

The Impact of Services Integration: Outcomes in Two Early Intervention Programs

by

Antonio V. Fevola

BSW, University of Pittsburgh, 1988

MSW, University of Pittsburgh, 1990

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UNIVERSITY OF PITTSBURGH

SCHOOL OF SOCIAL WORK

This dissertation was presented

by

Antonio V. Fevola

It was defended on

September 28, 2006

and approved by

Morton Coleman, Professor Emeritus, School of Social Work

Hidenori Yamatani, Professor, School of Social Work

Stephen Bagnato, Professor, School of Medicine

Thesis Director/Dissertation Advisor: Lambert Maguire, Professor, School of Social Work

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Antonio V. Fevola, PhD

University of Pittsburgh, 2006

Abstract

The aim of this research is to understand the factors that enhance and improve outcomes for children in early childhood intervention programs (ECI). This will be done by measuring the impact of the integration of services for children, especially children at developmental risk and/or with developmental delays/disabilities. This research will use existing early intervention data from two different early education programs in Pennsylvania, one which is identified as “Fully Integrated EC Program” and the other as “Consultative Ad-hoc- EC Coordinated Program”. The hypothesis being tested is that fully integrated program initiatives will show significantly better child and family outcomes than the more traditional consultative-ad-hoc community-based early childhood programs. The data will be analyzed using both descriptive statistics and multivariate analyses. The results have implication at the agency and practice levels as well as at the policy and funding levels. This study will also contribute to advance understanding and knowledge of best practices in early childhood intervention and education programs.

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PREFACE

School reform policies targeting pre-school, kindergarten and elementary education are increasingly an integral part of a larger spectrum of social interventions aimed at preventing poverty, underachievement, and crime (among other things). New studies in the fields of early childhood education and intervention have contributed to the understanding that better education in the early years of a child's life leads to significant achievements in later life. Notwithstanding the increased commitment to early childhood intervention and education, the disparate and at times contradictory results on both the short-term and long-term effects of early childhood intervention are still baffling to researchers, policy makers and other interested stakeholders. One of the central themes that emerge from the debate over the effectiveness of early intervention is that enhancing the quality of early childhood intervention programs requires innovative partnerships providing integrated services. There are a number of questions that must be answered in evaluating ECI/ECE programs, including – What does integration of services mean? How do we know when a program has achieved integration? The term “integration” in this context is very loose and elusive. The highly varied definitions of the term cause “integration” to become almost a common utterance in the everyday language preempted of meaning. It is used to connote “coordination”, “case management”, “comprehensive services”, “one-stop shop” and “collaboration/collaborative systems”. It is clearly a challenge to formulate a precise definition of the term as it relates to the social and human services field. For example, can we definitely say that because county programs are all in one place or location (i.e., the one-

stop shop model) that the associated system or programs are integrated? In fact, if the physical proximity has not resulted in a high degree of collaboration, open communication channels, interaction, and lessening of red-tape, the one-stop-shop approach is a nice-sounding label, but hardly an example of integrated programs. Similarly, the mere institution of case management and services coordination managers by a community-based agency may not be capable of providing their clients with a seamless continuum of services. Another element that contributes to the confusion around the term “integration” is that experts use it in many instances to discuss cost-cutting and promoting efficiency in means-tested, poverty-based programs. The fundamental question that arises from this morass is how can integration be achieved and sustained when our society continues to perpetuate different standards for the poor and the rich, the disabled and the non-disabled, the public and private health. When dealing with the lives of children, it is perhaps not integration that should be the goal but rather universalism (i.e., eligibility-free access to all children regardless of their parents’ income brackets).

In spite of the semantic challenges that surround the term integration, within the context of early childhood intervention, a need exists to identify, measuring and documenting its existence, especially for children at developmental risk and with developmental delays/disabilities (Head Start Bureau, 2000). Hence, whether integration is perceived as a condition, a strategy or a mechanism; schools, families and the community in general consider services integration to be vital for improving the quality of education, programs and outcomes for children and families. Integration is achieved and sustained through the efforts of public and private partnerships and investments. At the national level, programs designed to create and augment integration of services include Head-Start (HS), Early Head Start (EHS), and Full-

Services Schools (FSS). State and local initiatives include Better Beginning, Success by Six, and Focus on Future, among others. The goals and objectives of integration in these programs are reasonably consistent: namely to bring about improvement in the lives of poor/low income children and families through enhancing the quality of education and services. Another important aspect of recent education policies has been to increase the efforts to be as integrative and ecological as possible by reaching out to the families and to the children's immediate environment.

Two pre-selected community-based entities which have definitively different programmatic characteristics and two distinct interpretations of the terms "integration" were chosen to explore and assess the impact of integration. The aim of this study is to analyze how different types of organizational strategies might be best suited for achieving and sustaining improvement in the overall outcomes for children and their families. Whatever the outcome of this research, the goal is to contribute towards furthering our understanding of the effect of structural variables in the case of integration of education, health and support services. At a more personal level, I hope that this research will be viewed as an heuristic discourse to learn, discover and understand how can we work together toward a more anthropocentric, humanistic and universal social design in early childhood intervention and education..

I conclude this Preface by sharing a personal thought about the quest for understanding as it relate to thoughts and questions that raced in my mind as I proceeded in this research efforts:

Searching in our contradictions for solutions with a sense of urgency, and yet, with much confusion, frantically searching for answers to complex as ephemeral human conditions. Under a pile of contorted manifestations censored by centuries of pride and prejudice and consumed political hegemonies, there lies the boiling sufferance of humankind. Dormant like the magma of

a burden volcano, this sufferance intermittently smokes, buffs and then asunder explodes and with it, for the shortest of moments a glimpse of the truth erupts, for many too violent to understand and for others too short to remember. Despite it all the search consumes those who believe that all will not be in vain (A. Fevola, 2001).

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There are many people who I have crossed in my “learning path”, all of whom have contributed in no small measure to my growth and development into becoming a better human being. I would like to acknowledge each of the following people and to extend to each my heartfelt gratitude.

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As I moved onto further learning, I also had the fortune to meet new challenging minds at the School of Social Work of the University of Pittsburgh. First among these was Dr. Moe Coleman, through whom I came to understand the structure and the inner workings of American cities, culture and communities. His support and guidance was fundamental and has lasted throughout my educational and life experiences. My thanks are also extended to Dr. Jim Cunningham who contributed to strengthening my understanding of the economics of the welfare state.

For my appreciation of the field of social and community-based research, I must thank Dr. Hide Yamatani and Dr. Adrian Melzer. Dr Yamatani helped me to understand that research was not about finding causes as much as explanatory pathways. As a novice, I cannot hide the initial confusion I felt as I attempted to grapple with “third intervening variables”, “moderators”, “suppressor effects”, and “mediating” variables. Dr. Yamatani’s technical guidance, support and valuable suggestions were also critical for this research project. Dr. Melzer’s insights and teaching were a true gestalt and changed my way of understanding social phenomena and caused me to continuously question causal links. Concept like “bounded rationality”, “symbolic actions”, and “perspectives by incongruity” remain instilled in my mind as the result of his teaching.

My gratitude goes also to Dr. Steve Bagnato, whose insight and guidance came at a time when I needed focus and new learning challenges. These gifts, along with his availability and friendship, were of enormous help in moving this work along and me toward completing this learning cycle.

I was also fortunate to have special friends who provided support in moments of doubts and consternation. Among these, I extend a warm and loving thanks to my bygone friend, Suresh Konda, for his patience and love towards me and my family. Also, I am indebted to Cheryl Bartko for providing guidance in navigating the administrative mazes of the University and her friendly support in pressing me to “stick with it”! My gratitude and thanks go, in particular, to my partners in crime, Leo Hitt and Antonio Coppola. Antonio was always there to help me wrestle with my doubts using words and, when needed, a good grappa. Leo had to endure most of my wrath, while patiently editing and making sense out of my long-winding English-Italian sentences and, most of all, sitting through my lectures on how to solve the social security crisis and/or the health care crisis. Thank God, the wine was good!

Without doubt, the most important people whom I must thank are my family. First and foremost, I am grateful to my wife and above all friend Anna who stood by me all through these years providing a source of strength and courage. Also, my love and gratitude goes to my children, and, in particular, my son Kiernan who had to endure my mood swings and stress. His love, intelligence and presence were a comfort to me that will never be forgotten. My little ones, Martina and Leyla made all the gray days sunny with their smiles and voices. My mother and late father taught me the important values of friendship, loyalty, hard work and endurance.

Last and certainly not least, I would like to conclude this acknowledgement by dedicating this work to my mentor, adviser and, above all friend, Dr. Kiernan Stenson. His persistent and heartening belief in my ability was inspirational in the truest sense of the word and enriched my growth and formation as a professional certainly, but above all, as a person, every

step of the way. While he prematurely left this life, our heated discussions during classes, in the warmth of his pipe smoked filled office, or over a Jameson's in a pub, are forged in my memory for ever. His Socratic method instilled inquisitiveness and critical thinking deeply within me as we discussed the works of John Kenneth Galbraith, Gunnar Myrdal, Lewis Mumford, Karl Marx, Christopher Pierson, Jürgen Habermas, Robert A. Caro, and many others. I will never forget his matter-of-fact approach, and his way of ending every discussion with a loaded question (to be the topic at our next encounter) or with a maxim when he sensed frustration in my questioning. One of the maxims that stands out in my mind he uttered when he came to visit me in Ireland where I was finishing my Masters Degree as an exchange student at the University College of Dublin. As we reached one of our many impasses discussing the permanence of poverty, he smiled and then stated, in his droll way :<< Dear friend, if shit had a value, poor people would have been born without an ass >> leaving me to once again ponder over the meaning of a brief, yet image-laden, syllogism. Thank you my friend, and good-bye!

1.0 INTRODUCTION

One of the central themes that continue to emerge in the debate over the effectiveness of early intervention is that enhancing the quality of early childhood intervention programs requires innovative partnerships for integrated services. The efforts and attention need to be shifted from ascertaining whether early childhood intervention programs work, to what design, and/or structural factors makes them work, how and for whom (Reynolds, and Temple, 2005; Guralnick, 2005; Guralnick,1993; Shonkoff, Houser-Cram, Krauss and Upshur, 1988). That is, ask not what early intervention can do, ask for whom, when and how early intervention can work. There is very limited research addressing how integrated services impact children and family outcomes, which highlights the need for more field-based evidence on early intervention and education programs. The Commonwealth of Pennsylvania has been among the few states that have invested in child and family outcomes, and conducted evaluation on the subject (e.g., Bagnato et al., 2002). None of these past reports have examined specifically the impact of services integration in contributing toward more positive outcomes. The United States is not alone in the renewed interest in evaluating quality, cost, efficacy, and outcomes of early care and early education programs. Both nationally and internationally the debate over increasing accountability, documenting and evidencing the quality and efficacy of early intervention, especially for children at a developmental risk, has found renewed interests (Bagnato, Suen, Brickley, Smith-Jones & Dettore, 2002; Bryant & Maxwell, 1997; Christian, Morrison, & Bryant, 1998; Clifford, Peisner-Feinberg, Culking, Howes, & Kagan, 1998; Gil & Reynolds,

2000; NICHD,1999; Barnett, 1995; Bryant & Maxwell; Campbell & Ramey, 1995; Farran, 2000; Marcon, 1999; Schweinhart & Weikart, 1997; Clifford, et al., 1998; Bagnato, Neisworth, & Munson, 1997; Meisels, Bickel, Nicholson, Xue, & Atkins-Burnett., 2001; Meisels, Burnett, et.al., in press;). Leading scholars have indicated that we must move to ascertain the impact of structural factors in harnessing or hindering the effect of early intervention and education (Reynolds, & Temple, 2005; Guralnick, 2005; Guralnick,1993; Shonkoff, Houser-Cram, Krauss and Upshur, 1988). As a specialized field of inquiry, service integration fits within the postmodern research focus to which Guralnick refers as the next generation research in early childhood. The approach places services integration among the interrelated factors (elements) on the causality pathways impacting the outcomes of early intervention on families and children alike (Guralnick, 1991; Guralnick, 1997; Guralnick,. 2005). The “developmental system model” advanced by Guralnick (2005) is part of the large-scale school reforms such as envisioned in IDEA (1997-2004) and most recently in the No-Child-Left-Behind Act (2000). These and other policy initiatives become, in such a model, very important variants as they contribute to the tone and culture to which professionals responds. In addition, such programs influence program fidelity, classroom environment and curriculum quality (GAO 2002; The Nelson A. Rockefeller Institute of Government; 2003 access at http://www.rockinst.org/Ragan_Casey_Report_0603.pdf last accessed, 2/1/2006; Arnold & Doctoroff, 2003; NCES July 2005, at <http://nces.ed.gov/pubsearch> last accessed, 2/10/2006). Service integration is but one small part of a much larger early childhood ecology that makes programs work. It is within these confines that I have chosen to study two types of services integration. Each system is different, yet both may be seen as mechanisms working toward the same end, namely improved outcomes for children and their families. There have been policy and research efforts and interest from

educational institutions, families and the community in general, in the efficacy of early childhood intervention and education. Despite a fairly high degree of interest, services integration, as an entity, has not been studied extensively (Harbin & West, 1998; <http://www.uconnuicedd.org/Publications/files/RTC.pdf>, last accessed, 9/19/05). In order to be a useful tool to academics, policy makers and practitioners, such a study should attempt to measure and document the impact of services integration through its various manifestations including interagency partnerships and teamwork as an integral part of the evidence-based practices in early childhood studies. This type of study is potentially of particular interest to those specializing in children at developmental risk and with developmental delays/disabilities (Head Start Bureau, 2000). Another important aspect to this study is to assess the impact of two types of service integration understood both as collaborative strategies and concerted interventions taking place (as much as possible) within the natural environment of the child. Service integration is also considered among the “best practice” standards, best suited for sustaining improvement in both child’s and family’s overall outcomes (<http://www.cbpp.org/6-23-04bud.htm>, last accessed 12/28/2005). In the face of shrinking resources allocated to social programs including those that benefit children and families, this study’s relevance increases because it aims to contribute to a better understanding of what makes programs more efficacious.

1.1 CONCEPTUAL FRAMEWORK

When we speak of Early Childhood Intervention (ECI) and/or Early Childhood Education (ECE), encoded images of disability, problematic behaviors characteristics of children and families, and rules of eligibility procedures shape our understanding of their meaning. These

multi-systemic and multi-level mental images are reflective of the connectivity that exists between the *Micro* and *Macro systems*. The ecological system framework or the ecology of human and societal development advanced by Urie Bronfenbrenner (1979) provides the backdrop for this research.

According to Bronfenbrenner, humans exist and conduct their lives within contextual systemic frameworks. At the “*microsystem*” level, the contextual reference is the most immediate unit or environment within which the person is embedded, lives and forms early identities and concepts of self. Such environments might include the family, the school, the church and/or similar groups or contexts. In this study, the specific program setting in which the child and family is embedded forms and informs the microsystem. Such interactions among the microsystems’ entities are best understood as participative networks with which the child and the family have frequent formal and informal contacts.

Within the context of this study, the organizational structure of their classroom/school/agency setting, defined by the type, quantity and quality of family and professional contacts (e.g., collaborations, interactions, supports) represents the mesosystemic level. The permanence of the *mesosystem* is wholly or partially influenced by social and public policies, mores and rules that exist at the “*exosystem*” level. In relation to this study, the exosystem level consists of the policies and directives that apply to disability as much as those that are applicable to the educational and intervention settings such as the Individual with Disability Education Act (IDEA-1997-2004), No-Child-Left-Behind Act (NCLB 2001) and other similar social and public policies which directly or indirectly influence both the meso and micro systems. For instance, as far as this study is concerned, the set of policies that are most relevant would include policies relating to assessment, inclusive schools, inclusive classrooms, least

restrictive environments, early childhood education and intervention, services and school integration, services coordination, and Head Start policies. While individuals operating at the microsystemic and mesosystemic levels can, and to some extent, do influence what is done at the exosystemic level, the outcomes at the exosystemic level are dependent upon larger (and, in some cases, ephemeral) contextual variables such as culture, societal values or the hegemonic belief system(s) present at each particular historical juncture. This larger encompassing level is referred as the *Macrosystem* within the ecological model used by Bronfenbrenner (1979). This highest level is that which shapes the spheres of decision and power and is reflected in which policies are implemented and how the embedded concepts are organized and interpreted. Another way to view and/or understand the “macrosystem” is as a context-forming framework or as Habermas (1984) puts it “the taken for granted background that is always already there when we act” (Habermas, 1984. pp. xxvi).

It is within this set of interactive structures that, according to Bronfenbrenner, the human condition unravels. In this study, this ecological framework is a useful guide at two levels. At the interpretative level, the interaction between the selected independent and dependent variables is viewed as a part of a larger, more complex set of interactions (i.e., non-deterministic or post-positivist). At the generalization validity level, the results in two pre-selected early childhood settings (the independent variable) may not be taken as summative or reflective of any other programs. Moreover, the ‘*Exo*’ and ‘*Macro*’ systems, while considered and to some extent reviewed within this study are not the primary focus of this research. Instead, the primary focus of this research study is best captured at the specific meso and micro system settings. Specifically, at the meso level, consideration is given to such factors as the experimental interactive context or the level of programmatic services integration experienced by the child and

the family within the two specific programs (e.g., education, health and social services integration practices). The microsystem or the immediate family and child response to this level is captured by the outcomes measures used in the original Early Childhood Partnerships evaluation research from which the data is obtained. The description of the family and child attributes (such as living space socio-economic context, ethnicity, etc.) are reviewed and discussed by using the U.S. Census track 2000, as this information was not required in the original study and, hence is not available from the secondary source used. Additionally, how these children were assigned and/or under which particular or unique circumstances they happened to enter into each of the specific programs is unknown.

These are obvious weaknesses of this study. Nevertheless, as the ecological framework indicates,, even when all controls are in place, the results we observe should never be interpreted as causal determinants. At best, these results may validate their contribution within the complex web of mediating, moderating and intervening factors which form the pathways (limited as they might be) of our understanding. Therefore, the results and conclusion in this study must be considered within these and other limitations inherent in the use of secondary data sets.

CONTENTS OF THE PAPER

This research study will begin by reviewing the definitions of the main concepts and their rationales. Even for the reader already familiar with the pros and cons and definitional issues relating to services integration, these sections may be useful to review given the already discussed complexity associated with the concept of service integration. Included in the first part is a general overview of the dependent measures used by this study. This section will introduce the reader to the analytical model used in this research. These measures are then defined and

discussed in the methodology sections. Following the definitions of the independent and dependent variables is a review of the findings from the literature search.

In the methodology section, several topics are addressed including general program descriptions and their geo-demographic characteristics, as available. As previously indicated, much of the demographic data are downloaded from the **U.S. Census 2000** because such information was absent from the original data-set. A review of the sample characteristics as available from the Early Childhood Partnership (ECP) database will also be included in this section. At the conclusion of the descriptive statistics based on the sample, a discussion of the reliability and validity of the instruments/measures will be presented. After the methodology section there is a presentation and discussion of the findings. Before discussing this study's conclusions, the limitations of this research are presented in detail.

2.0 DEFINING SERVICE INTEGRATION

Two program models are compared in this research. One is identified as the “fully- integrated” model and the other as the “consultative-referral” model of early childhood intervention and education programs. The definition used in this study is obtained from the literature review as well as from the description provided by specific agencies. For confidentiality purposes, the programs are herein identified as the “Fully-Integrated Early Childhood Model (FI-EC) and the other as the “Consultative-Referral Early Childhood Model (CR-EC). As an initial step, this paper will consider the rationale together with a short overview of the etiology of how services integration in general has become an important factor in the definition of best-practices guidelines in early childhood education and intervention.

2.1 SERVICES INTEGRATION: AN ETIOLOGICAL OVERVIEW

There are multiple terms encountered in investigating the meaning and definition of integration, especially in the context of social and public programs such as those selected in this study. Fortunately, there is more agreement about the rationale used within the public and social policy arenas to justify the need for and the implementation of an integrated system of services and/or care. Generally, two interrelated rationales can be identified (always in the context of government-sponsored programming). The first rationale is prominent among the proponents of a “leaner and meaner” government, which is epitomized in the managed care initiatives and which views integration as a strategy for increased economic efficiency, productivity, and fiscal accountability in social and public programs (Sauber, 1983; Guralnick, 1997; Guralnick,. 2005).

Integration according to this view is meant to modernize a system ridden with inefficiency and redundancy (Langoria, 2005). The second rationale, which is prominent among the human services practitioners and community organizers, is seen as an action-response to reclaim a fragmented system of care, filled with unnecessary regulations and obstacles that preclude access and prevent rather than enhance the delivery of care where and when needed (Langoria, 2005). In spite of their different points of origin and references, both rationales can be linked to several important milestones marking the rise of services/system integration among the important aspects of care. One milestone of particular relevance to disability can be found in the civil rights movement of the 1950s and 1960s, which sought, among other things, to bring equity and access to public education for minorities, including individuals with disabilities (<http://ericec.org/faq/spedhist.html>). Another somewhat related milestone can be traced to 1963, when Congress authorized the creation of community centers to address a broad range of health needs faced by the poor and disadvantaged minority groups (Committee on The Future of Rural Health Care, 2005). Starting in 1965, we can observe the adoption of major federal initiatives promoting integration both economically and programmatically. Among these efforts are the creation of special entities such as the Bureau for Education of the Handicapped (the forerunner of the modern OSEP) and laws such as the Elementary and Secondary Schools Act (ESSA, 1966); Education of the Handicapped Act, (P.L. 91-230, 1970); and Education for All Handicapped Children Act (EAHCA, Public Law 94-142 1975 which would later be renamed IDEA). Originally, the stated goal of these governmental initiatives was the protection of the rights of people with disabilities. As these rights were secured, policy makers and stakeholders became aware of the increasing need for improving collaboration and partnership across all areas of services and programs to maintain and expand those rights

(<http://www.ed.gov/offices/OCR/regs/34cfr104.html>., last accessed, 2/14/2006). The process of deinstitutionalization of disabled persons in the middle 1970s further highlighted the importance of team building among programs and services. A good example of the recognition of such needs is the Rehabilitation Act of 1973, (aka. P.L. 93-112; 29 U.S.C. 794) section 504, which requires that children with disabilities and all individuals protected under the Act be educated and/or provided services in the Least Restrictive Environment (LRE) as much as possible and feasible (<http://www.ed.gov/offices/OCR/regs/34cfr104.html>, last accessed, 2/14/2006). The concept of LRE opened a Pandora's box by forcing stakeholders to accept new challenges including how to organize, achieve, and sustain an effective continuum of services, care and educational within the child's natural environment (Bagnato, 1998; Bagnato, 2002). The term integration as related to the fields of early childhood educational and intervention is undoubtedly linked to President Lyndon B. Johnson's "war on poverty". It is President Johnson who, in 1965, commissioned a special committee, under the guidance of Sargent Schriver and Robert Cooke, to create and institute the Head Start program. Head Start came into being to address the systemic failures in providing education services to poverty-stricken preschoolers and their families (http://www.headstartinfo.org/publications/im95/im95_18.htm, last accessed 10/4/05). Even 40 years later, the Head Start Act represents one of the largest federal initiatives to bring together under one roof (one of the meanings of integration) social, health, family and educational services (<http://www.acf.hhs.gov/programs/hsb/budget>, last accessed 12/26/2005). The Head Start Program was originally intended to increase the academic skills and competencies of children living in poverty to integrate educational activities with a vast array of services spanning the gamut of nutrition, family, health, in-home services, mental health and social services (<http://www.cbpp.org/10-1-01health.pdf>, last accessed 6/19/2005). An addition to this broad

range of services was the Periodic Screening, Diagnosis and Treatment (EPSDT) which was added as a provision of Title XIX signed into law by President Johnson on July 30, 1965. This provision is considered a major expansion of the Social Security Act of 1935 as the first recognition of health care as a crucial variant in the growth and development of children and families. A subsequent expansion of EPSDT services, namely the wrap-around services, expands the array of services to include individualized mental health services for children in the community, in schools and in their homes (<http://www.cbpp.org/12-20-05bud.pdf>, last accessed 11/12/2005). By 1983, wrap-around and EPSDT services were an integral part of the Children and Adolescent Service System Program (CASSP) (<http://www.cbpp.org/11-18-03health2.htm>, last accessed 11/21/2005).

