Early Education & Development
Publication details, including instructions for authors and subscription information:  
http://www.tandfonline.com/loi/heed20

The Effect of Early Intervention Services on Maternal Well-Being
Marji Erickson Warfield, Penny Hauser-Cram, Marty Wyngaarden Krauss, Jack P. Shonkoff & Carole C. Upshur

Available online: 08 Jun 2010

To cite this article: Marji Erickson Warfield, Penny Hauser-Cram, Marty Wyngaarden Krauss, Jack P. Shonkoff & Carole C. Upshur (2000): The Effect of Early Intervention Services on Maternal Well-Being, Early Education & Development, 11:4, 499-517

To link to this article:  http://dx.doi.org/10.1207/s15566935eed1104_8

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use:  http://www.tandfonline.com/page/terms-and-conditions

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae, and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand, or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.
The Effect of Early Intervention Services on Maternal Well-Being

Marji Erickson Warfield
University of Massachusetts Medical School

Penny Hauser-Cram
Boston College

Marty Wyngaarden Krauss

Jack P. Shonkoff
Brandeis University

Carole C. Upshur
University of Massachusetts, Boston

In this investigation we examine the relation between intensity, duration, and comprehensiveness of early intervention (EI) services and changes in three aspects of maternal well-being: parenting stress, social support, and family cohesion. Data on the hours, length, and types of services received by a sample of 133 children and families from EI programs in Massachusetts and New Hampshire were gathered from the point of entry into EI to the point of discharge around the child's third birthday. Hierarchical regression analyses were used to determine which measure of EI service intervention contributed significantly to the explained variance in changes in maternal well-being, over and above aspects of the child's functioning and prior levels of maternal well-being. Results indicated that, although greater service intensity was associated with improved family cohesion overall, mothers of children without motor impairment reported greater increases than mothers of children with motor impairment. Service intensity and comprehensiveness predicted significant increases in social support levels. EI services did not have a significant impact on parenting stress.

Three practice and policy implications are discussed: building flexibility into EI service provision to be responsive to individual family needs; attending to the accommodations required of families raising a child with a motor impairment; and incorporating other aspects of family functioning into future studies of EI effectiveness.

The Early Intervention Collaborative Study (EICS) was supported by grants MCJ-250533 and MCJ-250583 from the Maternal and Child Health Bureau (Title V, Social Security Act), Health Resources and Services Administration, U.S. Department of Health and Human Services, and by a grant from the Jessie B. Cox Charitable Trust, Boston. The authors acknowledge the contributions of Ann Steele, Kathy Antaki, Helene Chaika Fausold, and the children, families, and early intervention service providers in Massachusetts and New Hampshire who made this project possible.

Correspondence concerning this article should be addressed to Marji Erickson Warfield, Department of Pediatrics, University of Massachusetts Medical School, 55 Lake Avenue North, Worcester, Massachusetts, 01655. Electronic mail may be sent to Marjorie.Warfield@umassmed.edu.
The Effect of Early Intervention Services on Maternal Well-Being

The effectiveness of early intervention services for young children with disabilities has been a critical area of inquiry for the last 25 years. Recent reviews (e.g., Guralnick, 1998) as well as past meta-analyses (Casto & Mastropieri, 1986; Shonkoff & Hauser-Cram, 1987) indicate that children with disabilities who participate in early intervention services have developmental advantages over comparison groups. Most studies on the effectiveness of early intervention (EI), however, have focused on child outcomes (Bailey, et al., 1998), especially cognitive performance (e.g., Dunst & Trivette, 1994).

Although EI services aim to prevent or minimize children's developmental problems, such services do not focus exclusively on children's cognitive growth (Guralnick, 1997). Since the passage of Part H of the Education of the Handicapped Act Amendments of 1986 (PL 99-457), which was renamed Part C of the reauthorized Individuals with Disabilities Education Act (IDEA) (PL 105-17) in 1997, EI services have evolved from a primary focus on the child to an emphasis on the family system in which the child is nurtured. According to Part H (now Part C), the primary goal of EI is "to enhance the capacity of families to meet the special needs of their infants and toddlers with disabilities" (Education of the Handicapped Act Amendments of 1986, Pub. L. No. 99-457, 100 Stat. 1145). Indeed, the requirement that EI programs develop an Individualized Family Service Plan (IFSP) illustrates the acknowledgment by both policy makers and service providers that families are central to the development of children with special needs (Krauss, 1990). From this perspective, children with disabilities, like typically developing children, are viewed as being embedded within an ecological network of systems where the family is the core and where services like EI have impacts on both the family and the child (Bronfenbrenner, 1986; Lerner, 1998). Thus, rather than being primarily child-focused, EI programs for children with disabilities tend to function more broadly as family support services (Dunst, Trivette, & Jodry, 1997).

What can be said, however, about the extent to which and the ways in which EI services affect families? Stated differently, how much, if any, of the observed changes in parental well-being and family functioning that occur during the early childhood period can be attributed to the provision of early intervention services? This is a thorny and largely unanswered question, but one that is asked repeatedly by researchers, service providers, and policy analysts.

