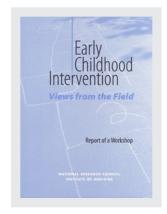This PDF is available at http://nap.edu/9858

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Early Childhood Intervention

Views from the Field

Report of a Workshop

Committee on Integrating the Science of Early Childhood Development

Jack P. Shonkoff, Deborah A. Phillips, and Bonnie Keilty, *editors*

Board on Children, Youth, and Families
Commission on Behavioral and Social Sciences and Education, National Research Council
and
Institute of Medicine

NATIONAL ACADEMY PRESS
Washington, DC

NATIONAL ACADEMY PRESS   2101 Constitution Avenue, N.W.   Washington, DC 20418

Suggested citation: National Research Council and Institute of Medicine (2000) *Early Childhood Intervention: Views from the Field. Report of a Workshop.* Committee on Integrating the Science of Early Childhood Development. Jack P. Shonkoff, Deborah A. Phillips, and Bonnie Keilty, eds. Board on Children, Youth, and Families, Commission on Behavioral and Social Sciences and Education. Washington, DC: National Academy Press.

International Standard Book Number 0-309-07039-2

Additional copies of this report are available from National Academy Press, 2101 Constitution Avenue, N.W., Washington, DC 20418

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EARLY CHILDHOOD INTERVENTIONS: VIEWS FROM THE FIELD

On June 24-25, 1999, the Committee on Integrating the Science of Early Childhood Development of the Board on Children, Youth, and Families of the National Research Council/National Academy of Sciences and the Institute of Medicine convened a workshop for researchers and practitioners to examine the underlying knowledge base that informs current best practices in early childhood services, from the prenatal period to school entry. The workshop was designed to provide an open forum in which leading authorities could discuss the diversity of working assumptions, theories of change, and views about child development and early intervention that currently shape a wide variety of social policies and service delivery systems for young children and their families. A central objective was to test the hypothesis that, despite the extensive fragmentation of early childhood service delivery and intervention research, this multidimensional field is guided by a common, convergent body of knowledge, derived from a rich mixture of theory, empirical research, and "practical" professional experience.

This workshop is part of the information-gathering activities that have informed the work of the committee. It is the committee's task to conduct a formal research synthesis based on a systematic review of the empirical literature. Its full report, which will include consensus statements about the scientific literature on early child development and intervention, will offer insights about areas of convergence, issues that remain hotly debated, and critical gaps in the knowledge base that guides developmental promotion and early childhood intervention.

> *I think we have come a very, very long way in three or four decades. . . . I think the answer is clearly yes, development can be changed.*
> *Craig Ramey*

Workshop participants were selected to represent the following distinct service streams: primary health care; child care/ early education; programs for children living under conditions of poverty; child welfare services, including foster care and adoption; substance abuse treatment programs; interventions for children with, or at risk for, developmental disabilities; and child mental health services. Drawing on the diversity of perspectives around the table, the workshop planners sought to elicit both common themes that cut across multiple service streams and issues that are unique to specific areas of service delivery. Within this framework, participants were asked to summarize the cutting-edge knowledge in their respective fields and encouraged to differentiate knowledge derived empirically through systematic investigation from knowledge

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based largely on either theory or professional experience.

It is equally important to understand what the workshop was not designed to accomplish. First, it did not conduct a formal or comprehensive analysis of the scientific literature on early childhood development. Second, it did not engage in a systematic evaluation of the empirical evidence regarding the efficacy or effectiveness of intervention services. Third, it did not generate specific recommendations. Rather, the workshop participants were asked to draw on their understanding of the existing science base in order to characterize the body of knowledge that guides the design, delivery, and evaluation of contemporary early childhood services. Consistent with the committee's charge, the workshop focused on the period from conception to school entry, and therefore did not cover school-age children.

To ensure productive interaction among the workshop participants, each invited speaker was asked to respond in writing to a set of questions that were provided in advance of the meeting. All responses were distributed prior to the workshop to avoid the need for extensive formal presentations and to maximize the amount of time available for informal discussion. These questions were grouped under four major topics: (1) desired child developmental outcomes; (2) family characteristics that influence child development and are amenable to intervention; (3) community characteristics that influence child development and are

amenable to intervention; and (4) the essential features of effective service programs.

The workshop program was organized around three panel discussions and a concluding integrative session. The first panel focused on universal services designed to promote child health and development, including primary health care and child care/early education. The second panel focused on targeted interventions designed to address family-centered vulnerability, such as programs for children living under conditions of poverty and child welfare services. The third panel focused on specialized interventions designed to address child-centered vulnerability (such as programs for children with, or at risk for, developmental disabilities) and children's mental health services. The workshop concluded with an integrative discussion designed to identify converging themes, specify areas of disagreement, examine distinctions among service streams, and explore the proposition that the broad diversity of early childhood policies and programs is informed by a shared, common knowledge base.

This report summarizes the major themes that emerged over the two-day meeting. Differences in the level of detail provided for each theme reflect the amount of attention each received. Quotations were culled from the written materials prepared by each participant and the rich discussion that ensued during the workshop.

During the course of the workshop discussions, two underlying perspectives became increasingly apparent. The first was the con-

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siderable extent to which participants viewed early childhood issues through a disciplinary lens. Each of these lenses was crafted by a distinct research base; a unique historical experience with regard to program design, service implementation, and funding streams; and a characteristic set of professionally guided beliefs. The second perspective was rooted in the pervasive influence of personal and professional values. Thus, although the workshop participants did not always agree on their interpretation of the existing science base, they shared a fundamental investment in the health and well-being of young children and a deep sense of responsibility to use knowledge derived from theory, empirical research, and practical experience to enhance the quality of their lives.

Within this context, the workshop format generated considerable creative tension between the desire for structured discussion and the richness of free-wheeling conversation. Nevertheless, the focus remained on the task at hand—to bring together a group of experts from a wide variety of service domains to differentiate knowledge from beliefs, and to explore the underlying science of developmental promotion and early childhood intervention.

In two days of lively interchange, the workshop participants shared their conviction that human development is influenced by the continuous and inextricable interplay between genetics and experience, and that structured interventions can affect the probability (i.e., "shift the odds") of achieving more desirable outcomes. They generally agreed on aspects of early childhood devel-

opment that can and should be changed, although they did not always agree on what it takes to achieve specific impacts. The most pervasive concept articulated throughout the proceedings was the universally supported view of child development as a continuous process influenced by reciprocal transactions between children and their caregivers, caregivers and the caregiving environment, caregiving environment and an array of external systems. The cumulative effects of these transactions over time were seen to contribute to the complexity of human development and the poor predictability of individual developmental pathways.

Perhaps most important, despite frequent disagreements about the strength of the underlying science, there was general agreement on the substance and focus of the body of knowledge that currently informs policy and practice across a wide diversity of independent service systems. Although all presenters and discussants were required to base their contributions on credible scientific evidence, specific citations have not been included in this workshop report. Thus, this document should be viewed as a reflection of the views expressed by the workshop participants, and not as a definitive assessment of the science of developmental promotion and early childhood intervention. We hope it will provide a departure point for other efforts to build a shared knowledge base that can guide greater cross-fertilization among policies and programs designed to improve the well-being and life prospects of young children.

DEFINING CHILD COMPETENCE AND WELL-BEING

Workshop participants were asked to provide a critical synthesis of the current knowledge base that underlies early childhood intervention policies and services in order to address the following questions: What assumptions are made about the nature of the child for whom each field is providing services? What child outcomes is each service stream hoping to change, and through what processes? For which children, at what points during development, are programs most effective in counteracting disadvantage and promoting health and well-being? What biological and social risk factors serve as a focus for service delivery, and what protective factors and sources of resilience do services aim to foster? How does one decide what is open to modification versus when to accommodate to a condition or situation? What have we learned about the extent of change in developmental trajectories that can be accomplished during early childhood? Are some subgroups of children more susceptible to positive change than others? What is each field currently measuring with regard to processes and outcomes, and what should it be able to measure in the future?

Notwithstanding the differences generated by their diverse disciplinary perspectives and early intervention experiences, the workshop participants identified a common set of principles to define child competence and well-being.

- The first principle is that the process of development is complex, nonlinear, and characterized by unexpected bumps, turns, openings, detours, unimpeded pathways, and insurmountable obstacles. Related to this characterization are the notions that there are multiple pathways to competence and that individual predictions are extremely difficult to make with any reasonable level of confidence, particularly in the early childhood period and especially over the long term.
- The second principle is the marked heterogeneity of children and families, the wide variations in their demonstrated abilities, and the limitations of viewing all child functioning within the context of a simple developmental continuum. Related to this concept are the often blurred distinctions among persistent disabilities, transient maturational delays, and individual differences within the broad range of typical development.
- The third principle identified is the interplay among sources of vulnerability and resilience, and their interactive influences on developmental pathways as children move through the early years of life and into middle childhood. Related to this concept is the notion of cumulative burdens and buffers, rather than the importance of single risk or protective factors, as the most potent determinants of individual developmental trajectories and outcomes.

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Generally speaking, the workshop participants agreed that the central goal of developmental promotion and early intervention services is to optimize children's development. Recognizing that some programs may focus on effecting changes in families or communities as a vehicle for enhancing child outcomes, several participants noted that positive benefits for families may themselves be worthy outcomes.

