Final Report

An Outcomes-Based Approach to Evaluating Service Coordination Models

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This is the final report of the three-year study entitled *"An Outcomes-Based Approach to Evaluating Service Coordination Models."* The purpose of the study was to investigate three commonly used Part C service coordination models, examining the degree to which services are delivered **efficiently**, including a cost analysis, as well as their effect on **child and family outcomes.** ***The goal of this project was to identify those service coordination strategies that best support system efficiency and child and family quality of life and developmental outcomes.*** This study is in response to the Field-Initiated Research Invitational Priority (d): Projects that advance knowledge about the coordination of education with health and social services.

Project Relationship with GPRA Performance Indicators

This project supported the achievement of the following GPRA performance indicators:

1.1: Responsive to needs of children with disabilities and their families. This research has informed the field by identifying successful service coordination strategies to better meet child and family needs.

2.1: Highest standards for methods and materials. This project applied high-quality quantitative and qualitative methods and tools to capture an in-depth assessment of child and family well-being and systems-level outcomes.

3.1: Communication to improve results. The dissemination strategies have ensured that successful service coordination strategies are disseminated to families, policymakers, practitioners, and researchers.

3.2: Use results. The findings from this project are useful in guiding personnel preparation guidelines for service coordinators and interagency coordinating bodies, such as state and local interagency coordinating councils.

Study Overview

A cornerstone of Part C of the Individuals with Disabilities Education Act (IDEA; PL 105-17) is the recognition of the need to create a coordinated system for families that is comprehensive, accessible, affordable, and appropriate. At the community level, these system attributes come together most effectively when families feel supported by educational, health, and social resources that make a difference in the well-being and developmental outcomes of the child and his or her family (Roberts, Rule, & Innocenti, 1998). As families discover their community's resources, they soon learn that some systems are more responsive to their individual situations and preferences while others provide more prescribed, narrowly focused services without awareness of a family's other priorities or other community efforts that may be helpful. These differences may have immediate and long-term consequences for children, families, and the service system itself because they involve two variables that serve as the center piece of this proposed research—*efficiency and effectiveness at each of the levels in a system of care*. The efficiency with which a family is able to utilize services and supports to address their priorities affects how they use services and impact their overall family well being. At the agency, community, state, and national levels, efficiency affects how public dollars are spent and the degree to which private/public partnerships are able to meaningfully and appropriately affect the outcomes they expect to achieve.

This study investigated three commonly used service coordination models to examine the degree to which services are delivered **efficiently**, including a cost analysis, as well as their effect

on **child and family outcomes**. To date, no studies have been reported that relate efficiency, cost and outcomes for children and families to variations within service coordination models currently being used. The study was in response to the Field-Initiated Research Project CFDA 84.324C, Invitational Priority (d): Projects that advance knowledge about the coordination of education with health and social services. It did so both by testing a conceptual framework to investigate the relationships of the variables mentioned above while at the same time providing information on the three most commonly used models of service coordination currently in use in Part C programs. *The goal of this project was to identify those service coordination strategies that best support system efficiency and child and family quality of life and developmental outcomes.*

This section describes the selected service coordination models of this study.. Information regarding the study sites, participants, and general research approach is provided first, followed by specific accomplishments listed by the originally proposed activities.

Selected Service Coordination Models

Three distinct service coordination (SC) models were selected for study. As mentioned in the original proposal, the Opening Doors Project identified three SC models that reflect the majority of the 228 communities that were surveyed (Roberts, Behl, & Akers, 1996). These findings guided the selection of the three models to be studied:

1. *The Independent model of service coordination:* The service coordinator (SC) provides no other EI services and is not housed/employed by an EI direct service provider.

2. *The Combined-Roles Model:* A primary EI program provides the SC and most therapeutic services, with the SC also providing direct EI services.

3. *One-Stop Shopping model:* The center serves as a single point of entry for multiple programs, providing SC as well as multi-agency coordinated services in an integrated infrastructure.

Service coordination model communities. Six communities were identified to represent

the three service coordination models studied. The specific communities were:

1. Independent service coordination model: Mesa, AZ, and Brevard County, FL.

2. Blended model: Weber County, UT and Farmers Branch, TX.

3. One-Stop Shopping model: Yakima, WA and Norge, VA.

Sites were selected based on their interest in participation, having a sufficient number of children enrolled for the sample selection, presence of racial/ethnic diversity in the community, and the capacity to provide needed data for the study. Descriptions of these communities are provided under the Results section, Objective 1.

Sample families. Following the provision of informed consent from parents/guardians, a total of 222 Part C-eligible children and their families were enrolled from the communities. Of these, 17 where dropped from the study because of incomplete surveys and other reasons, leaving the total participation at 203. Specific numbers by site and model are shown in Table 1. Children and families were selected by the researchers to ensure that the sample was representative of the demographic, disability, and health characteristics of the children and families served within the community.

Table 1
Sample size

Model	Site	# of participants
One-Stop Shopping	A	30
	B	31
Combined Roles	C	51
	D	30
Independent	E	30
	F	31
TOTAL		203

EIRI staff carefully considered the variables mentioned above as well as other factors that are important for this study. EIRI staff applied following criteria when randomly selecting children from the sites:

1. Select those children who are less than 3 years of age during the time of data collection.

2. Select those children who have been enrolled in the Part C program for at least 3 months to ensure that these families have adequate experience within the program.

3. Select those families who are receiving multiple services, which strengthen the importance of service coordination.

4. Select those whose ethnicities match the community demographics while ensuring that each site has representation from families of diverse cultures.

5. Select a fairly equal split by gender.

Efforts were made to ensure that no family was excluded from the study due to disability condition, racial/ethnic heritage, or financial status. For example, alternative response procedures were developed for families who do not speak English or who cannot read.

Subject recruitment was approached in the following way. The site liaison from each program took the lead in contacting families and getting the signed informed consent. EIRI has found that it is more effective and efficient to have one person obtain the consent forms, provided this is an individual who the family knows and trusts. However, some families who do not have telephones or perhaps do not speak English required the help of other staff who have better access and/or skills to communicate with the family. In such cases, the site liaison requested the help of the service coordinators.

All consents, surveys, interviews, and other instruments were translated into Spanish since there are a significant number of monolingual Spanish speaking families in the study.

A summary of the subject characteristics is provided in Table 2. As shown in the table, the sample of children in the study in general was ethnically and economically diverse. This was

expected, since the researchers wanted to ensure strong minority representation in our study sample. There was variability in the incomes of families across the sites, especially among the two, one-stop model sites.
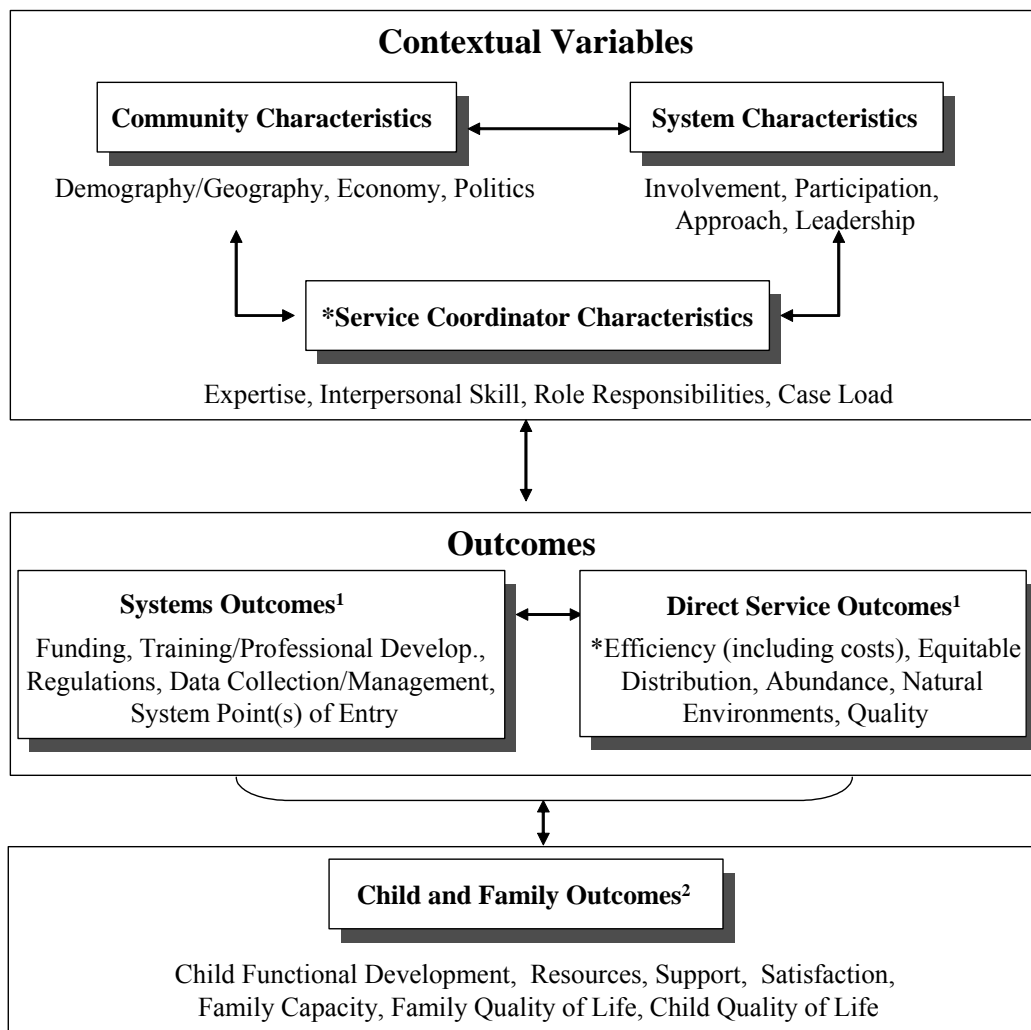
Table 2
Participant Characteristics

