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Second-Generation Research in the Field of Early Intervention

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THE 25-YEAR period between 1970 and 1995 was a most remarkable time for the field of early intervention. Evolving from a collection of disparate activities and therapeutic approaches, far more coherent, highly visible, and well-established programs of early intervention supports and services for children and families have emerged. Accompanying the emergence of these contemporary early intervention programs has been a set of principles and values that are beginning to achieve consensus. At one level, most professionals, parents, advocates, and policy makers now agree that it is a societal responsibility to provide needed early intervention programs for children with established disabilities and for those whose development may be compromised as a result of biological or environmental factors. Similarly, most agree that the early years constitute a unique opportunity for influencing child development and supporting families, an opportunity that may well maximize long-term benefits for all concerned. Apparent as well is a strong preventive philosophy in which the goal of intervention is to prevent or minimize developmental problems for children at risk as a result of biological or environmental factors. In addition, this preventive philosophy extends to children with established disabilities, as interventions seek to minimize related problems that may further compromise development.

Finally, consensus appears to have been achieved with respect to broad principles that guide early intervention programs. In particular, it is agreed that successful early in-

tervention programs must center on the needs of families, be based in local communities, be able to thoroughly and efficiently integrate the contributions of multiple disciplines, and have the capacity to plan and coordinate supports and services from numerous agencies within a systems framework. Specific practice issues regarding the developmental appropriateness, timing, and intensity of those services or supports, as well as specific curricular approaches, are among related program features embedded within these broad principles.

Despite this general consensus, many critical questions relating to the principles and practices of early intervention remain unanswered and even unexplored. Practitioners in particular are often confronted with conflicting conceptual models of development and are able to obtain only minimal guidance from the research literature to assist in identifying and selecting specific program features that constitute the most effective interventions. It is especially difficult to choose those program features that best match the characteristics of children and families in order to yield optimal developmental outcomes.

The core of this chapter consists of the presentation of a model that links factors influencing early childhood development to the components of early intervention programs. This linkage is accomplished by conceptualizing risk and disability status in terms of stressors capable of adversely affecting family interaction patterns that govern the developmental outcomes of children. It is this

framework that can form the basis for organizing recent research findings on the effectiveness of early intervention, particularly those that emphasize connections among program features, child and family characteristics, and outcomes. In addition, this same framework can be used to establish directions for the next generation of research addressing critical issues of principles and practice in the field of early intervention.

LEGISLATIVE AND DEVELOPMENTAL ORIGINS OF EARLY INTERVENTION

Before presenting this model, the following summary of the foundations of early intervention programs provides an important historical perspective. Interestingly, the legislative origins of contemporary early intervention programs can be found in a number of distinct yet interacting strands. The influence of maternal and child health programs originating with the establishment of the Children's Bureau in 1912 was especially significant in that it constituted "the first recognition that the federal government has a responsibility to promote the welfare of the nation's children" (Lesser, 1985, p. 591). Within the larger program, the Children's Bureau was especially interested in vulnerable populations, including children at risk for and those with established disabilities. Support continued in this era for programs for mothers and children, including children with disabilities, culminating with the enactment of Title V of the Social Security Act in 1935 (PL 74-271). Two of the provisions of that act, one focusing on maternal and child health services and the other on children with disabilities (primarily those with orthopedic disabilities at that time), strongly reinforced the federal commitment to the well-being of mothers and children and established the responsibilities of each state for developing services as part of a federal-state partnership (Hutchins, 1994; Richmond & Ayoub, 1993). Additional amendments to the Title V program over the years related to

mental retardation training, children and youth projects, service and research programs, and the Early and Periodic Screening, Diagnosis, and Treatment (EPSDT) Program. Passage of the Omnibus Budget Reconciliation Act of 1989 (PL 101-239) continued the process of amending the Social Security Act to create a more responsive maternal and child health program emphasizing a broader, systems-wide perspective (see Ireys & Nelson, 1992).

The strong prevention-oriented features of Title V programs were incorporated into the Economic Opportunity Act of 1964 (PL 88-452), eventually resulting in the Head Start program designed for children living in poverty (Zigler & Valentine, 1979). This program's recognition of the linkage between children's health and development, the importance of local community-based control, the emphasis on supporting parents in their decision making, and the need to be able to thoughtfully coordinate the many needed services from different domains further defined the components of emerging models of effective early intervention programs.

Paralleling these developments were efforts devoted primarily to special education programs for children with established disabilities. Head Start did eventually mandate inclusion of a small proportion of children with disabilities (10%) in the Economic Opportunity Amendments of 1972 (PL 92-424), but it was primarily the Handicapped Children's Early Education Act of 1968 (PL 90-538) that provided support for model demonstration, training, and dissemination projects in the field of early childhood intervention (Smith & McKenna, 1994).

The value of early intervention programs was recognized further in the Education for All Handicapped Children Act of 1975 (PL 94-142), the landmark legislation establishing the right to a free and appropriate education for all school-age children with disabilities. Contained within that legislation were incentives for including preschool-age children. It was, however, the Education of the Handicapped Act Amendments of

1986 (PL 99-457) that virtually ensured services for preschool children and created a new and comprehensive program for infants and toddlers with disabilities while encouraging additional programs for children at biological or environmental risk. The emphases on families, coordinating community services and supports, and fostering parent-professional partnerships were among the early intervention concepts that found expression in this legislation. A continuing process of legislative refinement is occurring as the field moves toward full implementation of these laws (e.g., Individuals with Disabilities Education Act Amendments of 1991 [PL 102-119]).