The importance of family functioning and parenting skills for children's development has received considerable theoretical and empirical support. Most recently, Guralnick (1998) presented a developmental approach for the study of child outcomes and reviewed the empirical evidence regarding the importance of experiential factors governing the course of a child's cognitive development, including the quality of parent-child interactions, family-orchestrated child experiences, and attention to health and safety provided by the family. He notes further that these three general proximal patterns of family interaction are in turn the products of an array of family characteristics, including the psychological well-being of the parents, the types and levels of supports available and utilized, and family interaction patterns. His emphasis on the importance of studying what parents as individuals and as "heads" of the family bring to their parenting challenge is consistent with a broad literature that recommends a multidimensional approach to the study of program effectiveness and parenting outcomes (Hauser-Cram, Warfield, Upshur, & Weisner, 2000; Krauss, 2000). It also suggests
that an important role for EI programs is to enhance, if not maintain, parental equilibrium in the face of learning how to care for a young child with a disability. To the extent, then, that EI programs positively affect parental management of stress, nurture the activation of appropriate levels of social support, and promote family cohesion, EI programs may both help to shore up the quality of the family as a caregiving environment, and enhance the psychological well-being of parents.

Despite the family-focus of EI programs, family-centered outcomes have been a relatively neglected aspect of efficacy studies both historically and currently. This paucity of family outcomes was highlighted in the findings of a meta-analysis of EI studies conducted over a decade ago (Shonkoff & Hauser-Cram, 1987). For this meta-analysis, 31 studies were selected representing the best available data on the impact of early intervention services for biologically vulnerable children younger than three years of age. Only seven of these studies included any parent-related outcomes other than measures of program satisfaction, and no study used measures of maternal well-being or family functioning. Given that those data were collected before the passage of PL 99-457, such neglect is instructive but not surprising. During the last decade, however, few investigations have filled that void (Bailey, et al., 1998; Guralnick, 1998; Krauss, 1997). The lack of family-focused outcomes research stems from several issues: the difficulty of defining appropriate family level outcomes; the reluctance of researchers and program staff to judge how families as units, and parents as individuals function; and the emphasis within programs to monitor what they do for families, rather than assess the effects of their programs on families (Krauss, 2000).

Notwithstanding the technical dilemmas involved in investigating parent outcomes, researchers continue to argue for the inclusion of parental and family outcomes in studies of EI impacts. Bailey and his colleagues (Bailey et al., 1998) contend that discussion about the relation between families and EI programs has been focused primarily on rationale and processes, rather than on outcomes. Alternatively, they propose a framework for assessing family outcomes based on two broad concerns: the family’s perception of the EI experience (e.g., McBride, Brotherson, Joanning, Whiddon, & Demmitt, 1993; Upshur, 1991) and the impact of services on the family. They outline several areas of family life where the impact of EI services may be assessed. One of these domains is the family’s perceived quality of life. While noting that quality of life is a complex construct with multiple dimensions, they pinpoint specific dimensions that are relevant for efficacy studies of early intervention, such as enhancement of social support and amelioration of parenting stress. Krauss (1990) reviewed the literature on the range of potential impacts on the family accruing from their participation in early intervention programs and noted that reduction of parenting stress, strengthening of parental and familial social support networks, and promotion of healthy family functioning were among the most commonly recommended areas for investigation. The present study focuses on these three outcomes (parenting stress, social support, and family functioning) in recognition of the need to expand the scope of efficacy research to include consideration of the effect of services on multidimensional aspects of parental and familial well-being.

Stress associated with parenting is ubiquitous as mothers and fathers make adjustments to the parenting role. Such adaptations typically include changes in the relationship with one’s spouse and friends, and the increased need for time and fatigue.
management. Although much research has focused on stress and coping in families raising children with disabilities, there is considerable evidence that parenting stress is not invariably elevated in families of young children with disabilities (Gallimore, Bernheimer, & Weisner, 1999; Scott, Atkinson, Minton, & Bowman, 1997). We have found that parenting stress was more highly related to other factors affecting the family, such as divorce and debt, than to children’s cognitive impairment (Warfield, Krauss, Hauser-Cram, Upshur, & Shonkoff, 1999). There is little empirical research, however, on whether service interventions are associated with changes in parenting stress over time.

Social support for parents of children with disabilities is widely viewed as a buffer, or a set of resources that can blunt the potentially deleterious effects of normative and non-normative stress (Dunst & Trivette, 1990). Although social support networks are often characterized by their size, function and helpfulness, the helpfulness dimension has proven most salient in empirical work (Dunst, Trivette, & Cross, 1986). Increasing the helpfulness of social networks makes it possible for families to mobilize resources to meet their needs (Dunst & Trivette, 1990). Consequently, many early intervention programs explicitly seek to enhance the sources of social support available to participating families, either through the use of parent support groups, or through providing linkages between parents and other community resources (Sloper, 1999).