Head Start (HS) is still considered one of the larger social policy experiments designed to achieve large-scale services integration for children and families in need. There have been many other efforts designed to promote services and program integration after HS, which have added and used a multitude of terms to define or describe what integration is or should be (Table 1 below summarizes terms relating to services integration). One of the many terms often encountered in relation to service integration is the “one-stop shop” services model introduced in the late nineteen seventies, which relates more to the dynamics of the relationship between various services (e.g., collaboration) rather than the actual bridging or nesting services and programs. It certainly can not be said that the one-stop-shop model has been a successful solution for what Bagnato (2001) refers to as the “un-system of care” or, for that matter that it has resulted in the integrative effects envisioned by its proponents (http://www.rockinst.org/publications/federalism/Ragan_Casey_Report_0603.pdf, last accessed 1/31/06).

Table 1.
Essential Terms & Concepts Found in Relation to Services Integration

Terms	Definitions
<i>Comprehensive</i>	Referring to something inclusive, covering completely and broadly, refers to a broad range of components (e.g., in health and education or combined).
<i>Integrated Delivery System</i>	Usually used to indicate a unified delivery system which functionally or otherwise meshes resources and responsibilities. Also defined as one method of obtaining comprehensive service coverage and/or procedures and structures that help several service agencies coordinate their efforts to address the full range of service needs presented by youth and families in an efficient and holistic manner.
<i>Fully-Linked/School Affiliated</i>	Found to refer to school-based collaborative efforts engaging both the school and community partners who share in the planning and governance and responsibilities.
<i>Services Coordination</i>	Instituting of formal relationships, mutual understandings, and mutual planning with a well-defined division of roles, and communication channels. Usually entails the assignment of one or more services managers or coordinators.
<i>Community-linked Services</i>	Services that connect schools and communities and can entail the referral from schools to places or agencies in the community but in most cases it is the community agencies which link with the school.
<i>Community-based Services</i>	Traditional community mental health models fit within this paradigm in which the school refers out to community based agencies which are hired through services or other agreements. Also refers to established centers providing a convenient, single point of entry.
<i>School-based Services</i>	Typically services and support provided on school grounds and closely coordinated by or within the school system..
<i>Collaborative entities or systems</i>	A generic term used in reference to multidisciplinary teams connecting, communicating, cooperating, and coordinating through mutual established guidelines and accountability. Collaborative systems can be found within and outside the school system.
<i>Comprehensive Family Services</i>	Referring to a combination of one or more services such as home visiting, case management and education services, usually defined by the needs of the family.
<i>Multidisciplinary</i>	Defined as the involvement of two or more disciplines or professions in the provision of integrated and coordinated services.
<i>Service coordination (one type of case management)</i>	Defined as activities related to the ongoing process carried out by a service coordinator across agency lines for the duration of the child's eligibility, serving as a single point of contact in helping parents to obtain the services and assistance they need.
<i>School-linked</i>	Referred mostly as a location of a service center in or near a school, which serves as the link between the service delivery system and families.
<i>Case management (e.g., intensive, medical etc.)</i>	Defined as a method of assessing the needs of clients and their families and helping to coordinate, monitor, evaluate, and advocate for services to meet those needs.
<i>Least Restrictive Environment</i>	Entails educating and serving students with disabilities in regular classes by providing appropriate aids and support.

One-stop shop is only one among many other terms that are used within what Franklin & Paula (1997) call the integration movement (Franklin & Paula, 1997). Among the many other terms used we find: the “*system of care*” (Knitzer, 2000ab; Hanson et.al., 2001; Kauffman Early Education Exchange, 2001; Bagnato, 1998; Bagnato, 2002; Stroul, 2002; Fox, Dunlap, Hemmeter, Joseph, Strain, 2003); “*Multi-professional collaboration*” and “*full-services schools or school-affiliated and community-linked services*” (Bronstein & Kelly, 1998; Aguirre, 1995; Dryfoos, 2003; Briar-Lawson, Lawson & Collier, 1997; Lane, 1998; Franklin & Paula, 1997). Within the community mental health system, a term often used to indicate the level of services integration is the “*continuum of care or services*” which is implicitly indicative of both the organization of the service delivery model and of the movement of children and families through a wide range of services. The continuum of services as a concept is derived from the health care system and it was one of the major tenets of community-based mental health systems during the 1980s and 1990s. With the advent of managed care, a new nomenclature of service integration has begun to emerge, resulting in additional terms being added to the list of descriptors of an integrated services and/or care model. For instance, an integrated model is seen as being a customer/family oriented model existing in a seamless continuum, using a health management model (as supposed to a pathological/clinical model).

But, as Franklin & Paula (1997) point out, integration has a multitude of meanings and interpretations (Franklin & Paula, 1997). One other type of integration in relation to early childhood education and intervention is the full-services school-linked service model. The full-services, fully-linked community schools emerge out of the need to reengineer the services delivery system in relation to children and youths (Dryfoos, 1998; Briar-Lawson, Lawson , Collier & Joseph, 1997; Aguirre, 1995; Dryfoos, 1994). This model envisions the school as the

hub around which a broad array of services and disciplines become connected in various ways. Importantly, the school and the service providers jointly share the operating responsibilities (Franklin & Paula, 1997; Dryfoos, 1998; Dryfoos, 1994). According to the authors proposing and supporting the full-services, school-linked service model, this type of integrated system is one that is culturally competent. The services are coordinated and delivered within a community-based setting, or as Bagnato (1991) describes it, the services are embedded in the children's and families' natural environments, fostering active family participation in all aspects of care including the decision-making process (Bagnato, 1991; <http://www.surgeongeneral.gov/library/mentalhealth/chapter3/sec8.html>, last accessed, 2/17/06). Recent legislation continues to emphasize that best practices are those which effectively integrate social, mental health and health services with educational services and a broad array of family and other support services. An integrated service system is, in fact, a fundamental tenet of the Individuals with Disabilities Education Act Amendments of 1997 and more recently renamed the Individuals with Disabilities Education Improvement Act of 2004 (see, IDEA, [P.L. 108-446](#)). As previously indicated, the origin of the concept of services integration can be found in the enactment of the legislations such as the Education for All Handicapped Children Act of 1975 (Public Law 94-142) which integrates the earlier Elementary and Secondary Education Act of 1965. The EAHC Act of 1975 provided, among other things, incentives and assistance to states for “whole-school approaches,...and scientifically based early reading programs,...interventions and supports, and early intervening services.....” and with the “...implementation of a statewide, comprehensive, coordinated, multidisciplinary, interagency system of early intervention services for infants and toddlers with disabilities and their families” (P.L. 108-446, H. R. 1350—3 & 1350—4, <http://www.nasponline.org/advocacy/IDEA2004.pdf>, last accessed,

2/14/06). The belief implicit in the EAHC 1975 is that integration would result in an accountable and coordinated educational and early intervention services system which, in the end, would benefit both children and their families. Indeed, the manifest intent of this legislation and of other recent bills is to change a disintegrated and disconnected educational system (Bagnato & Neisworth, 2001). According to the law, a more accountable, coordinated, educationally responsive system is seen as a necessary element “to the growing needs of an increasingly diverse society” (P.L. 108-446, H. R. 1350—6). When we consider that the great majority within the population from 6 to 20 years of age who consistently fail in school and are disproportionately assigned to special education, come from disadvantaged and minority populations, the need for an accountable and integrated early intervention and education system becomes even more evident (P.L. 108-446, H. R. 1350—5). Yet, despite the numerous references to services integration, the legislation remains vague as to how services integration is to be defined and attained. According to P.L. 108-446, and using terms and content from H. R. 1350—5 section (f) and in H. R. 1350—101, sec. 635, activities that are to be implemented by local educational agencies toward coordinated, early intervention services include:

- Professional development for teachers and other school staff;
- Providing educational and behavioral evaluations, services, and supports, including scientifically based literacy instruction;
- A right to a free appropriate public education;
- Coordination with Elementary and Secondary Education Act of 1965;
- A comprehensive child find system, for making referrals to service;
- A central directory that includes information on Early Intervention;
- Coordinated transition services and;
- A single line of responsibility in a lead agency.

It is possible to discern from this list some of the components of what is required for an integrated early childhood education and intervention system. In the next section, a formalized definition of services integration is provided as applied and used in relation to the “experimental and control variables” in this study.

2.2 FULLY-INTEGRATED VS. CONSULTATIVE AD-HOC SERVICES MODEL

Many policies and program initiatives have been created through the years with the manifest intent of providing an “integrated approach” especially for children at risk or with characteristics that impede learning (<http://ericec.org/osep/topical/fullsvc.html> , last accessed, 2/7/06). One of the fundamental advances in the field of early childhood intervention is the recognition of the effects of the ecology or the embedded contexts of the children and families on learning and on future development. This recognition has influenced a broad spectrum of early childhood education and intervention policies. For example, there is a realization that schools may be able to play a larger role and positively impact the results, especially in the early life of the child, if the collaborative efforts and linkages with the community are widened and strengthened (Guralnick, 2002). Guralnick and other experts in the field of early childhood, suggest that if success in education is to be achieved by children, especially by those children who already face distressing health and social conditions, the schools must take a whole child approach and the intervention must address all parts of the child’s life (Guralnick, eds., 2005; Bagnato, Neisworth, 1993; Simeonsson, 2002; Dunst & Bruder, 2002). Guralnick (2005) further suggests that while, theoretically and conceptually, this recognition is universal, different stakeholders have interpreted and translated the concepts into practice in very different ways.

Notwithstanding the differences discussed above, a general definition of services integration is provided for the purpose of this study and used to differentiate the two selected Pennsylvania's program sites. Regardless of the differences in interpretation and implementation of educational and/or services integration, at least in principle, the overall goals of these two programs are the same. Both programs claim to be designed to bridge the gap in readiness and learning among disadvantaged children and to support improved social conditions, health and education of these children and their families. How and to what extent each of these two programmatic approaches influences these stated outcomes is what this research will be investigating. While there are no controls on the quality and specificity of the programmatic aspects used as descriptors for those programs, there are nonetheless generally identifiable differences between the two. Figure 1 provides a summary of the communality and differences between the two selected early childhood providers. As indicated in **Figure 1**, both programs incorporate Head Start and/or other related practices, including a family oriented services approach. There appear to be specific programmatic differences in the way the two programs organize and deliver children, health, educational and family services. For instance, Fully-Integrated EC Site (FI-EC) offers numerous opportunities for the child's family members to be directly involved with their child's education and/or for the family to gain direct access to services or resources without being referred out. On the other hand, the program herein identified as the "Coordinated-Consultative EC Site (CC-EC) uses a coordinated community-based model in which families and/or children are usually referred out to multiple community-based agencies which in turn coordinate their access to services and resources. Both are considered to be high-quality best-practice ECE/ECI programs according to their sponsors and according to their current evaluations.

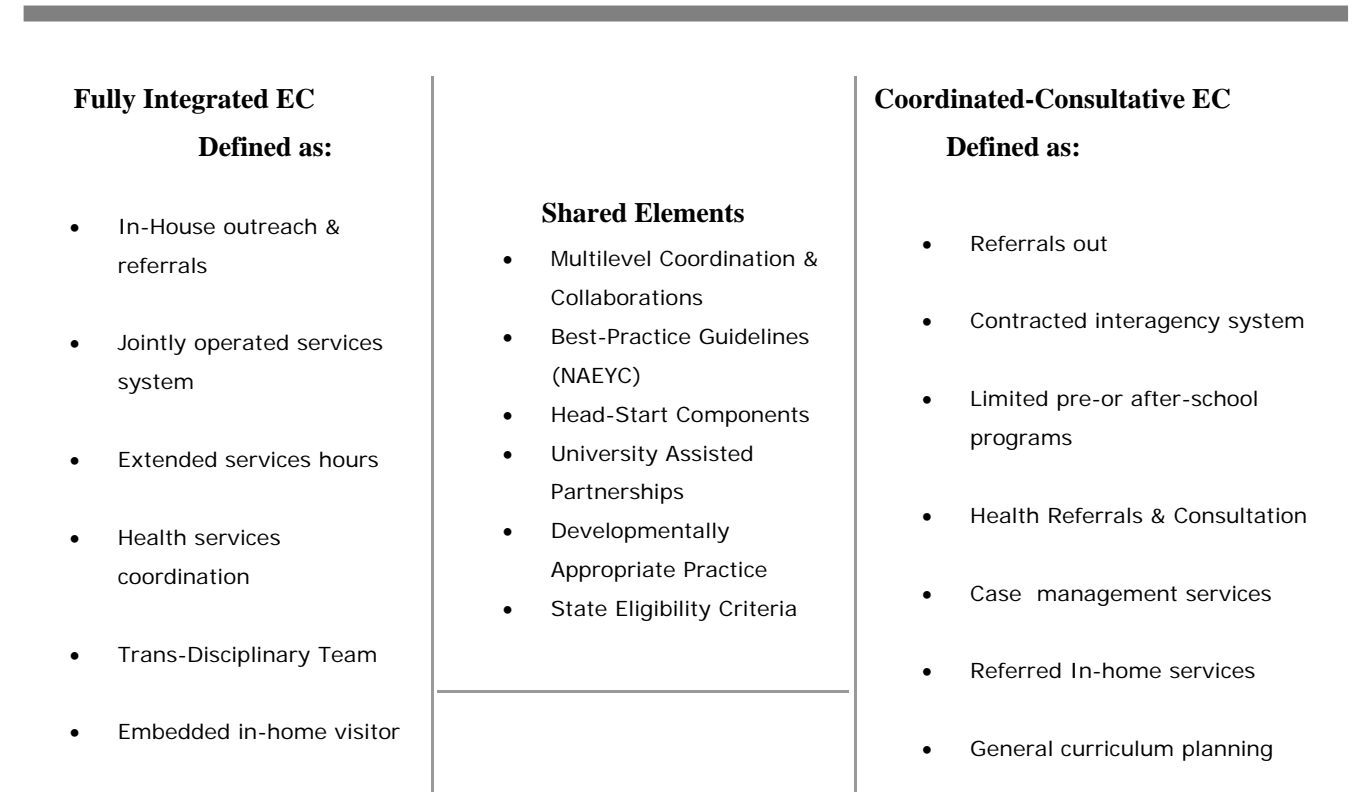


Figure 1. Definitional characteristics of selected early childhood programs in this study

Another way to evaluate the two programmatic approaches to integration considered in this study would be to place them on virtual integrated services continuum by way of using the policy elements and descriptors obtained from the literature. The representation provided in Figure 2 below attempts to visually capture where each specific program could be placed on a theoretical integration continuum derived from expected best-practices. On this theoretical continuum, a fully integrated EC education and intervention program will tend toward the left side of the continuum. As can also be observed in Figure 2, there are centered characteristics or practice characteristics such as cultural competency that are expected, regardless of the type of services integration model.

Having defined and described the experimental and control variables of this research, it may be helpful to briefly introduce the selected dependent variables or outcome measures used in this study (a more in-depth description of these measures and their technical quality including reliability and validity is the topic for a later section) to test the hypothesis that a fully-integrated program produces significantly more positive outcomes than the CC-EC model.

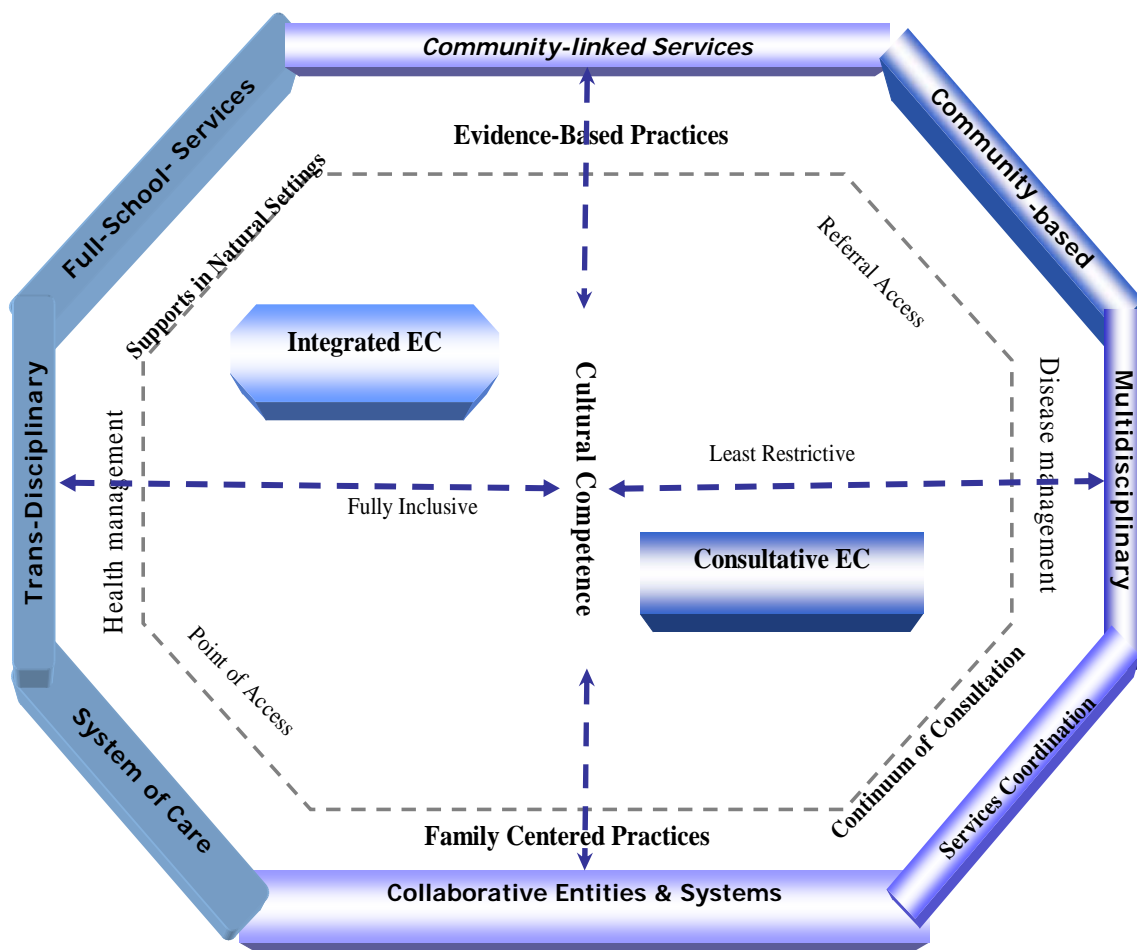


Figure 2. The Ecology of Services Integration Continuum

2.2.1 Dependent/Outcome Variables

In assessing the effects of the experimental variable (i.e., full services integration), a set of outcomes measures will be used as available in the database of the Scaling Progress Early Childhood Settings (SPECS) of the Early Childhood Partnerships, a division of Children's Hospital of the University of Pittsburgh. These outcomes measures include:

1. Child Outcomes Measures:

- **Developmental Observation Checklist** - age 0-6 years (**DOCS**; Hresko, Shirley, Sherbenou, & Burton 1994). Domains measured: Cognitive, Language, Social and Motor.
- **Preschool & Kindergarten Behavior Scales** - age 3-5 years (**PKBS**; 2nd Edition by Merrell 1994, 2002). Domains measured: Social Skills and Problem Behaviors.
- **Basic School Skills Inventory** - age 4-9 years (**BSSI**; 3rd Edition by Hammill, Leigh, Pearson & Maddox, 1998). Domains measured: Spoken Language, Reading, Writing, Math, Classroom Behavior, Daily Living Skills.

2. Family Outcomes Measures:

- **Parent Behavior Checklist (PBC)**; Fox, 1995). Domains Measured: Nurturing and Expectations.

These measures were used by the Pennsylvania Early Intervention Outcomes Study (PEIOS) and the Early Childhood Initiative designed, among other things, to explore and document the impact of early intervention programs on children from 0 to 3 and from 0 to 5, and their families (Bagnato, Suen, Brickley, Smith-Jones, Dettore, 2002; Bagnato, SJ 2002; Bagnato, Neisworth, 1993; Bagnato, Hawthorne, Suen, Fevola, Matesa, 2005). The current research builds upon these earlier studies and seeks to contribute in further expanding the existing knowledge base by investigating how and to what extent structural variables (i.e., integration) effect changes in these

outcomes measures. The measures in themselves are consistent and aligned with both PA and OSEP early childhood outcomes efforts, including the OSEP sponsored Early Childhood Outcomes (ECO) Center of SRI International and with Pennsylvania's New Early Learning Standards (2004).

2.3 PROVISIO

The data being accessed and the lack of control over assignment as well as over other services and personnel variables present inherent limitations. For one thing, not all demographic information about the sample population attending these programs is available because it was not part of the original design of those evaluation studies to collect this information. The slim demographic descriptors of the sample and the absence of family information such as socio-economic status, occupation, education and the presence of family hardship conditions are countered to some extent by using **U.S. Census 2000** data. The demographic and other census data are explored and presented in a later section and indicate that the two regions within which the two programs operate are very similar to one another, albeit the FI-EC program seems to be located in a region which is relatively more economically depressed than the one served by the CC-EC. Of course, it must be noted that knowledge of the characteristics of the people within the regions does not remove the veil of uncertainty over whether the sample population in the database is representative of the larger population. This uncertainty poses limits as to the external validity (i.e., generalizability) of the findings. In addition, the study's limited ability to control and account for randomization and other assignment errors poses limits as to the internal validity. Moreover, there may be other limits on the data which could influence the results (in

either direction). For instance, the lack of documented information on the teachers' qualifications, the fidelity of the collaborative framework, the fidelity of services and programs, as well as lack of control over the amount, level and intensity of services are further constraints on the internal and external validity of this study. The results of this study must be considered within these limitations. Given that there was no control on how children were selected or assigned and which families were selected and consented to the data collection, the possibility of sample biases are unavoidable.

Notwithstanding these limitations, this study does represent an important step in expanding the current knowledge base as to the contribution of structural factors on children and family outcomes. Future, more-controlled research studies will be required to obtain a more definitive answer as to the contribution of services and education integration; ideally these future efforts would extend beyond the early part of the child's life.

3.0 REVIEW OF RELATED LITERATURE

There are few if any critics who would argue against Early Childhood Intervention (ECI) as being a good thing for both the child and the family. What is debatable is which model is most effective, or, to put it in another way, what are the characteristics of a successful and effective ECI model (Guralnick, Edit.2005; Shonkoff & Meisels, eds.,.2000). The literature reviewed agrees on the overarching principles, best-practices guidelines, and structural elements that are associated with an integrated and coherent system of early childhood intervention practices (Ramey, & Ramey, 1998;Bagnato 1998; Guralnick, 2000; Guralnick, 2001; Bagnato, 2003; Simeonsson, 2002; NAEYC, <http://www.naeyc.org/default.asp>, last accessed, 2/1/2006; NCLB,2001 <http://www.ed.gov/news/speeches/2005/04/04072005.html>, last accessed 2/18/2006). Presented below is a list of the core principles which has been adapted from the literature, and which is taken to represent a synthesis of what defines a developmentally sound, integrated system of early care or what Guralnick (2001) calls the “developmental system model”(DSM). The elements of the DSM as advanced by Guralnick (2001) are summarized below and include:

1. Integration and coordination at all levels;
2. Utilization of a functional classification rather than categorical classification system;
3. Availability and easy access to comprehensive programs and support system;
4. Delivery of intervention in natural inclusive settings;
5. Utilization of authentic outcome-based measures;

6. Embedded, evidence-based ongoing surveillance and monitoring systems;
7. Culturally competent professionals and organizations;
8. Customization and individualization of plans and services;
9. Developmentally convergent practices;
10. Family centered, health (as opposed to disease) management approach; and
11. An integrated data and information management system.

