

# Valued Outcomes of Service Coordination, Early Intervention, and Natural Environments

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**ABSTRACT:** *A national survey of Part C early intervention program providers (practitioners and program directors) and participants (parents of young children with disabilities) was used to discern the desired outcomes of service coordination, early intervention, and natural environment practices. Survey participants judged from among 69 outcome indicators those that they considered to be the most valued benefits of each IDEA Part C service. Results indicated that certain categories of outcomes were more likely to be judged as the desired benefits of a specific Part C service, and that only two outcome categories (family satisfaction and improved family quality of life) were considered to be valued outcomes for all three services. Implications for practice and research are described.*

**T**he extent to which an environmental intervention can be expected to be related to desired outcomes depends, in part, on the hypothesized conceptual and operational dependencies between the intervention variable and the outcome variable (Babbie, 1995). The more clearly articulated is the relationship between conceptualization and operationalization, the greater the clarity in terms of what can and cannot be expected to be produced by a given intervention.

The study described in this paper was designed and implemented in response to observa-

tions about "overpromise" in terms of the outcomes and benefits of service coordination provided by IDEA Part C Early Intervention Programs. The study was conducted as part of the Research and Training Center in Service Coordination (see <http://childandfamily.uchc.edu/research/research.htm>). The Center describes service coordination models used throughout the United States and its territories, identifies the practices and strategies associated with different service coordination models, and identifies the outcomes that are realized from effective service coordination. Research to date indicates a lack of

clarity in terms of reasonable expectations for the outcomes of service coordination, prompting the conduct of the present study.

Observations about overpromise emerged from focus groups where participants were asked to identify the desired outcomes of quality service coordination/integration for children, families, and systems. At the time the present study was implemented, 26 focus groups had been completed in four states (Connecticut, Indiana, Massachusetts, and North Carolina) with parents of children with disabilities, early intervention program practitioners, service coordinators, childcare providers, and early childhood intervention program directors and administrators (total  $N = 252$  participants). Inspection of the indicators generated by focus group participants were both puzzling and problematic since there was little rhyme or reason why some outcomes were identified as benefits of service coordination (e.g., child sense of mastery).

The focus groups yielded more than 175 outcomes that participants indicated were associated with high quality service coordination. Synthesis of the outcomes found that the total number of indicators could be reduced to 69 that were nonredundant or different enough not to warrant further reduction. The outcomes run the gamut from those that are systems-focused (e.g., blended and combined funding streams), to those that are related to improved parent and family functioning (e.g., strengthening parenting competence), to those that reflect improved child functioning (e.g., improved child independence). Yet, conceptually and empirically, many of the outcomes identified by the focus groups as benefits of service coordination would more likely be realized by other early childhood intervention activities and practices, namely early intervention (Guralnick, 1997) or natural environments (Dunst, Trivette, Humphries, Raab, & Roper, 2001). More specifically, many of the outcomes identified as the benefits of service coordination seemed unrealistic (e.g., service coordination positively influencing the characteristics of child learning opportunities), while others would more likely be influenced by other kinds of practices (e.g., early intervention positively influencing parent/child interactions, and natural environ-

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ments providing contexts for increasing child learning opportunities). The basis for these contentions derives from a review and analysis of the existing service coordination literature.

Service coordination (Bruder & Bologna, 1993; Harbin & McNulty, 1990; Stepanek, Newcomb, & Kettler, 1996), care coordination (Appleton, Boell, Everett, & Kelly, 1997; Iscoe, 1984; Smith, Layne, & Garell, 1994), service integration (Akers & Behl, 1999; Illback, Cobb, & Joseph, 1997; Kagan & Neville, 1993; Kahn & Kamerman, 1992), and case management (Bailey, 1989; Linz, McAnally, & Wieck, 1989; Neal & Gilson, 1996; Weil & Karls, 1985; Zipper, Weil, & Rounds, 1993) are several terms used in the human services, health care, education, and early intervention fields to describe efforts ensuring that program participants receive the supports, resources, and services they need in an *integrated and coordinated manner*. The term case management has been used the longest (see Bailey, 1989; Dunst & Trivette, 1989; Linz et al., 1989; Voydanoff, 1995) to describe such efforts, but has more recently been replaced by other descriptors in response to the fact that it is not a very child- or family-friendly or sensitive term (Neill, 1997). Case management was the term first used to describe resource mobilization and integration as part of the Part H early intervention discretionary program for infants and toddlers with disabilities and their families (1986 amendments to the Education of the Handicapped Act), but has since been replaced by the term service coordination.

