

Early Intervention for Infants and Toddlers with Developmental Disabilities

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Although claims that early intervention is a necessary condition to optimize the developmental outcomes of infants and toddlers with disabilities generally go unchallenged today, this was not always the case. For most of the first 50 to 60 years of the 20th century, there was a strongly held belief that human growth and development to a large degree were not alterable by differential environmental experiences and that this especially held true for children with disabilities or other identified conditions (e.g., McNemer, 1940). The classic study by Skeels and Dye (1939) of young children with mental retardation living in an institution was one of the first experimental investigations to demonstrate that supplemental experiences provided to children with disabilities can, in fact, influence their early development.

J. McVicker Hunt's (1961) highly influential book *Intelligence and Experience* proved a tipping point in building a convincing case that human development was malleable and that environmental enrichment and deprivation can, respectively, have positive and negative effects on child behavior and development. The contention that the experiences afforded infants and toddlers can shape the course of growth and development was demonstrated in a series of studies subsequently conducted by Hunt and his colleagues (see Uzgiris & Hunt, 1987, for a review of this research).

The 1980s proved to be an important decade for amassing evidence either supporting or refuting the benefits of early intervention for young children with disabilities. A plethora of research reviews were published that attempted to answer the question, Is early intervention effective? (see, e.g., Dunst, Snyder, & Mankinen, 1988). Notwithstanding claims for or against the effectiveness of early intervention for infants and toddlers

with disabilities, the largest majority of these reviews were analyses of early intervention at a macro-, or program, level and not at a micro-, or practice, level. An examination of these previous reviews is beyond the scope of this chapter. Suffice it to say that the equivocal conclusions made by different reviewers were due, in part, to a failure to disentangle the *practice characteristics* associated with differential behavioral and developmental benefits.

The purpose of this chapter is to present an integrated set of research findings about one particular approach to early intervention with infants and toddlers with developmental disabilities and other identified conditions associated with poor developmental outcomes. The chapter includes five major sections: (1) a definition of early intervention that delimits the kind of research that constitutes the focus of review and analysis, (2) a framework for operationalizing the kinds of experiences and opportunities afforded infants and toddlers with disabilities that are intended to alter behavioral and developmental trajectories, (3) a presentation of findings from a series of practice-based research syntheses (Dunst, Trivette, & Cutspec, 2002) and corroborating studies that highlight those practice characteristics that are now known to positively affect child and parent functioning both directly and indirectly, (4) a critical analysis of the Individuals with Disabilities Education Act (IDEA) early-intervention program in light of available research evidence, and (5) a discussion of the implications of state-of-the-art knowledge for improving policy and practice. The chapter concludes with some thoughts about the reasons that evidence-based information is generally not being used to inform practice.

DEFINITION OF EARLY INTERVENTION

For purposes of this chapter, early intervention is defined as the *experiences and opportunities afforded infants and toddlers with disabilities by the children's parents and other primary caregivers that are intended to promote the children's acquisition and use of behavioral competencies to shape and influence their prosocial interactions with people and objects*. This definition excludes research on early intervention that does not include parents and other primary caregivers as primary sources of children's learning opportunities. It also excludes research on practices that do not support and strengthen either *parents' capacity* to provide their children with development-instigating learning experiences and opportunities or *children's capacity* to engage in child-initiated and child-directed interactions with people and the physical environment.

Guiding Principles

The particular approach to early intervention that constitutes the focus of this chapter is consistent with the intent of the IDEA early-intervention program that places primary emphasis on strengthening parents' capacity to promote their children's learning and development. The definition of early intervention used in this chapter is based on three principles that guide the ways in which early intervention is operationalized and practiced.

- *Principle 1. The experiences and opportunities afforded infants and toddlers with disabilities should strengthen children's self-initiated and self-directed learning and development to promote acquisition of functional behavioral competencies and children's recognition of their abili-*

ties to produce desired and expected effects and consequences. A fundamental distinction is made between experiences and opportunities that are contexts for a child's acquisition and use of behavior that is intended to have desired consequences (e.g., a child who learns to use a pointing gesture to get an adult to retrieve a desired object) and those intended to elicit a child's behavior (e.g., having a child name objects shown to him or her or by an adult). The former and not the latter is the type of early-intervention practice that constitutes the focus of this chapter.

- *Principle 2. Parent-mediated child learning is effective to the extent that it strengthens parents' confidence and competence in providing their children with development-instigating and development-enhancing learning experiences and opportunities.* This principle makes explicit that the benefits of early intervention should be realized by both children and their parents or other primary caregivers. The likelihood that parents and other primary caregivers will provide children with the kinds of experiences and opportunities that influence their development is maximized when adults recognize and understand the important role they play in influencing their children's growth and development.

- *Principle 3. The role of early-intervention practitioners in parent-mediated child learning is to support and strengthen parent capacity to provide their children with experiences and opportunities of known qualities and characteristics (i.e., evidence based) that are most likely to support and strengthen both parent and child capacity.* Knowledgeable practitioners are aware of what research "tells us" about the characteristics of practices that are associated with optimal positive benefits. Practitioners intervene directly with children only to the extent that it serves to model for parents the use of evidence-based practices with their children.