Finally, among the many dimensions and qualities that characterize family functioning, the core issues identified most frequently are adaptability, cohesiveness, and communication (Olson, Russell, & Sprenkle, 1983). These qualities share an emphasis on relational dimensions and suggest that families in which members are cohesive—that is, are connected and enjoy being together—have the potential of providing optimal growth opportunities for their children.

Among the relatively few studies that have looked at family dynamics, investigations of children with developmental disabilities indicate that family cohesiveness is an important predictor of child outcomes. In a study of 115 families of children with mental retardation, Mink, Nihira, and Meyers (1983) found that more cohesive, harmonious families had children with more positive socioemotional functioning. Mink and Nihira (1986) further found that family cohesiveness influenced the psychological adjustment of adolescents with learning problems. In an investigation of 34 preschool children with Down syndrome, Hauser-Cram (1993) reported that children from families with higher levels of cohesiveness demonstrated higher levels of mastery motivation on cognitively challenging tasks. Hauser-Cram and colleagues (Hauser-Cram, Warfield, Shonkoff, Krauss, Upshur, & Sayer, 1999) also have found that children with Down syndrome from families with more positive and cohesive relationships demonstrated significantly greater growth in communication, socialization, and daily living skills over the first five years of life. Taken together, these studies underscore the importance of family cohesiveness as a predictor of later development in young children with developmental disabilities. Therefore, one implication of these findings is that EI programs should aim to support, or enhance, the connectedness of family members.

In order to assess the effectiveness of EI services on parenting stress, social support, and family cohesion, however, the services themselves must be quantified in some way. The measurement of intervention services varies greatly. Guralnick (1998) delineates three aspects of service provision that are critical to understanding its efficacy: density, duration, and
Maternal Well-Being

503

comprehensiveness. Density, also known more commonly as intensity, refers to the level of intervention occurring within a specified time period; duration refers to the length of time services are delivered; and comprehensiveness refers to the range of different service components that are provided. No investigators have studied the relation between these three aspects of service provision and maternal well-being or family functioning.

In this analysis we investigate the relation between the intensity, duration, and comprehensiveness of early intervention services and changes in parental stress, levels of social support, and family cohesiveness. We reported elsewhere that there is tremendous variability in the intensity of services (as measured by service hours) provided to families during their first year in early intervention programs (Shonkoff, Hauser-Cram, Krauss, & Upshur, 1992). The present analysis builds on our earlier findings by including data from the full “career” of families in early intervention programs, including information on the three outcomes as measured upon entry into the service system, and again at the conclusion of early intervention services.

Method

Sample

The subjects were participants in the Early Intervention Collaborative Study (EICS), which is a longitudinal investigation of the predictors of resilience and vulnerability in the emerging competencies of young children with disabilities, and the adaptive capacities of their families (Shonkoff, et al., 1992). All families were recruited to the study at the time of their enrollment in one of 29 EI programs in Massachusetts and New Hampshire. Families with a child who met specific criteria in one of the following three groups were eligible to participate in the research: (1) children with Down syndrome (confirmed through medical record review); (2) children with motor impairments defined as evidence of abnormal muscle tone (hypotonia or hypertonia) or coordination deficit, along with delayed or deviant motor development, with or without other areas of delay; and (3) children who demonstrated evidence of delays in two or more areas of development, with no established diagnosis or etiology that implied a specific prognosis. In addition, all children had to be 27 months of age or younger when they enrolled in EI. A total of 190 families were recruited into the study.

The sample for the present analysis consists of 133 children and families for whom complete data were available on all the variables used in the analysis. Comparisons made between the 133 cases in the sample and those eliminated due to incomplete data (n = 57) revealed statistically significant differences in mothers’ marital status, employment status, and years of education and family income. The analysis sample included families with higher annual incomes, mothers with more years of education, more married mothers, and more mothers who were employed. There were no statistically significant differences between the groups in terms of child diagnostic category, child gender, or child cognitive performance.

In the analysis sample, slightly more than one-half of the children was male (56.4%), but the children were evenly distributed across the three diagnostic groups: Down syndrome (31.6%), motor impairment (37.6%), and developmental delay (30.8%). Mean age at study entry was 10.0 months (standard deviation [SD] = 6.5) and the initial mean Mental Developmental Index (MDI) measured using the Mental Scale of the Bayley Scales of Infant Development.
Development (Bayley, 1969), was 62.8 \( (SD = 24.9) \). The majority (77.4\%) were full-term births.

The mothers were 29.8 \( (SD = 4.8) \) years of age on average when their children entered EI. The vast majority were married (85.0\%) and Euro-American (93.2\%). On average, they had completed 14.2 \( (SD = 2.4) \) years of schooling, and 58.0\% were not employed outside the home upon entry into the study. The families varied in terms of economic status, with one-third (33.1\%) reporting an income of less than $20,000 annually while two-fifths (40.0\%) reported an income of $30,000 or more (1985-1987 dollars).