From the perspective of the field of child development, dramatic growth in our understanding of the capacities of infants and young children and of the impact of the environment on development was taking place during this same period. Of particular importance was a recognition of the long-term significance of early caregiver-child relationships, the influence of a child's health on development, and the identification of specific patterns of environmental stimulation likely to optimize child developmental outcomes. In fact, an extraordinary body of literature on specific patterns of parent-child interactions presumed to be important for particular aspects of development emerged (Clarke-Stewart, 1988), with corresponding growth occurring in our understanding of the mechanisms through which these influences appeared to operate (Barocas et al., 1991). It was, in part, this knowledge base of proximal patterns affecting development that helped attract a large group of intervention-oriented professionals to the field of early childhood and excited them about the prospects of promoting child development and family well-being through early intervention programs.

Equally informative to those interventionists was research that led to a conceptualization of the influence of the broader context on child development. Of special interest were those contextual (and more distal) fac-

tors related to social support provided by family, friends, and the community in general; the availability of financial and material resources to families; the degree of family coherence; the level of marital stress; and parenting practices and developmental expectations established through intergenerational and cultural standards. Within this framework, it is suggested that these and related contextual factors, in concert with a child's individual characteristics (e.g., temperament), are largely responsible for the more proximal patterns of family interaction that influence a child's development. In fact, three essential family interaction patterns can be identified:

1. The quality of parent-child interaction
2. The extent to which the family provides the child with diverse and appropriate experiences with the surrounding social and physical environment
3. The way in which the family ensures the child's health and safety

Taken together, it is the complex interplay of these influential factors that constitutes the foundation of contemporary developmental models. Representative approaches that capture these interactions include Belsky's parenting model (Belsky, 1984; Belsky, Robins, & Gamble, 1984), Sameroff's transactional model (Sameroff, 1993; Sameroff & Chandler, 1975), Ramey's biosocial model (Ramey et al., 1992), Dunst's (1985) social support model, and Bronfenbrenner's (1979) ecological model. The degree of convergence among these approaches is particularly striking and instructive given that the populations of interest from which these models were derived consisted of children at risk, children with established disabilities, and children and families not experiencing any unusual risks or stressors.

CONCEPTUAL MODEL OF EARLY DEVELOPMENT AND RISK FACTORS

These models are useful not only in understanding how development proceeds for di-

verse populations of children and families, but also in providing a conceptual framework to guide the complex process of early intervention. Figure 1 illustrates the approach taken in this chapter, which relies on the many common features of these earlier models while incorporating the additional construct of stress in connection with a child's disability or child and family risk status (see Bradley, Rock, Whiteside, Caldwell, & Brisby, 1991; Brinker, Seifer, & Sameroff, 1994; Thompson et al., 1994). Stress is conceptualized broadly in this context, consisting of factors that interfere with a family's ability to establish patterns of interaction supportive of a child's development.

The central portion of Figure 1 (Family Patterns) represents the three aforementioned proximal patterns of family interaction that have well-established associations with a child's developmental outcome. It is suggested that these patterns are of relevance to all children and families, irrespective of a child's disability or risk status. First, the quality of immediate parent-child transactions is perhaps of most significance. The research literature has documented in remarkable detail the importance of contingent, encouraging, affectively warm, nonintrusive, appropriately structured, discourse-based, and developmentally sensitive patterns of caregiver-child interactions in optimizing a child's development (Clarke-Stewart, 1988; Lewis & Goldberg, 1969; Wachs, 1992; Wachs & Gruen, 1982). A second critical factor in a child's development is those experiences with the social and physical environment that are orchestrated by family members. The frequency and quality of contacts with different adults, the variety of toys and materials available, and the stimulation value of the general environment contribute in important ways to a child's development (Elardo, Bradley, & Caldwell, 1977). Moreover, especially as the child moves into the preschool years, arranging for special developmental, educational, or recreational activities consistent with the child's talents, interests, or special needs can help to maximize developmental outcomes

through family-orchestrated environmental experiences. Finally, development is directly influenced by family patterns in connection with ensuring the general health and safety of their child (e.g., obtaining immunizations, providing adequate nutrition) (Barrett, Radke-Yarrow, & Klein, 1982).

Environmental or Family Risk

The extent to which these three family patterns are optimal in promoting a child's development is itself a consequence of numerous historical, extrafamilial, and intrafamilial factors. As noted previously, these contextual factors or family characteristics (see Figure 1) include the interpersonal characteristics of the parents (e.g., degree of depression, level of education, intergenerational parenting experiences including cultural expectations) and characteristics not related to a child's disability or risk status (e.g., quality of the marital relationship, child temperament, available supports including family resources and social support networks). As long as a family's general characteristics can support appropriate family interaction patterns, child development will proceed in a reasonable manner.