Model	One-Stop Shopping		Combined Roles		Independent	
Site	A	B	C	D	E	F
Mean Age at Time of Survey (months)	23	25	25	22	22	27
Male	63%	55%	71%	57%	50%	45%
Female	37%	45%	29%	43%	50%	55%
Medicaid	57%	19%	25%	27%	27%	58%
Caucasian	27.6%	73.3%	82.4%	63%	58.6%	35.7%
Hispanic/Latino	62.1%	3.3%	13.7%	11.1%	20.7%	17.9%
Multicultural	3.4%	0%	3.9%	11.1%	10.3%	10.3%
Other Race/Ethnicity*	6.9%	23.3%	0	14.8%	14.3%	32.1%
Average Number of Adults in Home	1.97	1.97	1.96	1.97	2.1	1.87
< $20,000	56.7%	12.9%	17.6%	10%	20.3%	29%
$20,000 – $39,999	26.7%	29%	23.5%	13.3%	30%	22.6%
$40,000 – 59,999	6.7%	6.5%	27.5%	10%	13.3%	12.9%
$60,000 – 79,999	3.3%	12.9%	17.6%	20%	6.7%	12.9%
$80,000 – 99,999	3.3%	9.7%	9.8%	23.3%	16.7%	3.2%
≥ $100,000	3.3%	22.6%	0	16.7%	6.7%	6.5%
Prefer Not To Say	0	3.2%	3.9%	6.7%	0	9.7%
Don't Know / Not Sure	0	3.2%	0	0	3.3%	3.2%

* A: Native American; B: 20% African American; D: 11.1% Asian/Pacific Islander; E: 6.9% African American; F: 7.1% Asian/Pacific Islander.

Service providers and policy makers. Service coordinators, local administrators (e.g., program directors from education, health, and social service agencies who coordinate with the Part C system), and policy makers at the local and state levels (e.g., chairs of coordinating councils, and other persons in key leadership roles) provided contextual and direct service information. These providers and policymakers were actively involved, providing the needed information.

Conceptual Framework and Methods

The conceptual framework used to drive the study methodology is presented in Figure 1. The study was built upon a framework developed by Kagan et al. (1995) because it has been demonstrated as a valid approach for determining the influences of service coordination and was one of the few to actually assess outcomes at the systems level. This study expanded Kagan's framework by (1) specifying and measuring child and family outcomes based on those suggested

Contextual Variables

Community Characteristics	**System Characteristics**
Demography/Geography, Economy, Politics	Involvement, Participation, Approach, Leadership

***Service Coordinator Characteristics**

Expertise, Interpersonal Skill, Role Responsibilities, Case Load

Outcomes

Systems Outcomes[1]	**Direct Service Outcomes[1]**
Funding, Training/Professional Develop., Regulations, Data Collection/Management, System Point(s) of Entry	*Efficiency (including costs), Equitable Distribution, Abundance, Natural Environments, Quality

Child and Family Outcomes[2]

Child Functional Development, Resources, Support, Satisfaction, Family Capacity, Family Quality of Life, Child Quality of Life

* = *Additional components/variations on Kagan et al. (1995) model.*

1 = Relates to OSERS GPRA Part C Objective 1

2 = Relates to OSERS GPRA Part C Objective 2

Figure 1: **Conceptual Framework.**

by Roberts and Wasik (1996) and Konrad (1996), and (2) targeting a population of children with disabilities, ages birth to three years. This study was the first to apply this conceptual framework to investigate system and family-level outcomes within three commonly used Part C service coordination (SC) models. Additionally, this conceptual framework encompasses the outcomes identified by the Office of Special Education Program's Government Performance and Results Act (GPRA) in terms of the targeted outcomes for children and families served by the Part C system. The application of the conceptual framework was tied to the study objectives; the specific components of the framework are referenced in the next section in relation to the objectives.

The study used a multiple-method comparison design to assess the outcomes of three distinctly different service coordination models. Outcomes was assessed both *within each model* and compared *between the models* to determine the effectiveness of characteristics found *across the models*.

Participatory action research (PAR), defined as collaboration with research participants to drive the study, was applied to the project (i.e., the development of the research methods, activities, and analysis). The use of PAR has been shown to result in a more sensitive and comprehensive understanding of the research questions (Innocenti & Roberts, 1999; Jeppson & Thomas, 1995; Roberts, Rule, & Innocenti, 1998; Turnbull, 1997). A liaison was identified within each community to facilitate the research activities.

Results

The study objectives are presented below followed by a description of the findings associated with the objectives. Copies of protocols developed for this study are available upon request.

Objective 1: *Describe the community characteristics, system characteristics, and service coordinator characteristics influencing the implementation of the service coordination models.*

Context refers to the conditions outside specific service coordination efforts that may influence the outcomes, including the factors that lend force and shape to the model's implementation. As a result, service coordination efforts require an analysis of the context in which the model exists to fully understand the outcomes achieved.

As described in earlier reports, this study utilized a variety of tools to capture the contextual characteristics of the programs and the communities in which they were located. These tools consisted of the following (copies of tools were provided in previous reports; copies also are available upon request to the principal investigators):

1. Part C Local Program Information Form,
2. Community Self Assessment Survey,
3. Document reviews of state and local Part C plans and interagency agreements,
4. Local- and state-level interviews,
5. Local interagency council survey, and
6. Service Coordinator survey.

Introduction to Community characteristics. Community characteristics pertain to the geo-political characteristics of the community. Demographics, economy, and politics, can exacerbate and accentuate service needs and service availability. For example, a large, urban area can better support a large number of service providers that would influence the abundance of services available to families.

Results re: Community characteristics. Table 3 provides a comparison of the contextual characteristics of the six sites. As noted in the table, the sites for the Independent model of service coordination were the largest in terms of the population of the catchment area served. The Combined-roles model communities were moderately-sized metropolitan/suburban areas. The One-stop model communities were both smaller communities; one of the sites was primarily

an agriculturally-based economy while the other was located adjacent to a tourist site with a mixture of rural and suburban areas.

Table 3
Contextual Characteristics of Outcomes Sites

Community characteristics	One-Stop Model	Combined Roles Model	Independent Model
Population size	Site A: 222,581 Site B: 127,963	Site C: 196,533 Site D: 339,288	Site E: 3,072,149 Site F: 476,230
Percent at poverty	Site A: 19.7% Site B: 4.1%	Site C: 12.3% Site D: 6%	Site E: 12.7% Site F: 10%
Percent minorities	Site A: 44% Site B: 17.8%	Site C: 12.3% Site D: 28.3%	Site E: 22.6% Site F: 14%
Historic Leadership and Collaboration	Site A: High Site B: High	Site C: Low Site D: Low	Site E: Low Site F: Moderate

The percent of families living at or below the federal poverty level was used as an indicator of the economic conditions of the communities. There was significant variability across the communities and across the models, with the highest and lowest percentages associated with the two One-stop models. There was significant racial/ethnicity variability across the sites and within the models, ranging from 12% to 44%.

Introduction to System characteristics. The characteristics of the system consist of the history, or foundation, that serve to support or hinder the Part C Early Intervention system. They include the **level of involvement** that existed between the community, state, and federal entities; the history of **participation** by consumers, various disciplines, and the private sector in the model; and the general **approach** to service design (i.e., one that has been family-centered versus program-efficiency centered).