With respect to the task of evaluating child competence, representatives from all of the service streams acknowledged that traditional measures have focused largely on the domains of cognitive, motor, and language skills. Workshop participants agreed, however, that the assessment of social and emotional development and the evaluation of underlying functional capabilities (e.g., mastery motivation, exploration, play, problem-solving skills, memory, attention, and social interaction) would enhance the value and meaning of the evaluation process. Implicit in this approach is the importance of understanding how a child attempts to master a given area of performance, how he or she uses those skills and abilities, what is frustrating, and what is motivating.

Notwithstanding the broad range of disciplinary lenses and the diversity of service system perspectives represented at the workshop, workshop participants acknowledged the central importance of three dimensions of child development: (1) self-regulation, (2) the establishment of early relationships, and (3) knowledge acquisition and the development of specific skills.

Self-Regulation

Although most early childhood interventions traditionally have focused on cognitive and preschool outcomes, there was strong support among the workshop partici-

> *If we begin to look at where the problem is in development, I would start with the ability to modulate state, to go to sleep, to wake up, to be alert. . . . The ability to control states is the basis for moving on to the ability to regulate emotions. One of the biggest problems that we see in the adult population is failure of emotional regulation.*
>
> Kathryn Barnard

pants for the importance of promoting self-regulatory behaviors beginning early in life. Mentioned prominently in this area of concern were early issues related to feeding, sleeping, and crying; ongoing interest in emotional reactivity, attention, and activity level; and later focus on the behavioral dimensions of school readiness, such as taking turns and following directions.

Workshop participants noted that young children with high levels of mastery motivation, persistence, and attention to tasks score higher on developmental measures in

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kindergarten and achievement tests in third grade. Infants with very low birthweight were identified as particularly vulnerable with respect to regulatory difficulties, most notably in their ability to handle different levels of intensity of interaction. The possible relation between early disorganization and later attention deficit hyperactivity disorder was postulated as an example of the importance of focusing on early self-regulation as a precursor to later higher-order functioning.

The need for greater focus on emotional regulation and social development was also mentioned throughout the workshop sessions. There was widespread agreement about the fundamental importance of early relationships, not only as a secure foundation for child exploration and learning but also as a medium for caregiver support and understanding of temperamental differences. The importance of promoting a child's capacity for self-regulation was viewed as a dimension of both normative developmental promotion and therapeutic intervention in the early childhood years.

Establishment of Early Relationships

Workshop participants were consistent in their conviction that the establishment of stable and secure relationships is a central feature of healthy human development, and

therefore a critical goal of developmental promotion and early childhood intervention. Beginning with the infant's attachment to his or her primary caregivers, and extending to the bonds that young children develop with other adults, siblings, and peers, early relationships were viewed as both the foundation and the scaffold on

> *When children learn that they can trust their primary caregiver, they develop expectations that they can generally trust others. . . . Children with the expectation that others will not be there for them tend to behave in ways that are consonant with these expectations.*
>
> Mary Dozier

which cognitive, linguistic, emotional, and social development unfold. Secure attachments and comfortable social interactions were identified as both an essential base and an ongoing context in which young children learn about how their actions elicit responses from others, how to explore their environment with confidence, and how to experience and deal constructively with a broad range of thoughts and feelings.

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Knowledge Acquisition and the Development of Specific Skills

From its earliest beginnings, the field of early childhood intervention has focused considerable attention on the promotion of cognitive-linguistic abilities and the mastery of concrete skills. Although most workshop participants expressed continued support for this goal, there was a great deal of concern about the way in which competence has been conceptualized and measured. Much of the discussion on this issue centered on the general challenges of early developmental assessment and the specific value and limitations of an IQ score as a measure of intelligence. As an alternative to relying exclusively on traditional normative evaluations of cognition, several discussants focused on the importance of assessing an array of functional capacities that underlie the process of knowledge acquisition, including mastery motivation, problem-solving skills, exploratory play, and the ability to generalize new learning from one situation to another. Some participants emphasized that the key challenge for the field is less a matter of how to define competence and more a question of how to assess it clinically and measure it empirically.

Linked to the global concept of knowledge acquisition is the achievement of specific milestones and the development of discrete skills. Examples include the capacity to communicate with gestures and words; the ability to perform perceptual-motor tasks, such as block building and writing; the emergence and refinement of self-care

skills in feeding, dressing, and toilet use; and the development of early literacy. For much of its history, the field of early childhood intervention has focused significant attention on the facilitation and measurement of such concrete attainments. While acknowledging that this legacy continues to dominate most early childhood settings (from generic child care centers to specialized programs for children with environmental and/or biological vulnerabilities), the workshop participants pointed out that greater importance should be placed on the social and emotional aspects of development, and on the assessment of underlying functional behaviors rather than simply the mastery of observable skills.

In this context, the high-stakes concept of school readiness was explored. Some discussants questioned the developmental appropriateness of any attempts to assess "work-oriented" skills during the preschool years. Several participants questioned the conventional meaning of "readiness" and referenced the perspectives of kindergarten teachers who identify the behavioral requirements of the school environment (positive peer interactions, remembering and following directions, etc.) as more important indicators than the mastery of a set of traditional preacademic skills, such as knowledge of letters, numbers, and shapes. Although participants agreed about the need to rethink what it means to be "ready" for school, they did not agree on a set of evidence-based criteria to inform its measurement.

Finally, workshop participants acknowl-

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edged that relations exist among early skill acquisition, the mastery of preschool developmental tasks, and later educational achievement. Notwithstanding the wide variety of disciplines and service system perspectives seated around the table, there was broad support for an assessment strategy that moves beyond a checklist of conventional milestones to include evaluations of the child's capacity to achieve greater self-regulation, form personal relationships, and make meaning of his or her world. The centrality of the family in facilitating early child competence in these areas led natu-

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Interviews with kindergarten teachers about what they thought was important for success [found that] they did not mention many of the skills that are measured by readiness tests. They didn't talk about colors. They didn't talk about numbers. They talked about work-oriented skills and social skills. . . . And what are these? They are abilities like being able to take your turn, remembering the directions the teacher gave you, and keeping up with your work.

Dale Farran

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rally to a discussion of family characteristics that warrant consideration in the design, implementation, and evaluation of early intervention programs.

FAMILY FACTORS THAT INFLUENCE EARLY DEVELOPMENT

Workshop participants were asked to reflect critically on the current knowledge base in order to address the following questions: What is the nature of the family and family processes that are the focus of services in each field? If not the direct focus of intervention, what is the role of the family in each area of service delivery? What family outcomes is each field hoping to change and through what processes? For which families, in which situations, are services most critical, and why? How does one decide which aspects of family functioning are open to change and when to accommodate to existing circumstances? What is each field currently measuring with regard to processes and outcomes at this level of analysis and what should it be able to measure in the future?

Because families are recognized as the primary caregiving context for young children, all contemporary early intervention policies and programs look to the family (both as a unit and as a collection of individuals) as an important mediator of developmental outcomes. Important influences are hypothesized to result from a mixture of

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transactions involving parents, siblings, and extended family members. The developmental process of parenting also evolves, as childrearing philosophies and styles are shaped by the personalities and behaviors of both children and adults.

As was found in the discussion on child outcomes, despite the diversity of perspectives around the table, the workshop participants reached rapid agreement on a common set of family characteristics as appropriate targets for early intervention efforts. These include: (1) parent-child relationships and interactive styles, (2) family status and function, and (3) cultural values and beliefs.

Parent-Child Relationships and Interactive Styles

In view of the long-standing paucity of substantive interaction among programs that target children living in poverty, services for children with developmental disabilities, preschool mental health services, and child welfare services (including foster care), it is particularly striking that both researchers and service providers in each of these fields have identified the parent-child relationship as the linchpin of effective intervention. Although some questioned whether there are sufficient data to demonstrate the strength and durability of long-term impacts, workshop participants noted that voluminous research demonstrates the powerful positive influence of nurturing, growth promoting, mutually responsive mother-child interactions on the health and

> *It is assumed that when children come to school they are already able to use adults as sources of information, discipline, and enjoyment. This is only the case if their families or other consistent caregivers have set the stage. The quality of early care lays the groundwork for the capacity to love and to use other humans as a source of comfort, hope, and guidance.*
>
> *Barbara Bowman*

development of young children. Conversely, the adverse impacts of abusive or neglectful relationships have been well documented, as has the possibility of effecting beneficial change through appropriate and timely intervention. The workshop discussions on this issue raised particular concern about the risk for young children whose primary caregivers exhibit difficulties that are beyond the therapeutic capabilities of conventional early childhood programs. Most prominent in this regard are maternal depression, substance abuse, and the personal consequences of domestic violence, including post-traumatic stress.

Extensive research conducted over the past several decades has provided rich documentation of the mutual influences that

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caregivers and young children have on each other. Caregiver characteristics that promote healthy child development include warmth, nurturance, stability, predictability, and contingent responsiveness. Child characteristics that influence the nature of their interactions with their caregivers include predictability of behavior, social responsiveness, readability of cues, activity level, and mood. Caregiver behavior may be affected adversely by immaturity or inexperience, low educational attainment, or mental health problems (e.g., depression, anxiety) related to family violence, substance abuse, economic stress, or constitutional illness. Child behavior may be affected adversely by prematurity, poor nutrition, illness, disability, or temperamental difficulties.