The extent to which these “core principles” are fully implemented in practice rest largely on how each of these principles is embedded and implemented within each individual organization and by their professionals. Dunst & Bruder, (2002), among others, point out that the relationship between models and practice is not as clear and direct as expected. This uncertainty attests to the multiple intervening factors that can and do influence both the program’s and practice’s outcomes (Dunst & Bruder, 2002). It can be deduced from this list that these elements are highly interdependent and that each is necessary in the development, realization and sustainability of an effective, integrated early-childhood system of care. Over the years there have been dramatic changes in the way we view and think about childhood intervention and education (Guralnick, eds. 2005; Neisworth, & Bagnato, 2004; Simeonsson, 2002; Shonkoff & Meisels, eds., 2000; Guralnick, 2000). Perhaps the best and most succinct characterization of the growth in the knowledge base and about the paradigm shift experienced in early childhood intervention and education is captured by Shonkoff, & Phillips, (eds.2000) in the phrase, “from neurons to neighborhoods, genetic and environmental effects operate in both directions” (Shonkoff & Phillips, eds. 2000. pp.24). Shonkoff and Phillips (2000) views have been articulated world wide and are the cornerstone of the World Health Organizations’ (WHO) International Classification

of Functioning (aka, ICF) (<http://www.who.int/classifications/en/>, last accessed 2/17/06; <http://www.cdc.gov/nchs/about/otheract/icd9/icfhome.htm>, last accessed 2/20/06).

The “evolution” observed in the field of early childhood intervention is, in many ways, reminiscent of the “re-evolution” in the modus operandi of business in our society in general. In less than three decades, the business paradigm has shifted from the Fordistic’s top-down management, to the more flexible shared horizontal management approach which has led to increased customization and re-engineering of products. Returning to early childhood, the major design changes can be described, in general terms, as migrating from a strictly clinical, disease-managed and office-based intervention to a multimodal health-managed and “transdisciplinary” participatory family centered-model with intervention delivered, to the extent feasible, in the community or in the natural child’s environment (Meisels & Shonkoff, in Shonkoff & Meisels, eds., 2000). As previously mentioned, there is an extensive body of research regarding the effectiveness of early childhood intervention, but much work remains to be done on understanding how different structural elements, such as integration initiatives, can inhibit or enhance program capacity and effectiveness while concurrently sustaining and advancing the child’s and the family’s development, especially for families and children facing disabilities or disabling conditions (Guralnick, 1993; Guralnick, 2001; Gandini, & Forman (eds.) 1993; Stegelin, 2003; Ceci & Papierno 2005; Robert, Innocenti, & Goetze, 1999; Gilliam & Zigler, 2001; Spiker, Hebbeler, Wagner, Cameto & McKenna, 2000; Reynolds & Temple, 2005;).

3.1 INTEGRATING EARLY CHILDHOOD INTERVENTION

Meisles and Shonkoff (2000) provide an insightful and complete historical overview of the roots of early childhood education and intervention, tracing it to the slums of European cities with two major nursery models, namely the MacMillan model originated in England and the Montessori model originated in Italy around 1910 (Meisles & Shonkoff in Shonkoff & Meisles, eds., 2000). Indeed, the origins of early childhood intervention and education are best understood as being embedded within the quest for civil rights and the strife for emancipation from dependencies, disabilities and poverty (Brooks-Gunn, Duncan & Maritato, 1997). Evidence abounds as to the detrimental effects of poverty and social and economic inequalities in general on child development and health. Such studies confirm the magnitude of their effects on the occurrence and frequency of disability and other comorbidities (Kawachi, Kennedy & Wilkinson eds., 1999); Brooks-Gunn, Duncan, & Maritato, 1997; Meisles & Shonkoff, eds., 2000; www.nschdata.org, last accessed, 2/17/02). While the full range of the statistics resulting from these studies need not to be reiterated here, a few numbers might help to put the issues in perspective. It is estimated that more than 200,000 children who are 2 years of age and younger transited through the Part C early intervention system, and that from the last known statistics, more than 9 million children from birth to age of 17 years, are identified as having special health care needs (http://www.aucd.org/legislative_affairs/early_improve_act.htm, last accessed, 2/17/06; (www.nschdata.org), last accessed 2/19/05). Minorities, especially African Americans, are disproportionately overrepresented among the poor and the disabled categories. Overall, children of African American descent, besides being besieged by disabling conditions, are also more likely to lack adequate health insurance coverage (<http://www.cdfactioncouncil.org/theact/blackchildren.asp>). These alarming statistics and

demographic trends continue to command our attention. It is unnerving that despite numerous interventions developed and implemented over the years, these efforts have had a surprisingly modest effect in shrinking the achievement gap, or reducing inequalities and related social and health care costs (Kawachi, Kennedy & Wilkinson eds., 1999; Ceci & Papierno, 2005; Halpern, 2000). It is this conundrum that early childhood intervention and education as a field of research must unravel.

Early intervention is the next best thing to prevention. Accordingly, it brings a sense of urgency and the need for immediacy of action. Early childhood intervention is set up to address two major fronts: (i) the child's life circumstances (family and his/her socio-cultural contexts) and (ii) the child's health and psychosocial protective factors (Garbarino & Ganzel, 2000). Elemental to early childhood intervention is the belief that effective intervention is that which universally attends to a wide variety of risk factors and disability conditions while at the same time, is capable to developmentally incorporate and accommodate the interventions and services within the natural and unique circumstances of the child, the family and the community (Guralnick, 2001; Guralnick eds. 2005; Bagnato, 1994; Orsmond, 2005; Neisworth & Bagnato, 2004; Garcia & Magnuson, 2000; Bailey & Powell 2005;). This commitment is reflected also in recent policy statements. According to IDEA (P.L. 94-142), for instance, the principal goals of early childhood intervention include among other things:

- Preventing disability in infants and children;
- Removing physical and social barriers;
- Promoting child growth and development;
- Supporting and complementing the well-being of the children and their families;
- Minimizing the likelihood for institutionalization; and

- Enhancing the capacity of the families to meet the special needs of infants and toddlers.

Most importantly the legislation (IDEA, 1997 and subsequent amendments) emphasizes in several sections the need for a developmental whole-child, family-centered approach to be used in the implementation of the intervention as well as the need for a concerted, coordinated intervention resulting from “integrative” efforts (P.L. 94-142; 20 U.S.C. Sec. 1471). What exactly services integration entails is vague in IDEA as well as in more recent legislation (e.g., NCLB, 2001). The term was also vague and undefined within the legislation which brought about the creation of the Head Start in 1965 (Entwisle, & Alexander, 1993; Zigler, Piotrkowski, & Collins, 1994; Arnold & Doctoroff, 2003; http://www.jcpr.org/newsletters/vol6_no2/articles.html last accessed 12/27/2005; Love et al., 2005; <http://www.highscope.org/Research/headstartstudy.htm> last accessed 12/16/2005; <http://nieer.org/mediacenter/index.php?PressID=7> last accessed 10/1/2005).

There are varied definitions and interpretation of services integration. For instance, in a 1995 article, Agranoff (1991) is quoted by Voydanoff in defining integration as "the quest for the development of systems that are responsive to the multiple needs of persons at-risk" (Voydanoff, 1995, pp.64). In another article, Kahn & Kameramn (1992) define system integration as a “systematic effort to solve for service fragmentation” (Kahn & Kameramn 1992). McCubbin & Huang (1989) see integration as linked to the built-in capacity of many families to develop resources, capabilities and strengths to manage the day-to-day care of their family unit (McCubbin & Huang, 1989). Following the lead of various authors and in particular of Bagnato & Neisworth, (1991) and Guralnick, (2005), an integrated, developmentally sound and authentic early childhood intervention can be defined “ideally” as:

- A flexible, universal communicative structure within which teams of parents, teachers and professionals formatively and continuously revise and implement their collective decisions about the best course of actions to augment the developmental, educational and health achievement of young children and to neutralize and ideally reverse any and/or all disabling conditions whether in the child's characteristics or his/her own environment, and in doing so attaining and sustaining the family unit well being - .

Guralnick is among a host of authorities in the field of early childhood intervention who stress that services integration, inclusiveness and engagement of all the stakeholders (especially the child, the family and the community) are among the defining elements of a “developmentally” sound and effective early intervention model (Dunst & Bruder, 2002; Guralnick, 2001; Shonkoff & Meisels eds., 2000; Ramey and Ramey 1998; Bruder, 2005; Blok, Fukkink, Gebhardt, & Leseman, 2005; Harbin, 2005). An integrated early childhood system is also central to all major legislation related to early childhood intervention and education. Nevertheless, despite its broad acceptance as a concept, how and the extent to which service integration can and does influence child and family outcomes remains to be investigated. At this point, we turn to the findings of the literature review as it relates to the effectiveness of early childhood intervention and education in general, and to services integration in particular.

4.0 RESEARCH IN EARLY INTERVENTION

A literature search was completed between August 2005 and January 2006, using the University of Pittsburgh's database search engines in addition to worldwide web searches conducted using Google. The search was conducted using both key phrases and authors' name searches in a snowball fashion as relevant articles were identified. The search, in general, yielded a wealth of research and information on early childhood intervention and education, although findings were more limited as to quantitative research specific to services integration. The research base on early childhood intervention can be summarized under three general strands: 1) Studies on the *effectiveness* of ECI; 2) Studies and position papers of the *efficacy* of ECI; and 3) Studies on *Equity/Best Practices* specifically as they relate to classification and assessment systems and approaches, both those available and those in the process of being developed (**Figure 3** below summarizes these three general literature strands). Since the focus of this research study falls within the "efficacy" strand, the other literature strands are only briefly recapped.

Guralnick (1991) suggests that "effectiveness" relates to the treatment, intervention and services provided to families, and answers the question "does ECI work"? Research within this strand includes studies and materials that consider the type of treatment, timing of treatments and/or interventions, qualitative aspects of the intervention such as curriculum and didactic approaches compared to others, etc.

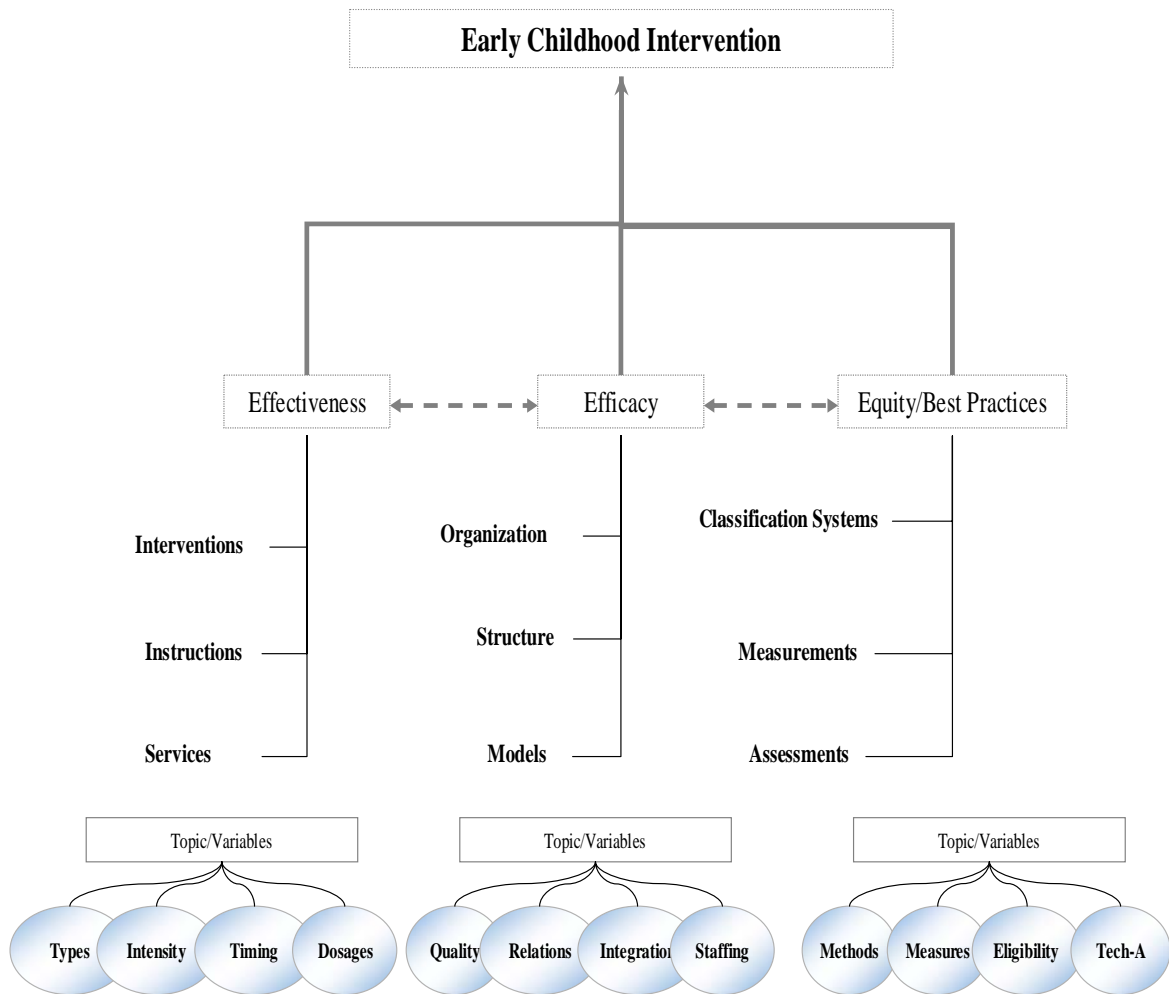


Figure 3. ECI Literature Organizational Strands & Rubrics

On the other hand, and as used herein “efficacy” will refer to programmatic and/or structural factors and answers the question “how and what makes it work, under what conditions and for whom?” (Guralnick, 1998). Under this rubric of studies and material are services integration, system of care, studies looking at relations such as those focused on effect of coordination and family participation, and studies analyzing policies and organizational models

such as school-based services. Lastly, “equity/best practices” is used here as a general term for research and materials geared toward measures, assessment approaches and diagnostic and functional classifications systems. The labels and descriptions for these three strands are only created by this researcher as a way to structure a discussion of otherwise interdependent and interwoven elements, policies and research-base.

4.1.1 On the Effectiveness of ECI

The first strand and the one which yields the bulk of literature results can be classified as research on the effectiveness of early intervention (i.e., answering the question does ECI work?). This question has received an affirmative answer as substantial evidence has and continues to accumulate relating to the ability of ECI to significantly minimize decline in development and to address and reduce risk factors (Guralnick, 1988; Guralnick, 1991; Guralnick 2001). ECI has over the past 3 decades gathered a strong conceptual base which continues developing and changing. Early childhood intervention or ECI is directed to address the needs of children between 0 and 5 years of age (in some states from 0-9) who are considered as, or suspected of, being at risk for developmental disabilities or delays. One of the most important goals of early intervention is to enhance development and prevent secondary disabilities that may result from an infant’s primary condition, a goal that is more likely to be achieved the earlier an infant and the family are identified and enter intervention (Guralnick, 1998, IDEA, 1997, Simeonsson, 1991; Simeonsson et al., 1982). One of the central tenets of early intervention is centered around the timing and comprehensiveness of the intervention. There is ample evidence that the immediacy (“*earliness*”) of the intervention is associated with a marked and steady improvement in children’s developmental patterns, better school results and significantly better overall

developmental outcomes (Simeonsson, Cooper & Schelner, 1982; Guralinick, 1988; Boocock, 1990; Zigler, 1994; Reynolds, Mavrogenes, Bezruczko, & Hagemann, 1996; Ramey & Ramey 1998; Barnett, 2000; Shonkoff & Meiseles, eds., 2000; Ramey et al., 2000; Leventhal, Brooks-Gunn, McCormick & McCarton, 2000; Currie, 2001; Gilliam & Zigler, 2001; Bagnato, et al., 2002; Olmsted, 2002; Reynolds, Temple, & Ou, Suh-Ruu, 2003; Bagnato et al., 2004; Reynolds, & Temple, 2005).

The public policy initiatives that have been developed and implemented over the years such as Head Start, also support “the earlier, the better” view of intervention. Several government-sponsored initiatives have highlighted the need for immediacy as well as its relevance to family satisfaction with ECI system. Among these governmental initiatives is the National Early Intervention Longitudinal Study (NEILS; <http://www.sri.com/neils/> last accessed 2/22/06). NEILS is part of a program of longitudinal studies funded by the U.S. Department of Education that are being conducted by SRI International. SRI International has produced several reports relevant to early childhood intervention and education. One of the NEILS reports focused on a representative sample of 3,338 children and documented the families’ initial experiences and impact with EI services among 93 counties and 20 states between 1997 and 1998 (http://www.sri.com/neils/FE_Report.pdf , last accessed 2/22/06). According to the statistics gathered by this study, the average family contact with the ECI system occurred between the 0-36 months age periods, and sometimes included families who had had prenatal screenings and/or problems which required early intervention (Graham, Bailey, Scarborough & Hebbeler, 2003). The same statistics indicate that, on an average, the family’s first expressed concern about the child was around 7 months of age, with early intervention having been accessed after initial diagnosis between 7 and 9 months later, and the referral processes having

been completed after 12 months, resulting in an IFSP (i.e., Individualizes Family Service Program) being developed on an average never less than 8 months after the first concern was identified (Graham, Bailey, Scarborough & Hebbeler, 2003).

Besides the timing of intervention, another important question in the effectiveness research has been the focus of, or unit to be targeted by, the intervention(s). More specifically, these studies have investigated which factors relevant to the child, the child environment or other protective factors are predictors of better outcomes both in the short term and in later life. Findings from a longitudinal study by Bee et al., (1982), indicated that assessments of child performance were poor predictors prior to 24 months, but excellent predictors from 24 months on (Bee, Barnard, Eyres, Gray, Hammond, Spietz, Snyder & Clark, 1982). The same study also finds mother-infant interactions and general environmental quality in addition to measures of family ecology (level of stress, social support, maternal education and parent perception of the child etc.) to be among the best predictors of later child performance, and of the child's IQ and the child's language at 24 and 36 months of age (Bee et al., 1982). Additional, subsequent studies also indicate that parents' characteristics and other environmental risk factors, as well as the presence or absence of other child's protective factors, have strong predicting power of a child's performance in later life (Sameroff, 1998; Landy, Tam, 1998; Peterson, Wall, Raikes., Kisker, Swanson, Jerald, Atwater & Qiao, 2004; Chapman, Scott & Mason, 2002). A longitudinal study by Sameroff (1998) suggests that focusing on single characteristics of individuals (e.g., resourcefulness, resiliency or intelligence) or the family status of the child (e.g., welfare or marital status, or single parenthood) can never explain more than a small proportion of variance in normal behavioral development (Sameroff, 1998). Instead, as this author states, major differences do emerge when comparisons are made between groups of children with many

risk factors and those with only a few risk factors, which suggests that the effects of accumulation of multiple negative influences that characterize high-risk groups (Sameroff, 1998). Another study by Ramey, et al., (2000), further supports the beneficial effects of ECI and early childhood education services. These authors found that high-quality educational programs combined with comprehensive support services not only resulted in educational advancement for the children but it also resulted in improved outcomes for the mothers (Ramey, Campbell, Burchinal, Skinner, Gardner, & Ramey, 2000).

While there is substantial agreement that ECI is a “good thing”, there are still many questions that remain to be resolved. For instance, the literature illustrates that children do show improved conditions as a result of ECI across most important areas of concern, but that much of the observed gains tend to fade out on the long run. According to Brook-Gunn (2003), the possibility that an intervention has limited effects must be understood and investigated in terms of the particular effects being measured and compared to the populations in which these effects do tend to fade (Brook-Gunn, 2003). This point is expanded eloquently by Currie, (1998) and Currie (2001). Currie (2001) proceeded to reviewing the more methodologically rigorous studies that have tackled the question about the fading effects on intermediate and long term child’s outcomes. What emerged from Currie’s review is that putting aside quality, competency and cost variables, intervention can not be expected to counter a lifetime of deprivation and disabling conditions faced by the disadvantaged who often populate the ECI programs (Currie 2001; Bainbridge, Meyers, Tanake, Waldfogel, 2005; Gormley, & Phillips, 2005).

Gormley and Phillips (2005) also point to another factor that might play a role in the fading effects of ECI. That is, the lack of universality[‡] which intrinsically creates selection biases within such programs, and within all public-funded programs in general. These authors, using a quasi-experimental random assignment design, investigated the effect of universal pre-k in Oklahoma. Their finding did indicate that, after controlling for various factors, there was a significant effect size (with an overall average percentage gain above 25%) in the cognitive and language skill among all children participating in the experimental universal program (Gormley,& Phillips, 2005). A meta-analysis of 19 studies centered around education and conducted by Blok et al., (2005), found that effects from ECI programs do fade over time and that, according to their calculation, with an average effect size $d = 0.30$, it would take approximately 10 years for those effects to completely disappear, and about 2 years for them to begin to fade (Blok, Fukkink, Gebhardt & Leseman, 2005). Questions as to the effectiveness of ECI have been raised numerous times in relation to Head Start and other publicly-funded programs. These questions continue to reemerge from time to time in spite of the accumulated evidence in support of such programs (Ziegler, Piotrkowski & Collins, 1994; Currie & Thomas, 1995; Felton, 1999; Garces, Thomas & Currie, 2001; Gill, Dembosky & Caulkins, 2002; <http://www.pbs.org/merrow/news/edweek.html> last accessed 2/22/06). It is perhaps for this reason that a new generation of research has progressed from studying the effectiveness of ECI to studying how to increase the efficacy of ECI.

[‡] Universality in this context is intended to mean the unrestricted, open access for all to public-funded programs. Hence, “lack of universality” is meant to indicate a systematic way to exclude some population from accessing public-funded programs (e.g., based on income, or other criteria).

4.1.2 On the Efficacy of ECI

One of the criticisms of ECI programs that are prevalent in the efficacy research strand, especially in evaluating programmatic effects of early intervention, is the lack of internal validity. This concern is especially poignant in reference to the possible regression effects and to the possible population biases, when considering that the ECI programs are accessible mostly by means testing and as a result of extremely low test scores (Shonkoff, Hauser-Cram, Krauss, & Upshur, 1988). Shonkoff et al., (1988) find that these internal validity threats are especially prominent in traditional evaluation research which lacks both statistical and methodological rigor, including the limited use of multivariate techniques and loosely operationalized independent variables (Shonkoff et al., (1988). While the questions regarding internal validity and about the causal mechanism of observed effects in early childhood intervention are not totally resolved, there have been substantial advances in other areas of evaluation research regarding ECI/ECE programs (Reynolds, 2003). As indicated herein, efficacy research is now considered complementary to effectiveness research, if not an alternative to such research, in advancing our understanding about the complex causal pathways defining the impact that services, structures and policies are having on children and their families (Shonkoff et al., 1988; Guralnick, 1988; Guralnick, 1989; Guralnick, 1991; Dunst, 2000; Reynolds, 2003). Efficacy research is defined in this research paper as a strand of studies that investigate the question of what kinds of specific structural elements, environmental conditions and/or aggregate attributes impact, positively or negatively, the effectiveness of interventions (Shonkoff et al., 1988; Guralnick, 1991; Reynolds, 2003). The result of the literature survey on efficacy research can be summarized under three general rubrics: 1) Studies on partnerships-coordination and collaborative practices; 2) Program and services evaluation studies including studies on program quality; and 3) Studies on delivery systems services integration. This third type of study is still a

highly underdeveloped area of research. These rubrics are not mutually exclusive. Each is closely associated and, in many ways, may be considered as a definitional component or as a complementary factor to one or more of the others - (e.g., integration without collaboration is unlikely, just as collaboration is integral to family-centered practices, etc.). Because of this “shared quality” among these rubrics, some semantic overlap is unavoidable. Moreover, this literature review focuses on specific structural elements, while certain others have been left out. There are for instance, terms like social inclusion, inclusive classrooms, social and cultural capital, classroom integration and related terms, which within the European ECI/ECE context have gained central stage. In the U.S., policies and research on service integration have instead tended more toward accountability, streamlining, eligibility and accessibility.