Results re: System characteristics. There was a great deal of variability in the extent to which the community and state agencies were involved in the local Part C system. For example, within the One-stop models, there was a strong history of community involvement, such as community fund-raisers to support services at the one-stop sites. The Combined-roles models

and the Independent models had a history of some involvement, such as child-find activities, although little evidence of strong leadership historically to support the broader service system. In terms of state involvement, the Independent models reported a strong influence by state regulations in driving their Part C service system; both of these sites also identified themselves as employees of a state agency. The Combined roles sites and the One-stop sites had some involvement in terms of the state offices directing funding and parent fees; however, since they were awarded contracts with the state to provide Part C services, they appeared to have a little more autonomy than the Independent sites. Additionally, the One-stop sites had involvement at the federal level in terms of being the recipients of federal grants. Both of the Independent model sites described some statewide campaigns to support children, such as ensuring healthy development or school readiness for all children.

The extent to which interagency collaboration and leadership has been in place historically was assessed via a variety of descriptive survey tools. The combined-roles sites did not report a strong history of interagency collaboration or any particular leaders that were laying a foundation for interagency collaboration. Within the Independent model, one of the sites had little to indicate strong leaders which drove the design of the system at the community level; the other Independent site had some leadership in place, particularly in terms of agencies and pre-existing councils to guide the Early Intervention system.

In terms of the approach to services, all of the sites appeared to have a strong focus on family-centered services. This was most likely due to the policies and regulations established by Part H and later Part C of IDEA.

Introduction to Service Coordinator Characteristics. Service coordinator characteristics involve the **expertise** of the service coordinator in terms of academic degree and area of study

and the size of their **case load,** two factors that have been reported to influence family satisfaction outcomes. For example, a service coordinator who does not have the expertise in knowing the range of available services may influence the abundance and quality of services provided to families. The interpersonal skills in terms of being responsive and culturally competent in their interactions were evaluated by the families, and these are part of the family well-being outcomes.

Results re: Service Coordinator Characteristics. Table 4 provides a description of the service coordinator (SC) characteristics for the sites. Across the sites, the SCs had 4-7 years of experience, the One-Stop model having the greatest number of years of experience. The One-stop model and the Combined roles model had the highest SC education levels as demonstrated

Table 4
Contextual variables: Service Coordinator Characteristics

Variables	A	B	One-Stop Shopping	C	D	Combined Roles	E	F	Independent
Contextual variables: Service Coordinator Characteristics									
N	8	12	20	17	20	37	13	13	26
Mean years of experience	4.8	7.5	6.4	5.1	5.0	5.0	3.8	6.5	5.2
Level of Education %									
N	8	12	20	18	20	38	12	13	25
High School	0	0	0	6	0	3	33	0	16
Associate Degree	0	0	0	6	0	3	17	0	8
Bachelor Degree	75	8	35	39	45	42	42	92	68
Masters Degree	25	92	65	44	55	50	8	8	8
Doctoral Degree	0	0	0	6	0	3	0	0	0
Caseload per 1.00 FTE Mean									
N	7	12	19	18	20	38	13	10	23
Caseload	57	11	32	46	20	32	57	80	67

ANOVA by model (p=.000); *t* Tests: One-Stop/Indep. (*p* = .000)
One-Stop/CR (NS)
Indep./CR (p=.000)

by the majority holding master's degrees. It is important to note that there was variability in who provided the service coordination among the two One-stop model sites. Site A used a "dedicated service coordination" model whereby the service coordinator provided only service coordination services. Site B utilized a "combined roles" model within their One-stop model. Given the nature of the combined roles model whereby therapists often serve as service coordinators, the higher education level for those sites using a combined roles model of service coordination is logical.

The Independent Model service coordinators (SC's) had the lowest education level, with most having a bachelor's degree and some with associate degrees. The SC's from the One-Stop model also had the most years of experience working with children and families; years of experience for the Combined Roles and the One-Stop model were essentially the same.

Objective 2: *Describe the system outcomes and direct service outcomes associated with the three service coordination models.*

Introduction to system outcomes. System outcomes represent the resulting infrastructure to support the service system, which comprises **funding** for service coordination and services; **training/professional development** in coordinating services; **policies** to support coordination; **data collection/management** to facilitate coordination and avoid duplication; and the **system points of entry** to allow families to access services easily and through multiple avenues. Although the ultimate goal of service coordination is the improved outcomes for children and families, reforms in improving the infrastructure itself are viewed as interim outcomes (Schorr, 1994).

Results re: System Outcomes. The strength of the community local interagency councils was assessed for each of the communities via interviews and surveys (see Table 5). Both One-stop models had active interagency councils, typically containing various subcommittees as well as an administrative tier and a direct service provider tier. Family participation on councils was

stable in both One-stop model sites. The Combined-roles sites varied in regard to their LICC activity. Site C of the Combined-roles model had a local interagency council in place, though the Early Intervention program was not a participant. The other Combined-roles site had an LICC that met infrequently and the Early Intervention Program had minimal participation. The Independent model sites varied in the vigor of their LICCs; one Independent site had an LICC that met regularly and served in an advisory capacity to guide state-level Part C policies; the LICC in the other community met regularly and was more structured; additionally, there was another interagency council to support the broader service system for all young children for which the Part C service coordination program was a member.

Table 5

System Outcomes by Site and Service Coordination Model

System Outcomes	One-stop	Combined Roles	Independent
LICC strength	Site A: High activity Site B: High	Site C: Low activity Site D: Low/moderate activity	Site E: Moderate Site F: Moderate/high
Systems integration	Site A: High Site B: High	Site C: Low Site D: Low	Site E: Low Site F: Low

In terms of other system integration strategies associated with the models, the One-stop models both had shared data bases and a common IFSP process among agencies co-located in their respective centers. The Combined roles and the Independent model sites had no formal data sharing or common IFSP process. Other agencies were sometimes mentioned on IFSPs, though no collaboration strategies were apparent. The One-Stop models were able to access a greater variety of funding sources, particularly in terms of greater private community dollars compared to the other models.

Introduction to direct service outcomes. Direct service outcomes represent the key variables influencing the services provided directly to children and families. They consist of

efficiency, defined as increased savings in the amount of time required to provide services; **equitable distribution** of funds and services more evenly throughout the community to ensure access to all children and families; **abundance** in the type and intensity of services provided; the provision of services in **natural environments** that are community-based, developmentally appropriate, and inclusive; and overall **quality** of services that are coordinated, culturally competent, and family-centered.

Direct service outcomes results. Direct service outcomes consisted of measuring (a) direct services provided to children and families measured via family self-report survey and prescribed services listed on the IFSP's, and (b) time service coordinators spend on activities such as accessing services, coordinating services, determining eligibility, and completing paperwork for monitoring via the Service Coordinator Time Diary Form completed for four one-week time samples; and (c) costs of service coordination per child for those enrolled in the Part C program.

Direct services provided to children and families. The frequency of contact families have with their service coordinator was one of the direct service outcomes measured in this study. Parent report of the mean frequency of contact with their service coordinator, be it via telephone, office, or home visit, is reported in Table 6. In terms of contacts with the service coordinator, families served via the Independent model reported vary few contacts compared to families in the One-stop or Combined Roles model. The One-Stop model varied from once per month for one site (using a dedicated service coordination model) to once per week for the other One-stop site (using a combined-roles model). Within the Combined-roles model, one site had contacts approximately 2-3 times per month while the other site had weekly contacts. The frequency of service coordination contact was lowest for the Independent model. There appears

to be a direct, negative relationship between the caseload size of the service coordinators and frequency of parent contacts.

Table 6
Direct service outcome: Frequency of contact with Service Coordinator

Site	Median
One-Stop	3 = Two to three times a month
A	4 = Once a month
B	2 = Once a week
Combined Roles	3 = Two to three times a month
C	3 = Two to three times a month
D	2 = Once a week
Independent	5 = Every two to three months
E	5 = Every two to three months
F	5 = Every two to three months

Note. A Likert Scale was used ranging from 1 = several times a week to 7 = every 7-12 months.

The array of services provided to families as well as the amount of service hours received by families enrolled in the study were measured based on family report and then compared to what was listed on the IFSPs. Table 7 presents the mean number of different services families reported that they were receiving. Families from the One-stop models reported receiving four to five services, which is more than families from the combined roles model reported that they received (a mean of 3 services). There was significant variability in the number of services received by families in the Independent model; families from one site reported receiving about five different services while families from the other site reported receiving about three services.