Service coordination (and its variants) is based on the assumption that integrating and coordinating services will result in better outcomes than would be the case if services are provided in a nonintegrated manner (e.g., Harbin & McNulty, 1990; Neal & Gilson, 1996; Saunders,

1995; Stepanek et al., 1996). A review of the literature, with a focus on the outcomes hypothesized to be realized from effective service coordination, finds that the predicted benefits include, but are not limited to, more efficient access to services (Akers & Behl, 1999; Farel & Rounds, 1998; Garry, Brown, Abernathy, & Brown, 1998; Marcenko & Smith, 1992; Roberts, Akers, & Behl, 1996; Smith et al., 1994), better flow of information to families (Akers & Behl, 1999), increased availability of funding (Akers & Behl, 1999), improved service quality (LeBas, King, & Block, 1998), increased availability of supports and resources (Tuchman-Ginsberg, 1997), better provider/family relationships (Summers et al., 2001), improved parent and family quality of life (Dunst, Trivette, Gordon, & Starnes, 1993; Tyler, 1998), enhanced parent and family well-being (Akers & Behl, 1999; Cloonan & Shuster, 1990), increased parent empowerment (Dunst & Trivette, 1989; St. Pierre, Layzer, Goodson, & Bernstein, 1999), improvements in child outcomes (Akers & Behl, 1999; Kilbride, Castor, Hoffman, & Fuger, 2000; St. Pierre et al., 1999), and more positive indicators of parent and family satisfaction (Koren et al., 1997; Romer & Umbreit, 1998; Weller, 1991).

Research on the relationship between service coordination models and practices and child, family, and systems benefits has produced mixed results, with some studies demonstrating positive consequences of service integration (Dolan, 1995; Dunst et al., 1993; Garry et al., 1998; Koren et al., 1997; Marcenko & Smith, 1992; Romer & Umbreit, 1998; Tyler, 1998; Weller, 1991), some producing no discernable positive or negative effects (Garry et al., 1998; Hughes, Brindis, Halfon, & Newacheck, 1997; Kilbride et al., 2000; Marcenko & Smith, 1992; St. Pierre et al., 1999; Tyler, 1998), and some demonstrating negative outcomes (Dunst et al., 1993; Provan, 1997; Romer & Umbreit, 1998; Weller, 1991). Close examination of the kinds of outcomes associated and not associated with service coordination indicates that better flow of resources, supports, and services are generally positive benefits of integrated and coordinated service delivery (see Weller, 1991, for an exception), parent satisfaction with provision of *needed* services and improved well-being and quality of life are more

often than not positive benefits, and parenting and child development outcomes are generally unrelated to improved service integration. In contrast, both parenting and child development outcomes are consistently related to variations in early intervention and natural learning environment practices (see e.g., Dunst, 1999; Dunst, Trivette et al., 2001).

Ecological systems theory (Bronfenbrenner, 1979) helps explain the direct and indirect influences of different environmental factors on systems as well as person benefits, and why different environmental variables would be expected to be associated with different outcomes. Placed in the context of an ecological framework, service coordination would be expected to be related to some but not other outcomes, depending on the conceptual foundations of how service coordination is defined and what reasonable outcomes would be expected to be produced by service integration. For example, service coordination would be expected to have direct positive effects on provision of resources and supports, and on the manner in which different approaches to service integration promote or impede the flow of resources and supports. In contrast, provision or mediation of child learning opportunities affording child experiences that lead to a sense of mastery would likely be realized by practices (e.g., natural learning environments) other than service coordination.

There are at least two possible reasons why the focus group participants may not have been more exact when identifying reasonable outcomes of service coordination. The first is that the focus group methodology simply was not well suited to the purpose of identifying the benefits of service coordination. The second is that the providers and parents simply were not able to differentiate between reasonable and unreasonable outcomes of this particular Part C activity. The approach used in the study presented next permitted identification of the valued outcomes of service coordination, early intervention, and natural learning environments, along with tests of whether different outcomes were associated with each Part C activity. This was accomplished using a methodology necessitating that study participants determine the particular outcomes most likely to be realized from each of the different activities.

## METHOD

### PARTICIPANTS

Study participants were 879 early intervention program practitioners and directors (59%) and parents of children with disabilities (41%) in 48 of the 50 United States. Participants were recruited from mailing lists of Part C programs in all states. Program directors from randomly selected programs in each state were contacted by mail to explain the purpose of the study and to inform them that a Research and Training Center staff member would call to discuss whether they or their designees would distribute surveys to providers working for the program and parents served by the program, respectively.

Providers and parents were an average of 38.12 ( $SD = 9.00$ ) and 34.38 ( $SD = 7.70$ ) years of age, respectively. The average years of formal schooling completed by the providers and parents, respectively, was 16.81 ( $SD = 1.30$ ) and 14.89 ( $SD = 2.21$ ). Providers were older,  $t = 6.34$ ,  $df = 878$ ,  $p < .0001$ , Effect Size ( $ES$ ) = .43, and had completed more years of formal schooling,  $t = 16.01$ ,  $df = 878$ ,  $p < .0001$ ,  $ES = .97$ , compared to the parent participants.