However, if these family characteristics constitute stressors of sufficient magnitude, such as extremely limited family financial resources, marital difficulties, or depression, then family patterns of interaction may exist that are far from optimal for a child's development. Whether a family is identified as "at risk" depends on the definitions selected as well as the purpose for identifying risk status. A multiple risk index has been suggested and can be extremely useful (Sameroff, Seifer, Barocas, Zax, & Greenspan, 1987). Alternatively, chronic poverty is often associated with serious and widespread consequences, and its presence alone may be sufficient to consider a family to be at risk (Bradley et al., 1994; Huston, McLoyd, & Garcia Coll, 1994; Parker, Greer, & Zuckerman, 1988). Fortunately, as Belsky (1984) has pointed out, parenting is a "buffered system," with considerable potential for the many factors con-

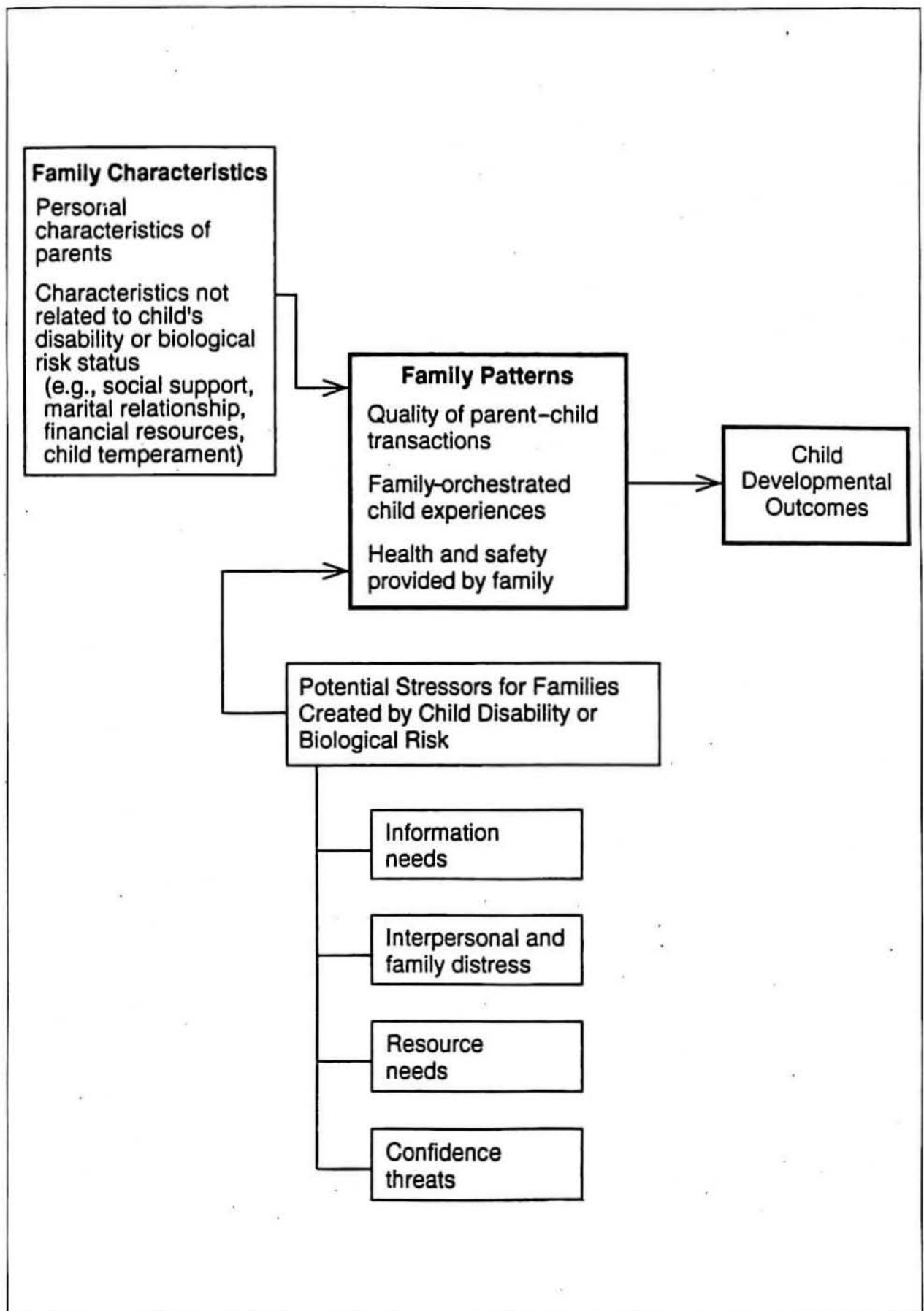


Figure 1. Factors influencing developmental outcomes for children.

tributing to a family's characteristics and interaction patterns to compensate for one another. Nevertheless, the often strong associations found among adverse or stressful family characteristics, family interaction patterns, and nonoptimal child development outcomes argue for the importance of the construct of environmental or family risk.

Child Disability or Biological Risk

As indicated by the model presented in Figure 1, a child's individual characteristics, especially a difficult temperament, can stress various aspects of family patterns of interacting (see Lee & Bates, 1985; Sameroff, 1993) but frequently not seriously enough to affect those patterns in any substantial way. However, potential additional stressors of considerable magnitude are created by children with established disabilities or those at biological risk that can, in fact, pose significant challenges to and often disrupt the interaction patterns of even the most stable and supportive of families. The lower portion of Figure 1 presents four categories of stressors associated with children with disabilities or those at risk that can potentially interfere with optimal family patterns of interacting.

First, families often face a crisis of information about their child's health and development, including questions regarding how to interpret their child's behavior, in what ways their caregiving activities can or should be altered, what a particular diagnosis might mean in terms of developmental expectations for their child, and the nature and effectiveness of therapeutic services that clinicians provide.

A second category of concern is the interpersonal and family distress that can result as a consequence of a child's disability or risk status. This distress may well affect marital interactions and can be highly intense and personal for family members, generally involving reassessments of what can be expected of themselves and their child (Hodapp, Dykens, Evans, & Merighi, 1992). In addition, families often must contend with the challenge to avoid social isolation (Bai-

ley & Winton, 1989; Lewis, Feiring, & Brooks-Gunn, 1987) or stigmatization (Goffman, 1963) that can occur, particularly for children with significant disabilities, and confront problems associated with the coping process itself (Affleck & Tennen, 1993; Behr & Murphy, 1993).