Table 7
Mean Number of Different Services Reported by Families

Site	A	B	One-Stop Shopping	C	D	Combined Roles	E	F	Independent
# of services	4.9	4.2	4.5	3.1	3.0	3.10	5.1	2.9	4.00

Table 8 presents data by model for the percent of families who reported that they were

receiving compared to what was listed as prescribed on their IFSP. These data show discrepancies between what was listed on the IFSP versus what parents reported that they were getting. There are multiple theories as to why these differences occurred. First, families may have accessed services on their own outside of what the Part C program prescribed; however, families typically responded "no" when asked on the survey, "are there any services that you are getting that are *not* on the IFSP." It could also be that families don't perceive "child care" or "respite care" as *Part C services* per se, but may view them as something they get that is outside

Table 8

Direct Service Outcome: Services Received According to Family and IFSP Report

Services	One-Stop		Combined Roles		Independent	
	% IFSP Reported	% Family Reported	% IFSP Reported	% Family Reported	% IFSP Reported	% Family Reported
Speech/Language	57.4	70.5	60.5	70.4	88.3	75.0
Occupational Therapy	47.5	41.7	40.7	38.8	68.3	65.0
Physical Therapy	57.4	60.0	27.2	42.0	71.7	61.7
Mental Health Counseling	0	0	0	0	1.7	0
Health Services (including in-home nursing)	27.9	15.0	4.9	3.7	0	5.0
Social Work	3.3	11.7	0	3.7	0	3.3
Vision Services	16.4	13.3	3.7	6.2	1.7	13.3
Audiology Services	27.9	18.3	1.2	8.6	6.7	10.0
Nutrition Services	24.6	33.3	1.2	11.1	0	11.7
Assistive Technology	3.3	8.3	0	6.2	10.0	8.3
Toddler Play Groups	1.6	42.6	12.3	32.5	0	11.7
Child Care	0	21.7	0	13.8	0	18.3
Respite Care	0	10.0	0	3.7	21.7	18.3
EI Special Instruction	42.6	26.2	3.7	19.0	63.3	40.0
Family & Parent Training	44.3	11.7	2.5	13.6	0	8.3
Parent-to-Parent Activities	0	23.3	8.6	4.9	1.7	8.3
Psychologist or Behavior Specialist	0	3.3	0	3.7	0	1.7
Psychological Services for Family	1.6	5.0	0	2.5	0	1.7
Transportation	18.0	16.9	0	6.2	0	10.0
Other Services Being Provided	11.5	26.7	16.0	16.0	8.3	23.3

of the Part C system. Another possible reason for the discrepancy may be that families were not certain about the specific names of the services they were receiving (i.e., occupational therapy vs. physical therapy). Definitions were provided to families for most, but not all, of the services.

It is interesting to note that respite care was not being provided to any of the families in the Combined Roles sites or the second Independent model site. This could be related to the availability of respite care (perhaps it is available only in larger communities) or with the Service Coordination Program's affiliation with Developmental Disabilities as a key lead agency, as with one of the independent model sites. Only a few families received psychological/mental health services; it was most prevalent in Site A that used a One-stop model, which housed a mental health provider within the center. Child care and toddler play groups, two examples of services typically provided in natural environments, were of greatest intensity within the Independent model and next within the One-stop model.

To study any potential differences across sites and models in terms of *intensity* of services, families were asked to report the number of hours per month that they received each of these specific services. However, researchers questioned the accuracy of the number of service hours reported by the families given the relatively high number of service hours per month. The data base was compared to the original source of data from the family surveys, and the data entry was found to be accurate. It is the opinion of the family survey data collectors that many families appeared to have difficulty answering the questions or that they may have overestimated the hours of services that they were receiving. A review of the subjects' IFSPs also was conducted as a reliability check; unfortunately, many of the IFSPs did not list specific prescribed service hours. Therefore, the researchers have chosen not to report these data given the questionable validity in terms of accurately reflecting delivered services.

Based on these data, it appears that there is not a strong relationship between the number of various services received and the service coordination model itself. There appears to be some variability in the receipt of some specific services; more families served by the One-stop Model received health-related services, and more families in the Independent Model received respite. Further analysis is needed to determine other factors that may influence this variability, i.e., the lead agency, services available in the community.

Service coordinator use of time results. Table 9 shows the percent of time that service coordinators spent in key activities by model. The activity that consumed the most time is different in each model with service coordinators in One-stop models spending over 26% of their time doing non-clinical administration. Service coordinators from the combined roles model spent over 22% of their time traveling to/from activities while service coordinators in the independent model spent the most time, 25%, doing clinical administrative activities.

Table 9
Direct Service Outcome: Time spent by Service Coordinators in Various Activities
(% of total time spent per activity)

Activity	One Stop	Combined Roles	Independent
Evaluation and Assessment	8.1	10.4	10.8
IFSP Development and Resource Identification	8.3	5.8	15.6
Consultation and Coordination with other Professionals	9.8	7.6	8.5
Transition Activities	3.4	1.5	4.6
Staff Training	2.3	4.4	5.6
Outreach/Child Find/Screening	2.4	2.3	0.2
Administration: Clinical	16.9	15.8	25.1
Administration: Non-Clinical	26.4	18.5	18.6
Travel to/from activities	16.1	22.4	8.8
Parent Education/Support	4.5	5.9	1.0
Other (e.g. providing transport., services to non-Part C children)	1.8	5.4	1.2
Total	**100%**	**100%**	**100%**

Controlled for caseload. Therapy and breaks were not included.

Administration, clinical and nonclinical consumed a much larger portion of the service coordinator's time than other activities—over 40% for the one stop and independent models and over 34% for the combined role model.

Table 10, which describes the percentage of time service coordinators spent in different settings, verifies the data in Table 9. Independent providers spent approximately twice as much time on the phone compared with providers in the other two models. Combined roles service coordinators spent more time providing services in natural settings and less time in the office and other program sites. One of the costs of providing services in a natural setting is that the time spent traveling is shifted to the provider—as in the case of the combined role service coordinators who spend significantly more time traveling. Other than telephone, the settings where services are provided are much more similar for the one stop and independent service coordinators compared with the combined roles service coordinators.

Table 10
Direct Service Outcome: Settings in which Service Coordinator Activities are Performed
(% of total time spent per setting)

Setting	MODEL		
	One Stop	Combined Roles	Independent
Telephone	3.5	4.8	9.4
EIP Class, Hospital/Medical/Residential Facilities	3.7	3.2	2.9
Office & Other Program sites	61.6	43.0	61.5
Natural setting	12.5	18.0	12.7
Other	18.7	30.9	13.5
Total	**100%**	**100%**	**100%**

Controlled for caseload. Therapy and breaks were not included.

One of the striking findings from these data is how little time is spent by most service coordinators doing resource identification and IFSP development, in parent education and support and providing services in natural settings. Administration is a huge responsibility for service coordinators and it precludes more of their time being spent in other direct service

activities and in providing services to children and families in a natural environment.

Results re: Service Coordination Costs. The data presented in Tables 11 and 12 show substantial differences in cost both by site and by model. The average cost per child for services in the independent models was very similar as was their average hourly wage rate paid to service coordinators. These two sites were the least expensive. The low cost is in part explained by the low wage rate paid to providers and also by the higher caseloads of their service coordinators. The one stop shopping models and the combined roles models are not so clear cut. The caseloads of providers at each of these four sites varied widely—from 11 to 57 as did their hourly wages—from $16.94 per hour to a high of $23.61. Sites B and D, a One stop shopping model site and a Combined roles model site show nearly identical average cost per child—both averaging $2,600 per child for service coordination services. Interestingly these two sites also reported the lowest service coordinator caseloads—11 at site B and 20 at site D. This low caseload translates into a high cost per child because the denominator is small—the cost is spread over fewer children and families. The average hourly wage rate for service coordinators

Table 11
Direct Service Outcome: Mean Service Coordinator Cost and Hourly Wage by Model

	Independent	Combined Roles	One-stop
Cost of service coordination per child	$896.00	$2,007.84	$2,318.00
Mean SC hour wage rate	$14.16	$21.68	$18.39

Table 12
Direct Service Outcome: Mean Service Coordinator Cost and Hourly Wage by Site

	One-Stop Shopping		Combined Roles		Independent	
	A	B	C	D	E	F
Hourly wage	$16.94	$19.83	$23.61	$19.75	$13.82	$14.49
Avg. cost per child	$1,957.94	$2,677.17	$1,452.23	$2,662.68	$1,059.01	$732.58

at these two sites was also nearly identical at approximately $20 per hour. These data suggest that caseloads and wages are key variables in explaining the differences in average cost per child. Site C has a relatively high average caseload size, 46, which offsets some of the cost of having the highest average service coordinator wage rate.