The approach to early intervention that constitutes the focus of this chapter is based on the assumption that responsibility for child rearing rests within the family and that professionals working with a family intervene in ways that support and strengthen parent capacity to carry out child-rearing responsibilities effectively and efficiently. This approach in no way is intended to argue against or refute professionally implemented interventions with infants and toddlers with disabilities. Notwithstanding this assertion, there is, as will be shown, a converging body of evidence regarding the practice characteristics that are a foundation for a parent-mediated approach to early-childhood intervention.

FRAMEWORK FOR INVESTIGATING EARLY-INTERVENTION PRACTICES

According to Bronfenbrenner (1992), the aim of a science of human development is the "systematic understanding of the *processes* and *outcomes* of human development" (p. 188), in which "variations in developmental processes and outcomes are [considered] a *joint* function of the environment and of a [developing] person" (p. 197). Bronfenbrenner (1993) also noted:

Among the personal characteristics likely to be most potent in affecting the course . . . of development . . . are those that set in motion, sustain, and encourage processes of interaction between the [developing] person and two aspects of the proximal environment: first, the people present in the setting; and second, the physical and symbolic features of the setting that invite, permit, or inhibit engagement in sustained, progressively more complex interaction with an activity in the immediate environment. (p. 11)

Given these assertions, the factors that influence child development include, but are not limited to, the characteristics of the developing child (e.g., type and severity of disability, gender, personal preferences), the characteristics of the child's parents (e.g., parenting style, parenting confidence, parenting beliefs about child rearing), and the characteristics of the experiences and opportunities that a child is afforded (e.g., material availability, interestingness, responsiveness). Consequently, the effects of experiences and opportunities afforded infants and toddlers with disabilities would be expected to vary as a function of any number of different factors and combinations of factors. For example, the developmental trajectories of infants and toddlers with disabilities or developmental delays who receive early intervention vary as a function of their etiologies and diagnoses in clearly discernable and expected ways (Dunst, 1998), in which variations in trajectories among children with the same type of disabilities are attributable to both intervention and nonintervention variables (Dunst & Trivette, 1994).

Although similar to other models and frameworks (e.g., Guralnick, 2005) that call for conditional tests of the relationships between intervention and nonintervention factors and their consequences (e.g., Does XYZ practice influence children with different disabilities in the same way?), the Bronfenbrenner framework focuses attention on the specific features of the experiences and opportunities afforded children with a focus on the *proximal characteristics* that account for observed effects. This is what was described earlier as a microlevel approach to examining early-intervention practice research. The goal of a *science of early intervention* is a better understanding of the practice characteristics that influence child learning and development and the identification of those processes that best explain the obtained or observed relationship between the practices and their consequences.

Practice-Based Research Syntheses

Bronfenbrenner's (1992, 1993) characteristics-consequences framework has been used to conduct what have come to be called *practice-based research syntheses* of early-intervention and related practices research studies (Dunst, Trivette, & Cutspec, 2002). A practice-based research synthesis involves the systematic analysis of a narrowly defined body of research that has investigated the same or similar practice with a focus on the extent to which the relationship between the practice characteristics and their consequences replicate across studies. The practice itself, to the extent possible, is *unpacked* and *disentangled* to identify the features, elements, and factors that account for the largest amount of covariation between the use of the practice characteristics and their effects or outcomes. For example, an analysis of the extent to which the clarity of a response-contingent relationship in infant operant-learning studies affects rate of learning is illustrative of this kind of investigative process (Dunst, 2003).

RESEARCH FOUNDATIONS FOR EARLY-INTERVENTION PRACTICES

Four different kinds of intervention practices are used to illustrate what is known about the characteristics of practices that positively affect the learning and development of infants and toddlers with disabilities: (1) response-contingent child learning, (2) parent responsiveness to child behavior, (3) everyday natural learning opportunities, and (4) capacity-building help-giving practices. These are by no means the only practices that

constitute the content and scope of early intervention (see, e.g., Guralnick, 2005; Odom & Wolery, 2003). They do, however, make up a conceptually and operationally coherent set of practices that, taken together, provide one way of thinking about parent-mediated, evidence-based early-childhood intervention (Dunst, 2000, 2004).

Response-Contingent Child Learning

The term "response-contingent child learning" refers to environmental arrangements by which a child's production of a behavior produces or elicits a reinforcing or interesting consequence that increases the rate, frequency, or strength of behavior responding (e.g., Hulsebus, 1973). The movement and sound of a mobile that occurs as a result of an infant swiping the apparatus is an example of this type of learning. Infants without disabilities or delays typically learn and remember this kind of relationship by 2 to 3 months of age (e.g., Lipsitt & Werner, 1981). Infants' recognition of the relationship between what they do and what happens in response to their behavior is called "contingency awareness" (Watson, 1966) or "contingency detection" (Rochat, 2001). This awareness or detection is often manifested by concomitant social-emotional behavior. Haith (1972) noted that an infant's ability to understand that he or she is the agent of an environmental consequence produces social-emotional responding because cognitive achievement is pleasurable.