With regard to the third category of concern depicted in Figure 1, resource needs, a child with a disability (as well as a child at significant biological risk with accompanying chronic medical conditions) often places considerable stress on parental caregiving and family routines (Beckman, 1983; Bristol, 1987; Dyson, 1993), making it difficult for the family to meet its many obligations and responsibilities. At the same time, the system of services can be bewildering or unresponsive as families seek to arrange and orchestrate the most appropriate therapeutic, educational, and social experiences for their child. The financial burdens for health care, respite care, and related services can mount quickly and unexpectedly as well, particularly for children with severe disabilities (Birenbaum, Guyot, & Cohen, 1990). As a consequence, additional resources, including direct services, are often needed.

Finally, as noted in the fourth category in Figure 1, these and other potential stressors together constitute threats to the confidence of families that can undermine their ability to solve the many current child-related problems and those that will inevitably arise in the future. Maintaining mastery and control of decision making and doing so with confidence and competence appears essential for the long-term well-being of the family and of the child (see Affleck & Tennen, 1993).

COMPONENTS OF EARLY INTERVENTION PROGRAMS

The implications of this model of development and the role of stressors for conceptualizing early intervention programs are presented in this section. As suggested by the relationships represented in Figure 1, all family characteristics (which may or may not

consist of significant stressors that place the child at risk) and those stressors related to a child's disability or biological risk converge to influence family patterns and, ultimately, child development.

For children with established disabilities and those at biological risk, the four categories of stressors in Figure 1 reflect only potential family interaction problems. The extent to which stressors actually have a substantial impact on family patterns will vary with the magnitude of the stressors and the prevailing characteristics of the family, including available supports, resources, interpersonal and problem-solving skills of the parents, and a history of sound family parenting practices. In this way, low family risk can have moderating effects. In contrast, significant family risk can exacerbate the effects of stressors from other sources. The importance of the association between high family risk and biological risk, for example, can be seen by the devastating consequences on child development that result from this combination of forces (Bradley et al., 1994).

From this perspective, it is evident that the origin and nature of stressors should result in

correspondingly different approaches to early intervention. Moreover, available evidence indicates that, to be effective, specific services provided by early intervention programs must closely match the needs of families (Affleck, Tennen, Rowe, Roscher, & Walker, 1989; Dunst & Trivette, 1990). For this to occur, a collaborative parent-professional relationship appears to be essential, in which professionals are able to listen effectively, establish systematic and family-oriented assessment procedures, and successfully negotiate differences in perspectives and values (Bailey, 1987; Duwa, Wells, & Lalinde, 1993). Having formed such a relationship, the various components of an early intervention program responsive to family-identified needs can then be organized and coordinated.

Program Components for Child Disability and Biological Risk

Figure 2 illustrates the possible components of such a coordinated early intervention program in which needs have been identified in all four categories of potential stressors created by children with established disabilities or those at biological risk. Initially, a service

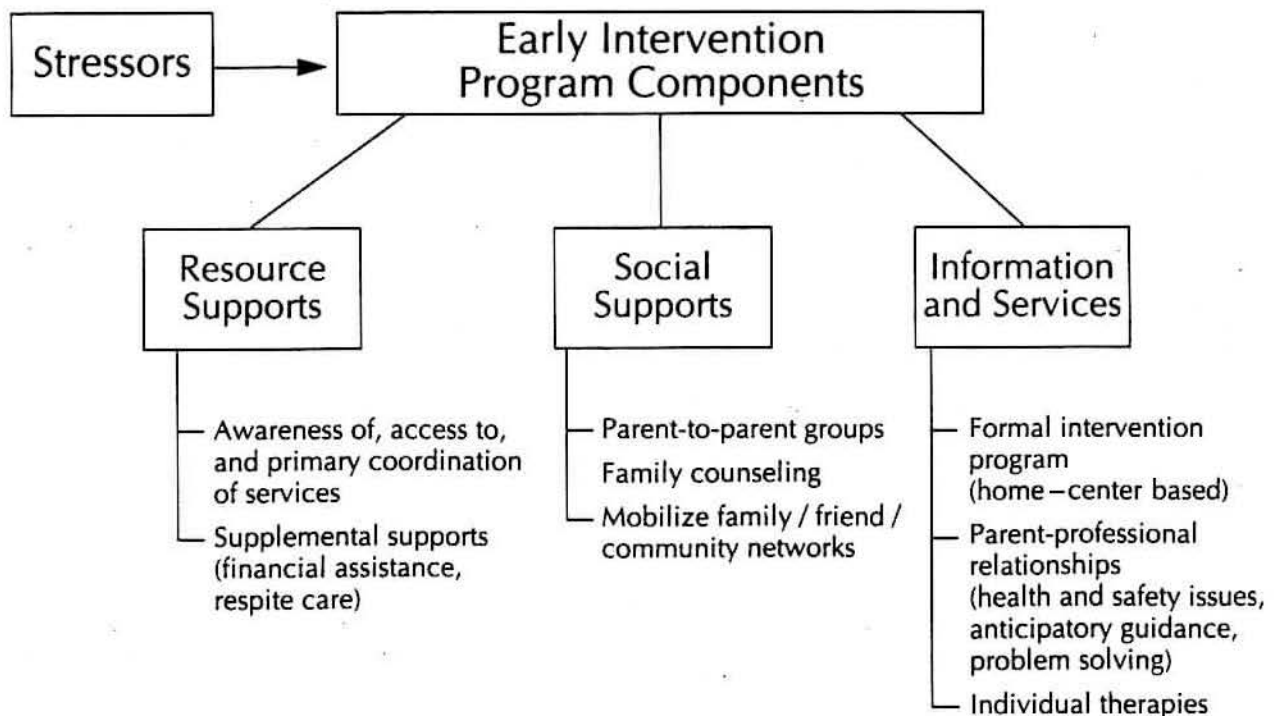


Figure 2. Components of early intervention programs as a response to stressors.

