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Family and Parental influence on the development of children with disabilities

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This study was to examined influences of family functioning, social support, parenting stress, and mothers' interactive style on the child development of young children with disabilities. Participants consisted of 50 mothers and their children who either had general developmental disabilities or had been diagnosed with Autism or Pervasive Developmental Disorders (PDD). The data used for this study included videotaped observations of parent-child play; a play based assessment; and standardized measures of mothers family functioning, social support and parenting stress. Correlational analysis indicated that there were low to moderate levels of correlations among family functioning, social support, parenting stress and mothers' interactive style. Hierarchical regression analyses indicated that both family factors (family cohesion, satisfaction with support and parenting stress) and maternal responsiveness contributed independently to children's rate of development. However, maternal responsiveness was the strongest predictor, accounting for 14% of the variance in children s' development. Results from the hierarchical regression were supportive of the hypothesis that family factors moderate the impact of maternal responsiveness on children's development.

Keywords : Maternal responsiveness, Family functioning, Social support, Parenting stress, Developmental disabilities

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It is becoming increasingly clear that the rate of development that children with disabilities attain is not only a function of their disability, but is also influenced by several characteristics of families (Dunst, Trivette, & Cross, 1986; Mahoney, O'Sullivan, & Robinson, 1992). Several years ago Dunst and his colleagues (Dunst, Snyder, & Mankinen, 1988a; Dunst, et al., 1986; Dunst, Trivette, & Jodry, 1997) published a number of papers which indicated that factors such as parents' social support and family functioning were associated with the development of children with disabilities, at least, in their early years of life. Other investigators reported that parents' style of interaction, in particular high responsiveness and moderate to low levels of directiveness, accounted for considerable variability in children's rate of developmental growth (Beckwith & Cohen, 1989; Bornstein & Tamis-LeMonda, 1989; Bornstein, Tamis-LeMonda, & Haynes, 1999; Bradley, 1989; Mahoney, Fingers & Powell, 1985; Vereijken, Ricksen-Walraven & Kondo-Ikemura, 1997; Yoder & Warren, 1999). These findings have been reported for diverse groups of children with disabilities including children who are at environmental risk (Bradley, 1989), children who have medical conditions associated with mental retardation such as Downs syndrome (Mahoney, Fingers & Powell, 1985), and children with severe social emotional problems such as autism or pervasive development disorders (Siller & Sigman, 2002).

These family factors not only predict children's development but also account for a substantial portion of the improvements children make in early intervention programs. For example, research reported by Dunst indicated that social support and family functioning predicted the gains children made while participating in early intervention programs. Mahoney and his colleagues (Mahoney, Boyce, Fewell, Spiker, & Wheden, 1998) analyzed the contributions of mother child interaction to the outcomes children attained in four early intervention research studies. Results indicated that the effects that intervention had on children's development was highly related to how much primary caregivers increased their responsiveness with their children. For example, in the Infant Health and Development Program (Infant Health and Development Program, 1990), a large, multi-site experimental study with low birthweight children, mothers responsiveness accounted for six times more of the variance in children's development than did children's participation in an intensive, high-quality classroom-based intervention program (Mahoney & Bella, 1998).

Research findings related to the impact that family factors have on the developmental functioning of children with disabilities provide important information for developing theoretical models related to the social environmental influences on the development of children with disabilities. These findings are highly supportive

of ecological models of child development which postulate a complex system of social environmental factors that influence children rate of development (Brofenbrenner, 1979; Sameroff & Chandler, 1975).

These findings have implications for early intervention practice as well. Over the past 20 years these results have been used as a basis for redesigning early intervention services so that they focus on working collaboratively with parents more than on addressing the needs of children in classrooms or clinics without parents' involvement.

Research related to family influences on children's development has been used to guide decisions regarding the types of procedures emphasized in early intervention. For example, one outcome of the research findings reported by Dunst and his colleagues is the Family Support Model for early intervention services (Dunst, Trivette & Deal, 1988b). This model, which has had a substantial impact on the way that early intervention is conducted in many countries throughout the world, emphasizes the need for intervention to address factors that should enhance parents' social support and improve the functioning of their families. This Family Support Model assumes that if intervention can enhance family support and family functioning, it will promote children's development by enabling parents to provide the kinds of stimulation that is necessary to address their children's developmental needs.