The extent to which infants and young children with disabilities are able to learn the relationship between their behavior and its consequences has been the focus of investigation in more than 50 studies spanning some 40 years (see e.g., Dunst, 2003; Hutto, 2003). Participants in these studies included children with Down syndrome, cerebral palsy, sensory impairments, hydrocephaly, microcephaly, seizure disorders, multiple disabilities, and other syndromes, etiologies, and diagnoses associated with developmental disabilities or delays.

The characteristics of response-contingent learning opportunities associated with variations in rates and patterns of learning in children with disabilities has been examined in three research syntheses of this practice (Dunst, 2003; Dunst, Storck, Hutto, & Snyder, 2006; Hutto, 2003). These syntheses included analyses of how long it takes children with disabilities to learn a response-contingent relationship, the correlates of rapidity of learning, the relative effectiveness of different types of environmental arrangements and reinforcers, and whether children with disabilities manifest social-emotional responding as a result of contingency awareness or detection in a manner similar to their typically developing peers. Taken together, findings from available studies clearly show that children with disabilities are capable of response-contingent learning and that these kinds of learning opportunities constitute a useful early-intervention practice for these children (e.g., Lancioni, 1980). In almost every published and unpublished study of children with disabilities, rates of behavior responding increased, sometimes three- or fourfold, once the children were reinforced for their efforts. There are, however, important differences in patterns of learning among children with disabilities compared with their typically developing peers.

Infants without disabilities typically demonstrate response-contingent learning in as few as 2 to 4 minutes. In contrast, it more often than not takes children with disabilities considerably longer to demonstrate the same kind of learning (Hutto, 2003) in which rapidity of learning is differentially affected by a number of factors. As might be expected, the more profoundly delayed a child is when he or she is first provided with response-contingent learning opportunities, the longer it takes the child to learn the

relationship between his or her behavior and its consequences. Furthermore, children with physical disabilities take longer to learn a contingency than do children who have other kinds of disabilities presumably because of their difficulty in executing motor responses.

The characteristics of the response-contingent learning opportunities themselves influence learning, as well. These include the type of behavior used to produce a reinforcing consequence, the type of reinforcement (e.g., social or nonsocial), and the type of contingency relationship (e.g., episodic vs. conjugate). In general, studies in which some type of manual response (e.g., arm or hand movements) was required to produce or elicit a reinforcer showed that a child with a disability took longer to learn a contingency. This is especially the case for children with physical disabilities. In contrast, rapidity of learning is very similar when leg kicks, vocalizations, head turns, or smiling are used to produce or elicit reinforcing consequences.

Social reinforcers are somewhat more effective than are nonsocial reinforcers in influencing learning (Dunst, Storck, et al., 2006; Hutto, 2003), as the social learning opportunities are more likely to evoke social-emotional child responding (Dunst, 2003). Somewhat ironically, in situations in which response-contingent learning opportunities are used as an intervention for children with disabilities, the children are much more likely to be provided with nonsocial learning opportunities (e.g., Dunst, Raab, Wilson, & Parkey, 1997).

The large majority of response-contingent learning studies have been conducted using either episodic or conjugate reinforcement paradigms (Dunst, Storck, et al., 2006). In episodic reinforcement studies, the reinforcement is delivered in a predetermined manner and amount following the child's production of a contingency behavior. In conjugate reinforcement studies, the amount or intensity of the reinforcement is proportional to the strength of the contingency behavior. Research shows that for children both with and without disabilities, patterns of learning are almost identical in episodic reinforcement studies, but that children with disabilities take up to three times longer to demonstrate learning in conjugate reinforcement studies (Dunst, Storck, et al., 2006).

Dunst (2003) examined the manner in which contingency awareness or detection was associated with positive social-emotional child responding in studies of children with and without disabilities. Findings showed that patterns of social-emotional responding among children with disabilities was much like those among children without disabilities but that the sheer amount of social-emotional behavior manifested by children with disabilities was considerably less than that of their typically developing peers. For both groups of children, the clarity of the relationship between a child's behavior and its consequence was an important determinant of social-emotional responding. In those cases in which a child's behavior produced a consequence within a few seconds and the behavior-response relationship did not overlap in real time, the probability was higher that the children would detect the contingency and display positive affect in response to their newly learned capabilities.

Response-contingent learning opportunities either arise naturally as part of children's everyday interactions with people or objects or can be intentionally arranged so that children have opportunities to learn the relationship between their behavior and its consequences. These kinds of learning opportunities are especially important for infants and toddlers with disabilities because they promote children's acquisition of behavior that can be used to initiate and produce desired effects.

Parent Response

Parents' sensitive parent-child interaction (Phillips, 2000). In a style with child intervention practice (Allen, 1982; Mar

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Parent Responsiveness

Parents' sensitivity and responsiveness to their infant or toddler's behavior during parent-child interactions is a potent determinant of child development (Shonkoff & Phillips, 2000). Encouraging and supporting parents' use of a responsive interactional style with children with disabilities has been recognized as an important early-intervention practice for more than 25 years (e.g., Affleck, McGrade, McQueeney, & Allen, 1982; Marfo, 1988).

It is generally recognized that parent responsiveness is a complex process that includes different elements and features that both individually and in combination influence child learning and development (De Wolff & van IJzendoorn, 1997). This process includes, but is not limited to, parental response quality, timing, appropriateness, affect, and comforting. In the context of the characteristics-consequences framework described earlier, parents' responsiveness to their children's behavior is considered an environmental (intervention) factor that contributes to variations in behavioral and developmental outcomes.