Procedure

The data were gathered from two sources. First, home visits were conducted by our project staff with each family within one month of their enrollment in an EI program and again within one month of the child’s third birthday (i.e., age of exit from EI). An in-depth interview was conducted with the mother and a standardized cognitive and functional assessment was conducted with the child. After each home visit, packets of self-administered questionnaires were completed by the mothers and returned to the study office.

Second, EI providers completed monthly service forms for each child and family by recording the number of hours of service received from the program in each of seven defined categories: (1) home visits; (2) center-based individual child-only services; (3) center-based individual parent only services; (4) center-based individual parent-child services; (5) center-based child only group services; (6) center-based parent and child group services; and (7) center-based parent group sessions, attended by mothers and fathers, both together and separately. A new form was completed each month from the point of entry into EI to the point of discharge at age three. A family’s participation in the EICS study did not influence the amount or type of services received. Services were individualized in accordance with the needs identified jointly by family members and EI staff. Over the course of their EI experience, most families received an array of services, with each type of service represented. A prior analysis of the variation in service formats revealed substantial differences in both the intensity and the combinations of services received by a given child and family on a month-to-month basis (Erickson, 1991).

Measures

Parenting stress. The Parenting Stress Index (PSI) was completed by mothers after each home visit by our project staff (Abidin, 1995). The PSI is a measure of the magnitude of stress in the parent-child system that consists of 101 items with primarily 5-point Likert scale responses. The Parenting Domain score was used in the analysis. The Parenting Domain score is composed of seven subscales that measure parent attachment to the child, sense of competence in the parenting role, parental depression, parent health, social isolation, restrictions in role, and relations with spouse. Higher scores indicate greater parenting stress. Cronbach’s alpha reliability coefficient for the Parenting Domain score was .92 at entry to EI and .93 at discharge from EI at age three years. The PSI has been used extensively in research and clinical settings to determine parental adaptation patterns (Goldberg, Morris, Simmons, Fowler, & Levison, 1990; McKinney & Peterson, 1987; Noh, Dumas, Wolf, & Fisman, 1989; Shonkoff, et al., 1992). Cutoff points have been established to identify
individuals with elevated stress who should be referred for mental health services.

**Family cohesiveness.** At entry to EI, family cohesiveness was measured using the Family Adaptability and Cohesion Evaluation Scale (FACES II), which is a 30-item self-report form that each mother completed (Olson, Bell, & Portner, 1982). Sixteen of the items form a family cohesiveness subscale which measures the degree to which family members are emotionally disengaged from each other (lower scores on the scale) or are emotionally connected (higher scores on the scale). The Cronbach’s alpha reliability coefficient for the EICS sample was .88 for the cohesiveness subscale. At age 3, the study’s measure of family cohesiveness was changed to a shorter instrument, a nine-item subscale of the Family Environment Scale (FES) (Moos, 1974), to reduce respondent burden. Similar to FACES II, the FES cohesiveness subscale assesses the degree of commitment, help, and support family members provide to one another. The reliability of this subscale was .61.

**Social support helpfulness.** Social support helpfulness was measured based on a scale adapted from the Family Support Scale developed by Dunst, Jenkins, & Trivette (1984). The scale used in this study consisted of 15 items and tapped a variety of sources of formal and informal support such as spouse, relatives, friends, neighbors, service providers and parent groups. After each home visit by our project staff, mothers were asked to complete the scale by rating the helpfulness of each source of support using a five-point Likert scale. A total helpfulness score was computed by summing the responses. Cronbach’s alpha reliability coefficient was .64 at entry to EI, and .72 at discharge from EI at age three years.

**Intensity of services.** Service intensity was defined as the average total hours of service received per month and was calculated by dividing the total number of service hours received by the total number of months each child and family participated in an EI program. On average, children and families received 8.7 hours of service per month (SD = 5.1, range = .12 to 29.6). As shown in Table 1, the total hours per month were most likely to consist of home visits and child group services, followed by parent support group services and parent and child group services. Individualized center-based services were provided less often.

**Table 1.**

Means and Standard Deviations of Service Intensity Variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Average Hours Per Month:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Home Visits</td>
<td>3.1</td>
<td>1.8</td>
</tr>
<tr>
<td>Individual Child Only</td>
<td>0.2</td>
<td>0.4</td>
</tr>
<tr>
<td>Individual Parent Only</td>
<td>0.0*</td>
<td>0.1</td>
</tr>
<tr>
<td>Individual Parent and Child</td>
<td>0.6</td>
<td>0.9</td>
</tr>
<tr>
<td>Child Group</td>
<td>2.6</td>
<td>2.9</td>
</tr>
<tr>
<td>Parent and Child Group</td>
<td>1.1</td>
<td>1.8</td>
</tr>
<tr>
<td>Parent Support Group</td>
<td>1.2</td>
<td>1.6</td>
</tr>
</tbody>
</table>

* The actual value is .02.
Service duration. EI provides services to families with children between birth and three years of age. Sample children and their families participated in EI for different lengths of time depending on the age of the child at program entry. On average, children and families participated for 26.1 months (SD = 7.1, range = 11.0 to 39.0 months).

