness and affect had positive associations with children's engagement. Maternal responsive accounted for 33% of the variance, while affect account for 30% of the variance in children's total engagement scores. The effects of these two maternal style factors were independent of the effects that children's developmental status on children's engagement.

<Table 4 about here>

Discussion

In this study we have reported data regarding the interactive engagement of young children with disabilities. Results indicate that children with disabilities can be differentiated from typically developing peers in terms of their level of engagement with their mothers. Group differences in engagement were not only related to the fact that these children had different biological capabilities for development, but also to the manner their mothers interacted with them. Maternal responsiveness was moderately associated with the degree that children manifested the engagement behaviors measured by the CBRS. As a result, some of the group differences in children's engagement were attributable to the fact that mothers of children with disabilities were less responsive and had lower affect than mothers of children without disabilities.

Interpretations of the findings from this study are dependent upon two assumptions. First, the kinds of maternal and child behaviors observed in this study are representative of both the manner that mothers typically interact with their children as well as children's typical level of engagement. Second, the child engagement behaviors we assessed are representative of the processes that play a critical role in children's early learning and development.

One of the more intriguing findings in the parent-child literature has been that one-time observations of parents' interactive style, that are often as brief as five minutes, are predictive of children's current and subsequent levels of developmental functioning (see Mahoney et. al., 1998).

To the extent that such findings point to parental influences on children's developmental functioning, at least two phenomena appear to be occurring. First, during these relatively brief observations, parents' interactive behavior reflects the general rules or habits that govern the way they interact with their children in most situations. Second over time, parents maintain a consistent general style of interacting with their children. If the samples of parental interaction assessed during these observations were not representative of the way mothers interact with their children over long periods of time, the probability that these brief observations would be statistically related to independent measures of children's development would be extremely low.

Recently we reported research findings which suggest that both of these phenomena may be occurring (Mahoney & Kim, Submitted). We assessed mothers' style of interaction from two 5-minute observations, mothers and children playing without toys and mothers and children playing with toys, at two observation points approximately 12 months apart. We found that there were significant differences in mothers' style of interaction across the two play situations. Mothers tended to be more directive and less responsive when playing "with toys" than "without toys". However, we also found a significant correlation between the ways mothers interacted with their children in these two play situations. Mothers who were more responsive in play "without toys" were also more responsive in play "with toys". Second, we observed few changes in mothers' style of interaction across the two observations points. In fact, the different patterns of interaction mothers displayed in the two play situations were nearly identical across this 12 month time period.

Thus, while the way mothers' interact with their children may be affected by the interaction context, there appear to be common elements that underlie mothers' style of interacting with their children both across contexts and over time. As the literature on parental responsiveness implies (Bornstein, 1989), the impact mothers have on children's development may have less to do with

the amount and type of information mothers exchange with their children and much more to do with the repeated and consistent influence mothers have on their children's behavior.

When the results from this study are viewed from the context of the research findings described above, it appears that mothers who are highly responsive with their children may be constantly encouraging their children to engage high levels of engagement. Insofar as mothers maintain a relatively consistent style of interacting with their children, the hundreds of thousands of interactions they have with their children during the early childhood period may shape their children's habits of engagement. These habits could form the basis for children's propensity to participate in active or constructive learning, and thus be critical determinants of the efficiency of their developmental learning.

This conceptualization of parental influence on children's development assumes that the types of engagement behaviors assessed in this study are the developmental processes that are critical to children's constructive learning. This notion remains to be empirically tested. Nonetheless, the concept that behaviors such as attention, persistence and initiation are core learning processes is widely accepted and is clearly compatible with prevailing theories of cognitive and language development. Much research remains to be done to better understand how different types of engagement contribute to children's cognitive and communication development.

Results from this study have two potentially important implications for early intervention. First, they suggest that children who have biological limitations that interfere with their developmental functioning may be at increased jeopardy for developmental delays if their parents do not routinely engage in highly responsive interactions with them. This can be a problem for parents of children with disabilities if they either fail to perceive their children as engaging in meaningful or substantial behavior that is deserving of their responsiveness, or they are focused primarily on trying to help their children learn the skills and behaviors they are not yet capable of

doing (Mahoney, Fors & Wood, 1990). Interventions that encourage parents to engage in highly responsive interactions may not only be important for promoting more enjoyable parent-child relationships, but may also be critical to helping children maximize their potential for developmental learning during their daily routines.

