



# School Readiness

Pamela C. High, MD, and the Committee on Early Childhood, Adoption, and Dependent Care and Council on School Health

## ABSTRACT

School readiness includes the readiness of the individual child, the school's readiness for children, and the ability of the family and community to support optimal early child development. It is the responsibility of schools to be ready for all children at all levels of readiness. Children's readiness for kindergarten should become an outcome measure for community-based programs, rather than an exclusion criterion at the beginning of the formal educational experience. Our new knowledge of early brain and child development has revealed that modifiable factors in a child's early experience can greatly affect that child's learning trajectory. Many US children enter kindergarten with limitations in their social, emotional, cognitive, and physical development that might have been significantly diminished or eliminated through early identification of and attention to child and family needs. Pediatricians have a role in promoting school readiness for all children, beginning at birth, through their practices and advocacy. The American Academy of Pediatrics affords pediatricians many opportunities to promote the physical, social-emotional, and educational health of young children, with other advocacy groups. This technical report supports American Academy of Pediatrics policy statements "Quality Early Education and Child Care From Birth to Kindergarten" and "The Inappropriate Use of School 'Readiness' Tests."

[www.pediatrics.org/cgi/doi/10.1542/peds.2008-0079](http://www.pediatrics.org/cgi/doi/10.1542/peds.2008-0079)

doi:10.1542/peds.2008-0079

All technical reports from the American Academy of Pediatrics automatically expire 5 years after publication unless reaffirmed, revised, or retired at or before that time.

The guidance in this report does not indicate an exclusive course of treatment or serve as a standard of medical care. Variations, taking into account individual circumstances, may be appropriate.

### Key Words

school readiness, kindergarten, early education, children's well-being, social and emotional development, role of the pediatrician

### Abbreviation

AAP—American Academy of Pediatrics  
PEDIATRICS (ISSN Numbers: Print, 0031-4005; Online, 1098-4275). Copyright © 2008 by the American Academy of Pediatrics

## EARLY EXPERIENCE MATTERS

All of a child's early experiences, whether at home, in child care, or in other preschool settings, are educational. When early experiences are consistent, developmentally sound, and emotionally supportive, there are positive effects on the child and the family. To focus only on the education of children beginning with kindergarten is to ignore the science of early development and to deny the importance of early experiences. Our current understanding of the importance of early experiences in early brain development and cognitive and social-emotional outcomes for children and the recent US policy agenda aimed at maximizing educational encounters and outcomes for all children converge in our contemporary conceptualization of school readiness. Children who enter school ready to learn are expected to achieve more academically. Academic success has been linked to improved social, economic, and health outcomes.<sup>1-3</sup>

## HOW HAS SCHOOL READINESS BEEN DEFINED?

"Ready to Learn" became a national mantra in 1991, when the National Education Goals Panel adopted as its first goal that "by the year 2000, all children will enter school ready to learn."<sup>4</sup> This panel identified readiness in the child as determined by a set of interdependent developmental trajectories. Three components of school readiness were broadly described as:

### 1. Readiness in the child, defined by:

- Physical well-being and motor development, including health status, growth, and disability;
- Social and emotional development, including turn-taking, cooperation, empathy, and the ability to express one's own emotions;
- Approaches to learning, including enthusiasm, curiosity, temperament, culture, and values;
- Language development, including listening, speaking, and vocabulary, as well as literacy skills, including print awareness, story sense, and writing and drawing processes; and
- General knowledge and cognition, including sound-letter association, spatial relations, and number concepts.

2. School's readiness for children, ensured by:

- Facilitating smooth transition between home and school, including cultural sensitivity;
- Striving for continuity between early care and education programs and elementary school;
- Using high-quality instruction, appropriate pacing, and understanding that learning occurs in the context of relationships;
- Demonstrating commitment to the success of every child through awareness of the needs of individual children, including the effects of poverty and race, and trying to meet special needs within the regular classroom;
- Demonstrating commitment to the success of every teacher;
- Introducing approaches that raise achievement, such as parent involvement and early intervention for children falling behind;
- Altering practices and programs if they do not benefit children;
- Serving children in their communities;
- Taking responsibility for results; and
- Having strong leadership.