### QUESTIONNAIRE

The questionnaire used for the survey included three main sections as well as a section for obtaining selected participant background information. The introductory section indicated that we were interested in the participants' judgments about what they considered to be the most important outcomes or benefits of service coordination, early intervention, and natural learning environments. More specifically, the participants were asked to indicate what they considered to be the most desired outcomes and benefits of these activities in the context of implementing the IDEA Part C Infant/Toddler Program.

The three main sections of the questionnaire included, respectively, definitions of service coordination, early intervention, and natural environments (see Table 1), and asked the participants to indicate from a list of 69 possible outcomes and benefits the 10 outcomes they considered to be the most important benefits of each Part C activity. Each section was formatted identi-

cally. The individual definitions of the Part C activities (Table 1) were listed at the top of each page. The bottom portion of the page listed the 69 indicators constituting the focus of participant judgments, which were compiled from the focus group findings described in the introductory section of this paper. (A complete list of the indicators can be obtained from the first author.) The middle portion of the page included the following instructions: "Below is a list of possible outcomes or benefits that might occur as a result of (Part C activity). Check up to 10 outcomes you think are the most important benefits of (Part C Activity)." Service coordination, early intervention, and natural environments were inserted as the parenthetical activity in each separate section respectively.

### DATA REDUCTION

A three-step data reduction process was used to categorize the outcome indicators and compute summary scores for each study participant. First, the more than 175 outcomes listed by focus group participants (see Introduction section) as service coordination outcomes were reduced to 69 descriptors by combining terms that were similar or synonymous (e.g., effective provider/parent relationships and parent/professional partnerships). Second, cluster analysis of variables (Aldenderfer, 1984) was used to categorize the outcomes into interrelated groupings. Clusters were formed using a maximum similarity amalgamating process. Third, the unidimensionality of clusters having three or more descriptors was confirmed through separate principal components factor analyses. Findings showed that the descriptors were grouped according to the 14 categories shown in Table 2.

Two summary scores were calculated for each outcome category. The first was the total number of items within categories that a respondent indicated was a desired benefit or outcome for each Part C activity. The summated outcome scores were simply calculated as the total number of indicators in an outcome category that a participant indicated was a desired benefit of each Part C activity. (The tactic of limiting the number of benefits to 10 per Part C activity necessarily resulted in small-summed scores per category.) The second was the standardized scores for the summated measures for service coordination,

TABLE 1

*Definition of Service Coordination, Early Intervention, and Natural Environments*

<i>Service</i>	<i>Definition</i>
Service Coordination	Service coordination is a process of (a) assisting parents of children who receive early intervention gain access to services, supports, and resources identified in a child and family's individualized family service plan, and (b) coordinating the provision of those services, supports, and resources. Service coordination is an ongoing process that continually seeks appropriate services, supports, and resources that are necessary to benefit each child's changing situation.
Early Intervention	Early intervention means the services, supports, and resources necessary to meet the developmental needs of each child who participates in an early intervention program, and the services, supports, and resources needed by parents and the family to enhance child development. Early intervention includes the activities, opportunities, and procedures for promoting child learning and development, as well as the opportunities provided to the family for them to use to enhance child learning and development.
Natural Environments	Natural environments are the home, community, and early childhood settings where children learn and develop everyday abilities and skills. Natural learning environments include the places, settings, and activities where children from birth to 3 years of age would typically have learning opportunities and experiences.

early intervention, and natural environments for each outcome category listed in Table 2. Standardized scores for each outcome category were calculated by aggregating the scores for the three Part C activities (service coordination, early intervention, and natural environments), producing a combined score having a mean of zero and standard deviation equal to one, and disaggregating the combined measures to obtain a score for each Part C activity. Because standardized scores are scaled the same, they permit comparisons between outcome categories for purposes of ascertaining the indicators that are considered to be the most valued benefits of service coordination, early intervention, and natural environments.

#### *METHODS OF ANALYSIS*

A 2 Between-Group (Provider vs. Parent) x 3 Within-Group (Service Coordination vs. Early

Intervention vs. Natural Environments) repeated measures ANOVA was used to analyze the summated outcome category scores. Separate analyses were performed for each outcome category, because the number of possible indicators per category varied from 2 to 12. Each analysis included pairwise *F*-tests comparing service coordination versus early intervention, service coordination versus natural environments, and early intervention versus natural environments. Effect sizes for the three pairwise contrasts were also calculated to establish the magnitude of the differences between means. An effect size was calculated as the difference between pairwise means divided by the pooled standard deviation for the three measures in each outcome category.