Comprehensiveness of services. Comprehensiveness was defined as the number of different types of services received over the course of a family's participation in EI. Of the seven different types of services available, families received an average of 4.5 services (SD = 1.4, range = 1 to 7).

Child characteristics. The Mental Scale of the Bayley Scales of Infant Development, measured at entry to EI, was used to assess cognitive performance (Bayley, 1969). The Mental Developmental Index was adjusted for gestational age for children born prematurely. Type of diagnosis was analyzed as a dummy variable comparing the motor impaired group to the other two groups (i.e., Down syndrome and developmental delay) since being in the motor impaired group was significantly correlated with higher stress (r = .20, p < .05), lower family cohesion (r = -.25, p < .01), and lower social support (r = -.24, p < .01) at age three years. Age of the child at entry to EI was also analyzed due to its relation to service duration.

Mother characteristics. Years of education, marital status (i.e., married versus not married), and employment status (i.e., employed versus not employed), measured at entry to EI, were assessed as potential correlates of maternal well-being.

Statistical Analysis

Several analytic procedures were conducted to test the hypothesized relations between service dimensions and changes in maternal well-being. First, correlations were computed between the score at entry to EI and the score at discharge from EI for each of the three outcome measures. Second, paired t-tests were conducted to examine change in each of the three outcome measures. Third, correlations were conducted to assess the relation between the child and mother characteristics and the three service intervention variables and to identify the significant correlates of maternal well-being. Fourth, based on the results of these correlation analyses, hierarchical regression models were tested to examine the extent to which service intensity, duration, or comprehensiveness, over and above child and mother characteristics, predicts changes in parenting stress, family cohesion, and social support between entry to and exit from EI. Interactions between the service variables and both the child and mother characteristics variables and the score for each dependent variable measured at entry to EI, were also computed. The interaction terms were created by centering the variables prior to multiplication, as recommended by Aiken and West (1991). The interaction terms were entered last into the regression models to see if they explained a significant portion of the remaining variance. The final models reported here contain only those interaction terms that were statistically significant.

Results

Table 2 shows the statistically significant associations between the score at entry to EI and the score at discharge from EI for each of the three outcome measures. The results of the paired t-tests indicated that the greatest change between the two time points was in social support. Social support helpfulness increased significantly from 23.8 to 27.7 (t = 5.3, p
Table 2
Descriptive and Correlational Statistics for Measures of Maternal Well-Being at Entry and Discharge from EI

<table>
<thead>
<tr>
<th>Variable</th>
<th>Entry to EI</th>
<th>Discharge from EI</th>
<th>r</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parenting Stress</td>
<td>119.0</td>
<td>122.1</td>
<td>.74***</td>
</tr>
<tr>
<td>Family Cohesion</td>
<td>65.6</td>
<td>7.4</td>
<td>.36***</td>
</tr>
<tr>
<td>Social Support</td>
<td>23.8</td>
<td>27.7</td>
<td>.52***</td>
</tr>
</tbody>
</table>

The measure of family cohesion used at entry to EI (i.e., FACES II) was different from that used at discharge from EI (i.e., FES).

.<.001). Parenting stress increased only slightly (t = 2.0, p =.05). In general, the mothers in the sample did not report excessive parenting stress. Less than 12% of the sample reported scores in the clinical range at either time point. Finally, although the family cohesion scores at the two time points were significantly correlated, any increase or decrease in cohesion cannot be assessed since different scales were used.

Correlations between the child and mother characteristics and the three measures of service intervention were computed to identify patterns of service provision (see Table 3).

Table 3.
Correlations between Child and Mother Characteristics and Service Intensity, Duration, and Comprehensiveness

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>INTENSITY</th>
<th>DURATION</th>
<th>COMPREHENSIVENESS</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHILD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Performance</td>
<td>-.36***</td>
<td>.06</td>
<td>-.13</td>
</tr>
<tr>
<td>Motor Impaired</td>
<td>-.06</td>
<td>-.13</td>
<td>.01</td>
</tr>
<tr>
<td>Age at Entry to EI</td>
<td>.14</td>
<td>-.84***</td>
<td>-.07</td>
</tr>
<tr>
<td>MOTHER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years of Education</td>
<td>.31***</td>
<td>.06</td>
<td>.18'</td>
</tr>
<tr>
<td>Employed</td>
<td>-.04</td>
<td>-.08</td>
<td>-.14</td>
</tr>
<tr>
<td>Married</td>
<td>.04</td>
<td>.02</td>
<td>.06</td>
</tr>
</tbody>
</table>

All distributions were examined for normality and log transformations were performed where necessary.

'* p < .05; ** p < .001
Cognitive performance was significantly and negatively associated with service intensity. Thus, children with lower cognitive abilities received more hours of EI services per month. As expected, children who entered EI at younger ages received services for more months than children who entered EI at older ages. Finally, mothers with more years of education received more hours of EI services per month and a more comprehensive set of services.

Correlations between each of the three dependent variables and the variables measuring child and mother characteristics and service intensity, duration, and comprehensiveness were also conducted to identify significant correlates to be entered into the hierarchical regression models (see Table 4).