coordinator provides instrumental support by working with families to establish needs and develop realistic priorities. Assistance is then provided so that families become aware of available services and learn how to gain access to those services. Additional roles of the service coordinator are to help families integrate the array of identified services, ensure that the services themselves do not intensify stress, and be sensitive to the importance of maintaining compatibility with a family's goals and values.

At the same time, supplemental supports, such as respite care or financial assistance for unusual health care expenses, are identified and eligibility requirements clarified. Assistance may also be provided in gaining access to appropriate parent support groups, which provide important information and can be of value in mitigating certain aspects of interpersonal or family distress that may have arisen. Moreover, assistance can be provided to families to mobilize natural sources of support involving spouses, extended family members, and friends. Encouraging frank discussions of issues of concern and promoting strategies that others have used successfully can contribute to strengthening the family's system of natural supports (Cooley, 1994; Shonkoff, 1985). On occasion, intensive family counseling may be seen as a necessary measure.

The most visible component of most early intervention programs is the information and services provided to families and children under the auspices of a formal early intervention program or through relationships with individual therapists. Parent-professional relationships enable families to obtain specific information about expected developmental patterns, the progress of educational and therapeutic interventions, and any special problems likely to be encountered. Other forms of anticipatory guidance are also likely to be provided, and discussions related to health and safety issues occur frequently. A focus on parent-child relationships and sug-

gestions for home and community activities are typically important topics as well.

Many of the educational, developmental, and therapeutic activities may primarily or exclusively involve the child as he or she is enrolled in home- or center-based programs, or both, for various periods of time. This circumstance occurs more frequently as the child becomes older. It is in this context that the child is exposed to a particular developmental/educational curriculum or a specific therapeutic approach. In accordance with the model presented in Figure 1, these formal interventions constitute an important family-orchestrated set of experiences for the child; in this instance, they are a response to specific child needs.

Within these formal programs, professionals may also work closely with parents to directly facilitate parent-child interactions. Techniques to produce a more balanced set of exchanges between parent and child, to assist parents to understand and read the cues of their children more effectively, and to constructively interpret their children's patterns of behavior, are common elements of these programs (Rauh, Achenbach, Nurcombe, Howell, & Teti, 1988; Seifer, Clark, & Sameroff, 1991).

Finally, if the components of early intervention described above are thoughtfully and sensitively applied, the cumulative impact will likely minimize threats to a family's confidence in their ability to solve the many problems they will encounter in the future. The professional's role in this regard should not be underestimated. As Cooley (1994) noted, "Professionals who foster cooperative partnerships with families are informally enhancing a family's self-confidence and feelings of mastery and control" (p. 118). Indeed, in the absence of family confidence (and competence), the withdrawal or reduction of intervention supports or services and the occurrence of subsequent stressors may result in nonoptimal child developmental outcomes, despite the success of interventions provided earlier (see Brooks-Gunn et al.,

1994). Understanding those processes that govern both the immediate and the longer term effects of early intervention constitutes a critical task for our field.

Program Components for Family Risk

Early intervention programs for children at risk because of family characteristics contain features similar to those of programs for children with established disabilities or those at biological risk. However, the source of the stressors requires somewhat different approaches. As suggested earlier, families at high risk usually experience numerous stressors, and a comprehensive intervention program involving the coordination of individual, family, and community components will likely be required to mitigate these risk factors.

The chronicity and pervasive impact of stressors related to family characteristics pose special challenges, however. Interpersonal difficulties of parents, such as depression or their own experiences with inadequate parenting, create problems that are resistant to change. Financial and social supports or even counseling can reduce family stress to a certain extent, but adverse conditions associated with poverty and disadvantaged status generally remain.

As a consequence, especially for families at extremely high risk, the formal aspects of early intervention programs associated with the information and services component in Figure 2 may intensify. Specifically, extensive home visits regarding child care may be scheduled to facilitate the quality of parent-child transactions. In addition, children may be enrolled in high-quality, highly intensive, intervention-oriented child care or preschool programs, even if parents are available, in order to provide needed experiences not found in the home, and close connections with local public health centers are established to address health or safety concerns. The level of the intensity of formal interventions required to have beneficial effects on child development for families at

risk constitutes a critical issue in the field of early intervention. A similar issue exists for certain groups of children with established disabilities or those at biological risk.

EFFECTIVENESS OF EARLY INTERVENTION

With this framework as background, the important question arises as to how well early intervention programs have fared. Have these programs been able to prevent or minimize developmental problems from occurring for children at risk through preventive interventions? Similarly, for children with established disabilities, have early intervention programs produced a positive impact on the well-being of children and their families? Answered from a public policy perspective, early intervention programs have done exceedingly well. Parents, advocacy groups, professionals, and policy makers who joined together to create the Education of the Handicapped Act Amendments of 1986, PL 99-457, have continued to press for full implementation at state and local levels. Indeed, as noted previously, a consensus has been achieved that early intervention makes a difference.