Beyond the salience of any particular attribute (either positive or negative), the quality of the caregiver-child relationship is influenced most often by the "goodness of fit" between the styles of each. An infant who cries frequently and is difficult to console may elicit a variety of responses (e.g., patience and comforting behaviors, anger, withdrawal) which, in turn, may lead to a range of social and emotional outcomes. A high-energy, demanding toddler may elicit exasperation and erratic discipline-setting from an overwhelmed parent, or a reinforcing and goal-directed response from a parent who views such behavior as the mark of ambition in a child who "knows her own mind." Young children with developmental disabilities may be less responsive to interaction and their cues may be more difficult to read, thereby requiring a more resourceful

caregiver. While some infants who are placed in foster care after one year of age tend to push their caregivers away, a sensitive foster parent can reach out and support the development of a secure attachment.

In all of these circumstances, the nature of the caregiver's response is critical and may be a stronger determinant of subsequent development than the child's intrinsic temperament. Thus, helping mothers (and fathers as well) to understand their child's unique features and providing guidance on how to build a mutually rewarding relationship, one that both facilitates the child's development and promotes a sense of parental well-being, are common goals shared by a wide variety of early childhood programs. Because the research literature is overwhelmingly dominated by studies of children's interactions with their mothers, several workshop participants expressed a clear need for greater attention to the impacts of fathers and nonparental primary caregivers.

Despite the marked heterogeneity of children, families, and service models that characterizes the early childhood field, the central importance of early relationships is universally acknowledged across systems. Several workshop participants emphasized the extent to which positive interactions during the first years of life tend to be linked with better subsequent cognitive abilities for typically developing children, as well as for children at risk because of environmental or biological factors. Examples included the importance of early mother-child interactions as mediators of the effects of recurrent

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otitis media (an infection or inflammation of the middle ear) on language comprehension, methadone exposure on cognitive performance, and premature birth on overall developmental outcomes.

Low income can create a particularly stressful context for caregiving, one in which positive interactions with children are threatened and punitive or otherwise negative relationships may result. Central to these concerns is the reported high prevalence of such disorders as maternal depression, attachment difficulties, and post-traumatic stress. The stresses experienced by mothers living in poverty can serve to undermine their development of empathy, sensitivity, and responsiveness to their children, which in turn can lead to diminished learning opportunities and poorer developmental outcomes.

Finally, several workshop participants noted that parents' views about their child's competence are an important dimension of their relationship and a potentially important moderator of child outcomes. As such, parental beliefs may influence a wide range of caregiving behaviors, including specific childrearing practices (e.g., discipline and limit-setting) and how they structure the home environment (e.g., for learning opportunities). Within this context, high expectations regarding performance and positive aspirations for the future may be either growth-promoting or emotionally debilitating, depending on the degree to which they are realistic and conveyed in a facilitating manner. Low expectations often communicate a resignation to failure that can convey

a powerful and ultimately self-fulfilling message. These issues are important for all children, whether or not they are dealing with the challenges of a developmental disability or a stressful family environment.

Family Status and Function

The most widely cited and well-documented finding in the early childhood intervention literature is the strong correlation between socioeconomic status and child health and development. Specifically, children in families with lower incomes and lower maternal education are at greater risk for poorer outcomes on a broad range of variables, including school failure, learning disabilities, behavior problems, mental retardation, developmental delay, and health impairments. Low-income children of racial or ethnic minority groups are particularly vulnerable. Less well appreciated is the disproportionate prevalence of children with biologically based developmental disabilities in low-income and less educated families.

Workshop participants acknowledged the significance of these patterns, but were clear in their conviction that demographic markers alone provide limited guidance for effective interventions. In this context, participants noted the importance of focusing on within-group variability and individual differences among children and families in the design and evaluation of early childhood policies and programs.

Related to the salience of differences within demographic groups is the impor-

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> *Poverty, substance abuse, and mental health problems are risks that often complicate individual developmental trajectories. While some families can use education and/or traditional therapies to build a responsive environment for their children, many others depend upon creating new social contexts. Employment counseling, housing relocation, and new social reference groups are important variables to consider if change is to occur.*
>
> *Barbara Bowman*

tance of individual family functioning as a significant influence on the health and development of young children. Workshop participants drew attention to both the protective effects of family cohesion and the negative consequences of significant discord. Particular concerns were raised about the powerful adverse impacts of family violence and parental substance abuse. For example, children who witness domestic violence, or who are the victims of physical abuse directly, experience serious consequences, such as psychosomatic disorders, anxiety, fears, sleep disruption, excessive crying, and school problems.

Several discussants emphasized the in-

fluence of a family's quality of life (e.g., emotional well-being, level of personal control, life satisfaction, and interpersonal relationships) as another important protective or risk factor for both child and family outcomes. For those living in poverty, stress is presumed to be ubiquitous. Families who have a child with a disability face additional challenges, but successful adaptation has been shown to be common. The considerable variability among and within population subgroups makes any broad generalizations particularly dangerous.

Despite widespread acknowledgment of the correlation between family status variables and child development, there was less agreement about the extent to which interventions that are focused primarily on adult family members result in measurable changes in their children. For example, several studies have linked parenting education efforts to improved caregiving behaviors, greater safety in the home, and increased use of child health care systems, but they have not been accompanied by significant impacts on measured child outcomes. Similarly, programs that target literacy or the achievement of a high school equivalency diploma for mothers of young children have rarely produced statistically significant gains in child performance, although some studies have shown positive correlations between changing maternal employment status and children's test scores. After an extended discussion about the quality of the knowledge base in this area, the workshop participants agreed that, although the relation between family status and child perfor-

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mance is conceptually and empirically strong, the science of promoting child development through changing family circumstances is relatively primitive

Cultural Values and Beliefs

The importance of culture as a context that shapes human development is another well-established principle recognized by workshop participants. The empirical knowledge base available to inform early childhood policies and practices in this regard, however, appears to be relatively thin. Culture influences child development by creating an environment of values and beliefs that shapes parenting practices, guides socialization, and frames expectations for children. Through the vehicles of language, communication styles, religious beliefs, family values, customs, food preferences, and taboos, culture provides both a context for children's experiences and the translation of those experiences into their daily lives.

For some groups in the United States, cultural differences may result in early patterns of development that differ from the expectations of mainstream public schools. In such circumstances, greater sensitivity to cultural and linguistic diversity is imperative in order to avoid inappropriate (and often self-fulfilling) diagnostic labeling. In some cases, different patterns of childrearing and disagreement on the criteria for defining maltreatment can result in highly sensitive challenges for the child welfare system. Families from different cultures also have

> *To the extent that interventions are perceived as culturally relevant and welcomed, they are more likely to be valued, used, and incorporated into participants' everyday lives.*
> *Craig Ramey*

different beliefs about disability and mental illness, which may influence service delivery strategies and the developmental course of a child with special needs. Although each of the diverse service streams represented at the workshop acknowledged the central importance of "cultural competence" as a cornerstone of state-of-the-art practice, much of the underlying science remains to be developed.

COMMUNITY FACTORS THAT INFLUENCE EARLY DEVELOPMENT

Workshop participants were next asked to reflect critically on current knowledge in order to address the following questions: What is each field's working model of community-level impacts on early childhood development? What influences on the child and family require attention in attempts to provide services? What is each field's work-

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> *We have to be really careful about this idea that all of the effects of living in a high-poverty environment are mediated through the behaviors of the parents. I don't think parents can actually buffer their children against many of these effects, even when they really try. We need to think about the broader context and about how society supports parents to do a better job.*
>
> *Dale Farran*

ing model of how community factors influence the design, implementation, and effectiveness of services? How is current thinking about these issues informing the nature of services in each area of expertise? What role is played by the institutional context in which services are delivered? What, if any, community resources must be in place and linkages must be made in order to foster effectiveness? What is each field currently measuring at this level of analysis and what should it be able to measure in the future?

The concept of community has been defined in multiple ways—as a network of social connections, a target for resource allocation, or simply a physical space. The hypothesized impacts of community factors on child health and development range from the positive effects of an environment rich in social capital to the adverse influences of one that is burdened by poverty, violence, substance abuse, and other threats to human survival. The benefits that supportive community settings can bring to the lives of children with significant disabilities and their families have been well documented. In contrast, extremely impoverished neighborhoods have been demonstrated to have particularly harsh impacts on child and family well-being, regardless of a child's intrinsic capacities. Beyond a certain level, however, as the quality of a neighborhood improves, its measurable influences on average family functioning appear to be less dramatic.

Workshop participants agreed that child outcomes are influenced by a complex interplay among family and community variables. Several discussants referred to studies that have shown that children growing up in comparable high-risk environments have similar IQ levels, despite their exposure to varying caregiver interaction styles. Research has also documented that preschoolers often adopt gender-specific roles that they learn from the broader environment, despite their parents' promotion of gender-neutral concepts. The adverse impacts of concentrated risk found in homogeneous communities in which a high percentage of public school children come from families living in poverty are particularly problematic.

Echoing the discussion on family influences, several discussants noted that it may

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be easier to modify the behavior of young children than it is to change their neighborhood environment. Nevertheless, the workshop participants discussed the importance of broader community variables and agreed that these contextual issues have been difficult to measure. Several community-level characteristics were identified as particularly worthy of further attention, including factors that present threats to the health and well-being of young children, as well as factors that provide growth-promoting opportunities. Social policies were also identified as important influences on children's development, including those created by legislation and regulatory action as well as policies generated by private-sector practices.

Threats to Physical Health and Safety

Workshop participants identified a number of community features that pose potential threats to the physical health and well-being of young children. These included poor housing (with its associated risk of increased exposure to infectious diseases and higher incidence of injuries), environmental toxins (particularly lead), and endemic substance abuse and violence (with their associated risk of child maltreatment). When safety concerns limit the extent to which children are allowed to play outside their homes, learning opportunities are restricted and development may be compromised. Several discussants underscored the signifi-

cant interaction between the adverse physical features of a poor neighborhood and the associated social context of a dangerous environment as a serious threat to both children's health and development.