Similarly, findings related to the effects of maternal responsiveness on children's development have led to the development of Relationship Focused intervention models. This approach to intervention encourages parents to use responsive interaction strategies (i. e., imitate the child; follow the child's lead) as a method for addressing children's developmental needs in the context of their routine interactions at home and with their families (McCollum & Hemmeter, 1997). It is based upon the assumption that if parental responsiveness can be promoted directly through the use of responsive interaction strategies, children should improve their developmental functioning regardless of their families level of social support or family functioning.

Clearly, these two approaches to intervention can complement each other. Nonetheless, they reflect two competing hypotheses regarding the manner in which the constructs of social support, family functioning, and parent-child interaction influence early development. The Family Support Model is based upon the hypothesis that social support and family functioning directly mediate the quality of parent interactions with their children. According to this Mediating Hypothesis (See Figure 1), the constructs of social support and family functioning are highly correlated to parents style of interacting, and contribute to children's development indirectly through their impact on the manner parents interact with their children. In contrast, Relationship Focused interventions are based upon the hypothesis that

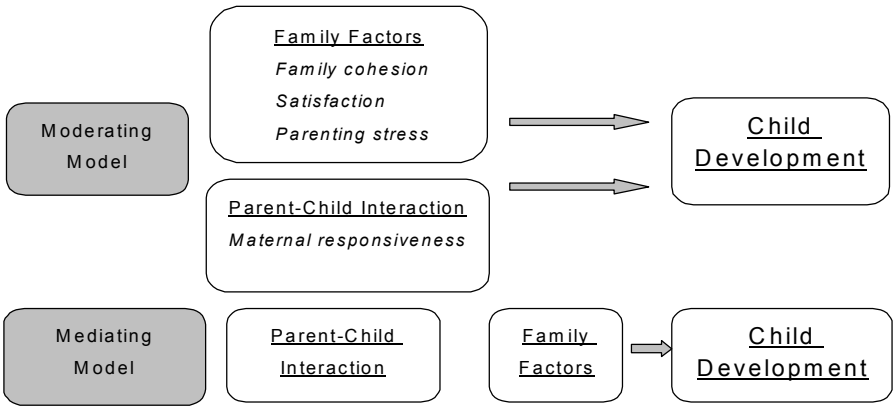

Figure 1. Moderating and Mediating hypothesis

social support and family functioning moderate the effects of parent-child interaction on development. According to this "Moderating Hypothesis" (See Figure 1) social support and family functioning contribute to children's development independently of the effects of parents' style of interaction. Furthermore, parents' style of interacting with their children is not correlated to their level of support or family functioning.

This study was designed to examine the associations between family variables (e. g. family functioning, social support, and parenting stress) and parents' style of interaction with the child development of a group of young children with disabilities. We were interested in both examining the inter-relationships among family variables and parent-child interaction variables, as well as to examine the independent contribution of these variables to children's rate of developmental functioning.

Methods

Participants

Participants were 50 mothers and their children who enrolled in an early intervention program in Akron in Ohio. Children either had developmental delays that made them eligible to receive early intervention services or had been diagnosed by their physicians as having autism or pervasive developmental disorder (PDD). A total of 54 children and their mothers were initially enrolled in this study. Four dyads were excluded due to incomplete data. The demographic characteristics of mothers and their children are summarized in Table 1. Mothers ranged in age from 20 to 43 years (M = 32.51, SD = 5.13) and had an average of 14.76 years (SD = 2.26) of education Children ranged from 8 to 54 months of age (M = 26.34, SD = 8.32).

Table 1. Demographic characteristics of participants (N=50)

Characteristic	N	M	SD
Children			
Age (months)		26.34	8.32
Sex			
Boys / Girls	32 / 18	64% / 36%	
Etiology			
Developmental disabilities	30	60%	
PDD/Autism	20	40%	
Mothers			
Age (years)		32.51	5.13
Years of education(years)		14.76	2.26
Marital status			
Married	48	96%	
Never married	2	4%	
Employment status			
Full-time	11	22%	
Part-time	12	24%	
Home	27	54%	
Family			
income(year)			
under $ 30,000	4	8.9%	
$30,000-$45,000	14	31.1%	
$45,000-$60,000	9	20.0%	
$60,000-$100,000	16	35.6%	
$100,000 up	2	4 .4%	
Number of children in family		2.12	.95
Participant children birth order			
First	21	42.9%	
Second	21	42.9%	
Third or later	7	14.3%	

Procedures

The data used for this study were collected either in a center-based setting or in participants homes over a 2 week time frame. In the first week, we administered a play-based child development assessment; and then conducted a videotaped observation of mother-child interaction while they were playing with toys. In the second week, mothers were asked to complete a questionnaire that assessed Family functioning, Social support and Parenting stress.