Clearly Table 12 shows that the two least expensive sites, as reflected by average cost per child served, are the two independent model sites. These two sites also have two of the highest caseloads and the two lowest average hourly wage rates. The two most expensive sites include one that represents a blended model and the other a one-stop shopping model. The other site that represented a blended model, site C, did so at a significantly lower cost probably as a result of higher caseloads as reported by the providers. Clearly there are a variety of factors that explain the average cost of service coordination services at each site—caseload and average hourly wage rate paid to service coordinators are the two key variables reflected here. These two variables are correlated with the service coordination model since independent service coordinators require less training, are paid lower wage rates and have higher caseloads than therapists who also provide service coordination services.

Objective 3: *Describe the child and family outcomes associated with the three service coordination models.*

Introduction to Child and family outcomes. The final component of the conceptual framework consists of those outcomes associated with improving child development as well as both the child and family's quality of life. The authors believe that, ultimately, service coordination should enhance the quality of life meaningfully and successfully in the daily routines of his/her family and community.

Child quality of life is the extent to which the child is able to participate as

independently as possible with needed accommodations. **Family outcomes** are defined in terms of (1) **resources and supports**, both formal and informal; (2) perceived **satisfaction** with the type, quantity, and appropriateness of the service system with particular attention to coordination among service entities; (3) the extent to which families report that early intervention services have increased their **capacity** to enhance their child's development**,** identify service needs, obtain and influence services provided, advocate for their children; and (4) overall **family quality of life**, defined as the extent to which families can maintain meaningful and sustainable daily routines as defined by individual families. These outcomes reflect GPRA Obj. #2, Indicator 2: the percentage of families that report that EI services have increased their capacity to enhance their child's development will increase.

Introductions to Child developmental outcomes. Specific child outcomes consist of **child development** defined as those skills which enhance the child's ability to participate as independently as possible with any needed accommodations. This outcome directly relates to GPRA Obj.#2, Indicator 1: the percentage of children participating in the part C program that demonstrate improved and sustained functional abilities will increase. To measure child development, the study planned to obtain extant child developmental assessment scores. The reasons for using *existing assessment results* are: (a) families report that the child assessment process is typically a negative experience that emphasizes their child's delays, (b) families report frustration with the duplication of assessment efforts rather than relying on currently-existing information, and (c) the administration of individualized child functioning measures is expensive both in tester costs and parent time.

Given the strong concurrent validity among most developmental measures, the researchers intended to use age equivalent domain scores at time of entry into the program and

later assessments corresponding with the collection of the study-designed family survey. The directors at the study sites initially stated that these scores were available and in a data base. The researchers discovered that in reality several of the sites do not collect comprehensive assessment data on children enrolled in the study. For one of the Independent model sites, many children were enrolled based on diagnosis and therefore testing was not necessary for eligibility. For several of the other sites, testing was conducted only in the domains of suspected delay and therefore comprehensive data were not available. Based on conversations with other researchers and providers in the field, this lack of developmental data to document progress is a consistent problem throughout the country.

Results re: Child Outcomes. Table 13 summarizes the results of child developmental outcomes based on developmental assessment data available for children enrolled in the study. To determine developmental progress, developmental change scores were calculated by taking the child's age equivalent score at time one and subtracting this from their age equivalent at time 2. This number was then divided by the number of months between assessments. The final developmental quotient (DQ) change score indicates the child's progress from time one to time to. For example if there were 12 months between assessments and the child had an age

Table 13
Child Health and Development Outcomes based on Extant Developmental Assessment Scores

Developmental Domain	One-Stop Shopping			Combined Roles			Independent		
	Time 1 DQ	Time 2 DQ	DQ Change Score	Time 1 DQ	Time 2 DQ	DQ Change Score	Time 1 DQ	Time 2 DQ	DQ Change Score
Motor	.72 (n=56)	.79 (n=43)	.85* (n=42)	.74 (n=78)	.73 (n=61)	.70 (n=59)	.64 (n=58)	.70 (n=43)	.72 (n=42)
Communication	.71 (n=53)	.70 (n=46)	.76 (n=39)	.65 (n=59)	.68 (n=63)	.88 (n=54)	.67 (n=59)	.68 (n=47)	.73 (n=45)
Cognition	.76 (n=58)	.81 (n=41)	.86* (n=40)	.76 (n=55)	.73 (n=45)	.73 (n=38)	.87 (n=45)	.85 (n=34)	.95 (n=30)

*$p < .05$

equivalent score of 4 months at time one and 16 months at time two the resulting DQ change score would be 1.0. This would indicate one month's growth per month of service.

Child development scores were analyzed between and within models. No statistically significant results were found between models. Statistically significant differences in developmental change scores were found in both the motor and cognitive domains in the One-stop model only.

As noted in the *n's* reported in the table, domain data were missing for roughly one third to one half of the subjects across models. Therefore, the researchers are not confident in drawing conclusions based on these data regarding the relationship among service coordination model and child development outcomes.

Introduction to Family outcomes. These outcomes consisted of parent/caregiver ratings of the referral process, service coordination, helpfulness of services, supports, resources, and perceived parent capacity to support their child's development. A Family Self Report Survey was developed and administered via telephone or written responses. This survey goes beyond mere satisfaction ratings to obtain information on reasons *why* families are dissatisfied, which will help guide recommendations for improvements in the service system (Roberts, Innocenti, Judd, Taylor, & Morris, 1998). The survey obtains responses using discrete counts, Likert-type scales, and open-ended responses and took approximately 30-40 minutes to complete. The telephone version of the survey was administered to all of the Spanish-speaking families using a translator well trained in ensuring that the questions and responses were fully understood and captured.

Results re: Family Outcomes. Survey items were analyzed based on "domain" scores derived from items that had addressed a common aspect of the early intervention system or service coordination and for which items were strongly inter-correlated. As shown in Tables 14

and 15, families across all the sites and models reported high ratings for accessing needed services, contacting their service coordinator to make changes in child's services or IFSP. Families in general rated their service coordinators as helpful and understanding, and they considered the early intervention program overall to fit well with their family routine. The families from the Independent Model scored statistically significantly lower than the families from the One-stop or Combined-roles model on several of the domains pertaining to their service coordinator in particular; there were no statistically significant differences between the One-stop Model and the Combined-roles model on the family survey domain scores, although in general the Combined-roles scores appear slightly higher. Also worth noting is the difference within the One-stop model. Site B, the One-stop site that used a combined-roles model of service coordination, had the highest scores compared to the other sites on all but one of the domains. This is also the site that had the most educated service coordinators with the smallest caseload

Table 14
Family Outcomes: Family Survey Domain Scores by Site

Program Site	One-Stop Shopping		Combined Roles		Independent	
	A x̄ (SD)	B x̄ (SD)	C x̄ (SD)	D x̄ (SD)	E x̄ (SD)	F x̄ (SD)
Satisfaction with getting connected to EIP (8 possible points)***	7.2 (1.0)	7.3 (0.9)	7.4 (0.9)	7.5 (0.9)	6.1 (1.4)	7.1 (1.4)
Evaluation satisfaction (8)	6.8 (1.2)	7.3 (1.1)	7.1 (1.1)	6.9 (1.4)	6.8 (1.0)	7.1 (1.1)
Ease of contact and changes (8)***	6.6 (1.2)	7.4 (0.8)	7.0 (1.0)	7.2 (1.0)	6.1 (1.3)	6.7 (1.0)
SC as helpful (36)***	32.0 (3.1)	33.5 (2.4)	32.6 (1.4)	33.6 (2.9)	30.2 (5.2)	32.4 (4.2)
Providers and location (8)	6.8 (0.6)	7.2 (0.6)	7.0 (0.3)	7.0 (0.7)	7.1 (0.5)	6.8 (1.2)
EI fit with family routine (16)***	12.9 (2.3)	15.3 (1.5)	14.7 (1.5)	14.7 (2.4)	12.6 (2.3)	14.1 (2.0)
Family routine index (20)***	14.1 (3.7)	17.4 (3.1)	16.8 (2.8)	16.3 (2.8)	13.8 (4.2)	14.5 (4.5)
Transition preparation (12; n=79)*	8.5 (2.4)	10.6 (1.4)	9.2 (2.6)	9.7 (2.4)	8.0 (2.4)	10.3 (1.5)

* p< .05
** p < .01
*** p ≤ .001

Table 15
Family Outcomes: Family Survey Domain Scores by Model

Dimension	One-Stop Shopping	Combined Roles	Independent
	x̄ (SD)	x̄ (SD)	x̄ (SD)
Satisfaction with getting connected to EIP (8 possible points)***	7.2 (.94)	7.4 (.89)	6.6 (1.5)
Evaluation satisfaction (8)	7.0 (1.2)	7.0 (1.2)	6.9 (1.0)
Ease of contact and changes (8)***	7.0 (1.1)	7.1 (.96)	6.4 (1.2)
SC as helpful (36)**	32.8 (2.9)	33.0 (2.1)	31.3 (4.8)
Providers and location (8)	7.0 (.63)	7.0 (.51)	7.0 (.89)
EI fit with family routine (16)**	14.1 (2.2)	14.7 (1.9)	13.4 (2.3)
Family routine index (20)***	15.8 (3.8)	16.6 (2.8)	14.1 (4.3)
Transition preparation satisfaction (12; n=79)	9.3 (2.3)	9.3 (2.6)	9.3 (2.2)

* $p < .05$
** $p < .01$
*** $p \leq .001$

size, who were reported to have contacts with families on a weekly basis, and the site associated with one of the highest cost per child for service coordination.