Threats to Social and Educational Opportunity

Beyond the threats to children's physical health and safety, workshop participants also identified characteristics of communities that undermine a sense of equal opportunity or individual possibility, beginning in infancy and extending throughout childhood. These include the adverse consequences of limited recreational facilities, inadequate child care, substandard schools, and a message of social exclusion as a result of racism or discrimination based on ethnic status, social class, or the presence of a developmental disability.

Research was cited that demonstrated positive outcomes for children as a result of relocating their families to eliminate the influence of concentrated neighborhood risk

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It is the supportive context of development that matters. High-competence kids in high-risk environments do consistently worse than low-competence kids in low-risk environments.

Arnold Sameroff

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factors. Because enormous change was deemed necessary to see significant family and child effects (i.e., two to three standard deviations, as might be reflected in a move from an inner-city housing project to an affluent suburban community), it was hypothesized that negative community influences may be significant only in the most impoverished environments, and that modest community-level interventions in such circumstances may be of limited benefit.

Severe Deprivation

Participants acknowledged that some children do indeed grow up in environments that are characterized appropriately as deprived, inadequate, or frankly destructive. Institutions for young children with Down syndrome and cerebral palsy provide historical examples. The conditions found in Romanian orphanages are a contemporary exhibit. In both circumstances, carefully conducted studies have demonstrated the devastating impacts of early and severe deprivation. Conversely, extensive research has documented the remarkable resilience of young children, both with and without biologically based disabilities, and their capacity to recover from the developmental assault of institutionalization if an alternative environment is provided as early as possible.

Facilitators of Growth-Promoting Opportunities

Parallel to the discussion on high-risk and clearly detrimental environments, workshop participants identified a number of community characteristics that have been shown to correlate positively with healthy child development. These include supportive social networks for families (particularly for mothers), inclusive community settings (e.g., organized programs that offer a welcoming environment for children of diverse backgrounds and make appropriate accommodations for children with special medical or developmental needs), and other manifestations of social capital that are easily accessible and utilized frequently by children and families, particularly by those who are often victims of systematic discrimination and/or social isolation.

The extent to which community resources can promote developmental opportunities for young children is determined by both the nature of the offerings and the commitment of the community to ensure their availability. Common examples of beneficial community assets include accessible and affordable health care, child care and preschool programs of high quality, and a diverse selection of recreational programs. As important as the presence of the programs themselves is the intangible sense of community and the message of social inclusion that is sent to all children and families that opportunities are available to them and that expectations for their healthy development and later achievement are high.

Social Policies Affecting Young Children

Social policies often have considerable impact on the well-being of young children and their families, directly or indirectly, and by either commission or omission. Contemporary examples include Temporary Assistance to Needy Families (welfare reform), the Individuals with Disabilities Education Act (federally mandated early intervention and special education services), the Family and Medical Leave Act (unpaid job leave for parents of newborns), state child care regulations, the shift in pediatric health services toward a managed care model, and corporate policies and practices that affect working hours, fringe benefits, and other supports for employees with young children.

Some policies affect child health and development by affecting the availability of material resources or the quality of family life. Others are designed to reduce reliance on individual caregiver behavior through regulating external environmental threats to health and safety. Examples of the latter include mandated child safety caps for medicine containers, legal limits on the maximum temperature settings of hot water heaters, the fortification of foods with iron or folic acid, and the regulation of automobile seat belts and car seats. The impacts of these policies were viewed positively by workshop participants, although some expressed concerns about public policies that circumvent family responsibility and control.

ESSENTIAL FEATURES OF EFFECTIVE INTERVENTIONS

Workshop participants were asked to identify the essential features of effective intervention programs within their field, based on currently available research. The following specific questions were posed: What has been learned about tailoring services to children and families in different circumstances and with different needs? How does each field decide when to focus on the child, the family, the community, or other significant adults in the child's life, and in what mix? What has been learned about thresholds of program intensity, dosage, and parent engagement necessary for measurable impact, particularly as they may vary for different populations? What about the developmental timing and duration of the services? What is required to sustain positive change, both in terms of the processes that must be set in motion and the ongoing services, if any, that are needed? What are the major barriers and constraints that limit the possibilities for positive change?

The variety of disciplinary perspectives (e.g., psychology, education, pediatrics, nursing, psychiatry, economics, and public health, among others) and service streams (e.g., health care, child care/early education, mental health, child welfare, early intervention for children living in poverty, and early intervention for children with disabilities, among others) represented at the workshop

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> *The primary issues for early intervention now are ones of the political will to aid vulnerable children, the appropriate scale of resources needed to provide potentially effective interventions, and commitment to conducting rigorous research to move the field of early intervention forward.*
>
> *Craig Ramey*

set the stage for a rich and lively interchange. Although discussants acknowledged widespread deficiencies in the empirical knowledge base on intervention efficacy and effectiveness, and there were frequent disagreements about the scientific rigor of selected bodies of literature, the workshop participants had little difficulty generating a list of essential characteristics of effective programs across a broad spectrum of service systems. Although several questioned whether the existing data constitute a true "science of intervention," participants were in agreement that current best practice is informed by a credible, maturing, widely shared body of knowledge.

Within this broad, cross-system context, five characteristics of effective interventions were identified: (1) individualization of service delivery; (2) quality of program implementation; (3) a family-centered, community-based, coordinated orientation;

(4) provider knowledge, skills, and relationship with the family; and (5) timing, intensity, and duration of services received.

Individualization of Service Delivery

Workshop presenters and discussants from a variety of service system perspectives agreed on the principle that effective intervention demands an individualized approach that matches well-defined goals to the specific needs and resources of the children and families who are to be served. Stated simply, there is scant support for a one-size-fits-all model of early childhood intervention. Consequently, there is little justification for an approach to program evaluation that asks generic questions about whether services are effective, in contrast to an assessment strategy that investigates the extent to which specific kinds of interventions have differential impacts on different kinds of children in different types of families. Central to this fundamental principle of effective services is the need for individualized functional assessments of young children that assess important dimensions of development and that are linked to the intervention in an ongoing, reciprocal fashion.

For children whose development may be compromised by an impoverished, disorganized, or abusive environment, as well as for those with a documented disability, general developmental delay, or biological vulnerability, early childhood interventions that are tailored to specific objectives have been shown to be more effective in producing

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One of the unifying themes from our discussions is the idea that more individualized intervention targeted toward the specific problem facing the child and family is most effective.

Barbara Howard

desired child and family outcomes than services that provide generic advice and support. Several participants reported that services that directly target the everyday experiences of children at risk appear to be more effective than those that seek to promote child development indirectly by enhancing either parental competence or the general quality of the caregiving environment. Others emphasized an important role for parent-moderated influences on the achievement of individually tailored goals for young children with disabilities, although it was noted that intervention effects vary significantly depending on the severity of the child's impairment. Some discussants added that no well-designed research has demonstrated significant or sustained changes in parenting behavior as a result of participation in a generic parent education program.

Research demonstrating differential effectiveness for specific subgroups of service recipients further supports the need for individualization of services to ensure maximum impact. For example, children whose mothers had the lowest IQs gained the most from

the Abecedarian Project.[1] Conversely, evaluation of the Infant Health and Development Program revealed that children at greatest biological risk, as measured by low birthweight, did not benefit as much from the program as did children at lower risk.

Linked to the need for individualized intervention strategies, workshop participants indicated that service outcomes should be tailored to the particular interests of each individual family. In this context, it was noted that two families with children who have the same developmental disability may have very different goals and aspirations for them. Similarly, families living in comparable levels of poverty may have different needs and desires for assistance.

Quality of Program Implementation

A second feature of early childhood services that received support across all service streams is the critical importance of the quality of the intervention that is actually delivered and received by target children and families. In this regard, workshop participants decried the extent to which model demonstration programs are initially endowed with abundant resources and highly trained staff, subsequently evaluated and shown to be effective, and then replicated with inadequate budgets and less skilled personnel. Beyond the fundamental importance of vigilant attention to quality

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[1]See Appendix A for a description of the early intervention programs mentioned in this report.

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control, this underscores the need for greater focus on program costs and funding issues as critical dimensions of the early childhood research agenda.

The research literature on child care has focused considerable attention on the critical impacts of service quality, and there was strong agreement among the workshop participants that high-quality, inclusive care can facilitate beneficial outcomes for both typically developing children from high-risk environments and children with a wide variety of special needs. Concerns about program quality and implementation have also been addressed, through research and advocacy (albeit to a lesser degree), for targeted interventions serving young children living in poverty, as well as for programs serving children with, or at risk for, disabilities. However, the literature in this area is less conclusive, in part because of the rela-

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Having to choose between a badly run child care program and a segregated program for a child with disabilities is a very poor choice for parents. There is no reason to believe that a program that does a poor job for kids without disabilities is going to provide a positive experience for kids with special needs.

Mark Wolery

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tively limited data that have been collected on the actual services received by families.

Family-Centered, Community-Based, Coordinated Orientation

The principles of family-centered, community-based, and coordinated services are firmly embedded in the knowledge base that guides all early childhood programs, from the generic child care facility to the most highly specialized intervention for young children with complex developmental disabilities or severely compromised life circumstances. Central to the concept of family-centered care is the notion of empowering parents as those who know best about their own child's and family's needs, and the goal of building a strong, mutually respectful, working partnership in which parents and professionals relate comfortably in a collaborative effort to achieve family-driven objectives. The essential characteristics of a community-based model are reflected in the extent to which services are delivered in a nonstigmatizing, normative environment that has both physical and psychological proximity to young children and their families. The fundamental rationale for service coordination is to ensure both a coherent experience for families and the efficient use of programmatic resources.