Procedures for observing parent-child interaction were similar to those used in several other early intervention studies (Mahoney & Bella, 1998; Mahoney & Powell, 1988). Mother-child dyads were videotaped for approximately 5-10 minutes while playing with a set of toys that had been provided. Toys were selected to be appropriate for the child's current level of developmental functioning. Mothers were instructed to play with their children as they normally do. Observations were interrupted whenever children became fussy or uncooperative and were resumed after they regained their composure or on a different day.

The play-based assessment involved a 45 minute videotaped observation of children playing with a play facilitator using a wide variety of developmentally appropriate toys and materials. Most of this observation was unstructured play, but about 10 minutes involved the play facilitator engaging in structured activities to probe the limits of children's developmental capabilities.

Measures

Child Development

Children's development was assessed with *the Transdisciplinary Play Based Assessment* (TPBA; Linder, 1993). The TPBA is a protocol that can be used with children up to six years of age which is compatible with the developmental assessment guidelines of Zero to Three (Greenspan & Weider, 1994). Developmental ages are derived by coding the developmental level of each of children's behaviors during a standardized 45 minutes play observation.

Interactive Styles

Mothers' interactive style was assessed with *the Maternal Behavior Rating Scales* (MBRS; Mahoney, et al., 1985; Mahoney, 1999). The MBRS includes 12 items that assess four dimensions of parental style: responsiveness, affect, achievement orientation and directiveness. Previous research indicates that this scale assesses interactive characteristics that predict children's developmental growth, and is sensitive to the effects of parent-mediated interventions (Mahoney & Powell, 1988; Mahoney, Boyce, et al., 1998).

Family Functioning

Family functioning was measured with an

abbreviated version of *the Family Environment Scale* (FES; Moos, 1989). *The Family Environment Scale* (FES) was developed to measure social and environmental characteristics of families. The 90 items of the FES are grouped into 10 subscales with three dimensions. Internal consistency reliability estimates for subscales range from .61 to .78. The abbreviated version of the FES used in this study included 21 items that assessed the four dimensions of family functioning which have been found to be most relevant to the adjustment of families of young children with disabilities (Mahoney, et al., 1992). These include Cohesion, Expressiveness, Control, and Active/ Recreation. Previous analysis of FES data from a sample of more than 500 mothers of young children with disabilities indicated that parents' responses to these items predicted at least 85 % of the variance of complete FES subscale scores (Mahoney et al., 1992).

Social Support

Mothers perception of their social support was measured with *the Arizona Social Support Interview Schedule* (ASSIS; Barrera, 1981). This scale provides an assessment of the respondents social network for the past 6 months. It assess 2 components (satisfaction and need for social support) across six dimensions (discussion of feelings, opportunities for loans, advice, recognition of ideas, help from others, and fun and recreation). The alpha reliability coefficient for the whole measure was .78.

Parenting Stress

Parenting stress was measured with *the Parenting Stress Inventory* (Short Form) (PSI) Abidin, 1990 - 2nd Ed.). This self-report questionnaire consists of 36 items which assess the effects of children on parents and families. It measures three sources of stress: Parental Role Distress; Stress Related to Parent-Child Interaction; and Stress Related to the Child Difficulty. Correlation of the Total Stress Scores from the short form with scores from the long for a sample of 530 subjects were reported to be $r = .94$.

Interrater reliability

Each of the videotaped observations of mother-child interaction were coded independently by raters who had received at least 40 hours of training on each scale and who had attained at least 80% agreement within one point. For the inter-rater reliability of MBRS, Spearman correlation was $r = .73$. Raters attained 60% exact agreement and 99% agreement within on scale point. This level of reliability is consistent the levels of reliability reported for previous studies in which these scales were used (e. g. Mahoney, et al., 1998). The inter-rater reliability of TPBA developmental ages which was calculated for 20 % of the observations was $r = .92$.

Results

Basic descriptive statistics were computed to examine the mean level of variables. Correlation analyses were used to assess inter correlations between variables and to select family functioning, social support, parenting stress, and parent-child interaction variables that were most likely to be predictive of children's development. This procedure was used to reduce the number of independent variables used in the regression analysis and to minimize problems of collinearity. Finally we conducted hierarchical regression analyses on family cohesion, satisfaction with support, parenting stress, and maternal responsiveness to examine the contributions of family functioning and parent-child interaction to children's development, controlling for the effects of children's chronological age.