Introduction to the Ecocultural Family Interview (EFI) (Methodology developed by the Ecocultural Scale Project; 1997) was used to assess family quality of life and family capacity to address the daily requirements of having a child with special needs. It was used to measure the extent to which SC models support the sustainability, meaningfulness, and congruence of family environment over time, as well as the degree of accommodation the family makes from its daily life due to the child's special needs. Trained interviewers conducted one-hour interviews conducted in the homes of 10 families from each of the sites. Another trained rater participated in the interviews, taking notes and then rated each family on ten dimensions. Ratings for individual items are based on an 8-point Likert scale with 0-2 reflecting little activity or evidence of the activity, 3-5 reflecting moderate activity or evidence, and 6-8 reflecting a high degree of activity or evidence. Scoring of the EFI averaged about 2½ hours per interview.

Results re: Ecocultural Family Interview. The researchers identified 4 of the 10

dimensions as most relevant to this service coordination outcomes study, and these results are provided in Tables 16 and 17.

Table 16
Family Outcomes: Ecocultural Family Interview Composite Score Dimensions by Model

	One-Stop Shopping (n=22)	Combined Roles (n=20)	Independent (n=21)
Dimension	$\bar{x}$ (SD)	$\bar{x}$ (SD)	$\bar{x}$ (SD)
Subsistence			
Resilience of Subsistence Base	3.5 (2.3)	3.9 (1.9)	3.5 (2.4)
Adequate Resources for Services	7.0 (1.2)	6.6 (1.8)	6.3 (1.7)
Effect of Child on Work	3.6 (2.7)	3.0 (2.6)	3.8 (2.6)
Services			
Multiple Service Involvement	3.6 (2.0)	3.2 (1.8)	3.8 (1.3)
Early Intervention Involvement	3.2 (1.8)	3.8 (1.2)	4.0 (1.6)
Non-disabled Network			
Involvement of Child in Non-disabled Network	4.6 (2.1)	5.7 (1.9)	4.9 (2.1)
Support			
Religious and Professional Support	3.5 (2.2)	3.4 (2.2)	4.2 (2.5)
Mother Household Help	2.3 (1.8)	1.3 (1.3)	2.4 (1.7)
Service Coordinator Support	4.3 (2.4)	4.3 (1.8)	3.2 (2.0)

Table 17
Family Outcomes: Ecocultural Family Interview Composite Scoring Dimensions by Site

	One-Stop Shopping		Combined Roles		Independent	
	A	B	C	D	E	F
Program Site	$\bar{x}$ (SD)	$\bar{x}$ (SD)	$\bar{x}$ (SD)	$\bar{x}$ (SD)	$\bar{x}$ (SD)	$\bar{x}$ (SD)
Resilience of Subsistence Base	2.6 (1.9)	4.6 (2.3)	3.7 (2.3)	4.1 (1.5)	2.8 (2.4)	4.2 (2.3)
Resources for Services	6.3 (1.3)	7.7 (0.5)	6.3 (2.3)	6.8 (1.2)	6.2 (1.6)	6.3 (1.9)
Effect of Child on Work	4.0 (2.7)	3.2 (2.7)	3.6 (3.1)	2.4 (1.9)	3.0 (2.2)	4.9 (2.6)
Multiple Service Involvement	3.4 (2.2)	3.7 (1.8)	2.9 (1.7)	3.6 (1.8)	3.6 (1.3)	4.0 (1.4)
Early Intervention Involvement	3.3 (1.9)	3.1 (1.8)	3.6 (1.3)	4.1 (1.0)	3.3 (1.0)	4.7 (1.8)
Involvement of child in nondisabled network	5.1 (1.7)	4.1 (2.4)	6.1 (2.1)	5.2 (1.6)	4.8 (2.0)	5.1 (2.3)
Religious and Professional Support	3.3 (2.0)	3.8 (2.4)	2.7 (2.2)	4.1 (2.0)	4.0 (2.6)	4.4 (2.4)
Mother household help	2.2 (2.0)	2.4 (1.6)	1.5 (1.5)	1.2 (1.0)	2.0 (1.6)	2.9 (1.8)
Service Coordinator Support	3.7 (2.6)	5.2 (1.9)	4.7 (2.1)	3.9 (1.3)	2.9 (1.7)	3.6 (2.3)

No statistically significant differences were found between models or across sites, although the *service coordinator* support dimension neared statistical significance for Site B, the One-stop model which also used combined-roles service coordinators with small caseloads. Still, these data provide insight into the challenges faced by these families. In terms of *subsistence*, families in general were rated as having moderate subsistence in terms of their income, ability to pay bills, and have adequate resources on which to live. In terms of adequacy of cost and access to needed health care and intervention, families were rated as having most of these costs covered. Families needed to make some accommodations in their work arrangements due to the needs of their child. In regard to the *services* dimension, families reported some—but not a lot—of involvement in getting and using services to address their child's need; families made reference to being involved in their child's services, but it was not a dominant activity in the daily lives. Under the *nondisabled* network domain, families described moderate activity in getting intentionally involved with typical, nondisabled activities, although it was not a dominant theme in their lives. The ratings on the *support* dimension reflect that religion is somewhat of a support, but not a strong one. The mothers interviewed reported that they received little help from others outside the home in managing the domestic workload. The average rating for *service coordinator support* reflected moderate support.

The researchers recognize the value of the EFI as a potentially rich qualitative measure that provides a great deal of insight into the stories behind the quantitative findings, shedding light on the specific ways that Early Intervention and service coordination plays a role in the lives of families. Further analysis is planned to explore the relationship among the eco-cultural family dimension scores, family socioeconomic factors, as well as the other child and family outcomes. Further analysis will occur with these data beyond the end of this project.

Objective 4: Describe the critical variables influencing the system outcomes,
direct service outcomes, and child/family outcomes.

This objective explored additional influences beyond the service coordination model alone and considered other variables that may be attributed to the differences in the outcomes. The system outcomes appeared to be influenced by the history of inter-agency collaboration and the presence of strong leadership. In turn, the system outcomes appeared to influence to the direct service outcomes (i.e., the array of services provided to families as well as the intensity of hours of service). The One-stop model provided slightly more services than the other models (although there was great variability within the Independent model) and the One-stop model was associated with a greater intensity of services.

The characteristics of the service coordinators most likely had the greatest influence on the cost of service coordination as the direct service outcome. The One-stop Model, followed next by the Combined Roles model had staff with the greatest years of experience and highest education levels.

Caseload size also is tied to cost as well as the frequency of contacts with the family (a direct service outcome). This in turn may be influencing the family well being outcomes; those families who receive the greatest number of contacts with their service coordinator and who are served by more experienced coordinators appear to have the highest scores on the measures of family well being.

To investigate the factors influencing the family outcomes, a regression analysis was conducted. First, a "reduced-item family well being survey score" was created based on a factor analysis of the survey's linear rating-scale items (Chronbach's Alpa equaled .91). Next, this reduced-item score was used as the dependent variable in a logistic regression analysis, taking into consideration variables that were known to vary across models (such as the model itself,

caseload size and average number of services provided to families) as well as family demographic characteristics that are suspected as influencing family outcomes, i.e., income, mother's education level. The results showed that the model of service coordination, service coordinator caseload, family income, and mother's education did not have a statistically significant effect on the family well being survey score. However, the number of services received by the family did have a statistically significant on the dependent variable.

These regression analyses provide valuable insight into one of the key factors that most likely is driving the differences in family well-being scores, yet this requires further investigation; future studies are needed that could empirically test the impact of services received while keeping the model constant.