Table 4.
Correlations between Child, Mother, and Service Characteristics and Measures of Maternal Well-Being at Age Three Years

<table>
<thead>
<tr>
<th>VARIABLE</th>
<th>PARENTING STRESS</th>
<th>FAMILY COHESION</th>
<th>SOCIAL SUPPORT</th>
</tr>
</thead>
<tbody>
<tr>
<td>CHILD</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cognitive Performance</td>
<td>-.03</td>
<td>.05</td>
<td>-.15</td>
</tr>
<tr>
<td>Motor Impaired</td>
<td>.20*</td>
<td>-.25**</td>
<td>-.24**</td>
</tr>
<tr>
<td>Age at Entry to EI</td>
<td>-.04</td>
<td>.01</td>
<td>-.11</td>
</tr>
<tr>
<td>MOTHER</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Years of Education</td>
<td>-.21*</td>
<td>.27*</td>
<td>.17*</td>
</tr>
<tr>
<td>Employed</td>
<td>-.10</td>
<td>.10</td>
<td>.12</td>
</tr>
<tr>
<td>Married</td>
<td>-.16</td>
<td>.15</td>
<td>.16</td>
</tr>
<tr>
<td>SERVICE</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intensity</td>
<td>-.04</td>
<td>.20*</td>
<td>.26*</td>
</tr>
<tr>
<td>Duration</td>
<td>.05</td>
<td>.03</td>
<td>.19*</td>
</tr>
<tr>
<td>Comprehensiveness</td>
<td>.05</td>
<td>.06</td>
<td>.18*</td>
</tr>
</tbody>
</table>

All distributions were examined for normality and log transformations were performed where necessary.

* \( p < .05; ** \( p < .01

Among the child characteristics examined, only diagnostic group was significantly correlated with the outcomes at age three. Children with motor impairments, as compared to those with Down syndrome or developmental delay, had mothers who reported less cohesion and support and more parenting stress at age three years. Similarly, only one of the mother characteristics variables was a significant correlate of the age three outcomes. Mothers with more years of education reported greater family cohesion and support and less parenting stress at age three years.

Different service variables were correlated with the different outcome measures. Greater service intensity was significantly and positively correlated with increased family cohesion.
Neither intensity, duration, nor comprehensiveness was significantly associated with changes in parenting stress and thus no hierarchical regression analyses were conducted on this outcome. In contrast, all three service variables were significantly associated with changes in the helpfulness of social support.

Hierarchical regression analyses were conducted on family cohesion in order to determine whether overall service intensity remained as a significant predictor of change in maternal well-being once the other correlates were controlled for. The regression model entered the significant correlates of service provision and family cohesion into the model first, followed by the level of family cohesion measured at entry to EI, service intensity and the significant interaction terms. Table 5 presents the results of the hierarchical regression analysis for family cohesion.

Table 5.
Predictors of Change in Family Cohesion

<table>
<thead>
<tr>
<th>INDEPENDENT VARIABLES</th>
<th>FAMILY COHESION</th>
<th>R² Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Cognitive Performance</td>
<td>.05</td>
<td>0.3</td>
</tr>
<tr>
<td>2. Motor Impaired</td>
<td>-.26</td>
<td>6.1</td>
</tr>
<tr>
<td>3. Mother's Years of Education</td>
<td>.25</td>
<td>6.3</td>
</tr>
<tr>
<td>4. Family Cohesion at Entry to EI</td>
<td>.29</td>
<td>7.8</td>
</tr>
<tr>
<td>5. Overall Service Intensity</td>
<td>.17</td>
<td>2.3</td>
</tr>
<tr>
<td>6. Intensity * Motor Impaired</td>
<td>.48</td>
<td>2.5</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>.22</td>
<td></td>
</tr>
</tbody>
</table>

' p < .05; * p < .01

Diagnostic group, years of maternal education, family cohesion at entry to EI, and overall service intensity were significant predictors of cohesion. After controlling for these variables, however, an interaction between diagnostic group and service intensity was also a significant predictor of change in family cohesion. Although greater service intensity improved family cohesion for all diagnostic groups, mothers of children without motor impairment (i.e., children with either Down syndrome or developmental delay) experienced greater increases than mothers of children with motor impairment.

Additional analyses were conducted to identify whether the intensity of any particular type of service (e.g., home visits, child groups, etc.) was a predictor of change in cohesion. None of the separately considered service intensity variables was significant.

Hierarchical regressions were also analyzed for the support outcome in order to identify which of the three service variables were significant predictors of change in support, over and above child and mother characteristics. The regression models entered the significant correlates of service provision and social support into the model first, followed by the level of support reported at entry to EI and the service variables. None of the tested interaction terms between the independent variables and the service variables was significant (see Table 6).
Diagnostic group and social support at entry to EI were significant predictors of support. After controlling for these variables, service intensity was also found to be a significant predictor of change in support helpfulness. More intensive services predicted greater increases in support helpfulness. Additional analyses revealed that specific types of services were responsible for this increase. More intensive parent support group services ($R^2_{change} = 2.0, p < .05$) and more intensive child group services ($R^2_{change} = 1.9, p < .05$) were each significant predictors of increases in social support when entered into the equation separately in place of overall intensity. Interactions between these two intensity variables and the child and mother characteristics variables and the prior level of support variable were also entered into the equation but none was found to be significant.