3. Family and community supports contributing to child readiness:

- Mothers should receive excellent prenatal care and children should receive comprehensive health care, optimal nutrition, and daily physical activity, so that children arrive at school with healthy minds and bodies;
- All children should have access to high-quality preschool; and
- As their child's first teacher, every parent should devote time daily to helping their child learn and should have access to education and support to be an effective teacher.

### WHAT DETERMINES SCHOOL READINESS?

An individual child's school readiness is determined in large measure by the environment in which he or she lives and grows. The Child Welfare League of America described a vision for the United States in which every child is healthy and safe and develops to his or her full capacity.<sup>5</sup> Five universal needs of all children were described. First, children need the very basics of proper nutrition, economic security, adequate clothing and shelter, appropriate education, and primary and preventive physical and mental health services. Second, children need strong nurturing relationships within their families, their communities, and their peer groups. Third, children need opportunities to develop their talents and skills and to contribute to their communities. Children with indications of disability need early assessment and intervention to prevent later, more-serious problems. Fourth, children need protection from injury,

abuse, and neglect, as well as from exposure to violence and discrimination. Fifth, children have a basic need for healing. When we have not been able to protect them, children need us to ease the effects of any harm they have suffered by providing emotional support, by addressing physical and mental health care needs, and by sometimes making amends through restorative judicial practices. Meeting these needs requires collaborative comprehensive approaches, so that children become a priority at the levels of the family, the community, and the nation.<sup>5</sup>

Education and child development literature has focused on 4 major conceptualizations of school readiness. The "idealist/nativist" view suggests that children are ready for school when they mature to the level of having self-control, peer relations, and the ability to follow directions and that this process is endogenously determined. In this construct, environment plays only a minor role and little can be done to accelerate this process. In contrast, the "empiricist/environmentalist" view of readiness is determined by what children know (eg, colors, shapes, counting, and address) and how they behave. This is understood as the direct result of what the child has been taught. In both of these constructs, the solution to a child's failure to achieve a universal level of proficiency would be to give the child more time to mature or to learn these more-basic concepts, by placing the child in less-demanding programs.<sup>6</sup> However, research shows that age is a less-important influence on developmental progress than is schooling. In one study, the independent effects of schooling were 4 times greater than those of age on kindergarten performance.<sup>7</sup> In a similar study, any age-associated academic advantage provided at first grade entry dissipated within a few years.<sup>8</sup>

A third perspective on school readiness is a "social constructivist" model, which rejects the idea that readiness is an endogenous process or a defined set of knowledge and sees readiness in social and cultural terms. The focus of this model is on the community and its values and expectations, rather than on the child. A potential problem with this view is the lack of focus on the individual child.

The final construct of readiness that has been proposed is an "interactional relational" model. In this perspective, the focus is on the child and the environment and also on the ongoing interaction between them. This theory focuses on helping all children learn, and it suggests that educational success depends on the reciprocal relationship between the school and the child, particularly on the mentorship of the teacher.<sup>6</sup> This fourth model has gained the greatest recognition by developmentalists, because it is most consistent with the current understanding of the importance of early experiences and early relationships, especially in promoting child development.<sup>9</sup>

### INAPPROPRIATE USE OF SCHOOL READINESS TESTING

There are 6 fundamental misconceptions prevalent regarding school readiness, which serve mostly to keep children out of school, rather than ensuring that chil-

dren will be ready and capable when they reach kindergarten. These misconceptions are as follows. (1) Learning happens only at school. (2) Readiness is a specific condition within each child. (3) Readiness can be measured easily. (4) Readiness is mostly a function of time (maturation), and some children need a little more. (5) Children are ready to learn when they can sit quietly at a desk and listen. (6) Children who are not ready do not belong in school.<sup>10</sup>

An emphasis on kindergarten readiness that looks only at the skills of a child places an undue burden of proof of readiness on that child and is particularly unfair because of economic, experiential, and cultural inequities in our society. Typical or normal development in 4- and 5-year-old children is highly variable, and labeling children at such an early age may cause them to be isolated from a more-appropriate learning environment.