Objective 5: *Disseminate an evaluation framework that will assist communities and states in developing an efficient, responsive service coordination model.*

Over the course of the 3-year grant period, numerous presentations were made to the sites as well as at national conferences. Descriptive information for each of the sites was presented via onsite visits. A teleconference is scheduled to be conducted with all the sites to share the results of the model comparisons; this is delayed due to difficulty in coordinating schedules across the sites. A list of presentations at national conferences is provided below:

Behl, D, Malone, M. D., Bruder, M. B., Gallagher, P. A., Roberts, R. N., Van Buren, M. (2004, December). *What does research tell us about implementing effective service coordination strategies?* Paper presented at the Division for Early Childhood Conference, Chicago, IL.

Roberts, R. N. (2005, May). *Service coordination can make a difference: Families tell us how.* Paper presented at the YAI National Institute for People with Disabilities, New York City, NY.

Roberts, R. N., Behl, D. D., Goetze, L. D., Johnson, R., Gordon, M., & Nordfelt, E. (2005, March). *How Important are Early Intervention Service Coordinators in the Lives of Families?* Paper presented at the annual PAC*RIM Conference, Honolulu, HI.

Roberts, R. N. (2005, February). *Leadership: Setting The Context For Change.* Paper presented at the annual Conference of the Association of Maternal and Child Health Programs, Washington, DC.

Roberts, R. N., Behl, D. D., Goetze, L. D., Johnson, R L., Gordon, M., & Nordfelt, E. (2004, December). *An Outcomes-Based Approach to Evaluating Part C Service Coordination Models.* Poster presented at the Division for Early Childhood Conference, Chicago, IL.

Roberts, R. N. (2004, May). *Fulfilling the promise of the law: A coordinated system of care for young children and their families.* Paper presented at the Interagency Autism Coordinating Committee Meeting, Bethesda, MD.

Roberts, R. N. (2004, April). *Critical practices in early intervention and early childhood special education.* Paper presented at the NECTAC Conference, Tampa, FL.

Roberts, R. N. (2004, February). *R. T. research is like a carnival gopher game: How do you keep the unexplained variables from popping up?* Paper presented at the annual Conference on Research Innovation in Early Intervention (CRIEI), San Diego, CA.

Roberts, R. N., Behl, D. D., Goetze, L. D., & Johnson, R. (2004, February). *An outcomes-based approach to evaluating Part C service coordination models.* Paper presented at the annual Conference on Research Innovation in Early Intervention (CRIEI), San Diego, CA.

Roberts, R. N., Behl, D., Goetze, L., Groseclose, C., & Johnson, R. L. (February, 2004). *An outcomes-based approach to evaluating Part C service coordination models.* Paper presentation at the Conference on Research Innovations in Early Intervention, San Diego, CA.

Behl, D., Goetze, L., Roberts, R. N., & Johnson, R. L. (November, 2003). *New methods to evaluate different service coordination models for infants and toddlers with special needs.* Paper presentation at the Annual AEA Conference, Sparks, NV.
2003
Roberts, R. Behl, D., and Akers, A. (October,). *Breathing Action Into Research! Using Participatory Models to Improve Community-Based Systems.* Division for Early Childhood Conference, Washington, D.C.

Roberts, R., Behl, D., Goetze, L., & Harlacher, J. (2002, March). *An Outcomes-Based Approach to Evaluating Service Coordination Models.* Poster presented at the Early Intervention Research Institute Conference, Utah State University, Logan, UT.

In addition, a telephone conference presentation and discussion was held simultaneously

with the principal investigators and representatives from all six of the research sites. This served

as an opportunity to not only share the findings, but it served to obtain feedback from providers

and administrators in regard to interpreting the results. In general, the response to the results was

very positive. Participants said that they found the information extremely valuable in terms of helping them make future policy decisions regarding service coordination. Another benefit of this conference call was the initiation of conversation among the research sites. In fact, future conference calls are planned among these site participants which will serve as a "learning community" to support community-level issues faced among early intervention programs.

Conclusions and Discussion

This study is one of the first to present a full overview of different models of service coordination within ongoing community-based early intervention programs. Descriptions of two different sites for each of three different models have been presented and compared. The sites are described within the context of: (a) the communities and systems in which the programs operate; (b) the families enrolled in the programs and the services they receive; (c) the costs of service coordination for each model distinct from the costs of the services and other supports to families; (d) the outcomes achieved for families and children; and (e) other factors besides the service coordination model itself that influence family outcomes. These data provide a realistic picture of this important component of early intervention services for policy and practice. Examples of how the results of this study can inform decision making are described in this section.

There is no objective way to determine if the six sites who so graciously allowed us to work with them for three years while conducting this study are representative of the early intervention programs with similar models in the field at large. These programs may be different from other programs using a similar model of service coordination because of the requirement to meet the criteria for our data collection process and their openness to working collaboratively with us. Unlike a state level evaluation, these programs had no mandate to cooperate with the researchers but did so in the interest of moving the field further and by seeing it as an

opportunity to learn more about the effectiveness of their particular programs. For their willingness to participate and the wonderful collaboration that was evidenced in the process, we thank them profusely.

Summary of Findings and Their Implications for Service Coordination

   Contextual variables. Contextual variables are those that represent ecological constraints and opportunities that help shape the possibilities of successful services and supports for families. They are not directly causal but do define the history of the community and the resources that can be drawn upon as programs develop and mature. As we have conducted interviews at several different levels and reviewed pertinent documents, we have looked for those examples that set the stage for ongoing program development and change. Tables 2 (p. 6) and 3 (p.10) clearly suggest that exemplars of each of the models of service coordination exist in very different community and systems settings. In general, the variability among community and system characteristics within models is at least as great as that between models.

   However, one contextual variable that varies consistently across models involves the **historic leadership and collaboration** variable. These two variables describe the history of working together within the service sector; and, both the type and strength of local leadership. The two programs in the one-stop model were associated with communities with high ratings in their history of collaboration and leadership. This distinguishes them from communities that sponsored combined roles and independent models of service coordination where both of these variables were rated as low or moderate at best. This difference by model makes sense. The One-stop model requires that community partners have strong leadership and have learned to collaborate before the one stop model can be developed into a program. A history of both leadership and collaboration are setting events for one stop centers to be considered as a viable

service model.   In earlier work (Roberts, Akers, & Behl, 1999), case studies of service delivery systems clearly documented the need for a high level of collaboration and leadership prior to and during the development of communities one-stop centers because the co-location of so many services and supports within one location is a complex administrative and collaborative exercise. The choice of which services and supports should be co-located requires both effective leadership, a willingness to work together that fosters a cultural norm for joint planning funding and program operations in a collaborative manner, and a thorough understanding of the clientele who will be served. One stop centers developed with little forethought to these considerations including the shared costs and finances will lack important services needed by families and defeat the purpose of the one stop center. Discussions with families and providers are necessary in order to ensure the appropriate mix (Roberts et al., 1999). These conditions were met by both examples of the one-stop model in this study.

Combined roles and Independent models may exist within communities where programs act fairly independently. There may be information sharing and some joint activities such as training across programs, but the service coordinator is assumed to provide coordination at the family level while other interagency frameworks must provide it at the agency levels if it is provided at all. Neither model in this study reflects strong interagency activity, though there is evidence that the councils do meet and share information. In other work, researchers have used a continuum of service system integration that moves from no community to very formal models of integration. Information sharing is the lowest level of the collaborative integration strategies. The data show demographic descriptors vary widely within each model and may not be related to the degree of systems integration in place.

The service coordinator characteristics are tied to the models as well the systems

characteristics. In this sample, one stop models have more experienced and more educated service coordinators than the other two models. The independent model is much more likely to use service coordinators with less formal education (AA degree). The independent model also has the highest case loads by a factor of at least 1.5. In summary, service coordinator characteristics such as skill level, job descriptions and the settings in which they worked differed most dramatically between the Independent model and the other two models.

This suggests that not all contextual variables are associated with specific models of service coordination. Rather, several key factors seem to be significantly related. These include the degree to which the community collaborates in service delivery, the strength of program leadership, and whether the job descriptions/required formal training of the service coordinators. Each of these variables are contextual factors that appear to discriminate among models.

Outcomes

With respect to **systems-level outcomes,** it is apparent that history and context matter. One stop models are much more likely to have strong working local interagency councils with a history of strong leadership and collaboration. As a result of the co-location, other fruits of the collaborative process are also evident through shared IFSPs and data systems. Again, these activities can only be successful and are more likely to be seen as important when agencies have reason, opportunity and mandates to do so. Being all together in the same location as a function of a common history of leadership and collaboration provides the conditions for a set of mutually dependent programs. It is not that the independent or combined roles models somehow constrain programs in the collaboratives. It is simply there is no strong press mandate or perceived need.