Findings from three practice-based research syntheses of different aspects of parent sensitivity and responsiveness highlight the features of this practice that matter most in terms of benefits to the child (Kassow & Dunst, 2004, 2005) and the strategies that are most effective for promoting parents' use of a responsive interactional style (Kassow & Dunst, 2005). Parents' contingent responsiveness to their children's behavior is associated with improved child functioning. The effectiveness of the parents' behavior is maximized when the parent is attuned to the child's signals and intent to communicate, when the parent promptly and appropriately responds to the child's behavior, and when parent-child interactions are synchronous and mutually reinforcing (Kassow & Dunst, 2004, 2005). Findings from a companion research synthesis indicated that behaviorally based interventions that specifically target parental awareness, interpretation, and responsiveness to their children's behavior are especially effective, and the effectiveness is enhanced when videotapes are used either to illustrate responsive parent-child interaction styles or to provide feedback to parents regarding their own interactional styles (Dunst & Kassow, 2004).

The extent to which parents' responsiveness to the behavior of children with disabilities influences the children's behavioral and developmental outcomes has been assessed in three practice-based research syntheses (Trivette, 2003; Trivette, 2004; Trivette & O'Herin, 2006). The studies included children with Down syndrome, Williams syndrome, hydrocephaly, physical disabilities, mental retardation, developmental delays, and multiple disabilities and children at risk for poor outcomes due to birth-related complications. The outcomes that constituted the focus of investigation included measures of children's cognitive, language, and social-emotional functioning.

In studies of children with disabilities, parents' responsiveness to the children's behavior shows very much the same kind of relationship with the outcomes that constitute the focus of investigation as is found in studies of children without disabilities. In almost every case, measures of parents' responsiveness during interactions with their children were positively associated with subsequent performance by the children on the outcomes measured in the studies. Notwithstanding differences in the absolute levels of functioning of the children with and without disabilities, the amount of covariation, or effect sizes, between parent responsiveness and child functioning were more alike than different for the two groups of children.

The reasons that parent responsiveness is associated with positive child benefits is perhaps best understood by considering what it "teaches" a child. A parent who is responsive to a child's efforts and success, who is helpful and supportive when necessary, and who is encouraging and facilitative helps a child learn that the parent is nurturing and dependable, which are exactly the kind of environmental conditions that are ripe for optimal learning and development. This would seem especially necessary for infants and toddlers with disabilities, who more often than not need an extra boost to learn about their own capabilities, as well as the behavioral propensities of others.

Natural Learning Opportunities

Children's lives throughout the world are made up of everyday activities that are the contexts for learning culturally meaningful behavior (Göncü, 1999). These everyday activities, or "microsystems" in Bronfenbrenner's (1992) terminology, invite or inhibit child learning depending on the characteristics of the setting and the behavior of the people in the settings. According to Farver (1999), the experiences and opportunities afforded children as part of everyday life are "ordinary settings in which children's social interaction and behavior occurs. They are the who, what, where, when, and why of daily life" (p. 201). Everyday activities, by definition, are natural learning environments in which contextually meaningful and functional behavior is learned, further increasing children's participation in family and community life (Dunst, Hamby, Trivette, Raab, & Bruder, 2000).

The extent to which infants and toddlers with disabilities participate in everyday activities and benefit from these natural learning opportunities has been examined in a number of practice-based research syntheses (Dunst, 2006; Masiello & Gorman, 2006; Raab & Dunst, 2006b; Trivette & Click, 2006) and other investigations (e.g., Dunst et al., 2001; Dunst et al., 2000; Dunst, Hamby, Trivette, Raab, & Bruder, 2002). These studies included children with Down syndrome and other chromosomal aberrations, physical disabilities, sensory impairments, autism, multiple disabilities, and other conditions associated with developmental delays.

Findings from research on naturally occurring learning opportunities indicate that everyday life is made up of some 22 different categories of natural learning opportunities (Dunst et al., 2000) and that preschool children with and without disabilities, on average, participate in about 40 to 50 different kinds of activities on a fairly regular basis (Dunst & Bruder, 1999). During the first 3 years of a child's life, participation in everyday family and community activities increases in a relatively linear fashion, albeit at different rates depending on the everyday activity (Dunst, Hamby, et al., 2002). More specifically, infants with disabilities from birth to 6 months of age are typically involved in about 19 ($SD = 13$) family activities and about 11 ($SD = 11$) community activities, and toddlers with disabilities 30–36 months of age are involved in about 34 ($SD = 9$) family activities and about 21 ($SD = 7$) community activities.

Infants and toddlers with disabilities on average tend to participate in somewhat fewer everyday activities compared with their typically developing counterparts. The differences in the experiences and opportunities afforded children with disabilities, however, are due less to their disabilities and more to their parents' beliefs about the value of everyday learning opportunities (Trivette, Dunst, & Hamby, 2004). In one study, for example, the children with the most profound developmental delays and associated disabilities and complications participated in even more family and community

activities than did most of the typically developing children, a fact that was easily traced to the parents' belief systems (Dunst, Bruder, Trivette, Raab, & McLean, 1998).