In a 1988 national survey, 10% to 50% of children in various states who were eligible to enter kindergarten on the basis of age did not enter because of readiness test scores.<sup>11</sup> A follow-up survey in 1996<sup>12</sup> did show a response to growing concerns about misuse of these kinds of data. Most states had moved away from readiness testing by developing policies against the use of such testing, by issuing publications on appropriate assessment in early childhood, or by providing professional development opportunities in early childhood assessment. However, local districts in many states continue to use standardized testing for young children. Although the definition of kindergarten eligibility in every state is based on child age, many states continue to conduct standard statewide screening or assessment, to allow local districts to choose their own instruments of assessment, and to develop statewide readiness assessments. Few states have no assessment of readiness, and methods for addressing children with special needs are determined locally in most states.<sup>13</sup>

The current disparity between school and child readiness may be because schools are not prepared to offer the necessary and appropriate educational setting for age-eligible children, not because children cannot learn in an appropriate educational setting. If there is a predetermined set of skills necessary for school enrollment, then commitment to promoting universal readiness must address early-life inequities in experience. This may be accomplished by providing access to opportunities that promote educational success, recognize and support individual differences among children, and establish reasonable and appropriate expectations of children's capabilities at school entry for all children.<sup>14</sup> The data gained from testing children at kindergarten entry need to be interpreted carefully. Ideally, data can be used as a tool to help prepare schools for the diverse group of children they will be serving, rather than as a means of excluding children from formal education at their potential entry point. It is the responsibility of the schools to be ready for all children and to work with families to make the school experience more positive for all children, even those who may be at varying stages of readiness. School programs should be flexible and adaptable to each child's level of readiness.

With an increasing national emphasis on school performance and accountability, it is likely that readiness assessment will become more prevalent. Assessing young children is difficult theoretically, psychometrically, and logistically. However, the question is becoming how to assess children, rather than whether they should be assessed. An important remaining issue is how these data will be used. The potential for misuse of these data, with long-lasting effects, is great. Nonetheless, data on the condition of children entering school can be important for interpreting later accountability measures and can help us understand how well early childhood programs perform in raising the developmental level of young children before school entry.

### **HOW READY ARE US CHILDREN AS THEY ENTER KINDERGARTEN?**

A landmark study by the National Center for Education and Statistics surveyed a nationally representative sample of 22 000 first-time kindergarten students and their schools, classroom teachers, and families. The study was designed to gather information about the entry status of the nation's kindergartners, to inform educational policy and practice. Information was obtained regarding children's cognitive, emotional, social, and physical development, as well as their family interactions and home literacy environment. In the study, children "at risk for school difficulty" were defined as children whose mothers had less than a high school education, children who came from single-mother families, children who had received public assistance, and children who lived in families whose primary language was not English.<sup>15,16</sup>

Fifty-one percent of parents of children who entered kindergarten for the first time in 1998 rated their child's general health as excellent, and 32% rated it as very good. Kindergartners whose mothers had higher levels of education, who were from 2-parent families, whose families had not used public assistance, and who were of white non-Hispanic descent were rated as having generally better health by their parents. Six percent of the first-time kindergartners were experiencing vision problems, and 3% were identified as having hearing problems. In that study, 12% of boys and 11% of girls were at risk of overweight, defined as BMI at or above age- and gender-specific guidelines. The risk was greater for children whose mothers had not attained a bachelor's degree and for children from homes where the primary language spoken was not English.<sup>15,16</sup>

The study attempted to examine the social and emotional status of first-time kindergartners. Teachers reported that 10% to 11% of children often argued or fought with others or angered easily, and 77% often formed friendships. Single parents were more likely to report behavior problems, such as fighting, arguing, and getting angry. Parents with partners, those with higher education, and those who had not received public assistance were more likely to have kindergartners with prosocial behaviors, such as often forming friendships. Teachers were less likely than parents to report that children were eager to learn (75% vs 92%). Children with lower maternal education, those from single-

mother homes, and those whose families had received public assistance were less likely to be viewed as eager to learn by their teachers.<sup>15,16</sup>

Variability also was seen in home literacy environments and in family interactions for first-time kindergartners. Forty-five percent of parents reported reading with their child every day, but this value decreased to 36% if mothers had less than a high school education, 38% if English was not the primary language spoken at home, 35% for black non-Hispanic children, and 39% for Hispanic children. Almost three fourths of parents reported having more than 25 children's books at home, but this was true for only 38% of kindergartners whose mothers had not graduated from high school and only 35% of those from homes where English was not the primary language spoken. Only approximately one half of kindergartners from black non-Hispanic, Hispanic, or Native American families had more than 25 children's books at home. In contrast, more families that had some of these risks engaged in singing and in exercise and game-playing with their young children. Although 45% of parents overall sang with their children daily, this increased to 51% in single-mother families, 49% in families that had received some public assistance, and 54% in black non-Hispanic families. Twenty-two percent of parents exercised and played games with their children daily. This value increased to 27% for mothers who had not completed high school, 24% for single-mother families, 29% for families that had received some public assistance, 29% for black non-Hispanic families, and 31% for Native American families.<sup>15,16</sup>