Further, as shown in Table 7, service comprehensiveness was also a significant predictor of change in social support.

The receipt of a greater number of different services produced greater gains in support helpfulness. Interaction terms were also entered into this equation but were not found to be significant.

Finally, duration was not found to be a significant predictor of change in support ($R^2_{change} = 0.4, p > .05$). No analysis was conducted entering combinations of the overall intensity, intensity of parent support group services, intensity of child group services, and service comprehensiveness variables in the same model since they are highly intercorrelated with one another ($r$ ranges from .58 to .68).

**Discussion**

Despite the emphasis in EI on enhancing the capacity of the family system to meet children's special needs, few investigations have focused on family outcomes. The analyses presented in this investigation were designed to determine the extent to which the intensity, duration, and comprehensiveness of early intervention services received “explain” positive changes in family-related outcomes reported by mothers of young children with disabilities.
Maternal Well-Being

Table 7.

Service Comprehensiveness as a Predictor of Change in Social Support

<table>
<thead>
<tr>
<th>INDEPENDENT VARIABLES</th>
<th>SOCIAL SUPPORT</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>beta</td>
<td></td>
</tr>
<tr>
<td>1. Motor Impaired</td>
<td>-.24</td>
<td>5.7**</td>
</tr>
<tr>
<td>2. Mother's Years of Education</td>
<td>.15</td>
<td>2.4</td>
</tr>
<tr>
<td>3. Social Support at Entry to EI</td>
<td>.50</td>
<td>24.9***</td>
</tr>
<tr>
<td>4. Service Comprehensiveness</td>
<td>.15</td>
<td>2.1*</td>
</tr>
<tr>
<td>Adjusted R²</td>
<td>.33</td>
<td></td>
</tr>
</tbody>
</table>

* p < .05; ** p < .01; *** p < .001

as they are discharged from EI services. Three aspects of maternal well-being were considered, including parenting stress, social support helpfulness, and family cohesiveness.

Several important findings emerge from these analyses. First, the overall intensity of EI services, the intensity of parent support group services, the intensity of child group services, and the number of different types of services received each predicted positive and significant change in social support helpfulness between entry to and exit from EI. These results expand upon our previous findings which showed that intensity of parent group participation was related to increases in both the helpfulness and size of social support networks after one year of EI services (Krauss, Upshur, Shonkoff, & Hauser-Cram, 1993).

Given the high level of intercorrelation between the four significant measures of EI intervention in our current analysis, it appears that families who become more engaged in the program report larger increases in the helpfulness of the maternal support network. Thus, these mothers, in comparison to those who were less engaged (e.g., those who chose not to participate in the support groups as much or who were offered a more restrictive set of services), reported being better able to engender help from supportive others, both inside and outside the family. As a result, these mothers were able to blend their young child with a disability into the family by building a helpful network of support that extends beyond the immediate family.

Unfortunately our data are not able to explain why some mothers became more engaged in the EI program than others. Given the variables that were controlled for in the analysis (e.g., cognitive performance, years of education) factors other than individual characteristics may play a role such as the organization and resources of the different EI programs and the training and experience of EI staff members. Future research is needed on the system level factors influencing EI service participation.

It is noteworthy, however, that we found positive and significant relations between maternal education and the intensity and comprehensiveness of services. Mothers with higher levels of education received more hours of service per month and a greater range of services. This may be because they advocated for more services, took greater advantage of
the services available, or the service system itself was biased toward more educated families
in service distribution. Families with fewer resources and lower education face multiple
barriers to service utilization such as transportation difficulties and the need to manage other
pressing family problems. Given their needs, however, one might expect the bias to be in
the opposite direction. Our study is not the first to find this positive relation between service
utilization and maternal education (e.g., Kochanek & Buka, 1998a), and future investigations
should focus on understanding this relation.

Further, we note that most families received a modest level of EI services. An average
of 8.7 hours of service per month (or roughly 2 hours per week) is equivalent to the time
many parents spend taking a child to a grocery store once a week. Given such a low intensity
of service, it is remarkable that EI produces measurable effects on family life. We speculate
that the impact of EI occurs both through direct means from service provider to parent and
through indirect means from parents linking with other parents to share adaptive strategies
and provide mutual support. Mahoney, O'Sullivan, and Dennebaum (1990) assessed the
extent to which the services received by 503 families of young children with disabilities who
were enrolled in EI programs throughout the United States were family-focused. They found
that the greater the tendency of programs to work directly with families, the more likely
mothers were to perceive service benefits. Programs rated as more family-focused provided
more direct family instructional activities (e.g., showing parents a range of games to
play with their child), linked families with other helpful services and other parents, and encouraged
parents to share their experiences with other parents. These varied ways of working with
families point to the benefits of more comprehensive interventions.