The extent to which the characteristics of the everyday experiences and opportunities afforded children with and without disabilities influence child behavior and development was examined as part of a research synthesis of interest-based child learning (Raab & Dunst, 2006b). Results showed that learning opportunities that either provided a context for interest expression or had interest-evoking features were associated with increased positive and decreased negative child functioning. Moreover, the benefits were greatest in situations in which interest-based learning occurred in the context of everyday activities, in which the pattern of relationships between the characteristics of the activities and benefits to the child were very much the same for children with and without disabilities.

The extent to which different approaches to conceptualizing and implementing natural-learning-environment practices have similar or different consequences has been the focus of several studies of infants and toddlers participating in Part C early-intervention programs (Dunst, Bruder, Trivette, & Hamby, 2006; Dunst, Trivette, Hamby, & Bruder, 2006). In both investigations, one or two samples of parents were asked to report the number and frequency of times they used different everyday activities as learning opportunities for their children, and one or two samples of parents were asked to report the number and frequency of times early-intervention practitioners implemented their practices in everyday activities. The outcomes constituting the focus of investigation included parent and child well-being, parent self-efficacy appraisals, parenting competence, and parents' judgments of their children's capabilities.

In both studies, parents' use of everyday activities as sources of natural learning opportunities was associated with positive consequences in nearly all the outcome measures, whereas early-intervention practitioners' implementing their practices in everyday activities had little or no positive effects and, in several cases, had negative effects on parent functioning. In the one instance in which both types of natural-environment practices were associated with positive child functioning, the effect size for parents' use of everyday activities as an early intervention was three times larger than that for practitioners' use of early intervention in everyday activities.

The everyday activities that make up the fabric of a child's life include, but are not limited to, the kinds of response-contingent and parent-child interaction learning opportunities described previously. Everyday activities are powerful contexts for child learning, and when used as sources of learning opportunities for children with disabilities, they can, and generally do, have positive child benefits, as well as parent benefits (e.g., improved sense of parent competence).

Capacity-Building Help-Giving Practices

The approach to early-childhood intervention that constitutes the focus of this chapter considers intervention effective when parents' as well as children's competence and confidence are strengthened as a result of the efforts of practitioners. Parents' sense of their own parenting abilities is considered a mediating factor influencing the kinds and characteristics of learning opportunities afforded their children (Dunst, Trivette, & Hamby, 2006b).

The extent to which practitioner help-giving practices influence (1) parents' competence in performing their roles and tasks, (2) parents' confidence in carrying out par-

enting responsibilities, (3) and parents' enjoyment in interacting with and playing with their children was assessed as part of three research syntheses of family-centered help-giving practices (Dunst, Trivette, & Hamby, 2006a, 2006b; Dunst, Trivette, Hamby, & Snyder, 2006). More than half of the studies in the different syntheses were conducted with parents of children with disabilities who were involved in early-childhood intervention programs. The children's disabilities included Down syndrome, cerebral palsy, sensory impairments, autism, multiple disabilities, developmental delays due to birth-related complications, and other disabilities associated with different etiologies and diagnoses.

Three different kinds of family-centered help-giving practices were examined as potential determinants of parenting abilities: relational help giving, participatory help giving, and parent-practitioner collaboration. Relational help giving involves practices typically associated with good clinical practice (active and reflective listening, empathy and compassion, reassurance, etc.). Participatory help giving involves practices that promote parent decision making and action based on choices necessary to obtain desired resources or attain desired goals. Parent-practitioner collaboration involves practices in which partners work together to plan courses of action and to decide what will be the foci of intervention.

A consistent pattern of findings occurred in those studies that examined the relationship between family-centered help giving and parenting. Collaboration had no discernable direct or mediational effects on parenting competence, confidence, or enjoyment (e.g., Dunst & Dempsey, in press). Relational help giving had small direct effects and somewhat larger mediational effects on the three parenting measures. Participatory help giving had both large direct effects and large mediational effects on parenting competence, confidence, and enjoyment. Moreover, the nature of the relationships between help giving and parenting was much alike for parents of children with or without disabilities.

In those cases in which family-centered help-giving practices had indirect or mediational effects on parenting competence, confidence, and enjoyment, the strongest mediational variable was parents' beliefs about their ability to execute courses of action necessary to achieve desired outcomes or attainments (Bandura, 1997). In almost every analysis that constituted the focus of review, practitioner participatory (and to a lesser degree relational) help-giving practices were positively related to parents' self-efficacy beliefs, which in turn influenced the parents' judgments of their parenting abilities.

The fact that participatory help giving proved the more important determinant of parenting competence, confidence, and enjoyment was not unexpected. Practitioners who use participatory help-giving practices with families encourage and support parents' involvement in experiences that provide contexts for them to successfully provide their children with learning opportunities that benefit parents, as well as children. In other words, when practitioners support parents and parents in turn support their children, both parents and children realize a heightened sense of competence and confidence.