Second, our results imply that if parents are encouraged to use responsive interaction strategies to promote their children's development, the child objectives targeted for this type of intervention need to be described in terms of children's engagement behaviors. Since responsiveness appears to be associated with different levels of child engagement, parents are only likely to recognize the value of these strategies if the intervention objectives for their children are related to promoting these behaviors. While responsiveness may be ineffective at encouraging children to learn pre-defined sets of developmental skills, data from this study suggest it may be a robust procedure for encouraging children's engagement.

To target children's engagement as intervention objectives, interventionists need to help parents understand the role that engagement plays in children's language and cognitive development. When parents understand that children's development is fundamentally dependent upon their active engagement, they are more likely to value and pursue these objectives for addressing their children's developmental needs.

As a final note, the subjects who participated in this study were mothers and children who lived in Korea. We have no reason to believe that this had any special significance for the findings for this study. While there may be differences in the manner mothers interact with children with disabilities in United States and Korea that can be attributed to cultural norms in the way that children with disabilities are treated in these societies, there is no reason to assume that cultural differences would alter the relationships between maternal style and children's engagement. Nonetheless, we recognize that it is important to explore the relationship between mothers' style of

interaction and children's engagement in a more representative population of parents and children. However, an even more important task is to develop a better understanding of how different forms of engagement contribute to children's developmental functioning and changes over time.

This paper is not intended to provide a definitive explanation of parental influences on child development, but rather to present findings that are suggestive of causal influences. We believe that these data are helpful for reframing interventions that promote parental responsiveness in terms of the impact they have on children's engagement. If responsiveness is as potent an influence on child development as research suggests, then it is critical to focus our interventions on the child behaviors that responsiveness promotes. Responsive interaction will continue to be underutilized as an early intervention procedure so long as children's primary intervention objectives are behaviors that can not be promoted with these strategies.

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Table 1. Demographic Characteristics of Participants

	Children With Disabilities	Children Without Disabilities	<i>t</i>
	M(SD)	M(SD)	
Mother			
Age(year)	33.69(4.73)	35.94(3.42)	1.51
Education(year)	13.00(2.23)	15.76(1.56)	3.80*
Children (number)			
Sex			
boy	6	8	.002 ^a
Girl	7	9	
Age(CA)	4.36(1.44)	4.94(1.43)	1.19
Developmetal age(SA) ^b	2.74		

^a = chi square

^b = Developmental age by Vineland Social Maturity Scale

* = $p < .01$

Table 2. Children's Engagement

	Children With Disabilities		Children Without Disabilities		F	ES
	M	SD	M	SD		
CBRS ^a					2.65*	.46
Interest ^b	3.31	1.25	3.88	.60	2.78	.09
Attention ^b	3.08	1.26	3.88	.60	5.42*	.16
Persistence ^b	2.77	1.01	3.59	.62	7.51*	.21
Initiation ^b	3.23	.93	3.53	.87	.82	.03
Affect ^b	2.69	1.49	3.41	.71	3.06	.10
Joint Attention ^b	2.69	1.11	3.59	.87	6.16*	.17
Cooperation ^b	2.92	.76	3.47	.51	5.54*	.20

$p < .05$ ^a = MANOVA, ^b = ANOVA

Table 3. Maternal Interactive Style

	Children With Disabilities		Children Without Disabilities		F	ES
	M	SD	M	SD		
	MBRS ^a					
Responsive ^b	2.56	.93	3.31	.90	7.26*	.21
Affect ^b	2.44	.78	2.91	.69	5.51*	.17
Achievement Orientation ^b	2.19	.80	2.76	.53	3.15	.11
Directive ^b	3.19	.83	2.88	.63	4.51*	.14

* $p < .05$ ** $p < .01$ *** $p < .001$, ^a = MANOVA, ^b = ANOVA

Table 4. Hierarchical multiple regression of maternal responsiveness on children's engagement

Independent Variables	Equations			
	<i>B</i>	<i>T</i>	Adjusted R ²	F
Responsiveness	.46	3.87***	.33	14.95***
Responsiveness	.38	3.04**	.36	9.15***
Child's disability	-.38	-1.59		
Affect	.58	3.75***	.30	14.03***
Affect	.48	3.12**	.37	9.46***
Child's disability	-.44	-1.90		

*** p<.001, **p<.01