A 2 Between-Group (Provider versus Parent) x 3 Within-Group (Service Coordination versus Early Intervention versus Natural Environ-

**TABLE 2**  
*Outcome Categories and the Description of Each Outcome Construct*

<i>Category</i>	<i>Number of Indicators</i>	<i>Description</i>
Systems coordination	8	Coordination of systems-level funding, interagency collaboration, and service integration
Information and referral	3	Information about and referral to community supports, resources, and services for children, parents, and families
Family support and resources	7	Provision of parenting and family supports, resources, and services
Family-centered practices	6	Information sharing for parents to make informed choices and practitioner flexibility and responsiveness to family priorities and concerns
Teaming	4	Intraprogram staff communication and coordination of program activities
Family satisfaction	3	Parent and family satisfaction with the child, parent, and family services and program practices
Child development and functioning	6	Improvement in child learning behavior and development, and decreases in poor child functioning
Child quality of life	4	Improvement in child physical and psychological health and functioning
Parenting competence and confidence	12	Improvement in parenting capabilities and family functioning
Family quality of life	5	Improvement in parent and family physical and psychological health and functioning
Child mastery	3	Enhancement of child mastery motivation and sense of accomplishment
Parent/child interactions	3	Engagement in mutually beneficial parent and child interactions
Inclusion	2	Increased opportunities for children with disabilities to develop prosocial relationships with other children
Child learning opportunities	3	Participation in everyday family and community activities that provide contexts for child learning and development

ment)  $\times$  14 Within-Group (Systems Coordination versus Information and Referral ... versus ... Inclusion versus Child Learning Opportunities) repeated measures ANOVA with the standardized scores as the dependent measures was used to ascertain the particular outcomes deemed the most important benefits of each Part C activity.

## RESULTS

### SUMMATED SCORE ANALYSES

Table 3 shows the findings from the comparisons of the within group analyses of the three Part C activities constituting the focus of investigation. The overall  $F$ -tests for all 14 analyses were significant, as were nearly all (90%) of the pairwise comparisons. The largest majority (83%) of effect sizes for the pairwise comparisons was .20 or higher, indicating there were discernable differences in terms of the outcome indicators considered to be the most important benefits of particular Part C activities (Lipsey, 1998; Rosenthal, 1994).

Several major patterns of findings can be gleaned from inspection of the effect size differences and pairwise  $F$ -test contrasts. First, systems coordination, information and referral, and family support and resources were found to be desired outcomes of only service coordination, as evidenced by the fact that effect sizes for the pairwise contrasts for service coordination versus early intervention and service coordination versus natural environments were all 0.76 or higher, and that the effect sizes for early intervention versus natural environments were considerably smaller (0.03 to 0.15).

Second, half of the analyses produced findings indicating a clearly discernable hierarchy of the desired outcomes of each Part C activity. A hierarchy in desired outcomes was found for child functioning and development, child quality of life, parenting competence and confidence, parent/child interactions, child mastery, inclusion, and child learning opportunities. The hierarchies are evidenced by significant  $F$ -test differences for all three pairwise contrasts and effect sizes approaching or exceeding .25 for pairwise differences. The specific nature of the hierarchies is

discernable from inspection of the mean scores for each Part C activity. For example, increased child learning opportunities was judged a more desired outcome of early intervention compared to service coordination, as well as a more desired outcome of natural environments compared to early intervention. Similarly, parenting competence and confidence was judged a more desired outcome of both early intervention compared to natural environments, and natural environments compared to service coordination.

The main effects for the within-group comparisons were qualified by Participant  $\times$  Part C Activity interactions for the measures of systems coordination,  $F(2, 1754) = 27.10, p < .0001$ , information and referral,  $F(2, 1754) = 12.28, p < .0001$ , family support and resources,  $F(2, 1754) = 7.64, p < .001$ , child development and functioning,  $F(2, 1754) = 7.40, p < .001$ , parenting competence and confidence,  $F(2, 1754) = 9.64, p < .001$ , inclusion,  $F(2, 1754) = 22.34, p < .0001$ , and child learning opportunities,  $F(2, 1754) = 25.51, p < .0001$ . Follow-up analyses of each of these interactions found that better systems coordination ( $ES = .48$ ) and increased information and referral ( $ES = .35$ ) were considered desired outcomes of service coordination by providers more than by parent participants. In contrast, improved child development and functioning ( $ES = .43$ ) and increases in child learning opportunities ( $ES = .29$ ) were considered desired outcomes of service coordination by parents more than by providers. Improvements in parenting competence and confidence were considered a desired outcome of both early intervention ( $ES = .50$ ) and natural environments ( $ES = .21$ ), and both child inclusion ( $ES = .38$ ) and increased child learning opportunities ( $ES = .29$ ) were considered desired outcomes of natural learning environments, by providers more than by parents. Follow-up analyses of the family support and resources interaction showed no differences between the providers and parents for any of the three pairwise comparisons. The fact that only 7 out of the 24 (29%) pairwise post hoc comparisons showed differences between the providers and parents in terms of the relative importance of desired outcomes indicates that provider and parent appraisals were more similar than different.