4.1.3 On The Nature and Practice of Service Integration

If the concept of service integration is placed in an historical perspective, it can be considered as a modern compensatory remedy to the inability of federal, state and local policies to successfully and comprehensively address the educational and services needs of disadvantaged families and individuals with disabling conditions. The configuration of service integration must be understood as being partly embedded in space (context) and time (development) or, more specifically, in the predominant approach or theoretical underpinnings distinctive to the accumulated experience in the specific field of study and in society in general, at any given point in time (Wheaton & Clarke, 2003). The term “service integration” entered into the jargon of the services industry toward the end of the 1980s. Of course, the comparable concept “system reengineering” was already an integral part of the manufacturing industry vocabulary before this time. This significant paradigm shift in the human services field, including early childhood

intervention, was preceded by other transitional movements among which are “*family-centered approach*” (Dunst 1999;Dunst, 2000; Desay, 1997;Guralinik, 1989; Ramey & Ramey, 1992; McWilliam, Tocci, Harbin, 1998;); “*wraparound services*” (Brooks & Webster, 1999; Potter & Mulkern, 2004); “*community collaborative and partnerships*” (Gray, 1985; White & Wehlage,1995; Berrick & Duerr, 1996; Bazzoli, Stein, Alexander, Conrad, Sofaer & Shortell, 1997; Butcher-Anderson & Ashton, 2004); “*services and/or care coordination*” (Harbin, Bruder, Adams, Mazarella, Whitbread, Gabbard & Staff, 2004; Bolland & Wilson, 1994; Appleton, Böll, Everett, Kelly, Meredith & Payne, 1997; Sloper, 1999; IDEA 1997; Dunst & Bruder,2002; Robson, A. Beattie 2004; Whitney, Kasper, & Riley,2003; Nolan, Young, Hebert & Wilding,2005; OSEP 2002. Additional concepts include, “*school-and-community-linked services*” (Lane, 1998; Franklin & Paula, 1997; Dryfoos, 1994; Cousins, Jackson & Till, 1997; Briar-Lawson, Lawson, Collier & Joseph, 1997; Bronstein & Kelly, 1998; Dryfoos, 2003; Reynolds, Temple & Ou, 2003; and, as discussed in earlier sections, other “pre-integration” models have included, “*single-point of contact*”, “*single-point of access*” and, more recently, “*team collaboration*” and “*interdisciplinary team approach*” (Bagnato, Neisworth & Munson, 1997; Neisworth & Bagnato, 1999; Larsson, 1999; Brooks & Webster, 1999; Klein & Gilkerson, 2000). These concepts all have significant attributes in common. First, they are all part of federal, state and local initiatives adopted at different points and times. Each was or is based on the assumption that realizing the state goal of the approach would bridge the education gap, improve the quality of education and services and, most importantly, have an overall beneficial effect on the well-being of children and their families. As the literature suggests, these assumptions are yet to be fully substantiated.

There are very few studies that directly address integration as their unit of analysis, and the literature seems even more meager on the subject of comparing different delivery services models. Overall there are no conclusive or well established results that can definitively be accredited to services integration or to coordination. In addition, the limited research has had desperate findings (Dunst & Bruder, 2002). There is a great quantity of literature that analyzes the quality of programs and the quality of the relationships among participant stakeholders, such as services coordination models and partnership effectiveness, albeit still far from providing conclusive evidence of how and in what way these structural elements produce better outcomes for children and families. Coordination, relational and partnerships studies refer herein to the research base that investigates or addresses the connectivity and the collaboration between different actors and/or functions within the ECI process. These studies can be considered consonant to “service integration” in that service-coordination can be seen as a proxy variable and a quintessential element in the definition of an integrated services care system. As used in IDEA Sec. 303.23, except in Sec. 303.12(d)(11), “service coordination means the activities carried out by a service coordinator to assist and enable a child eligible under this part and the child's family to receive the rights, procedural safeguards, and services that are authorized to be provided under the State's early intervention program” (IDEA 1997). The key words used within the Act are to “*assist and enable*” which looks to the activities of service coordinators working with the child and the child’s family to facilitate and “safeguard” access to services, at a minimum. Yet, integration is not attained by mere access to services, and therefore entails more than coordination. As indicated in the literature and within the ECI system itself, coordination should be conducted in a “family-centered” manner which implies an intersystem collaboration, with the necessary sharing of responsibility among all the participants. The lack of clarity as to

the definition of and linkages among, integration, coordination and collaboration also extends to the measurable outcomes that these should be producing (Dunst & Bruder, 2002; Butcher-Anderson & Ashton, 2004, Roberts et al., 1996, Harbin & West, 1998; Romer & Umbreit, 1998). This ambiguity has received well-earned criticism, but has also motivated further research designed to solve these puzzles. The majority of the research base is centered around service coordination, organization and professional and family partnerships. The findings from this research literature provide an insight into the complexity involved with developing, attaining, and sustaining a fully-integrated service system or what some have come to call an integrated system of care (Bagnato, 2004).

Service Coordination Collaboration & Partnerships

A study by Butcher-Anderson & Ashton, (2004) using a meta-analytic methodology explores the roles of intra-organizational, (i.e., interagency and inter-professional) collaborations in addressing family and children needs, and examines how schools have benefited from these collaborations (Butcher-Anderson & Ashton, 2004). According to their operational definition, intra-organizational collaboration entails the working together and the sharing of responsibilities among teachers, social workers, school psychologists, administrators, nurses and volunteers (Butcher-Anderson & Ashton, 2004). These studies indicate that collaborative models produce improved benefits, but that these results are affected by the quality of the linkages and facilitation within and across the collaborative networks (Butcher-Anderson & Ashton, 2004). Case management was among the many terms first used in 1986 amendments to the Education of the Handicapped Act to describe resource mobilization and integration (Haussein, Kaufmann & Hurth, 1992; Dunst & Bruder, 2002). According to OSEP's on-line resources, case management refers to activities that are designed to ensure that program participants receive the support,

resources, and services they need in an integrated and coordinated manner (<http://www.uconnuceedd.org/Projects/RTC/> last accessed, 2006). Dunst & Bruder, (2002) indicate that the most valued benefits of each IDEA Part C resulting from services coordination, early intervention and practices within the natural environment (Dunst & Bruder, 2002). By natural environment, the study refers to early childhood settings, such as the home, community, and other “natural everyday environments” in which children test and acquire their abilities. In fact, according to these researchers, “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” (Dunst & Bruder, 2002. pp.363). Their results indicate that the most desired outcomes of services coordination, early intervention and natural environment practices are child functioning and development, child quality of life, parenting competence and confidence, parent/child interaction, child mastery, inclusion, and child learning opportunities (Dunst & Bruder, 2002). Dust and Bruder are among a host of outspoken proponents who believe that effective family-centered practices and teaming should influence systems coordination and the provision of family support and resource, as well as their effectiveness (Bailey & Simeonsson,1988; Romer & Umbreit, 1998; Bolland & Wilson, 1994; Appleton, Böll, Everett, Kelly, Meredith & Payne, 1997;).

Romer & Umbreit, (1998), following earlier groundwork, argue that while much has been said about the needs to be family-centered and to work as a team, little is known about the exact role that these factors play in the overall scheme of ECI efficacy and effectiveness (Romer & Umbreit, 1998). Three types of services coordination and nine families were part of their study to investigate whether variation in the implementation of family-centeredness service coordination practices in Part H (infant & toddlers) of IDEA accounted for variability in family

satisfaction (Romer & Umbreit, 1998). A multiple baseline across subject design was used to collect satisfaction data from the 9 participating families over a one-year period. The result indicated a 93% post-implementation agreement that family-centered service coordination helped in connecting the family to services in a more appropriate manner than prior to the implementation (8% agreement) of that approach (Romer & Umbreit, 1998). What this study also suggests is that there are two multilevel factors involved in service coordination. First is the organizational ability to establish and maintain partnerships. Second is the human factor which is involved in the interfaces among the coordinator, the family and the services partnerships, which according to Romer & Umbreit (1998) requires careful training, cultural sensitivity and social validation.

Nickel, Cooley, McAllister, & Samson-Fang (2003), in a qualitative article, examine one partnership type known as the “Medical Home”. This type of partnership is established between the professional community, and children with special health care needs and their families, in the natural home environment. Key elements to the medical home approach include family-centered practices, services coordination, cultural sensitivity, and comprehensiveness of the services. According to the authors, this combination of elements leads to better outcomes, such as improved problem identification and diagnosis, improved compliance, fewer hospitalizations, lower cost, and increased satisfaction with care (Nickel et al., 2003). Yet, according to a study conducted by Nolan, Young, Hebert & Wilding (2005), the adequacy of services coordination for children with complex health care needs remains relatively underutilized (Nolan et al., 2005). Nolan and his colleagues point out the need for improved education among early interventionists and health care professionals as a way to better utilize collaborative networks and improve coordination across services. The need for improvement in this area is echoed in several other

research studies and journal articles including Bailey, Palsha & Simeonsson, (1991); Klein & Gilkerson, (2000), Musick & Stott (2000); McCain et al., (2004).

The human factor or, as Romer & Umbreit (1998) describe it, the social validation of a family-centered intervention within a culturally sensitive practice, relates to the need for professionals and early intervention workers, in general, to develop a set of competencies (knowledge, ability and skills) that can effectively address and serve the complex needs of youths (Romer & Umbreit,1998; McCain et al., 2004). Among these competencies are the abilities to engage and build relationships with family members or other significant persons; to connect youths to community institutions, resources, family advocacy, and supports; and to facilitate person-centered planning, appropriate assessment; universal access and design, and reasonable accommodation as well as auxiliary aids and services (McCain et al., 2004). There have been initiatives from the Office of Special Education Programs (OSEP), which is part of the U.S. Department of Education, to use technical assistance as a way of making programs more effective in finding strategies for collaboration and coordination (Hauser, Marks, Uperesa & Padilla, 2001). The study conducted by Hauser et al., (2001) suggests that programs which were provided with technical assistance did have better overall education performance results and affected their participants in a more positive manner (Hauser et al., 2001). High-quality coordination and collaboration as well as family-centered practices can be considered among the formative elements of services/care integration in the arena of early childhood intervention (Bagnato, 2003; Flores, Burke, & Coover, 2006; Bailey, Palsha & Simeonsson, 1991). Additional variables identified in the literature that contribute to efficacy in ECI include among others, better professionals development (Bailey, Palsha & Simeonsson, 1991, the need for continued training (Perry, Sherwood-Puzzello, Hadadian & Wilkerson, 2002; Klein & Gilkerson,

2000), and sensitivity to the family's particular needs (Harbin et al., 2000; Garcia, & Magnuson, 2000; Bagnato, 2003). And last, but certainly not the least, is the ability of professionals to collaborate and to form partnerships (Marshall & Mirenda, 2002; Turnbull, Turbiville & Turnbull, 2000; Bagnato et al., 2004; McDonald, Moberg, Brown, Rodriguez-Espiricueta, Flores, Burke & Coover, 2006).

The literature reviewed evidences and seems to support the view that service integration is partially the result of good, high-quality coordination in the care, education and developmental activity of the child (Kahn & Kamerman, 1992). At one level "coordination" contemplates the shared perceptions of parents and service providers, and of specific behaviors and attitudes of the stakeholders involved. At another level, care or service integration is a natural end product of the ecological approach offered by Bronfenbrenner (1974). Therefore, a coordinated family-centered approach, in some ways, refers to the ability of organizations and professionals to stimulate parents' involvement and to engage the whole family, and certainty to their ability to form community networks in the care and development of a healthy child. Parent and community involvement, besides being a major mandate under the IDEA, has been found to be an important variant in the cognitive development and academic achievement of young children as well as a cornerstone of an integrated and family-centered service approach (Summers, Hoffman, Marquis, Turnbull, Poston & Nelson, 2005; Bruder, 1998; Bagnato et al., 2004; Bagnato & Neisworth, 1999; Hamel & Feldman, 1998; Marshall & Mirenda, 2002; Dunst & Bruder, 2002; Bailey & Simeonsson, 1988; McWilliam, Tocci & Harbin, 1998; Larsson, 1999).

These findings, while suggesting the inclusion of these factors in the overall causal pathways to successful ECI, do not provide definitive evidence concerning the extent that these approaches alone can maximize the results of treatment and intervention. However, there does

appear to be a general consensus that effective service coordination and its corollaries (i.e., collaboration, relationships and partnerships), when placed in a responsive community of care and support policies, can contribute to move toward an integrated early childhood intervention system (Bruder & Bologna, 1993; Harbin & West, 1998; Kahn & Kamerman, 1992).

On the Effect of Service and System Integration

While the literature as a whole consists of articles that define and synthesize the need for, or the factors that determine the success of, service/system integration, the effect and/or outcomes of such integration has not been extensively studied. One of the main concerns expressed in the research base on the effect of system integration on the overall outcome of early childhood interventions is the scarcity of systematic research on the subject (Reynolds, 2003). This lack of evidence has drawn considerable attention from the critics of ECI and may, to some extent, cast doubts on the cost effectiveness of early education and intervention (Barnett, 1987; Barnett, 1995; Barnett, 2000). This subsection presents the literature that relates to “programs” as a unit of analysis in relation to services and system integration. These are studies that use integrated model program initiatives to present or to compare findings related to the effects of integration on the overall outcomes of intervention with children and families. Little if any, of the literature reviewed directly investigates or compares the impact of integrated as opposed to less - or non - integrated programs.

The paucity in this research strand might be partly the result of baffling variations in the interpretation, definition and implementation of “integration” within the context of ECI (Reynolds, 2003). An example of this variability is provided by Odom et al., (1999). In their article, 16 inclusive programs from 4 regional locations in the U.S. were explored in terms of their organizational context and how each interpreted and implemented an individualized

services delivery model (Odom, Horn, Marquart, Hanson, Wolfberg, Beckman, Lieber, Li, Schwartz, Janko & Sandall, 1999). As these researchers surveyed how administrator, teacher and parents defined the setting and delivery model of their programs, it became apparent that the participants all identified their setting as “inclusive”, and/or “integrated”, even though there were definitive differences in each of the models. Similar variations with regard to the interpretation and organization of the services system and delivery models were also reported by Harbin et al., (2000). Even with this semantic confusion, the literature is nonetheless consistent in highlighting the importance of adopting a broad contextual approach of inclusion, cooperation and integration of multiple comprehensive services as the best practice model to enhance the positive development of young children and their families within a community context and using a family-centered approach (Harbin, Bruder, Mazzarella, Gabbard & Reynolds, 2001; Harbin, Clifford & Bernier, 1993; Harbin & West, 1998; Bagnato et al., 2002; Roberts, Innocenti & Goetze, 1999; Shonkoff & Meisels, eds., 2000; Shonkoff, Hauser-Cram, Krauss & Upshur, 1988; Brookes-Gunn, Fuligni & Berlin, 2003; Guralnick, 2001; Dunst, 2000; Bruder in Guralnick, 2002; Guralnick eds., 2005; Park & Turnbull, 2003; Blok, Fukkink, Gebhardt & Leseman, 2005).

The most evaluated and researched example of an integrated (whole child approach) program remains to these days Head-Start. Head Start today serves close to twenty-two million children across the U.S., mainly from a low-income, disadvantaged population. The program provides access to educational services, as well as a whole host of other comprehensive services and supports (<http://www.childrensdefense.org/earlychildhood/headstart/headstartbasics2005.pdf> last accessed 9/20/05). Since its inception, Head Start has grown to a seven-billion-dollar program in 2001. The program has been under increasing public

scrutiny, and its effectiveness, especially the long term “fading” effects, has been and continues to be questioned and debated (http://edworkforce.house.gov/press/press108/05may/headstartintro_052203.htm, last accessed 1/21/06; http://www.childrensdefense.org/earlychildhood/headstart/reauthorization_q&a.pdf, last accessed 5/1/06). Steven Barnett, Director of the National Institute for Early Education Research (NIEER), presented a paper on September 13, 2002 at a Congressional Science and Public Policy Briefing on the impact of programs such as HS. In this paper, Mr. Barnett argued that the criticisms, especially those relating to the fading-out effects of ECI programs, are flawed (<http://nieer.org/resources/research/BattleHeadStart.pdf> last accessed 8/8/05). Perhaps, the major flaw is that most of the criticism has centered around accountability, resources, costs, administration and eligibility, rather than the quality, universalism and adequacy of current community agencies to modernize and to apply evidence-based practices (Kahn & Kamerman, 1992). Nonetheless, the question remains as to the extent to which the organization of the delivery mode impacts the effectiveness of ECI. This question is partly addressed in a meta-analysis by Blok, Fukkink, Gebhardt & Leseman (2005) who reviewed 19 studies and analyzed the relevance of the delivery mode and other programmatic characteristics in ECI since 1985. The measure used to compare the different delivery modes and other programmatic characteristics was the effect size. Three programmatic approaches were compared: home-based intervention, center-based intervention and a combination of the two. The results indicated that center-based and the combination programs were, by far, more effective than solely home-based intervention in the cognitive domain. In the social domain, no significant difference could be observed among the three approaches (Blok et al., 2005). The relationship between delivery mode and outcomes seems to be moderated and mediated by several other factors (e.g., dosage, intensity, family networks, age of onset) which

support the theoretical model presented in a later section of this research paper. The fact that the combination of delivery models achieved the best results also seems to suggest the importance of comprehensiveness of services in seeking to improve not just the child's but also the family's conditions (Berlin, Brook-Gunn & Aber, 2001).

The research literature on efficacy is mostly confined to a few "piloted" federal programs. These have not sufficed to decrease the mixed effect or undetermined role that service integration has in the causal pathways to positive outcomes (Harbin, Bruder, Mazzarella, Gabbard & Reynolds, 2001; Reynolds, 2003). Hughes et al., (1997) indicate as a possible factor to more transparent and less confounding findings, the need for a 'deategorization' of public-funded programs (Hughes, Brindis, Halfon & Newacheck, 1997). This study suggests that the efforts toward integration have been mostly limited to instituting case or care coordination mechanisms, as if integration represents solely a management of activities from a third party rather than a "comprehensive, seamless system of care for children and families" accessible regardless of eligibility or categorical requirements (Newacheck, Halfon, Brindis & Hughes, 1998, p.166). One such comprehensive and integrated approach in relation to young children is what Dryfoos (1995) has termed the 'Full Service School'. With all the relative support for the idea - there are more than 1,000 such school in the U.S.- there is very little research evidence that suggests how and/or the extent to which this level of service, health and education integration results in improved education, health or better developmental outcomes in the children, especially for children with chronic health problems and/or disabilities (Griffith, 2000; <http://www.polkbrosfdn.or/future-initiative-schools.html>, last accessed 4/4/2006).

Other studies have attempted to evaluate the effect of contextual structural factors. By examining services linkage and services use patterns Hurlburt et al., (2004) found that

coordinated services do seem to have moderated and partially improved the usage of mental health services (Hurlburt et al., 2004). Improved usage of services reduced the cost of health services (Foster & Connor, 2005), and prevented out-of-home placements for children at risk of developing serious emotional and/or academic difficulties (Chafaouleas & Whitcomb, 2004). Whether integration is interpreted as the right to access services, the right of disabled children to be placed in inclusive school settings and/or the context of the delivery of care and service such as ‘the continuum of care’, one study suggests that the problem might be with the integrity of the application of these principles. The participants’ perception that the context of their care was closer to the stated principles was associated with a reduction in the reported symptomatology, lower severity of the symptoms, and an overall decrease in children’s functional impairments (Stephens, Holden & Hernandez, 2004). The import of this study is that integration alone might not be a sufficient condition, and that there must also be a level of system integrity (i.e., fidelity of execution).

Other studies, such as the analyses presented by Margolis et al., (2001), and Larsson, (1999), suggest that an integrated service delivery system based in the community is indeed feasible, and that the positive effects of such a system are not confined to the child but extend to the family unit as well. These studies further suggest that an integrated team approach impacts differently on families and children (Margolis, Stevens, Bordley, Stuart et al., 2001; Larsson, 1999). Harbin et al., (2000) also supports these findings, indicating that services integration produces improved results, especially for children with disabilities and their families (Harbin et al., 2000).

In closing, almost all of the literature reviewed on the subject seems to view services and/or care integration as a remedy to the poor quality of services, and the presence or lack of integration as an explanation for the mixed results often observed in evaluating public programs. As the literature review indicates, there is widespread support for integrated service delivery systems, but there is a need for better understanding of how services/care integration enhances intervention effects on the cognitive, educational, and social emotional growth and produces improved educational and functional well-being of children and families faced with disabling conditions. Also, it is important to determine what type of integration produces the best results. It is hoped that this study will be a step in this direction.

5.0 METHODOLOGY

This study utilizes secondary data analysis (SA) to evaluate the relationship between two types of approaches to integrated services for children and family attending ECI/ECE programs. SA has long been recognized as a valid method for examining research questions. One of the prototypes for the use of this methodology is provided by Durkheim's 1897 analysis of suicide (Sales, Lichtenwalter & Fevola, 2005). The advent of relational and object-oriented databases, has facilitated the storage, retrieval and re-arrangement of previously collected data and archives. With this increased access and ability to manipulate data has come the increased use of secondary data analysis methodology as a powerful tool for researchers. Among the most-used archives and secondary data sources are the U.S. Census, the General Social Survey, National Survey of Families and Households, Panel Study of Income Dynamics and the National Longitudinal Survey of Youth. However, other sources, such as the one used in this research, are accessed increasingly by researchers to rework the data for the testing of new hypotheses or to retest and/or replicate previous results (Yegidis & Weinbach, 1996; Rubin & Babbie, 2005).

The data source used in this study can be referred to as a variables-oriented, survey dataset (Russell & Schutt, 1999), because the bulk of the data collected and stored by the ECP Scaling Progress in Early Childhood Settings (SPECS) focused on specific strands of childhood outcome measures (Bagnato et al., 2004). SA inherently presents some drawbacks including, but not limited to, definitional issues regarding variables; hidden biases due both to the quality of data and systemic errors in data entry, which may be hard for the subsequent researcher to detect;

and the extent and breadth of the descriptors available on the population (Yegidis & Weinbach, 1996; Rubin & Babbie 2005; Russell & Schutt, 1999). Two of the challenges specific to the dataset used in this study are the unavailability of demographics information and the variation in the completion rates of the outcome measures, especially of the families' outcomes measures. On the other hand, there are obvious benefits in the use of the SA method, such as avoiding intrusiveness, which, in turn, facilitates the IRB approval process, and the pragmatic efficiency of the SA method in terms of resources, as there is no need for data collection, and last, but not least, the opportunity for combining the data with other data sources (Sales, Lichtenwalter & Fevola, 2005).

