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**Science, Policy, and the
Young Developing Child**
*Closing the Gap
Between What We Know
and What We Do*

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The notion of “starting earlier” to make sure that more young children arrive at school eager to learn is gaining momentum. Yet, there remains a staggering gap between what we know and what we do as a society when it comes to early care and education. The gap exists for three basic reasons: mistaken impressions, misunderstandings and misplaced priorities. First, many people think that infants, toddlers and preschoolers are “too young” to learn. Second, many people do not have a clear understanding of how a good early learning program works. Third, too often, political rhetoric about the critical importance of early education is not translated into reality when public officials are devising and voting on budgets.

The Ounce of Prevention Fund invited a nationally recognized expert, Jack P. Shonkoff, M.D., to examine the current state of early childhood, and to explore ways to close the gap between what we know and what we do as a society. Dr. Shonkoff, the Dean of The Heller School for Social Policy and Management at Brandeis University, spoke at the Ounce of Prevention Fund’s 20th Anniversary Dinner. This report, written by Dr. Shonkoff, expands upon his remarks.

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What We Know: *Promoting the Healthy Development of Young Children*



The time has come to step back and ask how well we are doing as a nation of communities to shape the early experiences of all our children. This is a very important question for one simple reason—decades of scientific research have concluded that experiences in the first few years establish a foundation for human development that is carried throughout life. And how well these foundations are constructed constitutes an important shared responsibility.

This brief is informed by the findings of a landmark report issued in 2000 by the National Research Council and Institute of Medicine of the National Academy of Sciences titled, *From Neurons to Neighborhoods: The Science of Early Childhood Development*. Like all reports from the National Academies, that document was subjected to a highly demanding review process by a distinguished group of scientists to assure that its conclusions and recommendations were credible scientifically and free from even a trace of political advocacy.

The results of this extensive effort have implications for us all—from policy-makers to parents, and from early childhood educators to city planners.

Let's begin with four well-established, scientific principles of early childhood development.

Principle 1

Each of us is the product of an ongoing interaction between the influence of our personal life experiences and the contribution of our unique genetic endowment, within the culture in which we live.

The question is not *whether* early experiences matter. That question has been answered again and again—and the answer is “yes, absolutely.” The important unanswered question is, *how* does experience make a difference? How does it get into the brain? How is it that everything about each and every one of us is the product of *both* our environment and our genetics?

The answers to these questions are likely to come from the combined efforts of behavioral researchers (who have been teaching us about the developing child for decades) and neuroscientists (who are learning incredible new things about how experience actually affects brain architecture). Even the molecular biologists who cracked the genetic code are weighing in on this debate, for they have learned that gene expression itself is affected by environmental influences.

Principle 2

Human relationships are the “active ingredients” of environmental impact on young children.

Research tells us that a wide array of people play an important part in shaping young children’s lives. These include neighbors, friends, and teachers, in addition to parents, grandparents, and other extended family members. For large and growing numbers of children, it also means the other adults who care for them in the early childhood education programs where they spend a substantial part of every day.

Central to the impact of relationships on children in the early years is their quality, particularly as it is expressed in the continuous back and forth interaction that takes place between a young child and an invested adult. When relationships are nurturing, individualized, responsive, and predictable, they increase the odds of desirable outcomes. That is to say, they promote healthy brain development, as positive experiences contribute to the formation of well-functioning neural circuits. When interpersonal experiences are disruptive, neglectful, abusive, unstable, or otherwise stressed, they increase the probability of poor outcomes. In the case of excessive childhood stress, for example, chemicals are released in the brain that

damage its developing architecture. This link between adult-child relationships and children’s later achievements is not based on intuition or wishful thinking. It is grounded in hard science and reflected in evolving brain function.

Thus, when we measure the quality of an early care and education program, it’s the people—and the relationships they establish with the children—that make the difference between a good and a bad place for a young child to spend a large part of each day. It’s the extent to which caregivers are motivated to respond to children as individuals, which is hardly possible if you are responsible for 20 young children or if you think of your job primarily as keeping them safe and dry, rather than helping to facilitate their development.

Principle 3

The development of intelligence, language, emotions, and social skills is highly inter-related.

If you build a home, you don’t ask whether the electrical wiring in the living room is more important than the plumbing in the bathroom or the heating system in the den. Like the inter-related systems in the structure of a house, science tells us that you can’t isolate discrete abilities in the brain of a real live person, even in the earliest months of life.