The defining features of a family-centered approach to early childhood services include (1) treating families with dignity and respect, particularly with respect to their cultural and socioeconomic character-

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istics; (2) providing choices that address family priorities and concerns; (3) fully disclosing information so that families can make informed decisions; and (4) providing support in a manner that is empowering and that enhances parental competence. Several workshop participants described research findings that document strong correlations between the way in which formal support is provided and family ratings of program effectiveness, with higher satisfaction reported when service providers facilitate more active family involvement in learning new skills.

Some workshop discussants questioned whether a family-centered approach can become distorted, and asked whether we are talking about a philosophy that truly involves families in setting goals for their children, or simply an effective strategy to get parents to do what professionals want. There was general agreement, however, that ultimately families "vote with their feet." That is to say, the extent to which a program is viewed by its clients as family-centered is determined by measures of family satisfaction, service utilization, and participant attrition.

Providing developmental promotion and early intervention services in a community-based context facilitates broader access and avoids the stigma associated with service provision in a segregated setting. Several workshop participants noted the effectiveness of programs in school-based, church-based, and nonhealth, community-based settings. For children with developmental disabilities, the promotion of competence

within normative community contexts is particularly important as a vehicle for both learning how to generalize newly acquired functional skills and for gaining social acceptance.

The problems associated with service fragmentation have been endemic to the world of early childhood intervention for decades, and the workshop discussions reaffirmed the wasteful and counterproductive burdens of this legacy. Each service stream is able to recount numerous examples of both unnecessary redundancies and unacceptable gaps in the assistance provided to children and families with multiple needs. Indeed, it is generally the families with the most complex problems, who require an array of specialized expertise, who receive the most fragmented services. Consequently, workshop participants agreed that enhanced coordination of the multiplicity of early childhood service streams, if not true integration, is essential and long overdue. Despite this assertion, however, no new ideas were generated about how to achieve this persistently elusive goal.

Provider Knowledge, Skills, and Relationship with the Family

Workshop participants noted the diversity of conditions and circumstances with which early childhood programs are confronted, underscoring the extent to which the need for highly trained professionals with broad-based knowledge and sophisticated technical skills is a fundamental chal-

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lenge facing the field. Examples cited include infants with significant developmental disabilities with or without complex medical concerns, preschoolers with severe behavioral disorders, mothers with clinical depression, and families dealing with the stresses of poverty, marital discord, substance abuse, and/or recurrent domestic violence. Each of these types of problems typically requires a level of professional expertise that exceeds the generic skills of a child care provider, early childhood educator, child protective services worker, or nonprofessional home visitor.

Some workshop participants noted that research on child care has clearly linked well-trained, qualified teachers and staff to better child outcomes, particularly for low-income children at risk for educational underachievement. Others reported that child care providers and early childhood educators frequently express concerns about the inadequacy of their professional training and the paucity of available expert consultation to help them address the needs of children with disabilities. Several participants further underscored the high demand for sophisticated service providers to respond to a wide range of complex family needs.

Notwithstanding the widespread recognition of the level of professional education and expertise needed to serve families who are coping with complex developmental and socioeconomic concerns, the pressures to "do more with less" present enormous challenges to programs with limited budgets. Marked disparities in the training and skills of home visiting program staff are a promi-

nent example of this phenomenon. In this context, the workshop participants agreed that the ultimate impact of any intervention is dependent on both staff expertise and the quality and continuity of the personal relationship established between the service provider and the family. The massive shortage of mental health professionals to deal with very young children and the uneven level of skills and excessive rate of turnover (estimated at 30 to 40 percent annually) among child care workers were singled out as particularly critical problems in this regard.

Finally, considerable discussion was generated during the workshop about the challenges of establishing relationships with families who face varying combinations of child disability and adverse environmental circumstances. Families of children with special needs seek guidance in understanding how to promote their child's atypical development, and service providers are primed to balance their broader reservoir of knowledge about a wide variety of special needs and their responsibility to respect parents' unique knowledge about their own child's personal characteristics. Children living in impoverished or disorganized environments are presumed to need compensatory learning experiences, and their parents are presumed to need help in addressing basic childrearing needs, yet educators and therapists who design early intervention programs generally have little personal experience with the difficulties of parenting in a low-income environment. Consequently, there is a tension in the early childhood

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field between intervention models based on the assumption that parents are the ultimate authority with respect to their own children's needs, and those that view parents as requiring significant assistance in the everyday tasks of rearing young children.

Timing, Intensity, and Duration of Services Received

The research literature on service intensity, duration, and age of initiation was identified as perhaps the most complex and inconclusive aspect of the knowledge base examined in this workshop. Some presenters expressed confidence in selected intervention data that supported the value of "earlier" and "more." Others questioned the validity of such data and cautioned against the dangers of advocacy-driven program evaluation research. Further discussion explored a continuum of perspectives, from earlier is "critical" and earlier is "better" to

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No systematic testing of this "earlier is better" hypothesis has occurred. It is possible that there are "best" times to intervene during the early years, depending on the nature of the parent or child risk or the developmental stage of the child.

Kathryn Barnard

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earlier is "no better than later" or earlier may have "unintended negative impacts."

Several workshop participants noted that earlier is better, not just because the brain is more plastic but because representations, relationships, and perceptions of the child are formed early and have long-term impact. Others warned that although early intervention can be crucial for preventing developmental delays from becoming more serious problems later, services should not result in early labeling or the removal of children from typical experiences, thereby reducing the possibility of self-righting corrections or compensatory growth spurts. This caution was noted to be particularly important for interventions that can be viewed by families as intrusive, such as those that address problems in the caregiver-child relationship.

Most discussants argued for greater specificity, indicating that the real questions are whether and why some earlier interventions are better, in certain ways and for some children, than are others. For example, early identification and intervention is clearly effective in reducing the adverse impacts of a hearing loss on functional communication and cognition. Similarly, early tactile stimulation and skin-to-skin contact for premature newborns have been associated with better health and organizational outcomes in the nursery, including improved heart and respiratory rates, habituation to stimuli, and motor organization. Children who are placed in foster care before 12 months of age exhibit relatively few problems developing relationships, whereas

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older children have more difficulty establishing an attachment with their foster parents. Several participants noted that the impacts of prenatal home visits have been correlated with enhanced health and safety outcomes and decreased parental interaction difficulties for some groups (e.g., inexperienced adolescent mothers) but have shown minimal effects for others.

Many programs that have demonstrated effectiveness—the Abecedarian Project, the Brookline Early Education Project, the Milwaukee Project, Project CARE, and the Infant Health and Development Program—all began their services with infants. Some workshop discussants noted that high-quality programs that start earlier and continue for longer periods of time achieve greater benefits than do those that begin later and last for shorter intervals. However, all participants agreed that there are no definitive data about absolute critical periods for human learning, and no basis for concluding that educational interventions provided after certain ages cannot have positive impacts.

Several workshop participants reported that the level of intensity (or dosage) of an intervention is often related directly to its effectiveness. The concept of intensity, however, is defined operationally in many ways. Traditionally, it has been measured by the amount of professional time (e.g., hours per day, days per week, or weeks per year) spent with families or children. Those who participate more appear to reap the greatest benefits, and the most intensive interventions typically have the greatest

effects for those families at highest risk (i.e., disadvantaged teenagers and mothers with low IQ or low educational levels). Using rates of participation as a measure of intensity, the Infant Health and Development Program found a direct relation between service intensity and ratings of the home environment. The effectiveness of programs that targeted 3- and 4-year-olds (e.g., the Perry Preschool Project and the Early Training Project), which are generally considered "late" in the field of early intervention, was speculated to be a function of their high program intensity.

For young children with developmental disabilities, intensity is measured by the time spent with families focused on developing and maintaining relationships and on acquiring knowledge. These measures include engagement time, time on task, and the extent to which learning opportunities are embedded in typical, daily routines. In fact, the ultimate impacts of such programs are presumed to be related to the extent to which families incorporate the intervention techniques into their everyday interactions with their children, above and beyond the actual time spent with program personnel.

As a service variable, the duration of an intervention has also been found to be associated with significant impacts. Workshop participants noted that several longitudinal studies concluded that children who received services from birth to age 8 showed the greatest positive outcomes, followed by birth to age 5, and then up to 3, thereby demonstrating the importance of long-term services.

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Finally, workshop participants agreed about the markedly uneven methodological quality of the vast evaluation literature on early intervention timing, intensity, and duration. Most prominent among the noted criticisms were the failure to define both the target population and the desired outcomes with sufficient precision, and the typically poor quality of the data collected on the nature and quantity of the services that children and families actually received. Both presenters and discussants acknowledged the critical importance of these issues for policy makers and practitioners, but several participants expressed little confidence in the current state of the science in this regard.

CHALLENGES FOR POLICY AND PRACTICE

After two days of intensive discussion, the workshop participants identified a common knowledge base and a core set of shared challenges facing the broad-based and highly diverse field of developmental promotion and early childhood intervention. Seven issues were identified as in need of increased attention: (1) reducing barriers to access; (2) ensuring valid assessments; (3) identifying and responding to the special needs of distinctive subgroups; (4) influencing and assessing the impacts of postintervention environments; (5) minimizing unintended adverse consequences;

We have taken parenting resources out of family life with no replacement. . . . We have to somehow turn some of our energy into supporting [child development] in the way that the Department of Agriculture [supports] farmers and farm life.
Kathryn Barnard

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(6) strengthening the service infrastructure; and (7) enhancing professional training.