The sections in this chapter will provide a description of the sample and of the programs. These descriptions will be followed by a review of the psychometric properties of the dependent variables used in this study and a review of the research design as related to the statistical techniques and methods used to analyze the data. This chapter will conclude by reiterating and discussing issues pertaining to the internal and external validity of this study.

5.1.1 Sample Selection and Unit of Analysis

As previously indicated, the dataset being used does not provide much information about the demographics or other socio-economic characteristics of the sample because it was not a part of the original evaluation study design or requirements. In the face of this limitation, U.S. Census statistics were accessed and used to provide the reader with a better understanding of the context within which the two target programs operate. This first subsection is dedicated to describing the sample group in terms of the characteristics of the subject population and relevant regional characteristics. After describing the regions' demographics and socio-economic layout, the

subsequent subsections provide a comparative description of the population using entry level-data available from the ECP dataset. Descriptive statistics are presented to explore differences and similarities and overall distributions of the two groups of populations served in these programs between 2000 and the end of 2005.

5.1.2 Region Demographics & Samples Characteristics

Geographically, both programs operate in relatively rural areas; the FI-EC operates in the “north-central” region of Pennsylvania and the CC-EC in the “south-central” region of Pennsylvania. While there are some similarities between these two regions, they are also, in many ways, experiencing different demographic trends.

The FI-EC reaches 8 counties covering 778 square miles. In the region in which the FI-EC operates, the estimated population in 2004 was 631,016 people, which is about 5.9% of the total population of Pennsylvania. According to census statistics, this region is experiencing negative population growth (down from 633,486 or about -1.08% averaged rate from previous census data). The inverse is true in the CC-EC region, which experienced a 3.5% growth over the same period, and which is two and half times greater than that of Pennsylvania as a whole (i.e., 1%).

Overall the CC-EC is in a region spanning over 654.58 square miles with a population size of about 1,722,299 people (or about 14% of the total PA). The CC-EC region has a higher population density than its counterpart, with an average of 59.9 persons compared to 36 persons per square mile in the FI-EC region (U.S., Census 2000). In terms of their age demographics, the two regions are comparable, although the FI-EC region shows, on average, slightly older demographics with 17% of its population consisting of persons 65 years of age and older as

compared to 15% for the CC-EC region and 15.6% for PA as a whole. Not surprisingly, the presence of population under the age of 5 years in the FI-EC region (5.3%) is less than both the PA population (5.9%) and the population for the CC-EC region (6.5%).

The median age in 2000 for the FI-EC region was 38.4 years of age, which is about the same as the state median age (38 years), but more than the CCEC median age (36.5 years). In both regions, women residents appear to have a slightly higher median age than men, 39.9 to 38.8 years of age. Interestingly, the two regions are almost identical when it comes to ethnicity, with an overwhelming presence of white (Caucasian) persons within the CC-EC (93%, which is close to 10% above the state average of approximately 83.5%) and also within the FI-EC region (96.5% or 13% above the state average). In both regions, the African-American population is well below the overall state average (10%), with the CC-EC reporting about 1.7% and the FI-EC 2.1% of the total population. Hispanic/Latino presence in the south-central region makes up 5.4% of the population (which is above the 3.2% statewide presence), while in the north-central region their presence is less than 1% of the total population (see Figure 4, below). These demographics suggest that the population served in the two selected programs is approximately ethnically equivalent, with a far larger presence of whites than any other group.

Social Indicators

Data on education level achieved shows that the two sites are almost at the PA overall percentage (81.9%) in terms of high school graduation rates. The FI-EC region had 81.2% and the CC-EC region 78% high school graduation rates. Both regions lag behind the state average in terms of college graduation rates (22.4%) with 15.1% and 18% respectively.

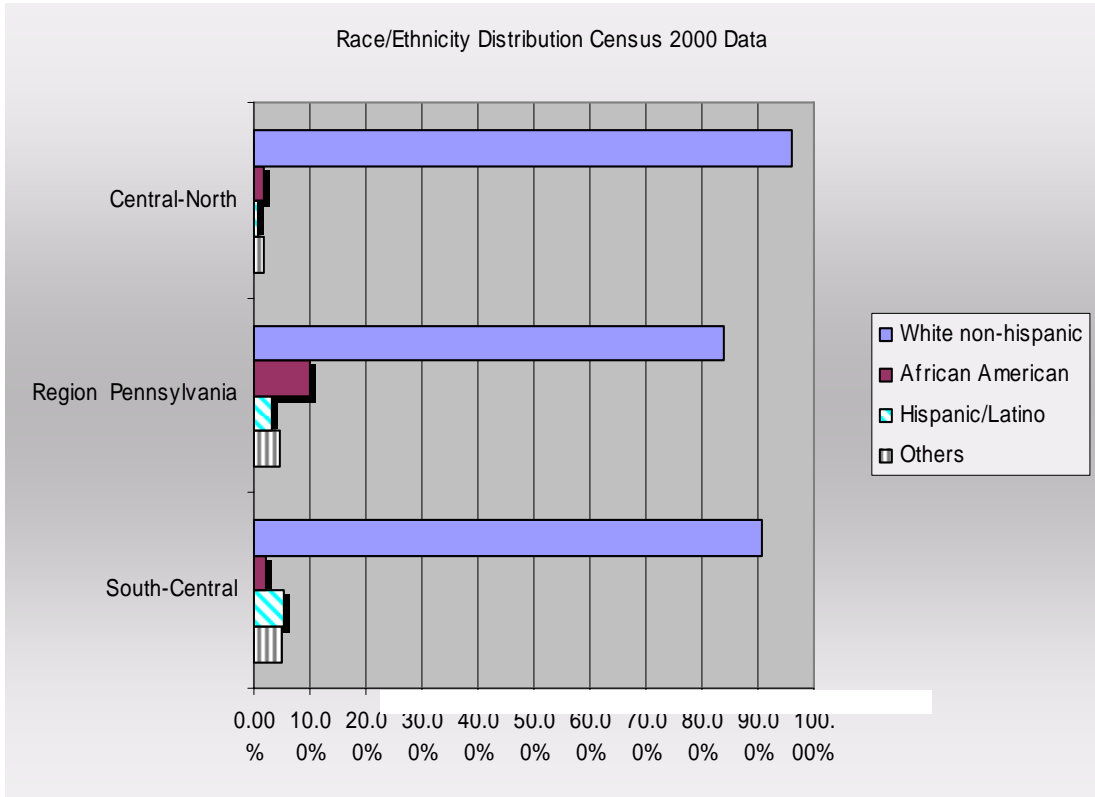


Figure 4. Comparative Demographic Distribution of the Regions by Percentage of Population’s Ethnicity (Census 2000)

The average family size and household size is comparable in both regions (2.95 persons in the FI-EC region vs. 2.99 for the CC-EC region for family size and 2.48 vs. 2.5 persons for household size). **Table 2** reports the distribution of household statistics between the two regions. As can be observed, the FI-EC region shows declining demographic trends compared to the CC-EC region in all aspects, as the economics of the regions indicate.

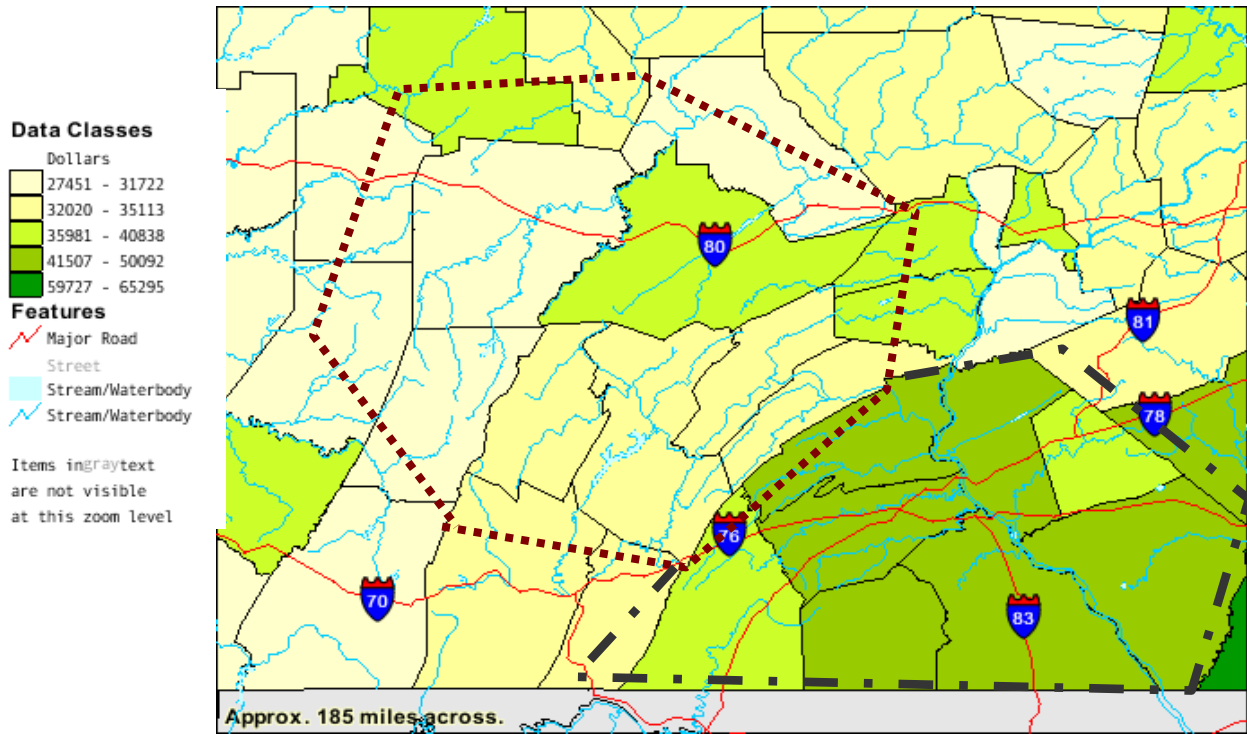
Table 2. Family Household Statistics Comparison Between FI-EC and CC-EC (U.S. Census 2000)

	FI-EC	CCEC
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Family Household Types	N	%	% FIEC Difference	N	%
Total Families	162,968	100%	NA	445,772	100%
Married-couple family:	131,134	80.5%	-1.0%	363,145	81.5%
With own children < 18 years:	52,740	32.4%	-2.0%	153,197	34.4%
Under 6 years only	11,097	6.8%	-0.8%	33,971	7.6%
Male householder, no wife present:	9,148	5.6%	0.4%	23,045	5.2%
With own children under 18 years:	4,663	2.9%	-0.1%	13,285	3.0%
Under 6 years only	1,397	0.9%	-6.8%	153,197	7.6%
Female householder, no husband present:	22,686	13.9%	0.6%	445,772	13.4%
With own children under 18 years:	11,995	7.4%	-0.7%	363,145	8.0%
Under 6 years only	2,530	1.6%	-0.2%	153,197	1.7%

Economic & Poverty Indicators

The unemployment rate for all of Pennsylvania in 2000 was 3.5%. The North-Central had a comparable unemployment rate (3.8%) but both were much higher than the 2.4% unemployment reported in the South-Central region. Another indicator often used as poverty indicator is the median household income. For PA as a whole, the median income was \$40,106 in 2000. The economic differences between the two considered regions have been captured using the thematic-maps features offered by the U.S. Census website. **Figure 5** shows clear and distinct income differences between the two regions. According to 1999 census statistics, the poor in the U.S., made up 12.4% of the total population (33.9 million) and 13.1% of the families in 1989 had an income below the poverty level (<http://www.census.gov/prod/2003pubs/c2kbr-19.pdf>, last accessed 2/28/06).



Note. The _ . _ line is the South Central or CC-EC site and the line indicates the North-Central or the FI-EC site. All of the geo-maps were obtained from: <http://factfinder.census.gov>

Figure 5. Average Median Family Income in Targeted Regions (U.S., PA. 2000, Census)

As is widely known, the poverty rate among the population age 18 years or younger (18.3%) is higher than the average rate, although between 1989 and 1999, poverty rates showed a deceleration of 1.7% (or down to 16.6%). More than 20% of the 17,978,025 children under 5 years of age were reported in poverty in 1989. By 1999, the numbers have shown a slowing rate of about -2%. Close to 25% of the African-American population was in poverty in 1999, compared to 9% of the total white population and 22.6% of the Hispanic/Latino population.

Turning our attention to Pennsylvania and to our regions of interest, the same economic statistics indicate that the North-Central region was more poverty-stricken than its South-Central counterpart. The 2000 census statistics in Pennsylvania report that the families in poverty constituted about 3% of the population. Single households with a child in poverty were about 1.4% of the population or 134,560 persons and overall individuals in poverty constituted 13% of

the PA population or 1,304,117 persons. Almost 22% of the total number of individuals in poverty reported having children between 5 and 17 years of age. **Figure 6** reports the percentage distribution of families in poverty within each of the two regions. As it is possible to observe from the thematic map below, poverty rates among families are higher in the FI-EC region, ranging on an average from a low of 3.2% to a high of around 7% rate compared to a 0.3% to 2% average rate across the south-central region. In both regions, a large majority of the families in poverty, (+/- 76%) had children under the age of 18 years and 33% to 39% of the families in the respective regions had children of 5 years of age or younger.

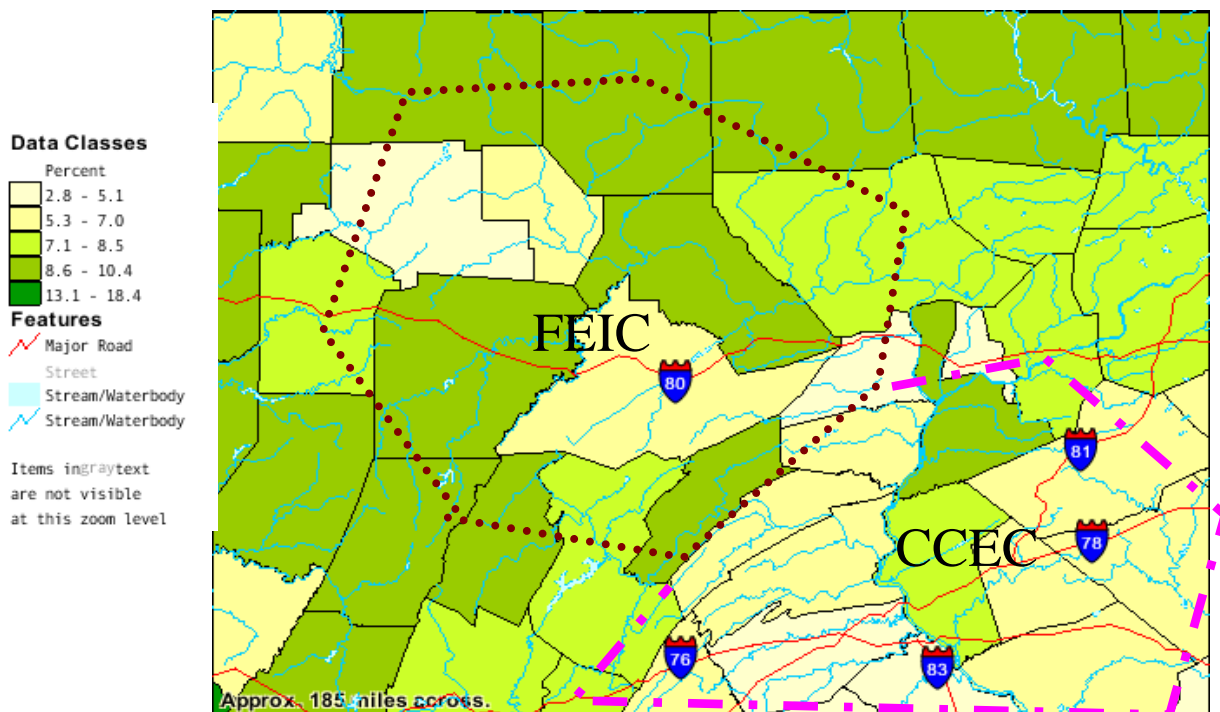


Figure 6. Percentage of Families in Poverty: Distribution Across the Targeted Regions (U.S., Census 2000)

In 2000, in the south-central region 2% to 2.8% of this population collected public assistance, compared to 2.6% to 3% of the population in the north-central region. The last thematic map (**Figure 7**) reports the disability rates across the regions of interest. In general, disability rates in

PA were 12.4%. In the FI-EC region, the disability rate was 17%, compared to the 15% in the CC-EC areas. According to the 2000 census statistics, the total population of disabled Pennsylvanians 5 years of age and older in 2000 was 2,111,771. The FI-EC region accounted for 12.04% (approximately 254,317) of the disabled population and the CC-EC for about 5.06% (approximately 106,807).

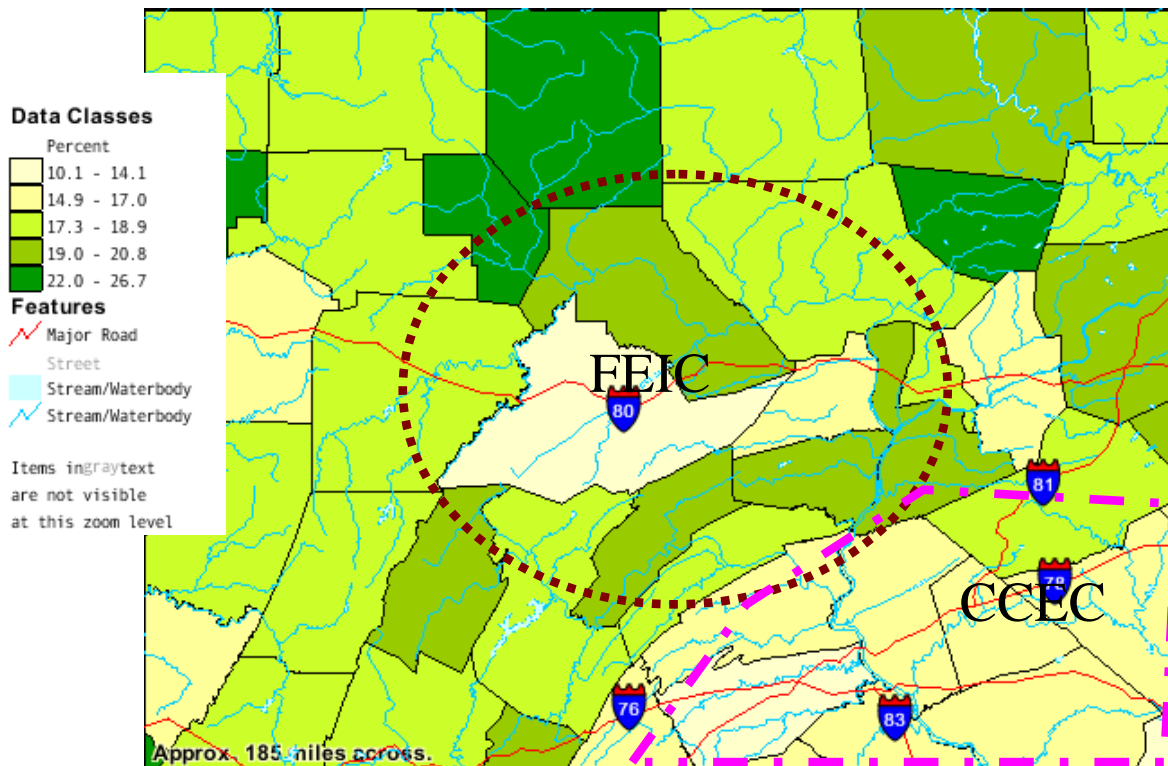


Figure 7. Disability Distribution as Percentage of the Population: Comparisons in Targeted Regions (U.S., Census 2000)

In summary, from the above presented statistics, it is possible to discern that the FI-EC serves areas that in many respects were more socially and economically disadvantaged than the CC-EC service area. It was also observed that, in both regions, whites constituted the vast majority of the population. There was a sensible presence of Hispanic/Latino population in the CC-EC area but not in the FI-EC region. In both regions, African-Americans constituted less than 3% of the total population. In terms of implication for this study, the experimental variable

(FI-EC program) appears to be serving a population that is relatively more disadvantaged, poor and with higher at-risk rate for disabilities. This discrepancy could partially explain the entry-level result of higher severity of problems or lower baseline assessment scores in the FI-EC area than in the CC-EC.

The next section of this research paper will describe some of the entry-level data on the populations served by the two programs, as obtained from the ECP/SPECS data set. This analysis would provide additional information about the distribution of the children upon entering the programs. This next section also describes the screening process used to arrive at the sample of children which was ultimately used to test the hypothesis of this research.

5.1.3 Sample Descriptions & Data Screening

The number of children contained in the ECP data set for the two selected programs (Independent Variables, IV) totaled to **2988** observations on children of which about 45% were females. The data that will be analyzed cover the period from January, 2000 to December, 2005. During this period, the Fully Integrated site (FI-EC) accounted for close to 64% (n=1900) of the total correct observations in the data set and the Consultative-Coordinated referral-based program (or CC-EC) accounted for the remaining 1089 children or 36% of the total correct observations in the data set. At entry, the mean age for the total sample was 36.3 months (Std. Dev.=17.36 months; Range 0 to 71 months). For the FI-EC children the mean age at entry was 37.9 months (Std. Dev.= 16.8; Range=0-69 months) and for the CC-EC, the age mean age at entry was 33.7 months (Std. Dev.= 17.02; range=1-71 months). The age of the two group of children at entry was found to be significantly different with the FI-EC children being relatively older at entry than the CC-EC children ($t= 7.565$; $df.= 2171$; $Sig. = <0.001$). Age is an important

variables considering that one of the tenets of Early Childhood Intervention is that the younger the identification of disability/delay the better the prognosis or progress is to be expected.

A second level of analysis involved evaluating the frequency of completion and pre and post in all of the evaluation batteries. The goal was to explore the sample in terms of their pre-post completion rates in each of the measures used, so that the most reliable and statistical robust sample size could be selected. Table 3 provides the distribution of the children by their completion rates in each of the measures by program types[§].

Table 3
Samples Completion Rates by Instruments and Type of Programs

Completion Categories	Total	Non-Integrated	% of Total	Integrated	% of Total
Total 2 Time Points for DOCS	2679	977	36.5%	1702	63.5%
Total 2 Time Points for PKBS	1966	601	30.6%	1365	69.4%
Total 2 Time Points for BSSI-3	415	111	26.7%	304	73.3%
Total 2 Times Point for PBC	1443	232	16.1%	1211	83.9%

The fully integrated program completed higher numbers of measurements both for time 1 and time 2, with an averaged completion for two time points of 72.5% compared to 27.5% for the CC-EC. Moreover, the two groups of children were relatively similar in terms of estimated mean time in program (calculated as the differences between the first and the last known evaluation date). However, from the standard deviation and the range is possible to detect that the FI-EC children stayed relatively longer than they counterpart. The mean time in program (or

[§] Please note that for the final analyses only the most robust sample size will be used (i.e., most complete data and the data that most reduces sample fluctuation. Hence, these numbers only represent that which was available in the original ECP database.

TIP) for the FI-EC program was 13.44 months (Std. Dev.=10.50; Range= 0 to 55 months) and for the CC-EC program was 13.10 months (Std. Dev.= 9.31; Range= 0 to 36 months). The difference as Figure 9 indicates was mainly due to the outliers and when these were eliminated, the mean TIP for FI-EC was 13.38 (Std. Dev.= 10.42) and the mean TIP for CC-EC was 13.10 (Std. Dev.= 9.31).