Early academic competencies were also surveyed in the study. In 1998 in the United States, as children entered kindergarten for the first time, two thirds recognized their letters, and 29% also recognized beginning sounds; 94% recognized single numerals and shapes and could count to 10, and 58% could count beyond 10, sequence patterns, and use nonstandard units of length to compare objects. Of those children, 37% demonstrated strong print familiarity skills, including knowing that print reads from left to right and knowing where to go when a line of print ends. Kindergartners' performance on math, reading, and general knowledge items increased with the level of their mothers' education and was higher for children from 2-parent families.<sup>15,16</sup>

Overall, children with few risk factors were more likely to have attained these various proficiencies and were in better general health than were children at risk. Follow-up evaluation of the same children in the spring of first grade showed that children who demonstrated early literacy skills and who came from a positive literacy environment, who possessed a positive approach to learning, and who enjoyed very good or excellent general health at kindergarten entry performed better in both reading and mathematics after 2 years of formal schooling than did children who did not have these resources. The relationships between the resources children possessed at kindergarten entry and their reading and mathematics performance in the spring of first grade remained significant after controlling for the influence of children's poverty status and their race/ethnicity.<sup>17</sup>

When these children were evaluated after 4 years of education, in the spring of third grade, children with more family risk factors (eg, living below the poverty level, primary language spoken in the home was not English, mother had not completed high school, and single-parent home) demonstrated lower mean achievement scores in reading, mathematics, and science. Over that time, children with more family risk factors made smaller gains in math and reading, so that the achievement gaps between disadvantaged and more-advantaged children grew wider over the first 4 years of school. The third-graders completed self-descriptive questionnaires evaluating internalizing (eg, shy, withdrawn, or sad) and externalizing (eg, fighting, arguing, or distractibility) behavior problems. Overall problem behavior scores were low; however, children with lower achievement and more family risk factors tended to rate themselves higher on both of the problem behavior scales.<sup>18</sup>

These findings, although they are disturbing, are not surprising to pediatricians, who have long been advocates for underserved pediatric populations. This inequity in school readiness, which is apparent at school entry and is associated with persistent academic underachievement and social-emotional risk, points to a need to address these differences before children enter kindergarten, especially for families and children at risk.

#### **CHILDREN WITH SPECIAL EDUCATIONAL NEEDS**

When discussing the issue of school readiness, it is critical to discuss the approximately 20% of children identified as having special educational needs. Foremost in this discussion is the importance of not using screening instruments or testing by nonprofessionals to label children or to place them in special education classes.<sup>19</sup> Farran and Shonkoff<sup>20</sup> argued that children with disabilities are of 2 primary types, namely, normative and nonnormative. Those who are classified as normative constitute only 2% of the population; they may suffer from blindness, deafness, autism, moderate/profound mental retardation, or some type of significant language impairment. It is understood that regular general education may not be appropriate for them. Nonnormative children constitute 18% of the population. Children in this population group may be categorized as having learning disabilities, mild mental retardation, or social and emotional maladjustment. These nonnormative categories may be a reflection more of what society accepts as normal behavior than of a lack of ability or development. The authors warned that "as more and more types of children are excluded because they are deemed not ready, smaller and smaller differences among the remaining children will be accented and new categories will be developed."<sup>20</sup>

It is important to point out that the number of children receiving special education services increases each year. There was a 64% increase in enrollment in special education categories in the public schools between 1976 and 1999, whereas total enrollment of children in elementary and secondary schools increased by less than 12% in that time period. Also, almost 2 million more children were labeled as having learning disabilities in

1999 than in 1977. However, there were 364 000 fewer children labeled as mentally retarded and 234 000 fewer children who were categorized as having speech impairments.<sup>21</sup>