Reducing Barriers to Access

The problem of uneven access to state-of-the-art early childhood services was identified by workshop participants as a serious challenge. In this regard, diminished accessibility was noted to be related to a variety of potential barriers, including cost, language, culture, citizenship status, transportation, eligibility standards, complex documentation requirements, program scheduling, and stigma associated with labeling, among others.

Considerable discussion focused on tensions between the reluctance of service providers to label young children and the organization and financing of health and human services that require approved diagnoses in order to authorize specialized treatments. The stigma attached to the label "emotional

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disturbance," which frequently results in the misleading identification of such children as "speech delayed" and the subsequent provision of inappropriate intervention, was identified as an illustrative example of this problem. Some participants criticized current trends in managed care as undermining the concept of comprehensive intervention by imposing both informal constraints and formalized system barriers to specialized services that are particularly important for children with special needs.

Beyond the failure of existing policies and programs to ensure the enrollment of all children and families who could benefit from appropriate services, many early childhood intervention efforts that target highly vulnerable families experience significant levels of participant attrition. The workshop discussion on this issue noted two consequences for the field—one for service delivery and the other for evaluation of service effectiveness. In the first case, the failure of families to continue in programs indicates the need to reevaluate both the goals of the program and the nature of the services that are provided. A reasonable hypothesis would suggest problems in the match between what the program offers and what the families need or are willing to accept. Cultural differences between service providers and recipients are particularly salient in this regard. In the second case, assessments of the impacts of programs that experience significant sample attrition must be interpreted with caution. The results of such evaluations can be instructive, but they tell us very little about how effective

It is perhaps a trivial statement to say that the nature of children, what they need, and views regarding the role of families are culturally embedded and reflected in public policy. It may be provocative to say that research inquiry about these matters is shaped by the culture, values, and socioeconomic position of the scientists.
Ruby Takanishi

the service model would be if it were delivered successfully.

Ensuring Valid Assessments

The insufficient availability of appropriate developmental evaluation techniques was a recurring theme throughout the workshop proceedings. Participants attributed much of the limitations in the science base and many of the unanswered questions in both research and practice to assessment measures that do not fully capture the essence of what really matters in early childhood development.

Knowing when to be concerned about a child's development depends on valid and reliable assessments of his or her performance and underlying skills. Unfortu-

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nately, the early childhood field is plagued by a paucity of adequate measures to identify developmental concerns, design intervention strategies, and evaluate program effectiveness. It has been proposed that assessment procedures that rely on single instruments, settings, or standardized tasks serve to limit the breadth of the developmental profile. Conversely, evaluations that focus on a wide range of skills are typically too broad to elucidate qualitative differences that signal concern, such as mild sensory impairments and regulatory disorders. Conventional developmental measures may also be too global to document more subtle growth in children with significant disabilities, and may artificially impose

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Assessment of young children can become misguided or misleading when it occurs in isolation from the child's family and lived context and . . . from the interventions that are designed to assist and advance childhood development. . . . [The preferred model] is one that uses assessment in order to inform intervention, but then takes information from the intervention context to help refine the assessment.
Samuel Meisels

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a linear orientation on a process that is typically characterized by spurts, plateaus, and extensive variability.

Workshop participants agreed that assessment and intervention that are iterative and reciprocal, situated within the child's natural context, and focused on developmental processes rather than on milestones, will produce the most useful picture of a child's competence. Participants also strongly endorsed the concept of assessment as an ongoing information-gathering process rather than a series of disconnected snapshots of competence. Furthermore, there was considerable support for focusing on qualitative functioning and developmental processes, rather than on etiology or risk status, as a way to enhance services for children who might otherwise fall through the cracks created by global assessment tools and stringent eligibility requirements. This was noted to be particularly important for those who are at risk for social-emotional problems, a subgroup that has been overlooked by mental health, early childhood, and special education professionals.

Both researchers and practitioners expressed dissatisfaction with current assessment options, but there were a variety of opinions about the role of IQ measurement. Some workshop participants endorsed the utility of IQ tests as a general measure of summative cognitive skills and an adequate instrument for evaluating program impacts. Others agreed that an IQ score can serve as a useful marker of current development, but they underscored its inadequacy for clinical decision making or for measuring growth over time. A

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> *The issue is not so much how you define competence. I think the early childhood field can agree on the issue of competence. The question is, "How do you measure it?"*
>
> *Jane Knitzer*

few discussants expressed the opinion that IQ tests are of little to no value and actually do more harm than good, particularly when they lead to diminished expectations for young children with low scores.

A great deal of discussion focused on alternative assessment strategies. Particular interest was directed toward observational measures of underlying processes and executive functions, such as attention and mastery motivation. Workshop participants acknowledged the considerable amount of time and expense required for many of these assessments, thereby limiting their practical applicability in the policy and service delivery arenas.

The measurement of developmental trajectories over time as an alternative to sequential, cross-sectional evaluations of specific skills generated a great deal of enthusiastic discussion. The potential benefits of such an approach were noted to include an enhanced ability to assess multiple influences longitudinally, thereby producing a continuous model of the developmental course that considers the child as well as the family and the community context.

Identifying and Responding to the Special Needs of Distinctive Subgroups

Although much of the workshop discussion focused on the common, shared knowledge base that guides the multisystem field of early childhood intervention, it was noted that specific subgroups of children and families confront unique challenges. For children, the presence of a biologically based disability, such as cerebral palsy or a sensory loss, requires an intervention strategy that incorporates knowledge about both normative development and adaptation to a specific physical impairment. For mothers, the diagnosis of depression or a substance abuse problem adds an enormous burden to the stresses of parenting, and necessitates services that go beyond the simple provision of advice and support. For families that confront severe economic hardship or ongoing domestic violence, the needs of their young children extend beyond the reach of educational enrichment activities. For policy makers and service providers, the challenge is to integrate specialized services, when they are required, within a comprehensive framework that addresses the generic needs of all children and families, while recognizing the importance of cultural competence in a pluralistic society.

Tensions between the generic and idiosyncratic characteristics and needs of children and families create a complex agenda for the early childhood field. For example, families of children with increased biological vulnerability or a diagnosed disability

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who do not face the additional stresses of severe economic hardship are generally successful in mastering interactional techniques that facilitate their child's growth. In some cases, however, the adaptation of the family may be compromised, independent of the nature or severity of the child's impairment. Children whose developmental vulnerability is rooted largely in a stressful caregiving environment often respond positively to enriched experiences in a structured intervention program, but changing problematic parental interactions is often difficult.

All children, with or without biological vulnerabilities, do best when they are reared in a nurturing environment that invests in their well-being and responds to their individuality. All families depend on informal social supports and varying levels of professional service. Despite the acknowledged reality of "special" child and family needs, the workshop participants repeatedly underscored the applicability of general developmental principles across the broad array of existing service models.

Yoshikawa presented a framework for examining the advantages and limitations of alternative causal models applicable to early intervention research to determine under what conditions and for whom positive change is most likely. Five models were presented: (1) the main effect model, which answers the question of whether there is an effect but offers no insight into the causal process; (2) the mediated model, which gives some information on how a program works but does not address how mediating

The combination of biological impairments and environmental liabilities can produce seriously compromised learning and functional performance. While the separate detrimental effects of biological and environmental variables are readily recognized, the environmental variables often are given less attention when children have biological impairments. Unfortunately, nothing about having a biological impairment makes one immune from the devastating effects of inadequate environments.
Mark Wolery

effects may differ for different subgroups; (3) the interactive subgroup model, which indicates whether the intervention effects differed by subgroup but does not increase understanding of variations in subgroup experience or how the causal processes may have differed for different groups; (4) spillover models (e.g., helping parents will help children), which provide information about how family subsystems influence each other but say little about under what conditions and why such spillover might occur; and (5) models that emphasize the diversity

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of causal process across groups, which may include variation in either the intervention experience, the outcomes of interest, or both.

These increasingly complex models provided a useful launching point for discussing many of the major challenges that continue to confront program evaluation research, including sample size limitations that thwart important subgroup analyses and persistent difficulties in studying individual differences. The workshop participants underscored the need for increased investment in collaborations across multiple sites (in order to achieve sample sizes sufficiently large for complex, multivariate designs) and for the implementation and evaluation of planned variations based on a host of critical variables, including the interventions themselves; child, family, community, and cultural characteristics; and expected outcomes.

Influencing and Assessing the Impacts of Postintervention Environments

The demands of policy makers for evidence of long-term impacts from investments in early childhood programs have put professional service providers and program evaluators in a difficult bind. Central to this dilemma is the well-supported assertion that effective early intervention does not serve as an inoculation that confers a lifetime of immunity to the adverse effects of later experiences. As one participant as-

serted, intervention prior to school entry can never be powerful enough to fully buffer a child from the effects of attending an inadequate school in a dangerous neighborhood. In such circumstances, it was suggested that the best expenditure on behalf of the children might well be fixing the schools and making them safe.