EARLY INTERVENTION AS WE NOW KNOW IT

Early intervention for infants and toddlers with disabilities in the United States has become synonymous with the Individuals with Disabilities Education Act (IDEA), Part C, early-intervention program. Evidence from a number of sources indicate that early-

intervention practitioners working in Part C programs generally do not use either evidence-based or recommended practices and that many infants and toddlers participating in Part C early-intervention programs are not provided with the kinds of experiences and opportunities that are likely to have optimally beneficial effects (e.g., Campbell & Halbert, 2002).

Part C early intervention *as we now know it* is, for all intents and purposes, a service-based program (or, as some states claim, a *system*) that more often than not involves practitioners from different disciplines working directly with infants or toddlers generally in an uncoordinated fashion. The latter is especially the case in states that use private-provider models in which practitioners from different programs and organizations separately work with eligible children. In those states that rely heavily on Medicaid reimbursement as a way of funding early intervention, the likelihood that practitioners will intervene directly with children in the absence of meaningful parent involvement is increased considerably. This is often but not always the case because practitioners are not reimbursed for their services if they do not deliver "hands on" therapy or intervention.

Sixteen services are mandated by law as constituting the focus of Part C intervention. Findings from different national surveys, however, indicate that most infants and toddlers participating in Part C early intervention receive primarily service coordination, special instruction, speech therapy, occupational therapy, and physical therapy (e.g., Bruder & Dunst, 2006; U.S. Department of Education, 2002). To the best of my knowledge (based on an extensive literature search), there have been no efficacy or effectiveness studies of service-based Part C early intervention, nor have there been any studies relating variations in Part C service provision to variations in child or parent benefits. As noted, Part C early intervention lacks any substantive evidence of effectiveness, and it is implemented based on the faulty assumption that the services provided by programs and practitioners are *de facto* efficacious. The evidence that is available suggests that service-based early intervention is not effective and in some cases has negative effects (see, e.g., Dunst, Brookfield, & Epstein, 1998; Dunst, Hamby, & Brookfield, 2006; McWilliam et al., 1995; Trivette, Dunst, & Deal, 1997). For example, Dunst, Brookfield, and Epstein (1998) found that more services provided more frequently by more practitioners was negatively related to parent well-being and functioning.

Part C service-based early intervention is based on yet another faulty assumption that has generally gone unchallenged. Proponents of Part C early intervention *as we now know it* often cite the Perry Preschool Study, the Abecedarian Study, and other infant and early-intervention studies as the sources of evidence justifying service-based early intervention. This is clearly not warranted. Early intervention as practiced in Part C programs bears no relationship whatsoever to how early intervention was implemented and evaluated in these studies. The leap of faith that Part C proponents make in terms of "building the case" for service-based early intervention is simply not defensible.

Three sets of findings are briefly examined here to illustrate that early intervention as currently implemented by early-childhood practitioners is not aligned with recommended or generally accepted practices, including those examined earlier in this chapter. The findings are from the Division for Early Childhood (DEC) recommended practices validation studies (McLean, Snyder, Smith, & Sandall, 2002; Odom, McLean, Johnson, & LaMontagne, 1995), an Everyday Children's Learning Opportunities Early Childhood Research Institute study (Dunst, Bruder, et al., 1998), and the National Early Intervention Longitudinal Study (Bailey, Scarborough, Hebbeler, Spiker, & Mallik, 2004; U.S. Department of Education, 2002).

Division for Early Childhood Recommended Practices Surveys

As part of the original development and subsequent revision of the recommended practices for early-childhood intervention by the Division for Early Childhood of the Council for Exceptional Children (DEC Task Force on Recommended Practices, 1993; Odom & McLean, 1996), social validation surveys of DEC members were conducted to ascertain whether members agreed that the recommended practices were considered valued and desirable and the extent to which the practices were currently used by early intervention and preschool special education practitioners (McLean et al., 2002; Odom et al., 1995). Findings from both surveys indicated that the largest number of recommended practices were judged *best or valued practices* but that very few were considered mainstay early-intervention practices.

Simple recalculations of data presented in McLean et al. (2002) finds that for the four child and parent intervention practices constituting the focus of analysis (assessment, child-focused interventions, family-based practices, and technology applications), respondents *strongly agreed* that 69% of the more than 20,000 indicators were recommended practices. However, only 28% of the same practices were deemed *frequently* used by early-childhood intervention programs and practitioners. Odom et al. (1995) noted in their analyses of the discrepancy between valued and used practices that very few indicators were judged as frequently used by survey respondents.

Individualized Family Service Plan Natural-Environment-Practices Study

As part of the Everyday Children's Learning Opportunities Early Childhood Research Institute, Dunst, Bruder, et al. (1998) conducted analyses of the extent to which individualized family service plan (IFSP) (as well as individualized education plan [IEP]) outcome statements and activities were implemented in the context of everyday family and community settings. The focus of analysis was 106 IFSPs from Part C program participants in nine states. The IFSPs included 1,466 outcome statements that specifically addressed child-level interventions.

Findings showed that less than 1% of the outcome statements were described as occurring in the context of any family or community activity. So striking was the noncontextual nature of the outcome statements that only 3% of the outcomes were judged as having a high probability of increasing the children's interactions with either people or objects. Furthermore, only 40% of the IFSPs were judged as focusing on the development of functional behaviors that might promote or encourage child participation in everyday activity.