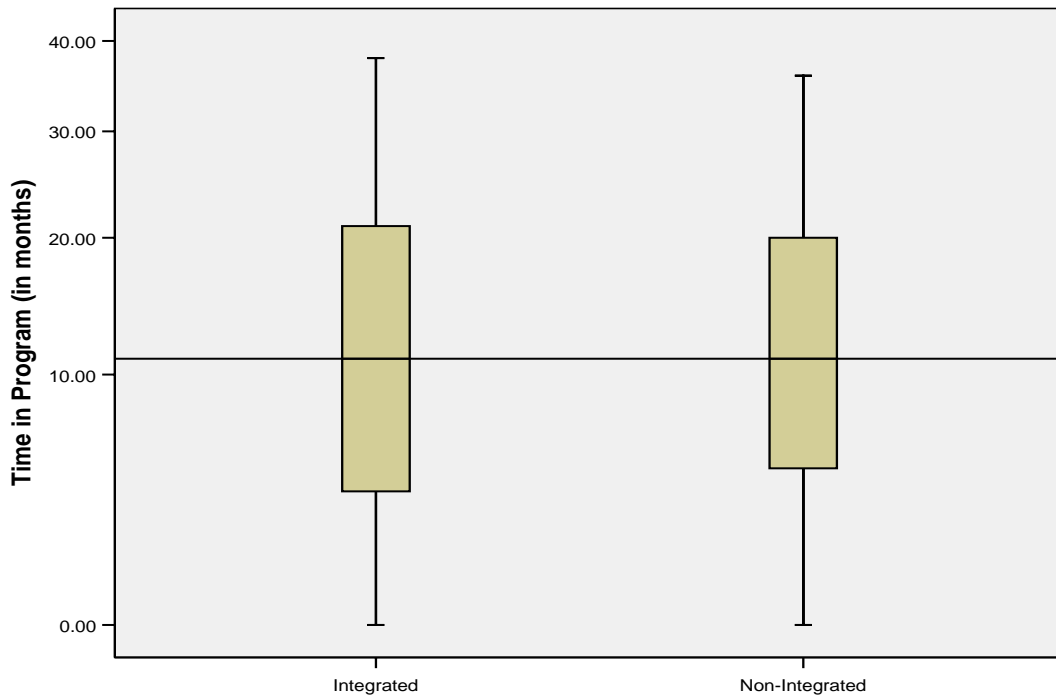


Figure 8. Box-Plots Comparison of Time in Program by Program Types (median=11 months)

According to the independent t-test statistics, the two groups are not significantly different in terms of time in program ($t= 0.798$; $df.=2474$; Mean diff.= 0.295; Sig. $p= 0.425$).

Further exploratory analyses were conducted to assess differences between the two programs on the dependent measures mean scores at entry. As the next table indicates, with the exception of the DOCS and the PKBS Problem Behaviors mean scores, the two groups show not to be significantly different in most of the measures, at entry.

Table 4 t-test Statistics:

Comparing Type of Program by Dependent Variables @ Entry

Dependent Variables	Program Type	Sample Size	Mean	Std. Deviation	t	df	p	Mean Difference
DOCS @ Entry	Integrated	1867	100.43	14.13	3.518**	2334	0.000	-1.855
	Non-Integrated	1086	102.29	13.63				
PKBS Social @ Entry	Integrated	1537	97.58	16.98	1.064	1688	0.288	-0.748
	Non-Integrated	773	98.33	15.39				
PKBS Problem Behavior @ Entry	Integrated	1537	97.42	15.54	5.304**	1618	0.000	-3.518
	Non-Integrated	773	100.94	14.78				
BSSI-3 (w/out writing) @ Entry	Integrated	900	102.60	14.10	0.242	847	0.809	0.199
	Non-Integrated	429	102.40	14.01				
BSSI-3 (including writing) @ Entry	Integrated	900	101.99	13.01	0.117	836	0.907	0.090
	Non-Integrated	429	101.90	13.12				
PBC Expectation @ Entry	Integrated	1609	34.82	9.88	0.521	1380	0.602	-0.241
	Non-Integrated	760	35.06	10.77				
PBC Nurturing @ Entry	Integrated	1610	31.29	4.79	1.270	1264	0.204	-0.308
	Non-Integrated	760	31.60	5.80				

Note: * = $p < .05$; ** = $p < .001$; *

It is worth noting that although the PKBS Problem Behavior mean scores at entry are different (with CC-EC reporting slightly higher scores), the scores themselves are not considered to be significant in terms of presence of behavioral problems in either cases (scores of concerns in the PKBS Problem Behavior are \geq than 120). Similarly, the mean DOCS score that indicates delay/disability is indicated by a score of 84 or below and both sample means are well within the normal range indicating a low presence of children with major developmental delays or disability.

The frequency or presence of children with at risk status or delay was explored using the entry DOCS standard scores and grouping the children according the categories used by the

Early Childhood Partnerships Program. The table below reports the frequency of risk status and delay by program type.

Table 5
Frequency Distributions of Children by Program & Occurrences of Risk Categories.

Risk Categories	Integrated	%	Non-Integrated	%	Overall	% Overall
No-Delays	1648	0.88	972	0.90	2620	0.89
@Risk(85.9>80)	113	0.06	71	0.07	184	0.06
Delays(79.99or<)	108	0.06	43	0.04	151	0.05
Total	1869	1.00	1086	1.00	2955	1.00

Overall, the integrated site (or FI-EC) reports a higher frequency of children in the category of @ Risk and delays than its counterpart (32% or n=107 more children).

This completes our review of the sample characteristics and differences that will be accounted for in the final comparative analysis of the post test scores. Next, I provided an in depth review and description of the dependent measures used in this research. Please note that at the time when the analysis was completed, the family measure or PBC was dropped from the analysis to decrease sample fluctuation which could confounds the statistical test.

5.2 DEPENDENT MEASURES REVIEW

This section will describe the psychometric properties of the independent measures used in this study to test the study’s hypothesis. As described in the previous sections, there are two programmatic approaches being compared. One is defined as **fully-integrated** (i.e., the experimental variable) and the other is defined as the **coordinated-consultative** services model

(i.e., the control variable). These two approaches represent the **independent measures**. Generally speaking, both programs provide for multiple types of services including, but not limited to, health care, education, mental health and family supports. These services were provided between 2000 and 2005 to a mostly underprivileged population of children and their families in the least restrictive setting within the community, school and home environments. Both approaches were part of a larger evaluation study referred to earlier as the Early Childhood Initiative (ECI) (Bagnato et al., 2002). The dependent or outcome measures used in this study are used by the ECI SPECS evaluation team at Children’s Hospital of Pittsburgh, PA. These measures were selected by the original ECI authors based upon precise expectations and perspective as to how assessments of young children should be conducted. This perspective is briefly reviewed below, followed by the presentation and discussion of the dependent measures.

5.2.1 The Authentic Assessment Alternative

An “early” assessment/evaluation of children who are at-risk or live in at-risk communities has become one of the landmarks of early identification and eligibility strategies in early childhood education and intervention (Bagnato, Fevola, Smith-Jones & Matesa, in press). The assessment of young children, especially children with learning disabilities or at risk of developing them, represents one of the major shifts in ECI/ECE (Bagnato, Neisworth & Munson, 1997; Neisworth & Bagnato, 2004; PA Department of Education & Public Welfare, 2005; Cress, 2004; Ratcliff, 2001; Gettinger, 2001; Pellegrini, 2001; Fewell, 2000; Bagnato & Neisworth, 1991; Meisels & Wasik, 1990). In a nutshell, traditional methods and practices concerning the assessment of young children are considered to be grossly inappropriate because: **a)** they “decontextualized” the content and relevance of assessment, especially for children with developmental delays or disabilities (Bagnato & Neisworth, 1992; Neisworth & Bagnato, 2004); **b)** they are culturally

insensitive (Meisels & Wasik, 1990; Cress, 2004); **c**) they tend to measure pathologies rather than functions (Simeonsson, Lollar, Hollowell & Adams, 2000; Ottenbacher et al., 2000; Simeonsson, Bailey, Smith, & Buyesse, 1995) and; **d**) they lack social and treatment validity as well as relevance to real world outcomes (Bagnato & Neisworth, 1994; Jessen, Colver, Mackie, & Jarvis 2003; Bagnato et al., 1997; Reitman et al., 1998; Bagnato & Neisworth, 1999). This last point might make traditional assessment practices sound totally negative. Another way to look at it is that the new practices are an indication of the growth and development that the field of early childhood intervention and education has experienced and continues to experience.

Accordingly, the Scaling Progress Early Childhood Settings (**SPECS**) Evaluation Team implemented an authentic assessment, conceived as a local "natural experiment", in which all children are included in the evaluation, and there are no "un-served" or "untreated" groupings, as in pure experimental design. SPECS utilizes tools and instruments that can be embedded in the natural environments of a child and/or the child's family (Bagnato et al., 2001; Bagnato et al., 2002; Neisworth & Bagnato, 2004). The SPECS Evaluation Team uses assessment and evaluation strategies that rely on the collection of repeated formative and summative authentic data in the natural home, preschool, and community contexts of the children. This approach has been supported at various levels, including NAEYC's position statement on [Developmentally Appropriate Practice in Early Childhood Programs Serving Children from Birth Through Age 8](#), which defines developmental appropriate practice as the "process of making decisions about the well-being and education of children based on knowledge of *child development and learning—knowledge of age-related human characteristics*"...the ability to discern and "*adapt for and be responsive to inevitable individual variation;*" and "...*knowledge of the social and cultural contexts in which children live*" ([NAEYC, 1997](#)). Similar support for the authentic approach is

found in a report of the PA Department of Education & Public Welfare (2005) which recommends the use of “*authentic measures*” that sample skills in the child’s *most natural environment* and that can be linked to the *PA Early Learning Standards (ELS)* and to the goals and objectives of the program and curriculum (PA Department of Education & Public Welfare, 2005). Bagnato, Neisworth & Munson (1997) encapsulated these positions in eight criteria to be used when determining an instrument’s and/or measure’s treatment and social validity as follows:

1. **Utility.** Assessment must be useful to accomplish the multiple and interrelated purposes of early care and education and early intervention.
2. **Acceptability.** The methods, styles, and materials for assessment must be mutually agreed upon by families and professionals.
3. **Authenticity.** Contrived tasks and materials as well as unfamiliar people and circumstances are not optimal for true appraisals of what children really know and do.
4. **Collaboration.** Assessment methods and styles should promote teamwork among families and professionals.
5. **Convergence.** Functional, reliable, valid information on the status and progress of children can be obtained when typical behavior in everyday routines is observed repeatedly by several individuals, such as, teachers, other professionals, and parents.
6. **Equity.** Assessment must accommodate individual differences. The principle of equity is recognized (and mandated) as essential for instructional materials.
7. **Sensitivity.** Professionals and families must be given the opportunity to use assessment materials that sample evidence of progressively more complex skill development so that even the smallest increment of change can be detected and celebrated.

8. **Congruence.** Materials must be designed for, and field-validated with, the very children who will be assessed, including those with typical development and those with varying degrees of mild to severe disabilities.

(Quoted and adapted from, Bagnato, Neisworth & Munson, 1997. Linking, pp.73)

As each of the dependent measures is discussed, the “social & treatment validity” rating of each instrument based on these eight criteria will be included whenever available.

5.2.2 Dependent Outcomes Measures

The Developmental Observation Checklist System (DOCS; Hresko, W.P., Miguel, Sherbenou & Burton, 1994) is the primary child development observation assessment instrument used in the SPECS evaluation. DOCS is a comprehensive developmental assessment system composed of 475 items covering the birth to 6 years age range, and normed on nearly 1,100 children in 30 states (Hresko et al., 1994). Developmental competencies on DOCS are organized into five major functional domains: cognitive, language, social, motor, and an overall developmental level.

The 475 developmental competencies comprising DOCS are considered naturally-occurring child skills and which can be linked to a curriculum and therefore teach-to-the-test type of instrument that has been assessed to be predictive of school success and sensible to the effect of intervention (Hresko et al., 1994; Bagnato et al., 1997). In terms of the validity and reliability constructs, the authors of the scale report a high coefficient alpha, scorer reliability and test-retest reliability correlations. For overall alpha-coefficients, the range was from .94 - .99. Overall scorer reliability was .94. Test-retest reliability ranged between .91 and .96 across three

age groups. Concurrent, criterion, and predictive validity data are strong (.78 - .94) as are inter-observer (parent-teacher = .81) and rater-inter-rater reliability (.95). Concurrent validity studies with various traditional measures of language, developmental and cognitive skills show moderate to high interrelationships, $r = .35$ to $.83$ (Hresko et al., 1994). According to the “LINK Index” in Bagnato et al., (1997), this instrument scores 2.5 out of 3 ratings.

The standard scores are also called component quotients, and there is an overall developmental quotient (ODQ), which is used to review the differences in the samples’ overall mean standard scores. ODQ is constructed with a mean of 100 and a standard deviation of 15. Test performance of quotients can be translated in qualitative ratings:

- >130, very superior;
- 121-130, superior;
- 111-120, above average;
- 90-110, average;
- 80-89, below average;
- 70-79, poor;
- < 70 very poor.

As indicated in the previous sections that analyzed the samples at entry, a score below 85 is considered to be a flag for the presence of a delay, while a score between 85 and 89 should be considered a flag for being at risk of a delay. This instrument can be completed by a teacher, family member or other relevant person who is in contact with the child on a regular basis. The scoring of DOCS use originally two rating categories, “no” (the child doesn’t know how to do

that yet), and “yes” (the child can perform the skill most of the time without assistance and in different situations). All items in the DOCS materials were written at the fourth-grade level.

Later, as is the case in many community-based research projects, it became apparent that the scale was not identifying the natural developmental progression in acquiring skills because a “no” did not indicate whether the skill was emerging (Bagnato et al., 2000). Hence the SPECS research group added to the scoring a “getting there” to the “no” and the “yes”. This middle category was applied as the child was beginning to acquire the skill, but was not able to perform it in a consistent manner or in different contexts. This research uses the original scoring.

The Preschool & Kindergarten Behavior Scales - age 3-6 years (PKBS; 2nd Edition by Merrell, 1994, 2002) is the second observation rating scale used in the original ECP study. PKBS focuses the assessment on the identification of social skills and problem behaviors in young children from 3 to 6 years (Merrell, 1994). The PKBS subscales are designed to capture social abilities and self-control behaviors. As with DOCS, PKBS is sensitive to the effects of intervention, and the measures can be used as predictors of early school success. PKBS is a norm-based scale using items and contents that are curricular or instructionally based. PKBS was nationally normed on 2,855 children and is appropriate for a variety of evaluative and clinical purposes. Validity and reliability data on PKBS are the strongest of any currently available preschool measure of social skills and behavior (.81-.98).

This measure consists, as previously indicated, of two general scales and five subscales. The first general scale is the Social Skills scale, (herein referred to as PKBS-S), it consists of 34 items and 3 subscales (i.e., Social Cooperation; Social Interaction and; Social Independence). The other general scale is called the Problem Behavior scale (herein referred to as the PKBS-B), which consists of 42 items and 2 subscales (i.e., Internalizing and Externalizing), covering 4

general behavioral concerns (i.e., Attention Problems/Overactive; Antisocial/Aggressive, Social Withdrawal, and Anxiety/Somatic).

The Psychometrics properties and the reliability and validity data for PKBS-2 suggest a strong alpha and correlation statistics (Merrell, 2002). Internal consistency reliability was calculated for the entire PKBS standardization sample using Cronbach coefficient alpha and the Spearman-Brown split-half reliability. Both standards uniformly indicate high coefficients of internal consistency, ranging from .81 to .97 for the PKBS sub-scale and area scores (Social Skills and Problem Behavior) and from .94 to .97 for total scores (Merrell, 1994). The Standard Error of Measurement (SEM) was also calculated by the developer of the scale and it was found to be relatively small. More recent information on reliability for PKBS-2 suggests continued high reliability findings with total tests scores ranging from .90 to .97 which are well above the recommended Cronbach coefficient alpha acceptability levels (Merrell, 2002). According to the “LINK Index” in Bagnato et al., (1997), this instrument scores a 2.5 out of 3 rating, which is relatively high in terms of its treatment utility and social relevance. Although there are some concerns about the effects of race and ethnicity on child behavior and more research is needed on the scale in this regard (Merrell, 2002), this issue would not seem to be a problem for this study, given the relative racial homogeneity of the population in the two selected sites.

The PKBS individual items are scored on a Likert-type scale, ranging from never = 0, rarely = 1, sometimes = 2 and often = 3. As indicated, the functional description for PKBS-B (behavior) is reflected in a score of 114 or higher, where the norm acceptable ranges from a standard score of 90 to 110. The qualitative ratings for the PKBS-B can be further broken down: 1) “no problem” (at or below 20% of the norm group); 2) “average” (20-80%); 3) “moderate problem” (80-95%) or; 4) “significant problem” (highest 5%). As we have seen from the CI-

95% at entry, the mean standard scores ranged overall between 95 and 100 and in both sites there was a low incidence of moderate or significant behavioral problems among the children.

The Basic School Skills Inventory (BSSI-3; Hammill, Leigh, Pearson & Maddox, 1998) is the last of the children outcome measures used in the original ECI evaluations. BSSI-3 is a norm-based curricular measure of early learning and basic competencies of children between ages 4 to 9 years and is usually completed by the teachers based on their observations, familiarity with the children, and their regular evaluation of the children's performance. BSSI-3 samples pre-academic and academic skills in reading, math, spoken language, writing (however, the writing subtest is not administered to children under the age of five), classroom behavior, and daily living skills. BSSI-3 was normed nationally on 757 children, across 12 states including Pennsylvania, and its authors have reported reliability and validity data (.64-.93) considered to be acceptable for evaluative purposes (Hammill, Leigh, Pearson & Maddox, 1998). In this study, BSSI-3 is used as the "transitional" and ultimate performance measure in that BSSI-3 is usually the last administered and available measure on the child (depending on the age of the child) prior to his/her transition to kindergarten and/or first grade. BSSI-3, as a measure, also marks the rite of passage from infancy to childhood as the attention of teachers and parents shifts to academic competencies and learning. Scoring on BSSI-3 is constructed in a manner similar to DOCS, on a mean of 100 and a standard deviation of 15 or, in terms of percentile of the overall skill level and standard score on a mean of 10 and a standard deviation of 3 (Hammill, Leigh, Pearson & Maddox, 1998). It is also similar to the other scales in that the scoring is rated on a Likert-type scale ranging from 1 = does not perform to 4 = performance indicates mastery (Hammill et al., 1998). In total there are 137 items across the six BSSI-3 domains and both the overall scale and subscales have indicated consistent responses in terms of internal consistency (reliability) with

an overall composite coefficient alpha of 0.98 (Bradley-Johnson, 1999). Test-retest reliability (whether the result changed over time on the same children) and inter-scorer/inter-rater reliability (different teachers rating the same child) indicate a coefficient alpha greater than .90 and .96 respectively. These reliability standards exceed the recommended threshold of .85 (Hammill et al., 1998; Bradley-Johnson, 1999; Rubin & Babbie, 2001).

Content validity - (the robustness of the meaning captured within each of the domains and as a whole in terms of measuring what is supposed to be measured, in preschool and kindergarten basic skills competencies) – was tested by the authors through a factorial item-discrimination analysis and a differential-item functional analysis, which appear to support the “content-description validity” and the relatively bias-free nature of the items across all the subscales (Hammill et al., 1998; Bradley-Johnson, 1999). Criterion-predictive or convergent validity is derived by testing the result obtained from BSSI-3 with other accepted instruments which measure similar constructs (Rubin & Babbie, 2001). BSSI-3 was tested against the Rhode Island Test of Language Structure, and the Expressive One-World Picture Vocabulary Test-Revised (Hammill et al., 1998). The coefficient alpha from these tests ranged from .46 to .87 on spoken language; a coefficient ranging from .37 to .54 on reading skills; and a coefficient ranging between .44 and .65 on writing skills. All of these scores indicate that BSSI-3 has satisfactory criterion-prediction validity (Hammill et al., 1998, pp. 43; Bradley-Johnson, 1999).

Construct validity is a term first coined in the 1950s by the APA Committee on Psychological Tests, and refers to the validation of a test “*whenever a test is to be interpreted as a measure of some attribute or quality which is not operationally defined*” (Cronbach & Meehl, 1955, obtained on line at <http://psychclassics.yorku.ca/Cronbach/construct.htm>, last accessed, 4/1/06). To put it more simply, criterion validity can be defined as a test concurrence and/or

correspondence among and between concepts and/or indicators that are supposedly linked or expected to occur together with other skills. In terms of BSSI-3 for instance, the authors expected that a child scoring high on the basic competency inventory would show better and significantly higher adaptive behavioral skills, including fine and gross motor skills and improved social skills performance, and would obtain better school grades and reports than children who scored poorly on the same test. Furthermore, if BSSI-3 is considered to possess construct validation, the scale should be able to discriminate between below-average, average and above-average performing students. However, because the scale is sensitive to age, it should show similar sensitivity across different aged students. Finally, the trend in each of the subscales should correlate highly with the scale's overall score. According to the validity test conducted against tests measuring motor, social and emotional skills, adaptive skills, self-help and other skills, the results reported by Hammill et al., (1998), indicate that the coefficient variation obtained in each of the above mentioned tests (the mean ranges of the test varied but, overall the median coefficient was .55) supported the construct validity of BSSI-3 (Hammill et al., 1998, p. 43; Bradley-Johnson, 1999). BSSI-3 was not one of the tools reviewed using the "authentic" or less traditional assessment of validity proposed by Bagnato et al, (1997). Two tests were used to assess the construct validity of the BSSI-3, the Hawaii Early Learning Profile (HELP) and the BRIGANCE Diagnostic Inventory of Early Development, Revised Edition (BDIED-R). HELP received the highest rating with a total LINK Index of 3.0, while BDIED-R received an acceptable rating with a LINK Index of 2.0 (Bagnato et al., 1997; p.116 and pp.188-191). Given these scores, it might be safe to assign to BSSI-3 an average validity LINK Index of 2.49.

BSSI concludes the review of the children outcomes measures. The other measure collected in the FI-EC and CC-EC sites, the Parent Behavior Checklist (PBC), is reviewed next,

and that discussion concludes the section on the validity and reliability of the dependent measures used in this study.

Family Measures

The Parent Behavior Checklist –Short Form (PBC/SF; Fox, 1994) is a parent-completed report scale designed to determine parenting skills, knowledge and beliefs (20 items) in three core areas: Expectations (child development); Nurturing (child care, interactions, teaching); and Discipline (behavior management). In the ECI study, the PBC/SF) was used to measure supportive parenting behaviors, skills and developmental expectations the parents had of their child (Bagnato et al., 2000). The tool consists of three subscales and was built, among other things, to assess the parent's or parents' functioning in raising the child and to assess strengths and weakness in parenting skills, including disciplinary attitudes. The latter dimension was not included in the short form of the original ECI study, due to the negative wording of the items and the emphasis on punitive parenting practices, which was thought to create a potential turnoff for family participation. As the developer of the scale, pointed out, parenting is a dynamic process involving attitudes and skills, such as expectations and nurturing, that play an important role in the overall development of the child (Fox, 1994). According to the author, a parent's beliefs as to what a child should or should not do at certain ages and the appropriate dosage of affection and nurturing directly influence how that parent raises the child (Fox, 1994). In addition to the ECI study, PBC has also been used in other studies relating to detecting and predicting problems in parenting skills (Florsheim, Moore, Zollinger, MacDonald & Sumida, 1999), as a tool for measuring treatment gains and the effect of treatment modalities (Shifflett & Cummings, 1999), in assessing the level of acculturation of Mexican-American mothers in terms of childrearing practices and behaviors (Thubi & Kolobe 2004), and as a tool for preparing and

training professionals in creating empirically-based parenting programs in the community (Fox, Duffy & Keller, 2004).