Workshop participants acknowledged the extensive documentation of program effect fade-out, particularly for children who live in impoverished environments and go on to attend substandard schools. Also noted were the few studies that have followed early childhood program graduates through the high school years and into adult life, demonstrating so-called sleeper effects in such areas as grade retention, special education placement, high school graduation, and incarceration. Examples mentioned include the Perry Preschool Project, which documented significant differences at age 27 favoring the intervention group over

For the first time in many years, questions are being raised about appropriate expectations for impact and what is required to sustain outcomes. This is a most welcome trend, and it is based on the larger corpus of research on program outcomes, rather than a few studies.
Ruby Takanishi

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controls in high school completion, employ-ment, college attendance, teen pregnancy, and criminal activity; the Abecedarian Project and Project CARE, which demon-strated significant differences in reading and math achievement scores up to age 15; and the Syracuse program, which documented short-term reductions in antisocial behavior and long-term effects on delinquency.

Workshop discussions acknowledged the legitimate demand for long-term follow-up data but underscored the importance of greater attention to the continuing mediat-ing role of the environment throughout the life span.

Several workshop participants noted that early childhood intervention profes-sionals have not yet determined the level of impact they truly expect to have on child outcomes over time—i.e., the "standard of proof" that endorses a program as "effec-tive." Even when positive results are ob-tained, it is not clear that early childhood services should be held to such a high stan-dard (i.e., demonstrating significant treat-ment-control differences as long as 15 years or more after the intervention has been delivered). Success in treating cancer, for example, is measured by five-year survival rates.

Although early intervention programs clearly cannot immunize children against all the possible adverse experiences they may encounter later in life, there also is a danger in simply blaming the lack of more dramatic long-term effects on inadequate schools. In the final analysis, the persistence of early childhood intervention effects is a complex

phenomenon that is constrained by the multiple variables that influence children's lives over time. To this end, both early childhood intervention and public school education require strengthening to ensure consistent quality within and across devel-opmental stages.

Minimizing Unintended Adverse Consequences

Several workshop participants raised concerns about the extent to which some early childhood interventions may have unintended negative impacts. From the perspective of the family, programs that focus explicitly on "parent training" may send a message of presumed parent incom-petence, which may undermine a mother's or father's self-confidence and inadvertently contribute to less effective performance. Similarly, parenting interventions that ad-dress cultural differences in a dismissive or pejorative manner are likely to precipitate significant conflict or simply be unaccept-able. Related to these concerns, some work-shop participants noted that the provision of professionally mediated support can po-tentially interfere with the natural develop-ment of informal social networks, which are essential for all families.

A variety of unintended consequences has been identified that can specifically undermine family competence and limit child opportunities. Inappropriate interven-tions may cause some parents to interact with their child in an unnatural, therapeutic

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> *Sometimes we are part of systems that actually undermine a family's intrinsic supports instead of helping them connect to (those) supports which are not only less demoralizing and more empowering . . . but also more likely to be long-lasting and culturally synchronous.*
>
> *Barbara Howard*

manner rather than through a natural and comfortable parent-child relationship. Workshop participants cited research that found reduced feelings of parenting competence and more negative mother-child interactions in families that received intervention services that they did not feel were needed. Similarly, the benefits of naturally evolving informal support networks may be undermined by professionally arranged support systems. From the perspective of the child, a tightly structured intervention that is delivered in a highly prescriptive manner may interfere with the normal adaptive and self-righting mechanisms that are inherent in the developmental process.

Strengthening the Service Infrastructure

As noted above, services to promote the health and well-being of all young children

and early intervention programs for those who are developmentally vulnerable constitute a highly diverse enterprise. Nevertheless, despite the persistence of significant fragmentation at both the policy and service delivery levels, two days of rich and lively discussion among the workshop participants confirmed the proposition that there is a common body of knowledge that cuts across the multiplicity of service streams. This integrated knowledge base can serve as a powerful resource to guide the design of a more coherent and efficient infrastructure for early childhood services that incorporates the multiple systems that have evolved independently over the years. Although the workshop participants recognized that much more remains to be learned about effective service integration, most felt that the major obstacle to a more cohesive infrastructure rests not in the limitations of current knowledge about early childhood development, but in the politics of human service delivery.

Beyond the overall challenges of service fragmentation and redundancy, the limited availability of mental health services for children under 6 years of age represents a glaring gap. This is particularly striking in view of the mandate for early intervention services for infants, toddlers, and preschoolers with developmental disabilities or delays, which currently responds primarily to the needs of children with cognitive, language, and motor impairments and does not accord a comparable entitlement to services for young children whose impairments lie in the domains of emotional and

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social development. In a related manner, young children who have been abused or neglected are managed by a child welfare system that typically has limited professional expertise in child development. In view of the dramatic advances in knowledge of early childhood development over the past few decades, much of which has been financed by public funds, the workshop participants characterized these gaps as completely indefensible.

Enhancing Professional Training

The implications of the workshop discussions for professional training in the field of early childhood intervention were considered briefly. Most noteworthy in this regard was the recognition that few training programs provide a comprehensive, cross-

> *Each professional discipline has its own training sequence . . . and there is no guarantee that graduates will have any exposure to young children and their families. Compounding these differences in training are differing philosophical and treatment options that affect the delivery of services within a discipline-specific area.*
> Mary Beth Bruder

disciplinary understanding of early childhood development. For example, preparation to deal effectively with the specialized needs of children with disabilities or the challenges facing families coping with severe economic hardship is rarely addressed adequately in the training of child care providers and early childhood educators, many of whom will be faced with these concerns daily. Conversely, the professional training of therapists who plan to work with infants and toddlers with special needs includes considerable experience with older children who demonstrate atypical development, but often relatively little hands-on exposure and theoretical knowledge specific to young children. Compounding these educational differences is the diversity of philosophies and treatment options that affect the delivery of services.

CONCLUDING THOUGHTS

It was apparent throughout the workshop that experts in early childhood intervention bring strong disciplinary perspectives to their work. These differences serve as a double-edged sword. On one hand, they ensure a rich and comprehensive approach to the needs of children and families. On the other hand, they often reflect parochial interests related to professional status and influence, as well as understandable conflicts based on competition for funding. This underlying tension illustrates the importance of preserving a mutually respectful,

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interdisciplinary, cross-system environment that acknowledges the value of different ways of knowing, seeks opportunities for greater coordination of effort, and invests in the continuous advancement of a rigorous, common science to guide the ongoing enhancement and ultimate integration of a broad diversity of early childhood policies and practices.

Within that context, this report should be viewed as the product of a cross-cutting, field-building conversation among a group of researchers and practitioners representing a variety of early childhood service streams that rarely interact. As such, the report represents a step toward developing greater convergence in knowledge across service systems and providing enhanced clarity about some of the shared assumptions that could shape an emerging common knowledge base. To this end, over the course of two days of intensely packed discussion, three important themes emerged.

First, state-of-the-art service delivery across a broad range of policies and practices is guided by a rich body of knowledge that represents a mixture of theory, empirical research, and "practical" professional experience. A critical examination of this knowledge base reveals considerable agreement on the broad theoretical foundations of the field, but continuing disagreement about how best to enhance the well-being of children. Throughout the workshop discussions, there was broad acceptance of a social ecological model of development in which child competence is viewed as a product of no single factor (i.e., there is no magic bullet), but rather is influenced by a combination of characteristics of the child, the family, and the community. Given this wide array of potential targets for intervention, disagreement typically focused on where selected interventions could be best directed (i.e., changing the child, the family, or the community). As choices were expressed, disciplinary perspectives frequently became apparent, and the need for a dynamic interdisciplinary data base became clear. These interdisciplinary needs become even more important with the recognition that improving individual child development often requires influencing the behavior of the family and/or the community, using methods from a variety of disciplines (e.g., sociology, economics, political science, anthropology) that do not generally focus directly on children.

Second, there is a serious gap between the cutting edge of child development research and the limited availability of appropriate instruments to assess child competence in the delivery setting, particularly in the emotional and social domains. The paucity of reliable and valid methods to evaluate important family and community variables was also underscored. This well-documented lack of measures has been a recognized problem for decades, yet the repeated call for new evaluation tools has remained unanswered. Discussants noted that the process of measurement development is an expensive undertaking and urged that this be addressed as an essential public investment.

Third, workshop participants noted that

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the overarching coherence of the knowledge base that informs the practice of early childhood intervention is compromised significantly by its highly uneven implementation. Access to child and family services is often complex and persistently unequal. Participant attrition is a significant but rarely acknowledged challenge, particularly in programs for families dealing with serious social or economic problems. In an effort to minimize costs, successful demonstration projects that rely on sophisticated staff expertise are often "brought to scale" with less-well-trained and lower-paid personnel who do not have the skills to deal with the challenges they face. Finally, child-focused models that have been demonstrated to promote developmental gains in young children are often overwhelmed by the impacts of adverse family circumstances (e.g., maternal depression, parental substance abuse, family violence) that require either in-house expertise or access to specialized consultation, neither of which is routinely available in conventional early childhood programs.

Finally, both the spirit and the content of this rich two-day exchange provided strong support for the central hypothesis that inspired the convening of the workshop. Despite divergent opinions about the criteria for defining "hard" knowledge, there was remarkable convergence across all service streams on the nature of the desired child outcomes (with more emphasis on social and emotional development), the most important family-based and community-based mediators of child development, and the broadly defined characteristics of effective interventions. When findings were discrepant, the differences seldom appeared to be program-specific or related to a specific discipline, but rather due to insufficient evidence. Thus, despite the deeply ingrained historical distinctions and continuing fragmentation that characterize the multiplicity of service systems that address the health and development of young children, they share a common set of goals, face a similar set of challenges, often serve the same children and families, and are guided by a convergent body of knowledge.