Second, an interaction effect between diagnostic group and overall service intensity
predicted significant change in family cohesion. Although greater service intensity improved
family cohesion for all diagnostic groups, mothers of children without motor impairments
(i.e., children with Down syndrome or developmental delay) experienced greater increases
than mothers of children with motor impairments. EI is known to be a highly individualized,
multidisciplinary, multi-service program (Guralnick, 1997). Families vary widely in the
exact arrangement of services provided to them, but most receive a combination of home-
based and center-based, individualized and group services (Erickson, 1991; 1992). The
data collected for this study indicate that the intensity of this constellation of services supports
families (some more than others) in building cohesive relationships within the family unit.
Unfortunately, our data do not determine how this occurs. It appears that beliefs about the
importance of the principles of family-centered services are strong among EI service providers
(Kochanek & Buka, 1998b; McBride, Brotherson, Joanning, Whiddon, & Demmitt, 1993).
We speculate that the individualized nature of services, guided by family-centered principles
of practice, lend support to the family, and that such support, if of sufficient intensity, serves
families in their optimization of cohesive functioning. Future research needs to specify
those discrete program mechanisms that interact with child and family characteristics to
influence these outcomes (Guralnick, 1997; Hauser-Cram, Warfield, & Krauss, 1997).

Future research also needs to examine why greater service intensity benefits certain
families more than others. In addition to poorer family cohesion, the correlation analyses
also revealed that mothers of children with motor impairment reported higher levels of
parenting stress and lower levels of helpful social support. The pervasiveness of these
findings suggests that the accommodations to family life required of parents of children with
motor impairment are more extensive than those required of other families. The nature of these accommodations may make it difficult for others to step in and provide support and respite. Gallimore, Weisner, Bernheimer, Guthrie, and Nihira (1993) have examined the ways in which families of children with disabilities create daily routines in response to their child’s needs. These special accommodations may include allowing extra time for caregiving activities (e.g., dressing, bathing, etc.), as well as scheduling participation in EI services. While many families make such accommodations in stride, and others “make meaning” out of these changes, some families find that such accommodations take a toll on family life. Further research should explore how EI services can better assist parents of children with motor impairment to make accommodations that respect and enhance the family’s internal and external support structure.

Third, no effects of EI services were found for reducing maternal parenting stress. Perhaps that is because the mothers in this study did not report excessively high levels of parenting stress either at entry to EI or at discharge when children turned three years of age. Although a small but marginally significant increase in parenting stress occurred for the sample as a whole, the mean parenting stress for the EICS sample at age three was nearly identical to that of the norming sample composed of mothers of typically developing three-year-olds (Abidin, 1995). Indeed, very few families in this sample were in the clinical stress range at either time point, and the correlation between parenting stress at entry and exit from EI was substantial ($r = .74$, $p < .001$), indicating that little change existed for the group as a whole. Thus, it is not surprising that hours of EI service do not relate to changes in stress levels in this sample where stress remains relatively stable and within the normative range. It is possible that participation in EI provides the general support that allows mothers to continue to function with normative, rather than greatly accelerating, levels of parenting stress. It is also possible, however, that given relatively modest hours of service and the array of services generally provided, EI is not well positioned to provide the types of clinical interventions needed by those few mothers who are highly stressed.

Our findings of a positive relation between different aspects of EI service intervention and both family cohesiveness and maternal social support suggest there may be other family outcomes that are influenced significantly by EI services. Thus, future research needs to examine whether EI affects other aspects of family functioning and adaptation, and the extent to which these effects are related to the intensity, duration, and comprehensiveness of services. Outcomes such as greater life satisfaction, enhanced parenting competence, and improved sibling relationships, among others, warrant careful examination (Bailey, et al., 1998; Krauss, 2000). Family perceptions of the EI experience (e.g., appropriateness, responsiveness, helpfulness, etc.) also deserve increased investigation (Bailey, et al., 1998; Upshur, 1991).

This investigation has several limitations. First, outcome measures were based on maternal report. Thus, the findings are susceptible to shared variance issues and, even more importantly, to restricted interpretation, as other family members may view the family differently. Fathers in particular are often neglected in research on families of children with disabilities (Hornby, 1995; Lamb & Billings, 1997) and their perspectives have been found to differ in several important ways from those of mothers (Krauss, 1993).

Further, although the sample included families who varied in their ethnic status, the vast majority are Euro-American. Views of the meaning of both disability and family cohesiveness,
as well as feelings regarding the receipt of formal intervention services, vary for different cultural groups (Hanson, 1992; Skinner, Bailey, Correa, & Rodriguez, 1999). Thus, the relation found between service intensity and comprehensiveness and family outcomes is not necessarily generalizable to all families.

Despite these limitations, the results of this investigation point to the value of EI services for families of children with disabilities. Specifically, our analysis is the first to identify different aspects of EI service intervention as significant predictors of two core aspects of maternal well-being, improved family cohesion and extended networks of helpful social support.

References