Descriptive results

Descriptive statistics for the independent and dependent variables are presented in Table 2. Results of the Child development indicated that children's developmental ages were about 9-13 months lower than their chronological ages and that their expressive language was lower than the other areas of developmental functioning. Results of the Maternal interactive styles indicated that mothers had average levels of responsiveness, affect, and achievement orientation, while their level of directiveness was in the moderately high range. Scores of the Family functioning indicated that families were moderately high in cohesion and expressiveness, but below average in active/recreation and control. Scores of the Social support were moderately low for both satisfaction and need for social support. Parenting stress scores indicated that parents had moderate to low stress. Parent-child interaction appeared to be the major source of stress to these mothers.

Correlation analysis

A correlation matrix of all variables is presented in Table 3. This analysis indicated that children's chronological age was highly associated with their developmental age ($r = .58$, $p < .001$). Maternal responsiveness was significantly associated with affect ($r = .79$, $p < .001$), family expression ($r = .29$, $p < .05$), and child development ($r = .44$, $p < .001$), but negatively associated with maternal directiveness ($r = -.28$, $p < .05$). Family cohesion was significantly associated with family expression ($r = .49$, $p < .001$), satisfaction with social support ($r = .28$, $p <. 05$), and negatively related to parenting stress ($r = -.30$, $p < .05$). Satisfaction with social support was highly related to need for social support ($r = .64$, $p < .001$) and negatively related to parenting stress ($r = -.37$, $p < .01$). Family cohesion and satisfaction with support variables did not have did not have statistically significant relations with child

Table 2. Descriptive statistics for study variables

Variables	M	SD	Range
Child development (total scores) [a]	14.62	5.87	3.75-28.00
Cognitive : objective abilities	16.98	6.65	3-30
Cognitive : symbolic abilities	14.80	5.60	4-30
Expressive language	12.98	6.25	2-30
Receptive] anguage	13.70	6.79	3-26
Maternal interactive styles [b]			
Responsiveness	2.97	.75	1.33-4.00
Affect	2.87	.58	1.80-3.80
Achievement orientation	2.93	.68	1.50-4.00
Directiveness	3.21	.69	2.00-5.00
Family functining [c]			
Cohesion	4.54	.48	3.40-5.20
Expression	4.36	.64	2.20-5.60
Activity	3.06	.64	1.60-4.40
Control	3.75	.72	2.00-5.00
Social support [d]			
Satisfaction	14.60	2.54	7.00-18.00
Need	11.50	2.39	6.00-17.00
Parenting stress (total scores) [e]	84.01	19.54	54.00-126.00
Parental distress	29.64	8.37	15,00-49.00
Dysfunctional interaction	24.09	6.89	14.00-41.00
Difficult child	30.28	8.69	18.00-56.00

[a] : by *Transdisciplinary Play Based Assessment* (TPBA; Linder, 1993).
[b] : by *Maternal Behavior Rating Scales* (MBRS; Mahoney, et al., 1985; Mahoney, 1999)
[c] : by *Family Environment Scale* (FES; Moos 1989)
[d] : by *Arizona Social Support Interview Schedule* (ASSIS; Barrera, 1981)
[e] : by *Parenting Stress Inventory* (Short Form) (PSI) Abidin, 1990 - 2nd Ed.)

development, but were correlated more highly to development than any other family variables.

Regression Analysis

For the hierarchical regression, children's three

< table 3. about here >

Table 4. Hierarchical Multiple Regression of predictor variables on children's development

Independent variables	Equations			
	Beta	R^2	R^2*change*	*F*
Step 1				
Child age	.58***	.34	.34	27.24***
Step 2				
Child age	.58***			
Family cohesion	.32**	.45	.12*	9.28***
Satisfactions	-.22			
Parenting stress	-.06			
Step 3				
Child age	.56***			
Family cohesion	.28**			
Satisfactions	-.12	.59	.14	12.64***
Parenting stress	.00			
Maternal Responsiveness	.38***			

*** $p < .001$, ** $p < .01$, * $p < .05$

chronological age was entered in the first step, three family variables, family cohesion, satisfaction with support, and overall Parenting Stress Index were entered in the second step, and one measure of parent-child interaction, responsiveness, was entered in the third step. As anticipated children's chronological age accounted for a major portion of variance in their developmental age scores (R^2 = .34, $F(1,48) = 27.24$, $p < .001$). The three family variables entered in the second step accounted for a significant proportion of the variance in children's development, even after controlling for the effects of child's age (R^2 = .45, $F(4,45) = 9.28$, $p < .001$). These variables accounted for an additional 12% of the variance which represented a significant R^2change ($p < .05$); however, only cohesion was statistically significant ($p < .01$). The results from third step indicated that maternal responsiveness accounted for a significant amount of the variance in children's development ($R^2 = .59$, $F(5,44) = 12.64$, $p < .001$). Maternal responsiveness contributed an additional 14% of the variance in children's development which was a highly significant R^2change ($p < .001$).