PBC/SF was nationally normed on 1,140 parents with at least one child and includes competencies that are amenable to parent education and support within a community-based setting. Validity and reliability data range from moderate to strong. PBC/SF consists of 32-items compared to the long version which has 100 items, and is focused on parents who have infants or children less than 5 years of age (Fox, 1994). The responses on the scale are based on a 4-point Likert-type scale with 4 = almost always, 3 = often, 2 = sometimes and 1 = almost never. The two subscales used in the ECI included: 1) the Expectations subscale comprising 12 items measuring parents' developmental expectations (e.g., what the child should or should not do given his/her age); and 2) Nurturing subscale comprising 10 items looking at specific parent behaviors pertaining to the promotion of the child's psychological growth such as activities done with the child and the ways of rewarding the child (Fox 1994).

The Expectation subscale scores range from a low of 12 indicating extremely low expectations to a high of 48 indicating extremely high expectations. The Nurturing subscale scores range from a low of 10 indicating seldom use of positive nurturing behaviors or activities to a high score of 40 suggesting more frequent use of positive nurturing activities. The interpretation of PBC/SF is straightforward, in that the higher T scores on nurturing are associated with increased parent use of positive supportive activities with their children. In turn, lower T scores are associated with less frequent use of supportive parent activities. Based on the representative sample, the reported internal consistency indicates a coefficient-alpha of 0.97 for the Expectation subscale and for the Nurturing subscale (Fox, 1994). Test re-test or interpreter correlations were 0.98 for the Expectation scale and 0.81 for the Nurturing scale. In addition, the

author indicated that the correlations between the longer 100-item and the short form as used in the ECI study, concurred (Fox, 1994).

The content validity was examined using professionals and parents. The construct validity was established using the same process as described above for BSSI-3 in that the author used the Marlowe-Crowne Social Desirability Scale with 42 mothers of children between the ages of 1 and 4 years, to assess concurrence as well as social desirability. The result on the social desirability was not significant, suggesting that parents tend to be honest about their parenting behaviors (Fox, 1994). The construct correlation statistics indicated a range from a low of 0.40 to a high of 0.85 on the Expectation subscale and a range of 0.37 to 0.60 on the Nurturing subscale. In all, 85% of the items within the two scales had a correlation value over 0.40 (Fox, 1994).

The PBC was included in the initial exploratory analysis and having found that the test did not seem to contribute to the overall Analysis of Variance and that the completion rate was an element of instability in the sample size, this measure was dropped in favor of obtaining more reliable statistical tests.

This concludes the review of the independent measures adopted in this study, but does not conclude our discussion of the validity and reliability issues. These topics are further discussed in the next section, which includes a review of the research design used to analyze the data in this secondary research.

5.3 RESEARCH DESIGN AND ANALYSIS

The research proposed involves two-group independent dichotomous variables (e.g., Integrated vs. Non-Integrated) compared based on multiple interval dependent measures (e.g., standard

scores, also known as developmental quotients, from each of the measures discussed and described in the previous sections). The two discrete variables are used as predictors (e.g., Fully-Integrated approach predicts better/higher scores than the Consultative-Coordinated approach). While the issue related to establishing causality will be discussed shortly, at this point it is sufficient to state that this study aims at establishing a preliminary assessment to the extent and significance of the relationship between structural factors (in this case the level of integration) and child outcomes.

Much has been discussed in earlier sections concerning the underlying role that structural factors such as services or program integration play, and about their potential contribution to enhance children's and families' outcomes. To reiterate, the generally held belief is that integration has a direct impact on the context and the quality of care/services (e.g., increased accountability, eased access, better quality and culturally competent care) and on the content of care (e.g., comprehensiveness and reach of the services, inter- and trans-disciplinary assessments, use of evidence-based practices, more effective intervention, etc.). In turn, these improvements could have an impact on the family and child functioning, as well as operate to reduce risk factors, and thus strains and stress on the families. Moreover, increased choices, effectiveness and comprehensiveness of the services also translate (according to selected theoretical model) into increased opportunities for families and children to improve their overall quality of life and overall conditions, including family relationships, resources and support networks, as well as better and improved participation in activities. These results should be observed in developmental, social and behavioral outcomes of both families and children. This theoretical pathway that links the level and/or type of system/services integration, to positive outcomes (i.e., positive social, behavioral and developmental results and better parenting and

nurturing skills) in the child and family is by no means, proven nor exhaustive, in that the model may not be inclusive of other potential endogenous and exogenous variables which impact the effectiveness of interventions and thereby observed child or family outcomes. For instance, the theoretical model presented earlier included only family-based factors as environmental conditions, but one can include additional factors as well, such as the safety of the neighborhood, poverty or economic opportunity of the regions and so forth. Similarly, and in terms of exogenous factors, other potentially relevant factors may include the child's predetermined characteristics such as resilience, adaptability and personality. Nevertheless, the theoretical model explicated in this research is only intended to show the path that best informs the relationship between the selected system variable and the selected outcomes measures. Next, we move on to discuss the research design used to test the proposed hypothesis of this study, namely that better-integrated programs produce significantly improved child & family outcomes.

5.3.1 Statistical Considerations & Controls

As indicated, the pathway from integration to outcomes has many intersections and interconnections. Accordingly, it is quite possible to either overstate or understate the contribution of system/services integration (e.g., Type II error) to the outcomes. The goal of this research is to avoid either underestimating or overestimating the true effects of the independent variable on the dependent variables (Type I or II error). As Rubin & Babbie (2001) indicate, the two choices (underestimating and rejecting or overestimating and accepting) are one of the risks associated with statistical analyses of this sort (Rubin & Babbie, 2001).

To restate in a slightly differently manner, the risks could be evaluated with respect to the repercussions that an erroneous acceptance of the stated hypothesis may have on resources,

people, and all the interested stakeholders. For example, the risk of accepting integration as a policy solution can be, for all intent and purposes, weighted against the considerable costs and burdens associated with the current fragmented, disconnected and decontextualized system of care. The choice would appear to be between continuing to accept the current risks (e.g., costs of fragmentation) and take no action to change the current state of affairs, or to work toward services and care integration at the same rate of expenditure of resources (human and other) as current policies allow. That is at a similar risk level. Lastly, the purpose of this study or other research is to finalize understanding and to ascertain with some degree of confidence whether the assumption that there is a relationship between service integration and children's developmental outcomes is supported, rather than establishing causation as in the traditional positivistic research model.

6.0 ANALYSIS AND DISCUSSION OF THE RESULTS

In the previous sections, a first exploratory level of analysis was conducted to ascertain the sample equivalence and normal distribution assumption within and between the two sample groups. As indicated, there were some significant variations in terms of scores at entry among the Non-Delay samples but not among the at-Risk and Delay samples of children. Furthermore, there were some significant differences between the two sites in terms of DOCS & PKBS-B standard score distributions at entry. Some of this variability is reduced and/or eliminated by taking out of the sample the outliers and extreme values/scores and/or cases. Other issues addressed include the age and the racial distribution of the sample population (e.g., as indicated, according to the census data in the two regions, there is an overrepresentation of Caucasian populations). Additional controls and statistical techniques were used to further explore the data and to rectify for errors or other issues. This included, multi-factor ANCOVA usually used in the analysis of such data and in testing a specific hypothesis such as the one set forth in this study.

The ANCOVA tests will be used to:

- 1. Determine if integrated programs correlate differently with post-test score measures than with non-integrated programs.**
- 2. Control for confounding variables (e.g., pre-test scores, gender, time in program, DOCS scores, etc.).**

In order to correct for potential intervening factors, multiple ANCOVA tests were conducted using SPSS (Statistical Package for Social Sciences) software. The reason for this additional step is that the ANCOVA procedure was utilized as a methodological alternative to account for, apparent effects of some of the potential third variables that are present in the absence of control over how the sample is assigned (Cooper & Weekes, 1983). Moreover, the multiple analysis of the relationship between the IV and DV is, to some extent, statistically controlled to ensure greater confidence in the results and to decrease the possibility of either hastily dismissing or too-readily accepting integration as an important factor in increasing efficacy and thereby effectiveness of ECI/ECE programs.

It is, however, still quite possible that the level of integration may not produce any significant observed difference because there are uncontrolled variables that act as suppressors and thereby may override the effect of integration (e.g., quality or fidelity of the program, staff competency, family psychopathologies, etc.). As discussed in section 6.3, in light of this study's limitations, such results are never a reason for hasty dismissal of the hypothesis without conducting further inquiries.

6.1.1 Data Analyses

Procedure

In each model, the independent variable (IV) was Program Type (i.e., Integrated vs. Non-Integrated). The relationships between the IV and the dependent variables (BSSI-3; DOCS; PKBSS and PKBBS) were analyzed in separate models. Each model was run as a univariate

analysis of covariance (ANCOVA). This was done, as indicated above, to control for the effect of possible related dependent variables apart from Program Type. For each of the models, the main effects were analyzed first. If Program Type was found to be statistically significant, all other statistically significant variables were analyzed and checked for possible interaction effects with the IV (Program Type). Even if Program Type was found to be not significant, interactions with some of these variables such as Age at Entry and Time in Program were checked since they were of special theoretical interest. But in general, if there was a non-statistical significance of the main effects and/or interaction effects, these were removed - (it is unusual, but possible, to find significant interaction effects when the main effects are not). This was done so that a more parsimonious model could be obtained. But as mentioned, one exception to this was the interaction effect between Program type, Age and Time in program (PxAxT) which has been included for its theoretical implications and for the overall discussion of the results.

For instance, the PBC measures were found not to add much to the analyzed models and actually decreased the available sample size due the extreme variation in completion rates between the two programs. Hence, it was decided to drop the PBC from the analysis all together, in order to gain more robustness with the remaining measures. The model presented reports only the main effects when no significant relationship was observed in the IV and reports also the interaction effects when a significant interaction was observed with both the Program Type and one or more of the dependent variables. For instance, when Program Type and Age at Entry were analyzed separately, it was observed that both were statistically significant for possible interaction effects. However, it was found that while age at entry remained significant in all models, when Program Type was factored in, there were no significant differences between programs and actually the main effect would tend to disappear as well. This, as it will be

illustrated later, it is consonant with early childhood intervention theories and findings, in that age at entry would seem an important variant, regardless of the program types. The same was found to be true for the length of stay in the program, used here as a proxy for the intensity of intervention.

The next subsections will present first the findings for each of the models explored and consequently present a discussion of the overall results and implications for the research hypothesis that this research set out to investigate.

Descriptive

SPSS 14.0 was used to analyze the data. An alpha level of 0.05 was used as the criterion for all statistical tests. The first output presents the descriptive information for all the variables analyzed. As can be observed in Table 6, many of the variables are not normally distributed (this is determined by taking the skewness or kurtosis and dividing them by their standard error and running a one-sample t-test, with $n-1$ degrees of freedom. ANCOVA assumes a normal distribution, but larger sample sizes generate tests sufficiently robust as in this case ($n=1189$) and this is most likely does not represent a problem (Box, Hunter & Hunter, 1978).

The overall sample size obtained after the elimination of the PBC, was $n= 1222$ children. As may be observed from the descriptive table in one case, the analysis included $n= 1190$ because some of the children had missing data (for instance gender information).

Table 6**Descriptive Information for All Variables Analyzed**

Variables List	N	Min.	Max.	Mean	Std. Deviation	Skewness	Std. Error	Kurtosis	Std. Error
Age at the First Evaluation	1222	0	67	46.7	9.99	-0.84	0.07	1.67	0.14
DOCS Overall Standard Score @T1	1222	64	137	101.9	14.52	0.01	0.07	0.09	0.14
DOCS Overall Standard Score @T2	1221	64	137	107.0	12.99	-0.78	0.07	0.80	0.14
PKBS Social Score @T1	1222	42	123	98.9	15.89	-0.65	0.07	0.07	0.14
PKBS Social Score @T2	1222	42	123	107.4	12.94	-1.07	0.07	1.27	0.14
PKBS Problem Behavior @T1	1222	52	150	97.5	15.65	0.34	0.07	-0.66	0.14
PKBS Problem Behavior @T2	1222	74	150	95.5	15.38	0.41	0.07	-0.60	0.14
BSSI Std Score Exclude Writing @T1	1222	29	146	103.0	14.04	-0.49	0.07	1.79	0.14
BSSI Std Score Exclude Writing @T2	361	48	155	101.1	18.61	-0.13	0.13	0.06	0.26
BSSI Std Score Including Writing @T1	1222	22	142	102.4	13.02	-0.75	0.07	3.38	0.14
BSSI Std Score Including Writing @T2	361	49	158	102.2	17.68	-0.11	0.13	0.16	0.26
Time in Program	1222	1	46	17.2	10.04	0.16	0.07	-1.15	0.14

Note. T1 = Pre-test and T2 = Post Test.

It is also possible to observe that, overall, the children mean age at entry was approximately 47 months or just below 4 years of age. Also, it can be noted that all the developmental measures show improvement at post test, indicative that all children have, to some extent, benefited from being in either program.

Which of the two types of program investigated had better outcomes is analyzed next. The analysis reports the findings in five models. Each of the models is presented and discussed separately starting with the BSSI-3 which assesses the child basic school skill readiness upon transition to pre-k or kindergarten.

Model 1 – BSSI-3 Writing Excluded

Please note that the BSSI-3 includes two scores, one for the younger children which excludes writing and the other for kindergarten age and/or older children which includes writing. This first model analyzed the relationship between Program Type and the control variables with the BSSI-3 (BSSI-No Write). In the majority of the case the BSSI-3 was completed only once (i.e., at transition). Accordingly, the time point with the largest number of BSSI completion was utilized (in this case identified as T1).

The Levene's Test of Equality of Error Variances indicated that it is safe to assume that the variables have similar variance ($F = 0.134$; $p=0.715$; $df1= 1$; $df2=1220$). This model included $n=850$ for the FI-EC (or Integrated Program) and $n=372$ for CC-EC (or Non-integrated consultative program).

Overall, the model explains 20.9% of the variance in the BSSI (No-Write T1) standard scores. The results of this model are provided in Table 7 below. It is possible to observe from the results that the children in the integrated program do have a slightly higher mean score (mean= 103.695; Std. Error= 0.433; CI 95% = 102.846 – 104.545) than the children in the non-integrated program on the BSSI (No Write T1) (mean = 102.093; Std. Error = 0.671; CI 95% = 100.776 – 103.409). This was found to be statistically significant at $p = <0.0001$.

As can be observed also from the output, while Program Type was found to be statistically significant, its effect size (or the practical significance of the results) are small

explaining roughly 1.0% of the total variance observed in the BSSI-2 scores (no Writing). Program Type also interacts with PKBS-S & PKBS-B at Time 1 (T1)** at statistically significant levels ($p = < .001$) suggesting that the effect of Program Type was not constant across levels of PKBSS and PKBS-B standard scores. Graphical analysis did not reveal the exact relationships in the interactions as the very small effect sizes made them difficult to determine. Nonetheless, The interaction effects suggests that the children with low PKBS-B scores at T1 in the non-integrated program cored higher than the children with low PKBS-B scores at T1 in the integrated program. This effect continues until the PKBS-B scores at T1 reach the mean of 70 standard points, at which time the children in the integrated program had higher post test scores than the children in the non-integrated program. This latter difference between the two programs becomes increasingly pronounced as the children's mean standard scores on PKBS-B at T1 increases. This suggests that children with a higher score on the PKBS-B (meaning a tendency toward the presence of problem behaviors) do relatively better in the integrated program while the children with lower mean scores (or no behavioral problems) perform relatively better in the non-integrated program.

These similar interaction trends are inverse with respect to the PKBS-S scores at T1. That is the higher the PKBS-S scores (or social skills) the better the performance for the children in the integrated program and the lower the score (or the lower the social skills) the better the performance of the children in the non-integrated program) and as it will be noted below, this same interaction trend is also observed in model 3 with respect to the DOCS mean standards scores.

** Preschool & Kindergarten Behavioral Scale measures social skills (PKBSS) and problem behaviors (PKBBS).

Table 7 Model 1 Analysis of Covariance:

Tests of Between-Subject Effects where DV is BSSI (No-Write); Main & Interaction Effects*.

Source	df	F	Partial Eta Squared	Observed Power(a)	Sig.(p)
Between-Subjects Effects					
Program Type (PT)	1	12.597	0.01	0.94	0.00
Child Age @ Entry (AE)	1	29.144	0.02	1.00	0.00
Overall DOCS Std. Score @ T1	1	129.212	0.10	1.00	0.00
Overall PKBS-S (Social) Std. Scores @ T1	1	12.545	0.01	0.94	0.00
Overall PKBS-B (Behavior) Std Scores @ T1	1	9.447	0.01	0.87	0.00
PT x PKBS-S@T1	1	11.883	0.01	0.93	0.00
PT x PKBS-B@T1	1	10.200	0.01	0.89	0.00
Error	1214				
Total	1222				
Corrected Total	1221				

R Squared = .214 (Adjusted R Squared = .209)

Model 2 – BSSI-3 Writing Included

The second model analyzes the relationship between the Program Type and the BSSI-3 writing Included (or BSSIWIC T1). The Levene's Test of Equality of Error Variances indicated that also in this case it is safe to assume that the variables have similar variance ($F = 0.282$; $\text{Sig.} = 0.596$). The sample size for both programs is constant for this analysis as well. Overall, this second model explains 19.6% of the variance in the BSSIWIC T1. Similar to the previous findings, while Program Type (IV) was found to be statistically significant ($F = 6.541$; $p = <0.05$), the effect size suggest that the IV only explains about 0.05% of the observed variance in the BSSIWIC T1. The children in the integrated program had slightly overall mean score (mean

= 102.953 standard score; Std. Error = 0.403; CI 95% = 102.163 – 103.743) than the children in the CC-EC program (mean = 101.059 standard score; Std. Error = 0.614; CI 95% = 99.855 – 102.263). The results of the main effects model are provided in Table 8 below.

Table 8 Model 2 Analysis of Covariance:

Test of Between-Subjects Effects where DV. Is BSSI-3 (Writing Included) Main Effects Only.

Source	df	F	Partial Eta Squared	Observed Power(a)	Sig.(p)
Between-Subjects Effects					
Program Type (PT)	1	6.5409	0.01	0.72	0.01
Total Time in Program (TI)	1	8.046	0.01	0.81	0.00
Child Age @ Entry (AE)	1	6.163	0.01	0.70	0.01
Overall DOCS Std. Score @ T1	1	126.556	0.09	1.00	0.00
Overall PKBS-B (Behavior) Std Scores @ T1	1	62.929	0.05	1.00	0.00
Error	1216				
Total	1222				
Corrected Total	1221				

^a Computed using alpha = .05

R Squared = .200 (Adjusted R Squared = .196)

Model 3 – DOCS Overall @ Time 2 (@ T2)

The next model analyzes the relationship of Program Type to the children’s standard scores obtained from the Developmental Observation Checklist System at Time 2 (or DOCS

@T2). In this case, the results of the Levene's Test indicate that it is not safe to assume that the variables have similar variance ($F = 20.116$; Sig. = $p. <0.0001$). Although, as previously indicated, the relative large sample size should still generate robust statistics to counter this violation (more specifically, the p-values may be lower than observed).

In model 3, the DOCS mean score at post test was in this case higher and significant ($F = 21.312$; $p = <0.0001$) for the CC-EC program (mean = 109.301 std. score; Std. Error = 0.589; CI-95% = 108-146 – 110.457) than for the children in the integrated program (mean = 106.381 std. score; Std. Error = 0.375; CI-95% = 105.646 – 107.117). Overall model 3 explains 30.9% of the variance in the DOCS overall standard scores at post test. Also in this case, as Table 9 shows, significant main and interaction effects were observed ($p=<0.0001$; $F = 21.312$). The main effect explains about 1.7% of the variance in the DOCS@T2 standard scores. The interaction shows that this effect was not constant across all levels of the DOCS@T1 standard scores. Again, because of such small effect size, it is hard to determine the exact relationships. Nevertheless, in this case, the results suggest that children who had moderately to low DOCS scores at entry in the non-integrated program had improved (albeit slightly) their DOCS scores at post test than the children in the integrated program.

Table 9 Model 3 Analysis of Covariance:

Test of Between-Subjects Effects where DV is DOCS @ Time 2; Main & Interaction Effects.

Source	df	F	Partial Eta Squared	Observed Power(a)	Sig.(p)
Between-Subjects Effects					
Program Type (PT)	1	21.312	0.02	1.00	0.00
Child Age @ Entry (AE)	1	19.748	0.02	0.99	0.00
Overall DOCS Std. Score @ T1	1	194.058	0.14	1.00	0.00
Overall PKBS-S (Social) Std. Scores @ T1	1	13.836	0.01	0.96	0.00
Overall PKBS-B (Behavior) Std Scores @ T1	1	7.090	0.01	0.76	0.01
PT x DOCS@T1	1	17.410	0.01	0.99	0.00
Error	1214				
Total	1221				
Corrected Total	1220				

^a Computed using alpha = .05

R Squared = .313 (Adjusted R Squared = .309)

Before moving to the fourth model, the reader should be aware that the standard scores reviewed thus far are positive for both programs. What this suggests is that improvement has taken place and/or has been maintained for the children in both programs.

Model 4 – PKBS Social Skills @ Time 2

This fourth model analyzes the relationship of Program Type and the control variables with the children’s standard scores on the PKBS Social Skills at Time 2 (PKBSS@T2). In this model, “gender” was included as a fixed factor given that is a categorical variable and hence could not be treated as a covariate. The sample size and gender distribution for this model is provided in Table 10, which show that females made up close to 46% of the overall children.

Also in this model the Levene's Test indicates that it is safe to assume that the variables have similar variance ($F = 2.183$; $\text{Sig.} = 0.088$).

This fourth model as observable in Table 11 found no significant effects ($p = 0.245$; $F = 1.355$) between the Type of Program on the Social Skills standard scores at time 2.

Table 10
Gender and Sample Size for Model 4 Analyses of Covariance.

Variables		Value Label	N
Gender	1	Males	648
	2	Females	542
Program Type	1	Integrated	818
	2	Non-Integrated	372

The children in the integrated program had a mean social skills standard score of 107.709 (Std. Error = 0.400; CI-95% = 106.924 – 108.494) and the children in CC-EC (or non-integrated) program had a mean score of 106.861 (Std. Error = 0.599; CI-95% = 105.686 – 108.036). Also interesting is the finding that neither age at entry ($p = 0.375$) or time in program ($p = 0.467$) seem to have an impact on the children social skills standard scores at post test, suggesting that the children progress is independent from these two factors which is overall positive considering the implication for maturation effects.

Table 11 Model 4 Analysis of Covariance:
Test of Between-Subjects Effects where DV is PKBS Social Skills @ Time 2; Main Effects.

Source	df	F	Partial Eta Squared	Observed Power(a)	p
Between-Subjects Effects					
Gender (G)	1	0.750	0.00	0.14	0.39
Program Type (PT)	1	1.355	0.00	0.21	0.24
Total Time in Program (TI)	1	0.529	0.00	0.11	0.47
Child Age @ Entry (AE)	1	0.786	0.00	0.14	0.38
Overall DOCS Std. Score @ T1	1	24.182	0.02	1.00	0.00
Overall PKBS-S (Social) Std. Scores @ T1	1	126.342	0.10	1.00	0.00
Overall PKBS-B (Behavior) Std Scores @ T1	1	9.071	0.01	0.85	0.00
Error	1182				
Total	1190				
Corrected Total	1189				

^a Computed using alpha = .05

R Squared = .238 (Adjusted R Squared = .234)

The next and last model analyzes the relationship between Program Type and the control variables with the children's PKBS Problem Behavior standard scores at post-test.