Direct service outcomes. The prime indicator of the frequency of family contacts by service coordinators appear to be the caseload size, which was somewhat independent of the

model. Frequency of SC contacts is discussed more fully in the next section on family and child outcomes.

Across the board, it is remarkable that relatively little of the service coordinators' time is reported to be spent engaged in the critical tasks within their job description. These include: finding resources, IFSP development, parent education and support, and assisting families to take advantage of natural settings within the community and the families' everyday routines to increase the developmental outcomes for their children.

Though there was some variation across sites, the overall finding is that when the time spent on these activities is added together, it still makes up less than a quarter of the time SCs dedicated time to service coordination activities. Given that these tasks are the central reason for the positions they hold, it is of concern that the time spent in accomplishing them is so minimal. Rather, the time diary logs suggest other more bureaucratic tasks continue to fill up much of their time dedicated to service coordination. These findings were confirmed for all three models of service coordination. In the dedicated service coordination model this finding is particularly surprising due to the relative lack of conflict with other duties. There may be other influences, such as extensive travel time and other administrative duties; even so, the percentage for these core tasks is low.

Child and family outcomes. Since the stated goals of the Part C system include enhancing child development, increasing parent competence and the overall well being of the family, we have examined these outcomes as the endpoint in our contextual framework.

Child development outcomes.   Several findings are important with respect to this outcome. To the extent possible within the capacity of these early intervention programs to assess child developmental outcomes, these data are reported as child developmental change

scores spanning roughly the 18 months each site was directly involved in data collection. For a number of reasons, even these very good sites had limited capacity to report these data. Child development outcome data based on a review of hardcopy client files had to be constructed by the research team for almost all of the children in each of the sites. Even though the enhancement of child development is one of the major rationales for the Part C program, these six sites were unable to provide evidence to document their effect on child development. Most programs did not track child development over time in a measurable way. There are many possible reasons for this. In states were there is presumptive eligibility by diagnostic categories, we frequently found that programs felt no need to establish a developmental baseline. Developmental testing data was not relevant for entry into the program, even though it should have been a critical element in the development of the IFSP. In many cases, parent report and clinical observation were believed to be more helpful in guiding interventions than more formal evaluations. Based on the traditional developmental data gathered in this study, there is little evidence that the Part C sites influenced the developmental growth rates of children. However, it is possible that other measures of child development (i.e., functional measures) may be more sensitive indicators. However, the use of such tools by early intervention programs on a large scale is weak. Further studies designed to capture child development are most likely going to have to administer their own assessments.

Family outcomes. Parent and family data collection involved measures that were developed and collected by the researchers for each subject enrolled across the sites. These data were under our control and thus much more complete for the targeted children specific to a given program. In general, families across all the models and sites reported high ratings of their service coordination and other services received. The families from the Independent model did report statistically significantly lower scores on the family survey. As noted in the report of the

regression analysis, the number of services families reported they received had the strongest effect on the family well being survey. However, it important to remember that there were relatively high survey scores (reflecting generally high ratings of the services and supports received) among families across all the models, and the degree to which this effect is functionally meaningful requires further investigation and replication.

The project design was built on the strengths of the existing natural variations in service coordination models that realistically exist in the field today. Part C law gives states and localities broad discretion in who can carry out service coordination activities, what their caseloads will be and the focus of their activities. This means that we have been able to identify sites that differ on the key variables for the study. As a result we have found that the model is associated with several key outcome variables. For example, the independent model is less expensive and services provided to families were rated lower in several key areas, such as service coordination is helpful, than services provided through the other models. At the same time it is difficult to hold constant other key variables, such as caseload and training, which would be theorized as strongly connected to family outcomes and cost without doing a rigorous randomized experimental trial. There are many challenges to doing randomized trials. One of those challenges is that they can be very expensive. It would be very interesting to implement the independent model comparison, for example, with caseloads more similar to those found in the blended models. However, programs cannot afford to pay for changing those caseloads and often the grant awards do not come close to awarding adequate funds to pay for such service differences.

The costs of service coordination. Existing Part C service coordination models have been adopted without empirical evidence about the costs and outcomes associated with each. Part C

administrators looking for cost-saving methods face difficult choices about restricting eligibility of the children and families served or altering the way that services are delivered. The Part C law provides flexibility in terms of coordinator education, experience, and caseload size, providing administrators with ways to reduce costs by substituting expensive therapists for with less-credentialed lower-salaried service coordinators. Other communities may be faced with using hiring less experienced, lower-salaries service coordinators because of cost and more because of a shortage of qualified therapists in their localities. Knowledge about the consequences of such decisions for services as well as outcomes for family and child outcomes children and families should really come before such decisions are made.

Future Directions

The findings from this study suggest that the model of service coordination does affect cost and family outcomes although the results for child outcomes are equivocal. Are the higher family outcomes worth the additional cost, or is there a service coordination model that can be implemented that achieves relatively positive family outcomes for an affordable cost? The combination of variables used in Site F of the Independent Model is a good example of this cost/ effectiveness conundrum. Service coordinators in this is model were the lowest paid and had the largest case loads of any in the study. Parsing tasks by skills and levels of training may be one way to deal with this issue though more study is needed to understand the effects of case load and experience in the service coordination role with respect to such variables as family and community knowledge and the administrative versus the therapeutic sides of service matching and coordination with family needs.

There are limitations to this study which point to the need for further research. For example, we did not evaluate the costs and effects of an independent service coordination model

where the service coordinators maintained relatively low caseloads of families. It would not be surprising if families gave higher ratings to their service coordination services in an independent model where the providers were spread across fewer families. We also did not document other key factors that might influence the way that service coordinators in the study spend their time—such as financing sources and regulations. There may be local and state policies in place in different areas that are driving paperwork and reducing the amount of time that service coordinators have available to spend in direct service to families. Future research should include a more detailed evaluation of the specific administrative activities that are required in each program. A thorough review of the paperwork requirements of each program would be worthwhile and might reveal key differences that may or may not be associated with the service coordination model.

The Part C finance requirements can be burdensome for service coordinators and others in state and local programs. The law requires that Part C funds be used only as payor of last resort and requires that other funds, such as Medicaid, be billed prior to Part C dollars. States and localities vary widely in the degree to which they have adopted these provisions as well as whether those funds are chased at the local or state level. These differences may have a strong influence on individual service coordinator paperwork responsibilities. Many have argued that these Part C finance requirements also have a negative influence on parent-provider relationship and that discussions of family income are stressful for both the provider and the family. States and localities vary in their family cost participation policies and Part C allows broad discretion in how these policies are implemented. These are additional variations that need to be studied to achieve a more complete understanding of which Part C program model variables are influencing key outcomes like cost and family well-being and child developmental outcomes.

There are many new research questions that the researchers intend to explore with the data from this study, particularly in terms of the effects of service coordination for subpopulations. For example, an analysis of the relationship among models, direct service outcomes, and child severity/diagnosis is of interest. Exploring the influence of other variables, such as family characteristics, on the outcomes also is warranted.

Replicating this study in other communities to demonstrate consistent findings associated with these service coordination models is important. Additionally, the researchers are interested in applying this conceptual framework to the evaluation of other service coordination models, varying the geopolitical characteristics and political characteristics, such as the lead agency.

Although these findings are preliminary and have yet to be replicated, they do provide important information to policymakers, providers, and families to help guide early intervention programming decisions. First, this study speaks to the importance of service coordination in the lives of families and therefore it deserves critical attention as a key component of the service system. The findings point to the importance of considering caseload size and the amount of time that service coordinators are given to establish a relationship with families. Therefore these data can be valuable when communicating with state and community level policy makers who are looking toward quality improvement strategies. The findings revealed gaps in the extent to which the Part C system is providing for the comprehensive needs of families. A very small number of families in this study received mental health, respite, and collaboration with their medical home; this points to the need for a critical look at how Part C can address this gap. Finally, early intervention programs and researchers need to be armed with evidence that service coordination and early intervention are achieving desired outcomes. States and communities face increasing demands that they demonstrate accountability for achieving desired outcomes. As demonstrated

by this study, too many programs do not have the documentation to monitor child as well as

family outcomes and thus demonstrate their effectiveness. Ultimately, it is the hope of the

researchers that this study has provided insights into the aspects of service coordination and the

broader service system to guide improved services for children and families.

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