Dunst, Bruder, et al. (1998) also investigated the kinds of instructional practices that early-intervention practitioners either used with Part C program participants or suggested that parents use with their children. The most frequently mentioned practice was repeated presentation of the same task, or repetitious practice. Yet repeated practice is not generally recognized as an evidence-based teaching strategy (Wolery & Sainato, 1996).

National Early Intervention Longitudinal Study

The National Early Intervention Longitudinal Study (NEILS), a prospective study of more than 3,000 infants and toddlers enrolled in Part C early-intervention programs in

20 states, includes a wealth of data useful for discerning the consequences of early intervention (Bailey, Hebbeler, Scarborough, Spiker, & Mallik, 2004; U.S. Department of Education, 2002). A critical examination of findings from NEILS indicates that Part C early intervention may not be having optimal positive benefits for either children or their parents.

Many of the children with identified disabilities in the NEILS study entered early intervention under 1 year of age, and they constitute the focus of discussion here. Child developmental progress, behavior, and functional skills were measured at entry into early intervention and at yearly intervals thereafter. The majority of children made motor, self-help, communication, and cognitive progress between measurement occasions 1 year apart. This is not surprising, because most children with disabilities demonstrate improved functioning even without the benefits of early intervention (see, e.g., Dunst & Rheingrover, 1981; Shonkoff, Hauser-Cram, Wyngarden-Krauss, & Upshur, 1992). What is surprising is the lack of improvements over the course of 1 year in certain areas of functional capabilities. For example, results showed that for the behavior marker "pays attention and stays focused" (a proxy measure of child engagement; McWilliam & Ware, 1994), there were no changes in the percentage of parents of infants ages birth-6 months or 6-12 months who indicated that the statement was "very much like their child." Inasmuch as research indicates that young children with disabilities show improved engagement when they experience high-quality environments (e.g., Ichinose & Clark, 1990) and that parent and teacher behavior contribute to high levels of engagement (e.g., Lussier, Crimmins, & Alberti, 1994), the lack of change in this kind of behavior in the NEILS study participants suggest that there may be less than optimal benefits associated with Part C early intervention.

Parents of infants and toddlers who receive early intervention report, for the most part, overwhelmingly positive appraisals of their experiences (see, e.g., Kontos & Diamond, 2002; McNaughton, 1994). Findings from the NEILS study (Bailey, Scarborough, et al., 2004) indicate that parents do not make these types of positive attributions about their experiences, as are typically found in other studies.

One of the main purposes of Part C early intervention is supporting parents so they can promote child learning and development. It therefore seems reasonable to expect that the largest percentage of parents of children who have participated in Part C early-intervention programs should make positive judgments of their experiences in order to consider early intervention successful. The generally accepted standard for ascertaining success is at least 85% of respondents giving the highest rating on a scale that measures program or practice quality (Reichheld, 2003). Not a single NEILS program quality measure got close to this percentage. In response to the question, "How would you rate the help and information your family received through early intervention?" just over half of the parents (56%) gave the highest rating ("excellent"). Similarly, in response to the question, "How has the help and information received [from early intervention] affected your family?" only 59% of the parents said that their families were "much better off" as a result of early intervention.

Parents' judgments of their ability to help their children learn and develop is perhaps the *sine qua non* for ascertaining the success of Part C early intervention. The results in the NEILS study are not impressive. Only about two-thirds (64%) of the participants "strongly agreed" that they felt capable of helping their children learn as a result of early intervention.

Summary

Taken together, different sources of evidence indicate that Part C early intervention is not aligned with either recommended or evidence-based practices and that the benefits realized by program participants are less than desirable. Available evidence "paints a picture" that early intervention *as we now know it* bears only a faint resemblance to what we know are evidence-based practices.

IMPLICATIONS FOR POLICY AND PRACTICE

Knowledge about the characteristics and consequences of intervention practices that have development-enhancing qualities and benefits, as well as knowledge about early intervention as it is generally practiced in many states, has implications for improving policy and for informing parents and practitioners about the key features of evidence-based practices. The research summarized in this chapter, as well as that reported elsewhere (e.g., Bailey, Aytch, Odom, Symons, & Wolery, 1999; Odom & Wolery, 2003), may be considered the standards against which current policy and practice are judged as either consistent or inconsistent with available research.

Policy

Current knowledge about optimally effective early-intervention practices has implications for policy at both the federal and state levels. There is an urgent need to completely update the federal Part C infant/toddler program legislation and rules and regulations in light of available research evidence. In the 20 years since the passage of the Public Law 99-457 Part H program that established the current early intervention system in the United States, there have been tremendous advances in our understanding of the factors that influence the growth and development of infants and toddlers with disabilities. But even a cursory examination of the various reauthorizations of Part H, and, subsequently, the Part C early-intervention program, indicates that the changes that have been made have not kept pace with the current knowledge base.

Two of the many changes that are needed in the federal legislation are briefly discussed here to highlight what evidence-based policy would look like. The first would be a redefinition of early intervention as a set of practices (rather than services) and a description of the kinds of practices that would be authorized by the Part C legislation. The second would be a reemphasis on the original purpose of the legislation—to support parents' capacity to promote their children's learning and development in *ways that strengthen parenting competence and confidence*. Some simple calculations indicate that twice-a-week hourly intervention or therapy, in the absence of parent involvement, accounts for only 2% of the total waking hours of a 1-year-old child (Roffwarg, Muzio, & Dement, 1966), hardly enough time for any kind of intervention to make a meaningful difference in a child's life (McWilliam, 2000).