### **HOW CAN SCHOOLS AND COMMUNITIES PROMOTE SCHOOL READINESS?**

Much less has been studied about the readiness of schools and communities to meet the needs of the diverse population of children.<sup>22</sup> One approach to identifying and tracking indicators of school and community preparedness is the School Readiness Indicators: Making Progress for Young Children program, a partnership of 16 states funded by the David and Lucile Packard Foundation, the Ford Foundation, and the Ewing Marion Kauffman Foundation. This initiative has 3 goals, that is, (1) to create a set of measurable indicators related to and defining school readiness that can be tracked at the state and local levels; (2) to have states adopt this indicator-based definition of school readiness, to fill in gaps in data, to track data, and to report findings to their citizens; and (3) to stimulate policies, programs, and other actions to improve the ability of children to read at grade level by third grade. Sample systems indicators tracked by this group include (1) the proportion of children with health coverage; (2) the proportion of 3- and 4-year-old children enrolled in high-quality early education and child care programs; (3) the proportion of schools offering universal access to full-day kindergarten; (4) the proportion of children with hearing, vision, or dental problems not detected at school entry; (5) the number of adults enrolled in adult education programs or programs teaching English as a second language per 100 adults seeking those services; (6) the proportion of births to mothers with less than a 12th-grade education; and (7) the proportion of children younger than 6 years of age in foster care who have had more than 2 placements in 24 months. The complete set of indicators selected by each state is available at the initiative Web site ([www.gettingready.org](http://www.gettingready.org)). It is the belief of those investigators that this work will play an important role in shaping the educational agenda for young children and their families across the country.<sup>23,24</sup>

### **WHAT PEDIATRICIANS CAN DO TO PROMOTE SCHOOL READINESS**

Pediatricians can and do promote school readiness in the children they serve, in many ways. In their day-to-day practices in medical homes, pediatric providers promote optimal nutrition, growth, and physical health as part of health maintenance, including provision of immunizations and anticipatory guidance. Their guidance regarding developmental and behavioral issues and concerns can help parents enhance their nurturing relationships with their children. By providing ongoing surveillance and information regarding injury prevention, pediatric providers can help protect children from injury and abuse. Pediatricians can screen for psychosocial risks, such as family violence, maternal depression, substance abuse, and lack of connection to community and family

supports. They can counsel families with these kinds of needs and refer them to appropriate resources within the community. Pediatricians can emphasize improved identification of children with delays in their development by integrating regular, systematic, developmental screening and surveillance into their practices.<sup>25</sup> Children identified as having delays and children at risk of delays can then be referred to community-based services, such as early intervention programs, home visitation programs, Head Start, and special education programs available through school departments. After referral, pediatricians can monitor children's participation and progress as a result of the referral.

As part of daily practice, pediatric providers can promote the "5 Rs" of early education, that is, reading together as a daily family activity; rhyming, playing, and cuddling together often; routines and regular times for meals, play, and sleeping, which help children know what they can expect and what is expected from them; praise as reward for everyday successes; and reciprocal and nurturing relationships, which are the foundations of healthy child development. Pediatricians can integrate literacy promotion into their practices toward this end.

Pediatricians should be well informed regarding interventions of known benefit to young children. A review of the effects of low income (the unifying factor associated with developmental risk) on child development identified many evidence-based interventions that have proven efficacy in improving psychosocial outcomes for children at risk.<sup>26</sup> Head Start for healthy preschoolers from low-income families has been shown consistently to improve vocabulary, early writing, and early mathematics scores. Long-term follow-up studies demonstrated remarkable differences for children who participated in these programs, compared with control children, in educational attainment, home ownership, incarceration rates, and employment.<sup>27-30</sup> A study of the economic features of investing in a 1-year, high-quality, universal, preschool education in California estimated a \$7000 net present-value benefit per child. This benefit equaled a return of \$2.62 for every \$1 invested, with an annual return rate of 10% over 60 years. This model did not include other benefits to society, such as the improved health and well-being of participating children and the potential intergenerational transmission of favorable benefits.<sup>31</sup>

Economists at the Federal Reserve Bank of Minneapolis examined the rate of return on investment for early education in Minnesota. When considering the Perry Preschool Program, which provided high-quality preschool to 3- and 4-year-old children in poverty, they found a "real" return on investment, adjusted for inflation, of 16%, with at least 75% of those benefits going to the general public.<sup>32</sup> The benefit/cost ratio (the ratio of the aggregate program benefits over the life of the child to the input of costs) was found to be greater than 8:1.<sup>33</sup>