From a scientific perspective, however, the existence of numerous methodological problems has posed significant challenges to our ability to establish unequivocal statements regarding the efficacy of early intervention (Bricker, Bailey, & Bruder, 1984; Dunst, 1986; Guralnick, 1988, 1991; Simeonsson, Cooper, & Scheiner, 1982). Yet, despite these concerns, the results of two meta-analyses (Casto & Mastropieri, 1986; Shonkoff & Hauser-Cram, 1987) as well as more traditional reviews of effectiveness (Guralnick & Bennett, 1987) support the generally held opinion that early intervention programs are indeed effective, producing average effect sizes falling within the range of one half to three quarters of a standard deviation.

It is important to recognize that these conclusions on the global effectiveness and mag-

nitude of the benefits of early intervention derived from research conducted prior to 1986 were primarily based on comparisons between children and families receiving newly developed early intervention services and supports and children and families receiving essentially no services or supports whatsoever. That is, prior to concerted efforts to establish community-based early intervention programs, the context for families was one in which prevailing services were poorly developed and highly fragmented, access to information was limited, qualified professionals were not always available or were difficult to locate, expectations for many children with disabilities or those significantly at risk were low, and families often found themselves isolated from the general community. Apparently, in one way or another, the various components of emerging early intervention programs were able to be responsive to those stressors affecting families of children with established disabilities and children at risk to produce the global effects that have been reported.

It is also important to note that the rapidly evolving service system, further stimulated by PL 99-457 in 1986, has altered permanently the ecology of early intervention programs for children and their families. Even when children are not enrolled in a formal service program, in the post-PL 99-457 era, community expectations for children are higher, a variety of support systems are in place, information is readily accessible, and professional training from an interdisciplinary perspective has improved substantially. Accordingly, any future comparisons involving innovative components of early intervention programs will, as a consequence of this state of affairs, be made between those innovative practices and this contemporary and more sophisticated level of services and supports. Viewed in this way, research conducted prior to 1986 can be referred to as "first-generation" research (Guralnick, 1988, 1993), and it has essentially put the global question about whether or not early intervention is effective to rest.

DIRECTIONS FOR SECOND-GENERATION RESEARCH

What, then, remains to be accomplished from an efficacy perspective in this post-PL 99-457 era? What "second-generation" research questions are of interest? One response is that second-generation research should address issues that can guide specific program directions at a level that is of value in the daily activities of clinicians, educators, interventionists in general, and families. As might be expected, given the heterogeneity of the populations involved in first-generation research in the field of early intervention, the rapid and continuing evolution of curricula during that period, the diverse conceptual approaches that existed, and the questionable scientific merit of many investigations, it has been difficult to extract specific principles and approaches that could be applied to the practice of early intervention at that level.

Program Features

In fact, the first-generation research literature contributed surprisingly little to the details of the design and implementation of early intervention programs. Which curriculum approach to select, how quickly services should be initiated for children and families, at what intensity and with what degree of structure, whether to emphasize relationship or didactic models, how families should be involved, and the extent to which social support systems contribute to developmental outcomes were among the important issues that failed to receive systematic attention. In fairness, some trends regarding successful program features or components did emerge in connection with the intensity of early intervention, the degree of structure that should exist when implementing a curriculum, and the role of parent involvement in early intervention. Given the nature of research at the time, however, such trends not only failed to be compelling but often were contradictory (Casto & Mastropieri, 1986; Guralnick & Bennett, 1987; Shonkoff & Hauser-Cram, 1987; White, Taylor, & Moss, 1992).

Accordingly, a major task for second-generation research is to identify those specific program features that are associated with optimal outcomes for children and families. Recent longitudinal research employing prospective, randomized designs with appropriate controls (White & Boyce, 1993) or comprehensive and intensive follow-up of carefully chosen samples (Shonkoff, Hauser-Cram, Krauss, & Upshur, 1992) has contributed important information within this framework. It is this issue of *specificity* that ultimately informs practice, improves the cost-effectiveness of services, minimizes false expectations, provides a research framework for evaluating innovative approaches, and may even be of value in helping us understand the mechanisms through which interventions operate. As will be seen, a number of chapters in this volume were selected to address directions for second-generation research emphasizing important program features of curriculum, social support, and parent-child interactions. As suggested previously, the model presented linking factors that influence early childhood development (Figure 1) and the components of early intervention (see Figure 2) through an identification of potential stressors on families resulting from a child's risk or disability status can serve as a framework for organizing second-generation research questions.

Child and Family Characteristics

From this perspective, we would not, of course, expect specific program features of an early intervention program to operate with equal effectiveness for children differing in developmental characteristics or children from families varying in terms of resources, family interaction patterns, existing supports, or related factors. Interactions that occur between program features and child and family characteristics form some of the most important and interesting questions in the field of early intervention. Moreover, they pose perhaps the major challenge for issues of specificity, the central theme of second-generation research.

Child characteristics, particularly the *severity* of the disability or risk status, in early intervention efficacy research have consistently accounted for a substantial share of the variance in developmental outcomes (Bricker & Dow, 1980; Dunst, 1986; Guralnick, 1991; Infant Health and Development Program, 1990; Palmer et al., 1988; Shonkoff et al., 1992). For children with established disabilities, as might be expected, severity is inversely related to the effectiveness of interventions (Guralnick, 1991). Research examining the relationship between severity of biological risk and responsiveness to a comprehensive, preventive intervention program reports a similar pattern (Infant Health and Development Program, 1990). Yet for certain program features, such as tactile/kinesthetic stimulation applied to preterm infants in the hospital, children with *more* obstetric and perinatal complications were more responsive to the intervention (Scafidi, Field, & Schanberg, 1993). Clearly, work is needed to understand how severity influences child outcomes and to obtain a better grasp of this construct in terms of its influence on an absolute as well as a relative basis.