The largest majority of state early-intervention programs and systems have been developed in ways that include features and elements that run counter to current knowledge about evidence-based early intervention. Take, for example, the faulty logic in the use of dedicated-service-coordination models in which service coordinators provide only service coordination but not early-intervention services and private-provider early-

intervention models in which early intervention is provided by contracting with individuals who often work for different agencies. Research findings from the Research and Training Center on Service Coordination indicate that dedicated-service coordination results in the provision of fewer service-coordinator practices (Dunst & Bruder, 2006) and that there is very little relationship between what service coordinators do and what services infants and toddlers receive (Bruder & Dunst, 2006).

Medicaid-funded early intervention, especially in states with private-provider models or in which services must be delivered by "qualified professionals" to be reimbursed, often excludes parents from the interventions with their children. This, at least in part, may account for the fact that professionally centered early intervention sometimes has negative effects on parent functioning (Dunst, Bruder, et al., 2006; Dunst, Trivette, et al., 2006): Parents' beliefs about their capacities to help their children learn may be compromised when professional practices take over parenting functions.

One use of research evidence for informing policy is in discerning where financial resources ought to be allocated to maximize the benefits of the funding. There has been a recent trend in states toward using federal and state Part C dollars to fund service coordination and nonintervention services (e.g., multidisciplinary evaluations) and to use Medicaid to fund the provision of early intervention (typically through a reimbursement system). There is little or no evidence that service coordination is an evidence-based practice (Bruder et al., 2005) or that multidisciplinary evaluations are useful for their intended purposes (Neisworth & Bagnato, 2004), yet tremendous amounts of public dollars are used to fund these kinds of activities. States would do a much better job of using available resources by funding evidence-based practices that support and strengthen parents' capacity to promote their children's learning and development.

Practice

Knowledge about the characteristics of practices that have desired benefits can be useful as well to both practitioners and parents. Practitioners can use evidence-based information as a standard for discerning the extent to which their work with infants and toddlers and their parents is consistent with the characteristics of practices most likely to have optimal positive benefits (see e.g., Raab & Dunst, 2006a; Wilson & Dunst, 2004).

Parents should find information about evidence-based practices useful for judging whether their children and family are receiving high-quality early intervention. A common theme that has emerged from the conduct of different practice-based research syntheses of early-childhood intervention practices is that intervention practices in which children are producers of their own behavior are ones that strengthen existing skills and promote acquisition of new skills that have capacity-building consequences (e.g., Brandtstädter & Lerner, 1999). In contrast, interventions in which participants are passively involved or in which things are done to them (e.g., noncontingent stimulation) are not associated with positive benefits. If, for example, parents see that their children are being passively manipulated or stimulated or are being asked only to produce or repeat adult-desired behavior, they should question the practice. Similarly, if parents are being asked only to follow professionally prescribed practices and are not acquiring knowledge and skills that can be used more broadly to provide their children with development-enhancing learning opportunities, the practices should be questioned as well.

CONCLUSION

Research on early intervention has increased almost exponentially over the past 40–50 years. The sheer amount of research informing early-childhood intervention is almost overwhelming. Trying to keep abreast of the knowledge base can be a daunting task. It is, however, essential that scholars, practitioners, and policy makers know how and in what manner early experiences are likely to influence infant and toddler learning and development. Yet research evidence that informs practices is often disregarded or treated with indifference (Campbell & Halbert, 2002).

In an informative and thoughtful article about why people “explain away” evidence when it contradicts their (often strongly held) beliefs, Chinn and Brewer (1993) list seven types of responses to anomalous data. “Anomalous data” refers to evidence that contradicts people’s personal theories, beliefs, or paradigms. The seven responses include such things as ignoring, rejecting, reinterpreting, and refusing to “hear” or acknowledge the data. Readers may respond in similar ways to at least some of the findings and assertions presented in this chapter. For example, some readers may take issue with the critical assessment of Part C early intervention. Perhaps it will stimulate healthy debate about the ways in which states currently practice early intervention and what can be done to better align state efforts with existing research evidence. Also, the parent-mediated approach to early intervention that constitutes the focus of this chapter may also be challenged based on the contention that professionally implemented interventions are more likely to be effective.

Hewlett and West (1998), in their book *The War Against Parents*, note that the

unintended consequence of the well-meaning crusade [of help-giving professionals] to save our children was the emergence of a new class of professionals—social workers, therapists, foster care providers, family court lawyers—who have a vested interest in taking over parent functions. Bureaucracies everywhere have a remorseless drive to expand—to widen their client base. If children are the clients, parents can quite easily become the adversaries—the people who threaten to take business away.” (p. 109)

Something akin to this seems to be happening in early intervention and is especially the case in states that are privatizing early intervention. The research foundations for supporting parents and families strongly indicate a much better way of conducting early intervention. Can that research continue to be ignored if the consequences are undermining the confidence of parents and their abilities to provide their children with learning experiences and opportunities of known quality?

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