**TABLE 3**  
*Means and Standard Deviations for the 14 Outcome Categories*

Outcome Category	Service Coordination (SC)		Early Intervention (EI)		Natural Environments (NE)		Overall F-Tests	Pairwise F-Test Contrasts				Effect Size Contrasts			
	Mean	SD	Mean	SD	Mean	SD		F	SC vs. EI	SC vs. NE	EI vs. NE	SC vs. EI	SC vs. NE	EI vs. NE	
Systems Coordination (8)*	1.84	1.32	0.66	0.96	0.51	0.79	442.56b	451.81b	622.17b	19.29b	0.98	1.11	0.13		
Information and Referral (3)	0.79	0.82	0.28	0.52	0.18	0.41	245.79b	232.32b	365.15b	24.00b	0.76	0.91	0.15		
Family Support and Resources (7)	1.37	1.07	0.55	0.77	0.58	0.86	255.45b	351.68b	314.33b	0.05	0.84	0.81	0.03		
Family-Centered Practices (6)	1.12	0.99	0.69	0.80	0.65	0.79	85.95b	111.58b	126.44b	1.34	0.48	0.53	0.04		
Teaming (4)	0.79	0.81	0.67	0.79	0.24	0.50	164.11b	15.05b	308.97b	202.42b	0.16	0.73	0.57		
Family Satisfaction (3)	0.29	0.50	0.21	0.46	0.18	0.44	14.70b	14.36a	25.81b	2.24	0.17	0.23	0.06		
Child Functioning (6)	0.56	0.81	1.29	1.10	0.92	0.95	135.20b	268.52b	67.04b	68.68b	0.73	0.36	0.37		
Child Quality of Life (4)	0.32	0.63	0.75	0.93	0.57	0.84	75.14b	145.48b	61.27b	21.24b	0.52	0.30	0.22		
Parenting Competence (12)	1.00	1.06	1.65	1.35	1.41	1.30	66.09b	141.44b	57.16b	13.54a	0.51	0.32	0.19		
Family Quality of Life (5)	0.55	0.75	0.55	0.75	0.71	0.86	15.95b	0.01	23.15b	21.47b	0.00	0.20	0.20		
Child Mastery (3)	0.14	0.43	0.51	0.78	0.65	0.84	141.47b	175.90b	274.00b	15.94b	0.50	0.69	0.19		
Parent/Child Interactions (3)	0.14	0.39	0.43	0.64	0.57	0.72	116.81b	136.13b	236.80b	20.34b	0.46	0.68	0.22		
Inclusion (2)	0.18	0.41	0.35	0.53	0.65	0.70	160.68b	71.57b	282.07b	97.30b	0.29	0.80	0.51		
Child Learning Opportunities (3)	0.41	0.61	0.92	0.78	1.26	0.90	275.42b	230.54b	499.71b	82.82b	0.60	1.00	0.40		

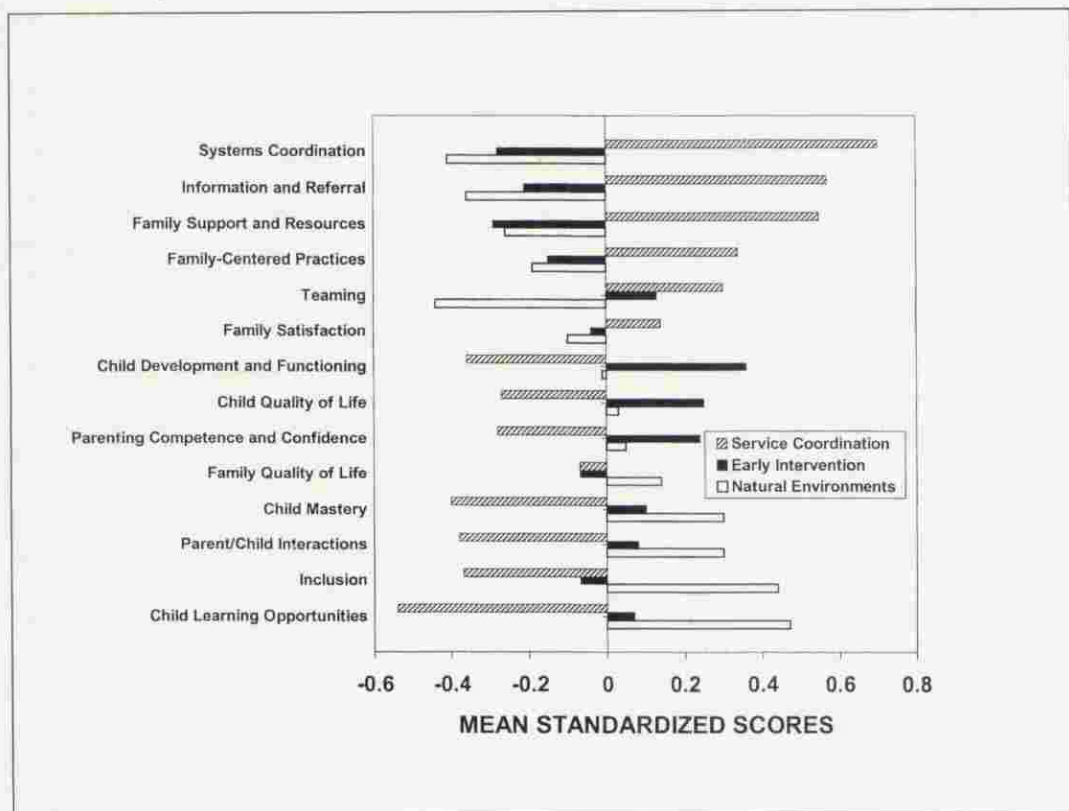
\* Number of indicators per category.