Discussion

The purpose of this study was to examine the contribution of family support and maternal interactive style to the developmental functioning of children with disabilities. There were several notable findings. First, results from our correlational analyses indicated that mother's style of interaction, as measured by their responsiveness and affect, was significantly associated with their children's development; while measures of family functioning including family cohesion and satisfaction with support had non-significant associations with children's development. However, mother's style of interacting with their children was not associated with either of the family variables that were associated with children's developmental functioning.

Second, results from our regression analysis continued to show that maternal responsiveness was a significant predictor of children's development, accounting for approximately 14% of variance. However, the regression analysis also indicated that family functioning, particularly as measured by family cohesion, contributed to children's developmental functioning as well. In fact family functioning accounted for approximately the same amount of variance in children's development as did mothers' responsiveness.

These results are consistent with results that have been reported in several other studies (Dunst, et al., 1988b; Mahoney, et al., 1992; McCollum & Hemmeter, 1997). They confirm the notion that both family functioning and mothers' style of interaction are likely influences on the developmental functioning of children with disabilities. In addition they help to clarify the relationship among these variables. They suggest that parents' style of interacting with their children has little to do with the personal characteristics of mothers, such as their feelings of stress or satisfaction with support, or with the manner that their families function. These results indicate that family functioning and parent-child interaction contribute independently to children's development. They support the moderating hypothesis, that parents' personal well being and the well-being of their families adds to, or accentuates, the effects that their responsive interactions have on their children's development.

Results from this study also suggest that at most levels of family functioning, or at least at the levels of functioning represented in our sample, primary caregivers may be capable of engaging in responsive, developmental nurturing interactions with their children. They are incompatible with the mediating hypothesis described in earlier in this paper. These findings challenge the underlying assumption of the Family Service Intervention model which postulates that family support services may be an effective means for enhancing parents' ability to interact with their children.

There are limitations in this study which need

to be considered in interpreting the results. One of the major limitations of this study is its descriptive correlational design. Correlational data cannot be used to establish causal relationships. Yet we believe that the findings of this study are entirely compatible with ecological theories of child development. These correlational data add to the accumulating evidence that factors such as family functioning and parent-child interaction are likely to be causal influences on children's development. Second, all of the children in this study were diagnosed with Autism/PDD or general developmental disorders. However, our sample did not have a sufficient representation of children with disabilities to determine how children's disabilities impact parents' ability to interact with them. Finally, the number of independent variables was limited to fulfill the sample size requirements for regression analyses. This may have resulted in our underestimating the effects of some the variables that which we dropped from our analyses.

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본 연구는 가족기능, 사회적 지원, 부모양육 스트레스, 그리고 어머니 상호작용 유형이 장애를 가진 어린 아동의 발달에 미치는 영향을 검증하고자 하였다. 연구 참여자는 자폐증 광범위성 발달장애(PDD)로 진단되었거나, 또는 일반적인 발달장애를 가진 50명의 아동과 그 어머니들이다. 자료 수집은 어머니와 아동의 상호작용 평가를 위해 비디오 촬영이 이루어졌으며 가족기능, 사회적 지원, 부모양육 스트레스를 평가하기 위해 어머니에 의한 자가 보고식 질문지가 수행되었다. 상관관계 분석결과는 가족 기능, 사회적 지원, 부모양육 스트레스, 그리고 어머니 상호작용 유형 간에 낮거나 중간정도의 상관관계가 있는 것으로 나타내었다. 위계적 회귀분석(Hierarchical regression analysis)결과는 가족 변인들(가족 응집력, 지원에 대한 만족, 부모의 스트레스)과 어머니의 반응성이 아동발달 수준에 영향력이 있는지를 나타내었다. 특히, 어머니의 반응성은 변인의 14%를 설명하면서 아동발달에 대해 가장 유의미한 예측변인으로 나타났다. 이와 같은 위계적 회귀분석 결과는 어머니의 반응성이 아동발달에 미치는 영향력에 대해 가족요인이 중재적이라는 가설을 지지하였다.

주요어 : 어머니의 반응성 유형, 가족기능, 사회적 지원, 부모양육 스트레스, 발달장애