There isn't an exclusive brain area that determines intelligence, nor is there one for emotions or social skills. Scientific knowledge on this issue is crystal clear—cognitive, emotional, and social competence evolve hand in hand. When a supportive environment is provided, the emerging structure is sound, and all the parts work together.

Learning is an interactive process that depends on the integration of multiple abilities and skills. It is never just one thing, particularly with respect to a child's readiness to succeed in school.

Principle 4
Early childhood interventions can shift the odds toward more favorable outcomes, but programs that work are rarely simple, inexpensive, or easy to implement.

There is extensive, credible evidence from several model programs that demonstrate our capacity to facilitate

positive outcomes for children who live with a variety of developmental burdens. These programs include interventions for children with specific disabilities, interventions for children who live in poverty, and interventions for children who live in violent homes, among others.

Stated simply, there is no quick fix in the world of early childhood intervention. Programs that work require sufficient resources to be implemented effectively. The question, therefore, is not as much about cost as it is about cost-effectiveness and return on investment, or doing the right thing at the right time in order to have the greatest impact on a child's future.

Poorly designed services delivered by staff who are inadequately trained, underpaid, and/or overburdened with heavy caseloads generally cost less but are unlikely to produce significant benefits. Knowledge-based interventions that are funded sufficiently and delivered effectively by well-compensated staff with appropriate skills can produce important outcomes that generate a substantial return on the investment.

The former are unacceptably expensive, regardless of their relatively lower cost. The latter provide good value, even when the price tag is high. Generally speaking, prevention is less costly than treatment. But in the end, as is true for most things, you get what you pay for.

What We Do:

Ignoring the Science Undermines Progress

Policies that dismiss or ignore the science of early childhood development miss important opportunities to address the root causes of many of our nation's most pressing social concerns.

The most recent decades of scientific findings lay out a blueprint against which we can now evaluate our collective effectiveness in shaping the future for our children. Are the policies and programs that our communities support consistent with the science? As soon as we begin this exercise, we discover significant gaps between what we know and what we do to promote the healthy development of young children. This hard realization should lead all of us to consider four very important questions that demand sober reflection and thoughtful responses.

How can we invest in expensive education reforms that require stronger performance standards and financial incentives to attract and retain talented teachers for grades K-12, while we tolerate inadequate training and poor compensation for the providers of early care and education throughout the important preschool years?

Once we understand the new science of development, this contradiction becomes illogical and untenable—and we realize that education reform must begin earlier. Science tells us that learning extends from birth through

childhood, adolescence, and adulthood. There is nothing about kindergarten entry that indicates a sudden need for skilled teachers that did not exist before. That kind of thinking not only contradicts mountains of scientific evidence—it also just doesn't make any sense.

When we understand the implications of new research on brain development, we recognize the need to expand our concept of education reform in ways that promise to be much more effective in the long run—because we realize the need for a stronger foundation well before the first day of kindergarten.

How can we all agree about the critical importance of supporting families, yet do so little as a society to provide an economic cushion to help parents delay their return to work after the birth of a baby, and then not assure access to decent quality child care when they re-enter the workforce?

The critical role of an environment of nurturing and stable relationships in promoting the healthy development of children is clear and incontrovertible. This is particularly important during the early childhood years, when positive experiences are shaping the normal architecture of the brain and excessive stresses are stimulating the release of chemicals into the central nervous system that can disrupt that evolving architecture.



The policy implications of these scientific findings are clear. We must figure out how to provide more viable choices for mothers and fathers about whether or when to return to the workforce after the birth or adoption of a child. A depressed mother who is working around the clock and trying to care for a new baby is not able to be fully available to the child. These situations can be predicted and prevented, and appropriate interventions are among the most cost-effective we can make as a society. And, at the same time, we must assure the availability of stimulating and stable relationships with caring adults in the daily arrangements made for young children whose parents are at work.

Why do we measure the success of welfare reform without evaluating the extent to which we have increased the likelihood that affected children will have better opportunities to improve their life outcomes?

Why don't we recognize that those opportunities start well before the children ever enter school, and that we can improve their long-term odds by improving their early environments?

As the public debate about poverty continues, it is striking that arguments over the relative success of programs aimed at low-income adults simply ignore the population we are most likely to be able to help—the children.

When we understand that the quality and predictability of a child's personal experiences matter greatly to the developing brain, we also begin to understand why poverty is such a strong predictor of academic difficulties in school. More importantly, we can appreciate the implications of recent evidence that suggests that poverty in early childhood is a stronger predictor of not completing high school than is poverty in later childhood.