APPENDIX A
DESCRIPTIONS OF EARLY CHILDHOOD INTERVENTION PROGRAMS MENTIONED IN THE REPORT

Abecedarian Project

The Carolina Abecedarian Project was designed to test the effectiveness of intensive early intervention with children from low-income families. All 111 children who participated received nutritional supplements during the first years of life, and their families received social service referrals (when needed) until the participating child was 8 years old. In addition, 57 of the participating children received a year-round, all-day, educational childcare/preschool program emphasizing the development of cognitive, language, and adaptive behavior skills, until they were 5 years old. The parents also participated in parent group meetings.

Burchinal, M.R., F.A. Campbell, D.M. Bryant, B.H. Wasik, and C.T. Ramey
1997   Early intervention and mediating processes in cognitive performance of children of low-income African American families. *Child Development* 68:935-954.
Campbell, F.A., and C.T. Ramey
1994   Effects of early intervention on intellectual and academic achievement: A follow-up study of children from low-income families. *Child Development* 65:684-698.
Ongoing updates on this project can be accessed online at http://www.fpg.unc.edu/~abc.

Brookline Early Education Project

The Brookline Early Education Project provided home visits to families, parent training, parent support groups, toddler and preschool education through play groups and a prekindergarten program, health and developmental exams, and toy and book lending libraries for 185 children. It was part of the Brookline Public School system in Brookline, MA.

Schultz, T., E. Lopez, and M. Hochberg
1996   *Early Childhood Reform in Seven Communities: Front-Line Practice, Agency Management, and Public Policy.* Washington, DC: Office of Educational Research and Improvement, U.S. Department of Education.

Early Training Project

The Early Training Project was an educational intervention that involved 92 black American 3- to 4-year-old children from low-income families in two small southern cities. The project placed half of the children in a 10-week summer preschool program for the two or three summers prior to the first grade, and the families of these children also received weekly home visits during the remainder of the year. The other half of the children were in control groups. The program emphasized both affective and cognitive development, and aimed to impact attitudes relating to achievement and school performance.

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Gray, S.W., B.K. Ramsey, and R.A. Kalus
  1982   *From 3 to 20: The Early Training Project.*
          Baltimore: University Park Press.

Infant Health and Development Program

The Infant Health and Development Program was a comprehensive intervention for low birth weight and premature children and included 985 children spread over 8 diverse sites across the country. All of the children received pediatric surveillance and community referral services. One third of the families also received family support through home visits, full-day child care in the IHDP sites' Child Development Centers, and regular group meetings for the parents.

Gross, R.T., D. Spiker, and C.W. Haynes, eds.
  1997   *Helping Low Birth Weight, Premature Babies: The Infant Health and Development Program.* Stanford, CA: Stanford University Press.

Milwaukee Project

The Milwaukee Project targeted mentally retarded parents and their children and included 35 economically disadvantaged families. From birth until age 6, when they started school, the children in 17 of the families participated in a specialized nursery and preschool program that promoted language and cognitive development, and reading and math skills. Their mothers received parenting education and access to social services through a home visitor. In addi-

tion, the mothers in these families were enrolled in adult education classes, received vocational training, and were helped to find a job.

Garber, H.L.
  1988   *The Milwaukee Project: Preventing Mental Retardation in Children At Risk.* Washington, DC: American Association on Mental Retardation.

Perry Preschool Project

The Perry Preschool Project included 123 3- and 4-year-old children who were assigned to either the intervention or the control group. The intervention group received 2.5 hours of preschool experience 5 days a week for 7.5 months each year for 2 years (except for one small group of children who received only one year of services). In addition, teachers visited each mother and child at home for 90 minutes once per week during the school year.

Schweinhart, L.J., and D.P. Weikart
  1997   *Lasting Differences: The High/Scope Preschool Curriculum Comparison Study Through Age 23.* Ypsilanti, MI: High/Scope Press.

Project Care

Project CARE targeted children from birth through the preschool years who lived in families with low socioeconomic status. The 65 children who participated were split up in to three groups: the first group participated in high-quality child care that ad-

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dressed both cognitive and social development and received family education through home visiting; the second group received only family education through home visiting; and the third group received only nutritional supplements. All groups had access to a social worker.

Wasik, B.H., C.T. Ramey, D.M. Bryant, and J.J. Sparling
  1990   A longitudinal study of two early intervention strategies: Project CARE. *Child Development* 61(6):1682-1696.

Syracuse Program

The Syracuse University Family Development Research Program was designed to support parenting strategies that enhanced children's development. It provided extensive child care, home visiting, health and nutrition, and human services resources to 108 families, beginning in the third trimester of pregnancy and continuing throughout the first five years of the children's lives.

Honig, A.S.
  1977   The Children's Center and the Family Development Research Program. Pp. 81-99 in *Infant Education: A Guide for Helping Handicapped Children in the First Three Years*. B.M. Caldwell and D.J. Stedman, eds. New York: Walker & Co.

APPENDIX B
WORKSHOP AGENDA

June 24-25, 1999
National Academy of Sciences
Washington, DC

Thursday, June 24, 1999

8:00 a.m. – 8:30 a.m.   Continental Breakfast

8:30 a.m. – 9:00 a.m.   **Welcome and Goals of the Workshop**
    Jack Shonkoff, Brandeis University
    Chair, Committee on Integrating the Science
    of Early Childhood Development

9:00 a.m. – 10:30 a.m.   **Panel One**
Services designed to promote child health and development

    Moderator: Deborah Phillips, Committee on Integrating the
        Science of Early Childhood Development

    Panelists: Barbara Howard, Johns Hopkins University
        Veronica Feeg, George Mason University
        Samuel Meisels, University of Michigan
        Ruby Takanishi, Foundation for Child Development

10:30 a.m. – 10:45 a.m.   BREAK

10:45 a.m. – 12:15 p.m.   Panel One, continued

12:15 p.m. – 1:30 p.m.   LUNCH

    Speaker: Hiro Yoshikawa, New York University

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1:30 p.m. – 3:00 p.m.	**Panel Two** **Interventions designed to address family-focused vulnerability**

Moderator: Greg Duncan, Northwestern University

Panelists: Dale Farran, Vanderbilt University
                   Craig Ramey, University of Alabama
                   Mary Dozier, University of Delaware

3:00 p.m. – 3:15 p.m.	BREAK
3:15 p.m. – 5:00 p.m.	Panel Two, continued
5:00 p.m.– 6:30 p.m.	RECEPTION

Friday, June 25, 1999

9:00 a.m. – 10:30 a.m.	**Panel Three** **Interventions designed to address child-focused vulnerability**

Moderator: Michael Guralnick, University of Washington

Panelists: Jane Knitzer, Columbia University
                   Mary Beth Bruder, University of Connecticut
                   Mark Wolery, University of North Carolina

10:30 a.m. – 10:45 a.m.	BREAK
10:45 a.m. – 12:30 p.m.	Panel Three, continued
12:30 p.m. – 1:30 p.m.	LUNCH

Speaker: Jeanne Brooks-Gunn, Columbia University

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1:30 p.m. – 3:00 p.m.	**Discussion** **Implications for an integrated science of early childhood** **development and intervention**

	Moderator:	Jack Shonkoff, Brandeis University
	Discussants:	Arnold Sameroff, University of Michigan Barbara Bowman, Erikson Institute Kathryn Barnard, University of Washington Deborah Klein Walker, Massachusetts Department of Public Health

3:00 p.m. – 3:15 p.m.	BREAK

3:15 p.m. – 5:00 p.m.	Discussion

APPENDIX C
SELECTED REPORTS FROM THE
BOARD ON CHILDREN, YOUTH, AND FAMILIES

Children of Immigrants: Health, Adjustment, and Public Assistance (1999)

Revisiting Home Visiting: Summary of a Workshop (1999)

Reducing the Odds: Preventing Perinatal Transmission of HIV in the United States (with Institute of Medicine) (1998)

America's Children: Health Insurance and Access to Care (with Institute of Medicine) (1998)

Systems of Accountability: Implementing Children's Health Insurance Programs (with Institute of Medicine) (1998)

Longitudinal Surveys of Children: Report of a Workshop (1998)

From Generation to Generation: The Health and Well-Being of Children in Immigrant Families (1998)

New Findings on Poverty and Child Health and Nutrition: Summary of a Research Briefing (1998)

Violence in Families: Assessing Prevention and Treatment Programs (1998)

Welfare, the Family, and Reproductive Behavior: Report of a Meeting (with the Committee on Population of the National Research Council) (1998)

New Findings on Welfare and Children's Development: Summary of a Research Briefing (1997)

Paying Attention to Children in a Changing Health Care System: Summaries of Workshops (1996)

Beyond the Blueprint: Directions for Research on Head Start's Families: Report of Three Roundtable Meetings (1996)

Child Care for Low-Income Families: Directions for Research: Summary of a Workshop (1996)

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Service Provider Perspectives on Family Violence Interventions: Proceedings of a Workshop (1995)

Integrating Federal Statistics on Children (with the Committee on National Statistics of the National Research Council) (1995)

Child Care for Low-Income Families: Summary of Two Workshops (1995)

New Findings on Children, Families, and Economic Self-Sufficiency: Summary of a Research Briefing (1995)

Cultural Diversity and Early Education: Report of a Workshop (1994)

Benefits and Systems of Care for Maternal and Child Health: Workshop Highlights (with the Board on Health Promotion and Disease Prevention of the Institute of Medicine) (1994)

America's Fathers and Public Policy: Report of a Workshop (1994)

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