a  $p < .001$ , b  $p < .0001$ .



**FIGURE 1**

*Mean Standardized Scores for the 14 Service Coordination, Early Interventions, and Natural Environments Outcomes Categories*



#### STANDARDIZED SCORE ANALYSES

The 2 Between-Participant X 3 Within-Part C Activity X 14 Within-Outcome Category repeated measures ANOVA of the standardized scores produced a Part C Activity X Outcome Category interaction,  $F(26, 22802) = 153.52, p < .0001$ . The nature of the interaction is shown in Figure 1, which makes more explicit the particular outcome categories considered to be the most desired benefits of each Part C activity, as well as the outcome categories deemed to be valued benefits of all three services. A large positive mean standardized score indicates that an outcome category was judged to be a desired benefit of a particular Part C activity, whereas a large negative mean standardized score indicates that the outcome category was not judged to be a desired benefit of a particular Part C activity. The closer all three mean standardized scores are to zero, the

more the outcome is a desired benefit of all three Part C activities.

There were only two outcome categories (family satisfaction and family quality of life) that were not identified as the primary benefits of any particular Part C activity. Follow-up analyses of multivariate pairwise comparisons substantiated this finding. The effect sizes for service coordination versus early intervention ( $ES = .05$ ),  $F(1, 877) = 7.65, p < .01$ , service coordination versus natural environments ( $ES = .07$ ),  $F(1, 877) = 0.03, p = .90$ , and early intervention versus natural environments ( $ES = .07$ ),  $F(1, 877) = 5.91, p < .05$ , found no meaningfully discernable differences in study participants' judgments about the outcomes.

Five outcome categories were identified as primarily the desired benefits of service coordination (systems coordination, information and referral, family support and resources,

*Providers and parents generally agreed as to which outcomes were the most valued benefits of service coordination, early intervention, and natural learning environments.*

family-centered practices, and teaming), three outcome categories were found to be primarily the desired benefits of early intervention (child development and functioning, child quality of life, and parenting competence and confidence), and four outcome categories were identified as primarily the desired benefits of natural environments (child mastery, parent/child interactions, inclusion, and child learning opportunities). The between-outcome category follow-up tests of each Part C activity described next confirmed the fact that there were specific outcome categories clearly identified as benefits of only particular activities.

*Service coordination.* Multivariate analyses of the standardized scores for the indicators found to be valued service coordination outcomes indicated that the mean standardized score for the five service coordination ( $M = 0.49$ ,  $SD = 1.13$ ) outcome categories (systems coordination, information and referral, etc.) differed significantly from the mean standardized scores for the three early intervention ( $M = -0.16$ ,  $SD = 0.88$ ) outcome categories (child development and functioning, child quality of life, etc.),  $F(1, 877) = 579.04$ ,  $p < .0001$ ,  $ES = .65$ , and the four natural environments ( $M = -0.33$ ,  $SD = 0.75$ ) outcomes categories (child mastery, parent/child interactions, etc.),  $F(1, 877) = 1041.75$ ,  $p < .0001$ ,  $ES = .82$ .