Perhaps most difficult to understand is the extent to which our nation's public policies attempt to address problems in vulnerable families while ignoring the most compelling needs of the children. It is well known, for example, that a significant percentage of women who have been unable to secure steady employment are burdened by limited education, depression, family violence, and/or substance abuse, all of which are well documented threats to the well-being of young children.

Why are the needs of these children not on the radar screen when we talk about time limits and mandated maternal employment in the welfare reform debates?

How is it possible that the welfare system has expended such a limited amount of energy on providing high quality early care and education or specialized intervention services for vulnerable young children? This skewed policy approach is particularly problematic in view of the finding that high quality services help shift the odds toward better health and developmental outcomes.

Simply put, we are focusing our policies on adult behavior and not investing our dollars in helping children build the capacity to triumph over adversity. Most important, science tells us that capability begins to be shaped by experiences in the first few years of life. And those experiences can be enhanced through a wide range of community investments, from child care and education to health care and housing.

How can we reconcile our concern about violent crime with the fact that we have developed effective treatments for young children who have been exposed to family violence or have been abused or neglected themselves—yet most emotionally traumatized youngsters never receive these mental health services?

Early exposure to violence is a highly stressful experience for the developing child. Science tells us that when young children are subjected to significant periods of stress, chemicals are released in their brains that interfere with the development of its normal architecture. In some cases, this can produce a lasting change in the “set point” for aggressive responsiveness, which can lead to a greater risk for violent behavior later in life. What’s new about the emerging science is that we now know that it doesn’t have to be this way.

Many young children who have been traumatized emotionally by witnessing or experiencing violence directly develop a variant of post-traumatic stress disorder, a serious mental health problem first described in adult war veterans. The encouraging news is that there is a rich clinical knowledge base to inform the treatment of such children. The bad news is that our public priorities do not include sufficient funding for these programs, and therefore severely restrict the number of affected children who receive appropriate help. This short-sighted set of priorities results in intergenerational cycles of domestic and community violence that clearly can be reduced.

Closing the Gap: *Using Science to Inform Public Policy*



The encouraging message that comes from extensive scientific research is that we can do better. To this end, there are science-based solutions that policymakers at all levels of government can rely on to help build stronger communities that will produce healthier and more capable citizens. What is needed is a blueprint for the future that helps us put our knowledge into practical use.

The following three examples illustrate how we can strengthen the connection between state-of-the-art knowledge and enlightened action.

If we really want to enhance children's readiness to succeed in school, then we must pay as much attention to their emotional health and social competence as we do to their cognitive abilities and emerging academic skills.

If you can't sit still in school or control your temper in a classroom, no amount of reading instruction will improve your chances for achievement.

Moreover, your ability to pay attention to the teacher is heavily influenced by your early brain wiring and not simply by your willpower.

If we are really serious about promoting early school success, then we should be training and recruiting teachers for early care and education programs who have the skills to create exciting learning opportunities as well as to promote social competence and manage emotional and behavioral difficulties. This should not be a competition between early literacy experiences and mental health. Both are essential, and the science of social and emotional development is as sophisticated as the science of cognition.

If we really want to support families and promote healthy relationships between children and the adults who raise them, then we must create more viable choices for working parents who are trying to balance their responsibilities to their children and their jobs.

The central challenge of the work-family conflict facing our nation is the need to provide both wage replacement for parents who wish to stay at home with their babies and decent quality care and education for the children of those who return to work.

All our children deserve and need the same attention to their early development and learning opportunities that other industrialized countries have begun to recognize and already put in place. These countries have less wealth than we do, but they have decided to make children a priority. Our challenge as a nation is to come together across party lines and agree on how we can provide economic security and decent quality care and education for every young child.

If we really want to secure a promising economic, social, and political future for our country, then we must enhance the value of our investments in all young children.

Central to a prudent investment strategy for our nation is a well-balanced child portfolio that combines three essential components:

- effective supports for parents
- a serious commitment to expanded training and enhanced compensation for non-family providers of early care and education
- high-quality, evidence-based services that begin early and make a real difference for children at considerable risk for poor outcomes because of developmental disabilities or significant family problems, especially maternal depression, parental substance abuse, and/or family violence.

If we really want to break the cycle of intergenerational poverty, then we must invest in the care and education of young children whose life circumstances seriously limit their opportunities for success. This is particularly critical for children in families who face economic hardship that is complicated by mental health problems. For example, science tells us that babies of depressed mothers show evidence of unusual brain development, which can improve if the needs of the mothers and children are addressed at an early age.