As suggested previously, severity of family risk is an equally important factor. It is interesting to note that children from families at most risk as a result of poverty and related conditions also appear to be more responsive to interventions (Ramey & Ramey, 1992). However, even this relationship is not a straightforward one, because family risks and biological risks interact to moderate the effectiveness of early intervention programs. For instance, consistent with the model presented in Figure 1, Bendersky and Lewis (1994) found that a family risk measure composed of assessments of social support, stressful events, parent-child interactions, and organization of the environment was an unusually strong predictor of child developmental outcome for a large group of preterm children. Of importance, this relationship was stronger for children at lower biological risk, a finding consistent with intervention effects obtained for groups varying in terms

of family and biological risk (Brooks-Gunn, Gross, Kraemer, Spiker, & Shapiro, 1992). Unquestionably, interaction patterns occurring between program features and child and family characteristics are complex, even when focusing along the dimension of degree of risk. This relationship may well depend on certain threshold values for severity of risk or disability and on how risk and severity are defined. What is certain is that no simple generalizations will be forthcoming.

In addition to the severity of a child's disability or risk status, the type of child-related risk or disability deserves consideration. There are, of course, obvious and important distinctions between a child at risk and a child with an established disability in the context of early intervention. Moreover, within the extensive group of children classified as at risk, the conditions giving rise to the categorization of risk—including prematurity and low birth weight, prenatal exposure to alcohol and other drugs, low maternal education, the potential for or actually experiencing neglectful or abusive relationships, or being raised in impoverished environments—constitute markers for a constellation of definable risk factors and likely stressors that require a specific array of early intervention program features in order to yield optimal developmental outcomes. The combination of risk factors (and accompanying stressors), particularly their cumulative impact on development, serves as a major challenge for preventive intervention programs (Bradley et al., 1994; Sameroff et al., 1987).

Similarly, the dramatic increase in our understanding of the developmental characteristics of children with different types of established disabilities, such as those with Down syndrome (Cicchetti & Beeghly, 1990), autism (Cohen & Donnellan, 1987; Dawson, 1989), or communication disorders (Johnston, 1988), and the emergence of etiology-specific research strategies (Hodapp, Burack, & Zigler, 1990; Hodapp & Dykens, 1991) suggest that various early intervention program features will be differentially effective for children with different types of disabilities.

Accordingly, in this volume, individual

chapters explore outcomes of early intervention and establish directions for second-generation research organized not only in terms of program features but also in relation to risk conditions and the child's type of disability. Severity of risk or disability, as well as related issues, is discussed within these more general categories of type of disability or primary risk factor.

Outcomes of Early Intervention

Finally, judgments of the effectiveness of early intervention vary with the types of outcome measures employed. Although, historically, selection of outcomes has been primarily developmental domain specific, even here considerable care must be taken to conduct a comprehensive assessment of the effects of early intervention because outcomes are constrained by the domain evaluated. For example, early motor development appears to be determined primarily by biological factors, with medical status, not environmental influences, being the most reliable predictor of development in this domain (Bendersky & Lewis, 1994; Stanton, McGee, & Silva, 1991). In contrast, considerable variance in cognitive and language development can be traced to environmental factors, above and beyond biological risk, suggesting greater responsiveness to components of early intervention (Bendersky & Lewis, 1994; Shonkoff et al., 1992). Accordingly, where appropriate, a range of outcome measures is needed, based on the characteristics of the children, the nature of the intervention, and the expectations of the extent to which change is likely to occur.

Outcome measures that extend beyond the primary domains of cognitive, language, affective, and motor development to domains considered integrative, such as the development of children's social competence or improving children's health status, constitute other types of outcome measures that reflect a broader perspective of the goals of early intervention. These have been valued but historically neglected goals in the field of early intervention (Guralnick, 1990; Taft, 1983; Zigler & Trickett, 1978), ones that may be un-

usually responsive to comprehensive early intervention programs. Similarly, the effects of early intervention on families themselves, such as those related to family cohesion or adaptability, as well as on belief systems and problem-solving abilities of families in connection with their children's development, constitute other possible outcomes of early intervention. Family-related measures can be seen as important ends in their own right but, perhaps more important, as mediating factors in their child's development.

Accordingly, in addition to the domain-specific outcomes emphasized in numerous chapters throughout this volume, separate chapters consider issues related to improving children's social competence, the importance of assessing the impact of early intervention on families, and how early intervention can affect parents' belief systems and problem-solving skills. The important theoretical and empirical issues regarding the expectations for immediate or longer term benefits of early intervention are addressed whenever possible in the context of the other chapters.

Summary

Figure 3 presents a multidimensional model that depicts the three primary elements discussed that should be considered by second-generation researchers: 1) the influence of program features, 2) the influence of child and family characteristics, and 3) the specific outcomes or goals of early intervention. This organizational framework is intended to represent as well the interactions that are possible among these three dimensions. The challenge to researchers is one of first identifying the relevant features for each of the three dimensions, then assessing them carefully, and finally carrying out systematic and programmatic research. Of course, attention must be given to the scientific rigor of the research, and contemporary developmental principles must be considered, issues that have plagued earlier research in this area (Guralnick, 1993). Despite the difficulty of the work ahead, it is anticipated that, as research findings gradually provide information sufficient to fill the cells of the matrix in

Figure 3, the information obtained will become increasingly valuable to professionals, administrators, families, and policy makers.