*Early intervention.* Multivariate follow-up tests of the standardized scores for the indicators found to be desired early intervention outcomes showed that the mean standardized score for the three early intervention ( $M = 0.28$ ,  $SD = 1.09$ ) outcome categories differed significantly from the mean standardized scores for the five service coordination ( $M = -0.30$ ,  $SD = 0.80$ ) outcome categories,  $F(1, 877) = 190.94$ ,  $p < .0001$ ,  $ES = .58$ , and the four natural environment ( $M = 0.02$ ,  $SD = 0.99$ ) outcome categories,  $F(1, 877) = 74.28$ ,  $p < .0001$ ,  $ES = .26$ .

*Natural environments.* Analyses of standardized scores for the indicators found to be valued natural learning environments outcomes indicated that the mean standardized score for the four natural environment ( $M = 0.38$ ,  $SD = 1.14$ ) outcome categories differed significantly from the mean standardized scores for the five service coordination ( $M = -0.42$ ,  $SD = 0.65$ ) outcome categories,  $F(1, 877) = 554.08$ ,  $p < .0001$ ,  $ES = .80$ , and the three early intervention ( $M = 0.04$ ,  $SD = 0.97$ ) outcome categories,  $F(1, 877) = 127.29$ ,  $p < .0001$ ,  $ES = .33$ .

## DISCUSSION

Findings indicated that when providers and parents were specifically asked to select outcomes they considered to be valued benefits of service coordination, early intervention, and natural learning environments, clear and discernable differences in the outcomes associated with each Part C activity emerged. Moreover, providers and parents generally agreed as to which outcomes were the most valued benefits of service coordination, early intervention, and natural learning environments. Similar agreement between providers and recipients of supports and resources has been reported by other investigators (Marcenko, Herman, & Hazel, 1992; Wesley, Buysse, & Tyndall, 1997).

The fact that the 69 indicators constituting the focus of this investigation could be categorized into internally consistent groupings, and that the indicators in most outcome categories were deemed valued benefits of a particular Part C activity (and not others), deserves comment when one recalls that all 69 indicators were identified in a previous study as the characteristics and consequences of high-quality service coordination. On the one hand this suggests that the focus group methodology used to produce the outcome indicators was not well suited for identifying outcomes thought to be realized by service coordination, and on the other hand this indicates that the providers and parents who participated in this study were able to differentiate between outcomes likely to be benefits of service coordination, early intervention, and natural learning environments when explicitly asked to do so.

Closer examination of the findings from this study indicates not only between-Part-C activity differences, but also within-Part-C activity differences in terms of the *processes* and *outcomes* of service coordination, early intervention, and natural environments. Inspection of the outcomes deemed to be the most important benefits of service coordination indicates that two categories (family-centered practices and teaming) are best conceptualized as process variables, and that effective family-centered practices (Dunst, 1997) and teaming (McGonigel, Woodruff, & Roszmann-Millican, 1994) would be expected to influence systems coordination and provision of family supports and resources (e.g., Dunst et al., 1993). Similarly, examination of the three early intervention outcome categories indicates that supporting and strengthening parenting confidence and competence would be expected to operate as a process variable contributing to improvements in child development, functioning, and quality of life (Landry, Smith, Swank, Assel, & Vellet, 2001; Smith, Landry, & Swank, 2000). The same is true for the outcomes deemed to be the benefit of natural environments. Three outcomes (child learning opportunities, inclusion, and parent/child play episodes) are best conceptualized as the contexts of child learning, and child mastery is best conceptualized as one benefit of these different natural learning opportunities (Dunst, Bruder et al., 2001; Rusher, Cross, & Ware, 1995).

At least one set of findings raises questions about how study participants perceived early intervention versus natural environments. The fact that the benefits of early intervention (improved child development and functioning, better child quality of life, and enhanced parenting competence and confidence) were deemed to be different from the benefits of natural environments (e.g., increased child learning opportunities, parent/child interactions, and child mastery) suggests a need to know how and in what manner practitioners and parents view these as different. This seems especially important in light of the fact that available research indicates that these two sets of practices and outcomes are highly intertwined (see Dunst, Bruder et al., 2001; Dunst, Trivette et al., 2001).

At least one limitation of the present study and its findings needs to be highlighted. The pre-

sent study identified providers' and parents' *perceptions* of expected benefits, and not actual outcomes realized from the different Part C activities. The extent to which service coordination, early intervention, and natural learning environments in fact produce anticipated effects would need to be explicitly tested in one or more studies. One such study is currently planned as a Research and Training Center on Service Coordination activity. The present study is being used to inform the conceptualization of this investigation. The implications for this research study include, but are not limited to, the development of better measures of both the processes and outcomes of the different Part C activities and the systematic analysis of the relationships among measures (e.g., Byrne, 1994). This study should better inform an understanding of the ecology of IDEA Part C activities, and how different activities are conceptually, procedurally, and empirically related.