If we really want to reduce the economic, political, and social costs of violent crime, then we must confront its early roots by providing effective treatments for young children who have been victimized by abuse, neglect, or early exposure to family violence. Science says that the key to reversing this trend is providing skilled mental health services for very young children. The clinical knowledge base to inform such treatment is available. But currently those services are very hard to find.

Putting an End to Four False Dichotomies



This brief ends with the identification of four fruitless and non-productive polarizations that have burdened the early childhood field for decades and that continue to consume precious energy that could be channeled into more constructive public discussion. These false dichotomies must be put to rest. In fact, if we can get beyond such futile debates, we will begin to discover the answers to many important questions that are right under our noses.

False Dichotomy 1

Nature versus nurture.

Science tells us that the developing child is influenced by both genetics and experience. There's no such thing as one without the other, and they both matter a great deal. So let's stop arguing about which is more important.

False Dichotomy 2

Cognitive versus emotional development.

Developmental scientists have concluded that you can't really separate these two domains of development within a child. And educators know that it doesn't

matter how well you are able to read if you are pre-occupied with anxiety or fear or you can't control your behavior. Since a kindergartner who is emotionally healthy but has not mastered any pre-academic skills also is headed for difficulty in school, why are we wasting our time arguing about the relative importance of reading skills versus emotional well-being? Why can't we simply agree that they are both very important?

False Dichotomy 3

Individual versus shared responsibility for children.

Accountability for the healthy development of young children cannot be viewed through a single lens. Are parents the most important people in their child's life? Of course. Can parents raise children by themselves? Absolutely not.

What communities, businesses, and government do, or not do, can have tremendous impact on how families are able to succeed in this critical responsibility.

There are things that only communities can do, like provide essential informal support for families. There are things that only the workplace can do, like provide flexible time for working parents to visit their child's preschool program. And there are certain things that only the government can do, like reduce poverty for working families through tax policies, enforce quality standards in early care and education programs, and assure sufficient funding for specialized interventions for all children with special needs.



False Dichotomy 4

Social justice versus economic investment.

The care and protection of young children is a fundamental moral responsibility. But if we truly are committed to meet that responsibility, we must go beyond simple lip service about values and recognize the indisputable fact that the future of our nation really is dependent on the well-being of our children. Moreover, we must be willing to confront hard questions about what it will cost to secure that future, and how we can maximize the return on our investment.

The concept of return on investment, in turn, must be driven not only by economics. There is an equally compelling imperative about what we might call *moral capital*. That is to say, there are certain things that are important to do because of what they say about our values as a society, above and beyond what they cost in monetary terms.

The protection of frail elderly people is one such imperative. We don't invest in nursing care for people at the end of their lives because of the taxes they will pay later. We do it because it is the right thing to do and because it makes a statement about who we are.

Similarly, we should invest public resources in our young children, not only because they will be more productive citizens later, but also because it says something about the value we place on the quality of their lives as an important goal in its own right. It says that we will not allow any child to live below a certain level of decency in our society because it's the right thing to do.

Why do we argue about whether taking care of young children and maximizing their opportunities for successful lives is a question of social justice *or* smart economics? We should insist on the importance of both.

Reframing the Public Dialogue to Focus on Science, Value and Values

Finally, if we really want to change the way we address the needs of young children, then we have to reframe the public dialogue. This means moving beyond blaming parents, communities, business, or government, and finding an appropriate balance between individual (private) and shared (public) responsibility for the health and well-being of all children. It means establishing common ground for an enlightened approach to early childhood policies and programs that is guided by science, value, and values.

A focus on *science* can help us understand the complex interplay of influences that result in healthy development, as well as assess the kinds of interventions that can make a difference. A focus on *value* reminds us that wise decisions about resource allocation are less about cost and more about cost-effectiveness and return on investment. And finally, a focus on *values* asks us to think about how we take care of all our children, and what that tells us about who we are and the kind of world in which we want to live.



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The Ounce of Prevention Fund

works with parents, policymakers and early childhood providers to ensure that more young children grow up safe, healthy, eager to learn and ready for school. Founded in 1982, the Ounce is a place where the most promising academic theories are tested in “real-world” circumstances and then turned into best practices shared with the early childhood field.

To learn more, please visit
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The National Scientific Council on the Developing Child

brings sound and accurate science to bear on public discourse and decision-making that affects the lives of young children. Composed of many of the nation’s leading neuroscientists and child development researchers, the Council publishes reports that explain the relation between early experience and the developing architecture of the brain, and address the gaps among early childhood science, policy, and practice.

To learn more, please visit
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