PURPOSE AND ORGANIZATION OF THIS BOOK

The major task of this volume is to establish an agenda for second-generation research in the field of early intervention. To accomplish this, the organization of the volume follows closely the conceptual child development and early intervention framework presented earlier and the related themes outlined in this chapter.

Two sections of the book are concerned with early intervention programs for children at risk, with two parallel sections following focusing on children with established disabilities. Separating at-risk children from those with established disabilities is consistent with populations selected for research and provides a way to meaningfully organize different categorical groups of children who present special challenges in the field of early

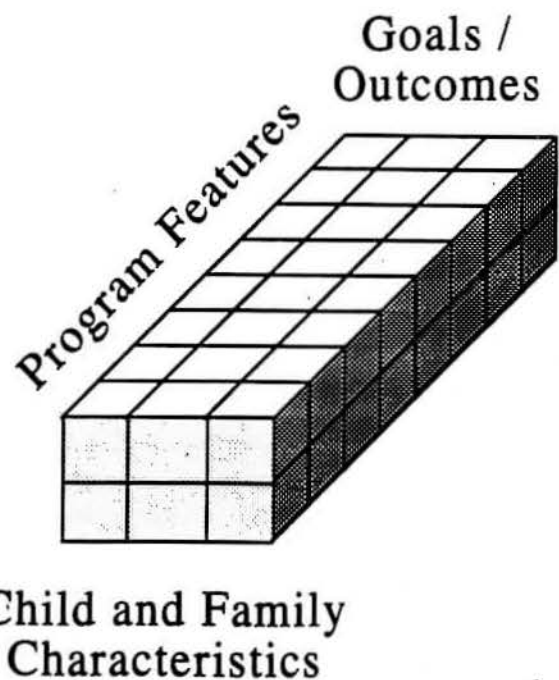


Figure 3. An organizational framework for second-generation research. (From Guralnick, M.J. [1989]. Recent developments in early intervention efficacy research: Implications for family involvement in PL 99-457. *Topics in Early Childhood Special Education*, 9(3), 1-17. Copyright 1989 by PRO-ED, Inc.; reprinted by permission.)

intervention. This division is also consistent with the populations identified in PL 99-457.

In the section on risk factors, individual chapters focus on children raised under environmentally impoverished conditions (Chapter 2), children receiving interventions in neonatal intensive care units (Chapter 3), children born prematurely at low birth weight (Chapter 4), children at risk for neuromotor problems (Chapter 5), and children of mothers who have mental retardation (Chapter 8). In addition, populations of children exposed prenatally to alcohol and other drugs (Chapter 6), those who have been abused or neglected (Chapter 7), and children with acquired immunodeficiency syndrome (AIDS) or HIV infection (Chapter 9) have been included not only because of the increased prevalence of these risk conditions in recent years but also because of the tragic circumstances surrounding these children and their families. Although overlap exists among risk factors for these populations, each constitutes an important focus of research and practice. For all risk populations, early intervention is best conceptualized as providing preventive intervention.

Children with established disabilities are considered separately as well. Individual chapters examine early intervention effectiveness for children with Down syndrome (Chapter 13), autism (Chapter 14), motor disabilities (Chapter 15), communication and language problems (Chapter 16), behavior disorders (Chapter 17), and hearing (Chapter 18) and visual (Chapter 19) impairments. It is recognized that these populations often overlap with one another in their developmental profiles or related characteristics (as do risk populations) and that community-based services are not typically organized around such groupings. Nevertheless, they constitute conventional categories employed in research studies and have many important distinguishing features that affect the nature of early intervention services. No attempt has been made to be inclusive; rather, the intent is to represent the spectrum of cognitive, language, motor, sensory, affective, and behavioral disabilities.

Chapters addressing early intervention for children at risk and those with established disabilities examine research primarily carried out since the passage of PL 99-457 in 1986. Research from that time until 1996 is summarized, and directions for future second-generation research are identified. Whenever possible, authors of chapters focusing on specific risk and disability groups go beyond child characteristics and explore interactions with family characteristics and program features, as well as discuss outcome measures likely to be most meaningful for that group of children. However, by virtue of the preliminary and limited nature of much of the available research for a number of groups, many of these secondary analyses are highly speculative.

In accordance with the themes introduced earlier, three program features have been selected for more intensive analyses in separate chapters: 1) social support, 2) parent-child interaction, and 3) curricula. By focusing on these program features, an alternative, in-depth perspective of important issues in early intervention is provided. Program features occur, of course, in conjunction with children and families with their own characteristics. To highlight the relationship between program features and child characteristics in particular, separate chapters consider program features for children at risk (social support [Chapter 10], curriculum [Chapter 11], and parent-child interaction [Chapter 12]) and those with established disabilities (social support [Chapter 20], curriculum [Chapter 21], and parent-child interaction [Chapter 22]).

In the last section of the book, three chapters address new directions for evaluating the outcomes of early intervention. First, the integrative domain of social competence is put forward as a potentially useful goal and outcome of early intervention (Chapter 23). Next, outcomes for families, a most complex and even controversial issue, are examined (Chapter 24). Finally, how early intervention could be devoted to enhancing parents' problem-solving abilities and altering their attitudes and belief systems is discussed (Chapter 25).

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