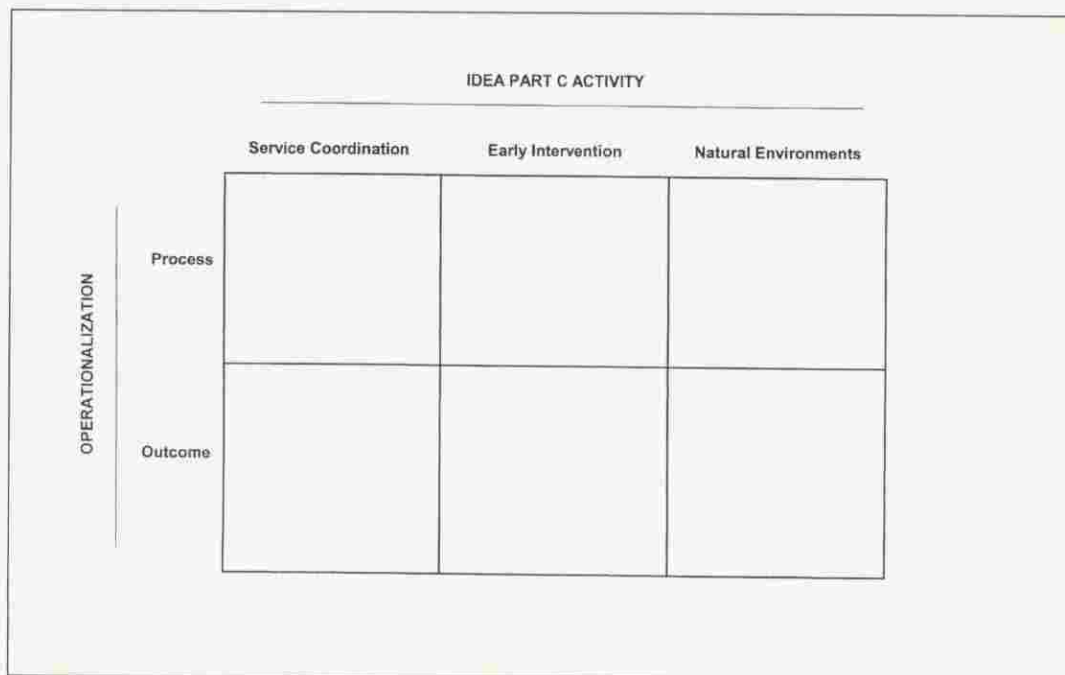
#### IMPLICATIONS FOR PRACTICE

The information provided in this article, and especially the conceptual (Bronfenbrenner, 1979) and operational (Babbie, 1995) frameworks used to disentangle the outcomes most likely to be associated with different Part C activities, provides useful guidance for everyday practice. Figure 2 shows a framework that would seem especially useful to practitioners (as well as parents) for structuring efforts to be more precise about different interventions and the outcomes that can be expected to be produced by different practices. The framework differentiates between the three Part C activities constituting the focus of the present study and the *processes* and *outcomes* of the activities. The latter provides a way of linking conceptualization to operationalization (Babbie) and differentiating between what is done and

*The present study identified providers' and parents' perceptions of expected benefits, and not actual outcomes realized from the different Part C activities.*

**FIGURE 2**

*Framework for Operationalizing the Processes and Outcomes of Different Part C Activities*



what can be expected to be realized from what is done (i.e., the intervention or practice). For example, it would be reasonable to expect that provision or mobilization of supports and resources (a service coordination process variable) would improve family quality of life (an outcome variable). Other process/outcome linkages are easily derived from this way of relating interventions to expected benefits.

Systematic examination of different practices, and how and in what manner these practices are likely to have different benefits, cannot but bring clarity to the manner in which processes operate to produce desired benefits. This is especially true when there is conceptual clarity regarding intervention processes, and how the processes are expected to influence expected outcomes. The reader is referred to Babbie (1995) for a useful and clearly articulated distinction between conceptualization and operationalization, and how they are practically and procedurally related.

There is at least one important benefit to be realized from the above-recommended exercise. The specification of the relationship between any one intervention and its benefits will lead directly to identification of needed measures for both

processes and outcomes. Measurement procedures for processes will help determine if interventions are being carried out in ways that are expected, and measurement procedures for outcomes will help determine if recipients indeed realize expected benefits. Relating process and outcome measures in turn would provide an evaluation of the degree to which variations in processes are associated with variations in outcomes. The reader is referred to Dunst (1999), Dunst and Trivette (2001), and Dunst et al. (1993) for three different ways in which this kind of process/outcome relationship can be determined.

Relating research to practice in a useable manner is a highly desired activity. The present study provides at least one lens for accomplishing this linkage. The effort to do so hopefully will be useful to practitioners who provide service coordination, parents who are recipients of service coordination, and researchers who study service coordination.

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