Model 5 – PKBS Problem Behaviors @ Time 2

The PKBS-2 Problem Behavior measures various socio-emotional domains to assess the presence and/or extent of behavior and emotional disorders. Similar to the social skills analysis, in this analysis gender was used as a fix factors together with program type. The sample size for this analysis is the same as in Model 4. The Levene's Test in this model also indicates that it is safe to assume that the variables have similar variance ($F = 1.223$; $\text{Sig.} = 0.300$).

In this model, while Program Type does not show a significant effect on children’s problem behavior scores at post test, gender does appear to impact the scores ($p = 0.008$; $F = 7.142$) and this is concurrent with the literature suggesting that boys do tend to act-out more than girls. At the same time its practical significance (i.e., effect size) is extremely low, explaining roughly less than 1% of the variation in the PKBS Problem Behavior scores. It can also be observed in Table 12, that the DOCS or developmental status of the child at entry tends to predict significantly the post test scores of the children on the PKBS-2 Problem Behaviors scale ($F = 17.009$; $p < 0.0001$). The mean problem behavior standard score for the children in the FI-EC (integrated) program was 95.105 (Std. Error = 0.471; CI-95% = 94.184 – 96.034) and for the CC-EC (non-integrated) program the mean standard score was 96.072 (Std. Error = 0.705; CI-95% = 94.689 – 97.456).

In both cases, the mean standard score is well below the concern ranges (std. mean scores of 115-120) indicative of a relative absence of extreme or severe emotional or behavior disorders among the children in both programs. It is worth noting that the children who had higher PKBS-Behavioral Problem scores at entry did relatively better on the BSSI-3 when compared to the children in non-integrated program.

**Table 12 Model 5 Analysis of Covariance:
Test of Between-Subjects Effects where DV is PKBS Problem Behaviors @ Time 2; Main Effects.**

Source	df	F	Partial Eta	Observed Power(a)	p
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	Squared				
	Between-Subjects Effects				
Gender (G)	1	7.142	0.01	0.76	0.01
Program Type (PT)	1	1.261	0.00	0.20	0.26
Total Time in Program (TI)	1	0.367	0.00	0.09	0.54
Child Age @ Entry (AE)	1	1.772	0.00	0.26	0.18
Overall DOCS Std. Score @ T1	1	17.009	0.01	0.98	0.00
Overall PKBS-S (Social) Std. Scores @ T1	1	1.155	0.00	0.19	0.28
Overall PKBS-B (Behavior) Std Scores @ T1	1	205.328	0.15	1.00	0.00
Error	1182				
Total	1190				
Corrected Total	1189				

^a Computed using alpha = .05

R Squared = .257 (Adjusted R Squared = .252)

In summary, each of the models presented has suggested the importance and significance of various factors in impacting children developmental outcomes. It was observed for instance that Program Type did have an effect on the selected dependent measures but also that its contribution differs in the presence of other variables (interaction effects). However, these results are not to be considered conclusive but only as a baseline or first exploration of the impact of service/program integration on developmental, social, behavioral and basic school skills of children attending publicly funded early intervention programs. Also, as previously emphasized, the sample used for this analysis was the one with the most completed measurements and, as mentioned, the parents' behaviors measures had to be dropped from the

analysis in order to increase the sample size to afford a more robust statistic result. These salient findings are summarized below.

1. Overall, the IV (in this case integrated program) did show in general a statistically significant relationship with the children basic skills school readiness (i.e., BSSI-3 standard scores at post-test) and with the children overall developmental growth (i.e., DOCS standard scores at post test).
2. Statistically significant interaction effects were observed between IV and the children social and behavioral functioning (i.e., PKBS-2 standard scores at pre-test) which increased the overall effect size or practical significance of the effects on children basic school readiness and on the overall developmental outcomes measure.
3. Age at entry and Time in Program were found to be statistically significant in at least three of the five models presented but their effect tended to be independent of program type (i.e., IV).
4. Gender did not have statistical significant effects except in the case of the PKBS-B when moderated the effect on the children's problem behaviors scores at post test (in this case boys tended to show higher problem behavior scores. But as indicated these score were still within the normal developmental range).
5. Program type does show a differential statistical significant effects and this effect vary based on the children's developmental status at entry, the children social skills at entry and/or children problems behaviors standard scores at entry.
6. Non-integrated program show a statistically significant relationship with the children DOCS standard scores at post test and that children who had a moderate to low developmental status at entry did fare slightly better than the children in the

integrated program. The inverse was true when considering the children with higher PKBS-B or problem behaviors. In this case, children in the integrated program fared better at post test than the children in the non-integrated program.

6.2 DISCUSSION

While some of the results seem to support statistically significant relationships between Program Type and some of the dependent measures, it was also observed that its overall practical impact (i.e., effect size) appears negligible or at least, that the Program Type alone is not a sufficient element in contributing to improved outcomes for children. Moreover, the statistical results from the interaction effects are puzzling and difficult to interpret, when considering that children in integrated program who had relatively higher problem behavior scores seem to do somewhat better on the BSSI-3 but not the kids who had lower PKBS social skills scores. Usually, the kids who tend to have a higher problem behavior score also have a low social skills score which would suggest that children with these opposite characteristics should fare better in the integrated program. On the other hand, it also appears that children in the non-integrated program, who scored low on the DOCS at entry and had slightly lower social skills score at entry, did just as well or slightly better than the children in the integrated program on the BSSI-2.

This does not minimize the importance and/or contribution of program/services integration, rather it supports previous research studies which have emphasized the interplay among different (yet related) structural and global dimensions of the services and programs (File & Kontos, 1993; Berlin, Hughes, et al. 1997; Brooks-Gunn & Aber, 2001; Newacheck et al., 1998). The results of this study have indicated for instance that both types of programs share a

relatively equal impact. What this suggests, among other things, is that the net effect of program integration is most likely linked to some shared characteristics of the programs, such as the overall quality of the services, and/or of the staff. This is very likely given that both were demonstration programs and that both programs have been recognized for best practices. Despite the relative small effect size, it was also observed that there was a significant relationship between the integrated program and the children's school readiness and overall developmental growth at post test. This would further evidence that level of services integration is most likely to strengthen and supplement the effect of qualitative elements already present in a program. What this also means is that policies fostering integration of programs and/or services but do not focus simultaneously on assuring and improving their quality, are most likely to be ineffective in improving the lives of the children participating in early intervention and/or education programs.

In three of the five models, the relative age of the child at entry was found to have a statistically significant impact on the dependent measures. This finding supports previous research studies and provides further evidence to support of one of the central tenets of early childhood intervention. That tenet is that intervening earlier rather than later is, in the long run, most likely to yield the best chance for rehabilitation and developmental progress. Time spent in a program (in this case used also as proxy for the level of intensity of the intervention) while impacting positively the developmental growth and school readiness of the child was not found to be statistically significant in most cases. Indeed, both age at entry and time in program did not have a statistically significant impact on the PKBS-2 social skills and/or problem behavior outcomes measures at post test. One reason for this unusual result could be that there are not enough age-variations among the two programs. It must be stressed however that overall the

results would suggest that children seem to fare overall just as well in either types of program environments.

In closing, the result of this study seems to suggest that policies geared toward program integration can work only in the presence of other structural dimensions. In this discussion, quality was mentioned as one such factor. However, quality itself has an ephemeral meaning as long as these programs are only accessed by the poor and the economically disadvantaged population. One reason for this fact is, with out a doubt, that access to most publicly funded programs is based on categorical and/or means-tested. At the same time, it is hard to claim best early intervention practices if and when these are not applied and used universally and for all children regardless of their family income.

Finally, the findings from this study do support the conclusion that early entry into programs, combined with early developmental intervention, is most likely to impact the readiness and quality of the transition of the children as they move into a school setting. Regardless of the relatively small effect size that these result produced – (most likely indicative of the “backgrounds noise” from non-controlled factors) - the findings establish a baseline in the exploration of the relationship between type of program integration and children developmental outcomes.

6.3 STUDY LIMITATIONS: VALIDITY & RELIABILITY ISSUES

The issues surrounding validity and reliability in research designs can be grouped in two general categories. The one that was presented in the section on the dependent measures above focused on the validity and reliability assessment of the tools or instruments, and refers mostly to the accuracy, sensitivity and appropriateness of the measures. The second type of validity and reliability, as set forth by Campbell & Stanley (1963), focuses instead on the evaluation of strengths and weaknesses within the research design, sample selection and factors that can decrease the reliability of the inferred causal relationships. These two general categories are interrelated. That is, just as studies using unreliable instruments and measures cannot be validated, studies with poor or biased research design, regardless of the goodness of the measures, will most likely lack internal and external validity. This second type of validity and reliability assessment is that discussed in this section, as the strengths and weaknesses of this study are reviewed and discussed.

The associational relationship between the independent variable (in this study system integration) and the dependent variables (selected child & family outcomes) was examined in reference to the presence of the selected control factor (non-integration) -- relative size and significance of the variance displayed on the dependent variables (e.g., in terms of improved child developmental, social and school readiness post-test scores). These associational links and theoretical underpinnings, as previously indicated, find support in the reviewed literature. In one of these studies, Guralnick (2005) posits that a systematic and comprehensive early intervention system can change the developmental trajectories and prevent co-morbidities, as well as influence optimal family patterns. This would suggest, at least at face value, a first-level validation, in terms of establishing the reliability and applicability of the theoretical model used

in this study to connect a structural-level variable to the “experimental-level” variables (i.e., developmental improvement).

The original SPECS study used Generalizability Analysis techniques to account for the lack of randomization in the exposure to the experimental variable. A subsequent study conducted by the SPECS evaluation team indicated that the ECI data used to evaluate the effectiveness of early intervention was tested against a statistically generated control group (Bagnato et al., 2002). The method involved creating a control group on predicted vs. expectation performance based on the “chronological age by using ...the children as their own control group” which also controlled for the effect of maturation, another major threat to internal validity (Bagnato et al., 2002. p.573).

This same study also indicated that “*history*”, another extraneous threat to internal validity, was not an issue because all children and all families continued during their permanence in the study to receive some form of services and programs. History also relates to events that might have happened to the child and/or the child’s family between the first and other subsequent measurements, independently from the treatment or services. For instance, it could be that a general change in the public’s attitude towards, and understanding of, disability during the 10 years that the evaluations were conducted had an effect on how teachers or other participants viewed and therefore scored certain behaviors or cognitive delays. In the case of this study, it was observed that Program Type did not have a practical significant impact. This does not mean that the level of program integration is irrelevant but only that other factors might be more important (e.g., quality of the services and quality of the staff) and/or that in this case, there might be too many unaccounted (confounding) factors at play that could suppress or neutralize the effects of integration.

Other sources that might could have confounded the outcome of this analysis relate to potential internal validity biases including: 1) teachers scoring the children from their own classroom; and 2) sample selection/response biases relating to both response integrity (completeness of data) and missing group or data resulting from individuals who did not consent to participate, and therefore were not included in the study. As indicated, the latter was certainly a factor because in order to make the analysis more robust some children with incomplete sets of data were dropped all together.

It is also possible, that a potential bias results from the fact that the participants who may be more prone to participate are those who have most of the data completed. This factor has implications for external validity because it could result in the study capturing only one segment of the child population, and perhaps only those who had more motivated and more involved parents. As a result, the data might be representative of families with certain characteristics and/or cultural attributes. It is also important to emphasize that the selected programs were both part of a state-pilot project and both were recognized as best-practice programs. These facts could have affected the teachers who participated in the study, and conceivably biased their post-test responses if they had been under the impression that a bad performance by their students would reflect low-quality teaching on their part. To some extent, these issues can be avoided or at least their effect minimized, through a longitudinal multi-rater approach, such as that which was used by the ECI researchers (Bagnato et al., 2002). However, this concern also points to the fact that quality of the organization, professionalism and preparation of the staff and the quality of services and methods used might be more important as factors than the manner in which the services are presented and/or delivered to the targeted populations.

Just as there are potential threats to internal validity in secondary data sources, there exist opportunities for external validity threats as well. External validity is not completely independent of internal validity in that their relationship is, at times, inverse. The more controlled the testing environment is (e.g., laboratory-like referred to as “*the reactive effects of the experimental arrangements*”) the less is the likelihood that the results can be transferred to the real world (Campbell & Stanley, 1963, p. 6). In relation to this study context, the issues of reactivity can also be present. That is, the two programs selected were part of two major state-funded pilot initiatives, and the fact that both staff and the programs were under careful observation by the state and other stakeholders could have motivated the staff to be attentive to expected state’s objective and thereby produced biased results.

An external validity threat relating to the original study sample is probably the representativeness of the sample. As indicated, the sample might have been overrepresented by Caucasian population living in rural or semi-rural settings; accordingly, other racial populations or populations who live in more urbanized centers are underrepresented. Moreover, as previously mentioned, those within the sample population who consented to participate in the original study, might have been culturally and/or educationally different than those who did not participate. This might have translated in biased results, as the sample may be representative of more motivated parents who are prone to go the extra mile to obtain positive results for themselves and for their children. In addition, it is impossible, given the absence of family data, to know which of the families might present psychopathological conditions which could further affect (in either directions) the observed results of this study.

Nonetheless, by maximizing statistical rigor researchers can exert control over many of these inherited design weaknesses. For instance, by employing multiple analyses of variance (ANCOVA) and Bonferroni's adjustment technique - (a more conservative p value is obtained by dividing the number of analyses or controls being run, which in this case are 5 total variance analyses increasing the p value to 0.025 instead of the usual 0.05 level). As indicated by Bagnato et al. (2002), this same data has been analyzed using statistical regression controls (e.g., controlling for change due to the normal, expected development of the child) and still showed overall significantly more positive outcomes than statistically expected. This suggests that both types of programs have contributed to improve the developmental growth of the children. The question analyzed and investigated in this research was however to ascertain the specific contributions of services integration and these results were, in larger part, inconclusive.

This study acknowledges that the data adjustments and statistical controls, in the absence of random assignment and other "up-front" controls, can only establish that integrated program seem to do comparatively the same as the non-integrated, but this fact should not undercut that the experimental program did produce in some cases significant (i.e., $p < .01$) change in outcomes than the control program. Notwithstanding these limitations, this research does provide a valuable contribution to what Guralnick (2000) refers as the second-generation research in ECI. Second-generation research does not ask whether ECI works, but rather it has the more difficult task to examine for whom and under what circumstances it does work. Overall, this study adds to and does not take away from the dialogue of how policy makers can improve the existing social and public programming in early intervention and education.

One final comment must be made in relation to whether this study or other similar studies represent a robust model of scientific inquiry. Without question, the inability of the researcher and those who follow to generalize the effect of an independent variable to the larger population is detrimental in the same manner as is the inability to neutralize the explanatory power of third intervening and extraneous variables. In the case of community-based “authentic” research approaches, this tension will hardly ever be absent. Moreover, accepting randomized experimental design as the gold standard for scientific inquiry is increasingly being regarded as “deterministic” and “inadequate” for the advancement of scientific knowledge (Habermas, 1988; Hauser-Cram, Warfield, Upshur & Weisner, in Shonkoff & Meisels, ed., 2000). The traditional positivistic paradigm bases the validation of scientific inquiry on the assumption that the experimental environment is uncontaminated and free of biases and that the research has sufficient control over extraneous factors. Hauser-Cram et al. (2000) provide a succinct discussion of the countless criticisms of these and other positivistic assumptions and present a compelling argument for moving toward a “post-positivistic framework” that promotes scientific inquiry based on empowerment and the development of critical consciousness of the study participants (Hauser-Cram et al., 2000).

In conclusion, the criticism against “positivist science” is that, even in the most controlled experimental settings, the experimenter is wittingly or unwittingly engaged with the subject of his/her study, and with the measuring instrument used, which as Habermas (1988) points out, is partially derived from the shared subjective cultural world and, thus not free of any biases (Habermas, 1988; pp.94-105). This study falls within the post-positivist paradigm in that the goal is not to arrive at an absolute truth, but merely to advance our understanding of the problem and of the possible solutions.

7.0 PRACTICE IMPLICATIONS & CONCLUSIONS

As indicated in the opening sections, the reason for selecting the “Efficacy” instead of “Effectiveness” strands of research is for the implications that the former strand has for social work practices.

Effectiveness research asks the basic question “does it work” and it is usually answered by comparing two treatments or interventions and/or programs’ effects on selected dependent variables. Efficacy research asks a more complex question and that is: “what does make it work, for whom and under what conditions?” This is herein contended to be the domain of study more consonant to and for social work practices. In using the Efficacy framework, Social workers contribute to integrate two practice levels. At the micro level, (e.g., case management, counseling and/or therapists) we worker along side local people and services user, yes to address their therapeutic needs, but also to link these micro needs to the larger context and vice-versa (i.e., informing the programmatic context of the intervention). At the macro level, the social work contribution is to use tools such as research, evaluation and/or aggregating case-studies to build empirical evidences for enabling systemic changes. This two-way road also captures one of the major functions of social work practices and that is linking people, systems and resources, and in so doing promoting change and/or increasing the capacity for change and innovation at both systemic levels.

This work is seen as contributing to the development, implementation and sustainability of policies based on evidence for best practices. Evidence-based practices also epitomizes the

intricate relationship between values and facts that our profession is often faced with and/or called to upon to conciliate. Indeed, what constitute best practice guidelines for best serving the needs (in this case) of at risk children and their families? One of the adopted assumptions in social work and other professions has been that the more integrated are the services the more efficient and effective these will be. Of course, the findings from this study do not fully support this assumption. Yet, in the act of establishing that the values do not match the facts, this research is accomplishing one of its practice goals and that is to bring about critical thinking on social issues and social problems, while searching for workable and sustainable solutions.

Another point to be made and one which it is felt characterizes our profession is that social workers do not view the individual as the core of social pathologies nor that such pathologies exist in a vacuum (i.e., place these faults solely within the individual or system). Rather, social work practices and practitioners undersign to the ecological perspective, which means that our aim as social worker researchers is to investigate the interactions among and between systemic influences. For example, we cannot solve for child abuse without solving for the family pathologies. Yet, we cannot solve the family pathologies without intervening on the neighborhood in which these exist. And we cannot operate at community level without addressing the broader social-economic and political factors, such as inequalities, social exclusion, discrimination, poverty...etc. It is this type of “social workings” that is most likely to contribute and operate successfully upon policy changes and innovations.

In sum, there are 5 kernels that this research contributes to social work practices.

1. **In terms of Policy Focus:** Should we continue to focus and support services integration as a viable policy solution for improving the services delivery system? The results from this study suggest that integration might be only valuable as long as that which is integrated is of quality (just imagine if what is being integrated is garbage or rubbish). Hence, stakeholders (including social workers) are given an opportunity to reexamine these policies and put integration in perspectives and that is asking what is that are we calling for integrating; and is it sufficient integrating these practices to enhance and/or improve the experiences of families and children within these services?

2. **In terms of Promoting Social Development:** Policies calling for integration are really the result of fiscal restraining and retrenching of public funded programs. Hence, as a fiscal strategy its objective is focused on the short-term programmatic gains and economic savings. Integration has meant in many ways the transfer of monies away from social development and investments. This research is in a way contributing to questioning the true value of services integration for social development and human capital investments. Is it serving to building assets? Better utilization of savings? Who is better off as a result?

3. **In terms of Direct Practices Improvements:** One of the contributions of this research has been to re-define, re-elaborate and re-present the meaning and definition of services integration for front line practitioners and the field in general. It has been suggested new ways to understand integration as a communicative action within and among practitioners rather than as a superstructure pre-imposed from without. This definition

of integration is one that can best help practitioners rethink and gain meaning out of abstract terms as interdisciplinary intervention, multi-agencies collaboration and last but not the least family centered service milieu.

4. **In terms of Advancing Understanding:** Social work is part of the larger social science community. As part of this community one of our tasks, as social workers researchers, is contributing to advance understanding. With all of its limitations, this research has humbly accomplished this task by re-opining the dialog and discussion on the topic of services integration.

5. **In terms of Personal & Professional Growth:** As a social worker we must use research as a means to continuously question our values and our judgment and challenging our beliefs and assumptions. Hence, this research adds to this professional growth and personal values formation. By personal formation is intended the act of rejecting personal biases whatever the source might be (cultural, ethnical, social etc) through information and research.

8.0 CONCLUSIONS & FUTURE CONSIDERATIONS

In closing, future investigations can increase the internal and external validity by exerting and controlling for some of the additional potential sources of variations that the present research had no control over, such as variation due to:

1. Family background (random variations, non controllable in these circumstances)
2. Program Services intensity (requires further data collection not available)
3. Raters or teachers (random variation non controllable since requires additional controls not available).
4. Type of disability (while the degree of disability can be discerned from scores, the type of disability was not available).
5. Family level of engagement/participation/involvement (not available; could be inferred from PBC but unreliable).
6. Support network and/or level of family and child participation in extracurricular activities.
7. Peer influence.
8. Level of academic challenge and content.
9. Fidelity and quality of service and interventions.

While this study does establish some baseline findings, it remains difficult to disentangle the exact observed effects of service integration, not just because of third uncontrolled factors, but also and perhaps most importantly, because of the need (to paraphrase Kahn & Kamerman, 1992) for integrating the meaning and definition of service/program integration. This study, if nothing else, brings forth this and other needs and a call for re-examining the adequacy of current health and educational policies and of current services options available to young children and families, especially for those faced with multiple disabling conditions. It is not sufficient to assume nor to expect that service or system integration can miraculously effect changes in the behavior, attitude and competencies of professionals and programs or that it can increase the effectiveness of treatment and/or services and that, somehow, all of this will result in “real” developmental gains or improved well-being for the child or the family as a whole. By the same token, and directed to the critics of EI/ECE, it is inappropriate to dwell on the cost effectiveness of early intervention and/or early education and, worse, it is utterly erroneous to consider EI/ECE a failure based only on the failure on the part of programs to attain some arbitrary standards, derived from arbitrary measures or outcomes. Both of these two types of explanations or justifications for a failing system of early care and intervention do nothing else than hurt children and families. The current ad hoc, intermittent and means-tested states’ policies do nothing more than perpetuate a system of convention and convictions rather than changing it (as the law requires) to a system based on evidence and best practices. Nothing moves such goals farther from view than the belief that it is possible to successfully intervene in children’s lives without addressing equity and sustainability issues. It is further impossible to obtain reliable qualitative and quantitative positive results from public, means-tested categorical programs created on a generic (one size fits all) services and supports models, and designed to

serve only the most disadvantaged population, and with an often less-than-adequate funding budget and resources (human and other). These realities or issues are not new but have yet to be adequately addressed at the state and federal policy levels.

Future research efforts should be focused on disentangling and elaborating on the exact location of integration on the theoretical pathway to improved children and family outcomes. This could be done by a careful selection of the most meaningful variables to include in the research via meta-analytic techniques. This would mean to ascertain the effect size and level of contribution of qualitative factors (i.e., quality of programs, staff, etc.) and of structural factors (i.e., type of organizational approach of the services and program). Among the variables which should be more carefully monitored are the fidelity of program implementation and definitional components of the integrated programmatic services/programs. This would ensure a more reliable control over the exact nature, definition and levels of program integration. Furthermore, and as mentioned above, future research should focus on further elaborating on the interaction effects observed in this research. This would enable a separate analysis of the children and family with delay/disabilities to ascertain the exact nature of the contribution of the services and programs to these populations. It is also important to neutralize potential intrusive effect of family and neighborhood factors. This would enable a more clear understanding to the extent that the services and program effects are indeed trickling down to the family unit and the life space within which the child and family live. At the same time this would help to better understand in what ways and which family or neighborhood characteristics positively or negatively influence services and programmatic outcomes. Such a research project is ambitious but it is not farfetched, especially if designed and conducted by and in collaboration with an interdisciplinary research team.

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