Other evidence-based interventions with substantial effects on school readiness include early intervention programs for formerly preterm infants, which have been shown to prevent developmental delay, to improve grade retention, and to accelerate placement into special

education.<sup>34-36</sup> Food supplement programs, such as the Special Supplemental Nutrition Program for Women, Infants, and Children, have been shown to reduce rates of low birth weight<sup>37</sup> and iron deficiency.<sup>38-40</sup> Children attending schools with school nutrition programs have improved scores on standardized academic tests.<sup>41</sup> Home visiting by nurses has been shown consistently to reduce rates of childhood injury, to increase fathers' involvement, to reduce family welfare dependency, and to improve school readiness.<sup>42</sup> Housing subsidies have resulted in improved neighborhood safety and reduced exposure to violence.<sup>43</sup> In addition, clinic-based, literacy-promoting programs that include the provision of children's books and anticipatory guidance about the importance of reading aloud with young children have been shown to enhance language development in toddlers<sup>44</sup> and preschoolers.<sup>45</sup>

Programs and policies that are without proven efficacy but are deemed likely to have positive effects on child development include housing policies to decrease frequent moves, smoking cessation programs for parents and pregnant women, improved access to high-quality health care, and identification and treatment of maternal depression and other mental health problems.<sup>26,46</sup>

As respected child advocates and political consultants, pediatricians can promote school readiness by advocating for provision of services that are evidence-based and that demonstrate efficacy in promoting optimal early brain and child development. Some examples include (1) access to health care, including mental health services, for all children; (2) standards for state Medicaid and Early and Periodic Screening, Diagnosis, and Treatment programs that conform, at a minimum, to American Academy of Pediatrics (AAP) recommendations<sup>47</sup>; (3) full funding for Head Start (which now must turn away 4 of 10 eligible children because of lack of resources), for Early Head Start (which now serves <5% of eligible children and families), and for federal child care subsidies (now available to only 1 of 5 eligible families)<sup>48,49</sup>; and (4) improved funding for and infrastructure to support the provision of high-quality, universal, early education and child care from birth to kindergarten for all families, as described in a policy statement from the AAP.<sup>50</sup>

Pediatricians can advocate, individually and through collaboration in their own communities, with their AAP chapters on the state level and in coordination with the AAP Washington office on the national level. AAP chapters can be the centers for advocacy because they have experience, resources, and established relationships with policymakers who will be making decisions at the state level.<sup>51,52</sup> The AAP offers opportunities to affect these policies on a national level through the Federal Advocacy Action Network. Opportunities also exist for pediatricians to get involved in State Early Childhood Comprehensive Systems activities in their states. The goal of this federally funded initiative is to implement a comprehensive early childhood system that promotes the health and well-being of young children, enabling them to enter school ready and able to learn (for more information, see [www.healthychildcare.org](http://www.healthychildcare.org)).

## CONCLUSIONS

School readiness needs to become an outcome measure for community-based programs, rather than an exclusion criterion at the educational starting gate. Indeed, kindergarten should no longer be viewed as the beginning of a child's educational experience. Our new knowledge of early brain and child development has demonstrated that modifiable factors in a child's early experience can greatly affect that child's learning trajectory. Three qualities that are necessary for children to be ready for school are intellectual skills, motivation to learn, and strong social-emotional capacity and support.<sup>9</sup> These qualities are influenced by the health and well-being of the families and neighborhoods in which children are raised. Many US children enter kindergarten with limitations in their social-emotional, physical, and cognitive development that might have been significantly diminished or eliminated through early recognition of and attention to child and family needs. There is much that pediatricians can do to address and to diminish these discrepancies.

### COMMITTEE ON EARLY CHILDHOOD, ADOPTION, AND DEPENDENT CARE, 2007-2008

Pamela High, MD, MS, Chairperson  
Elaine Donoghue, MD  
Kerry L. English, MD  
Jill Fussell, MD  
Paula Kienberger Jaudes, MD  
Veronnie Faye Jones, MD  
Moirra Ann Szilagyi, MD, PhD  
Dennis L. Vickers, MD, MPH

### LIAISONS

Jerlean Daniel, PhD  
National Association for the Education of Young Children  
Claire Lerner, LCSW  
Zero to Three  
Millicent M. Williams  
Child Welfare League of America  
Phyllis Stubbs-Wynn, MD, MPH  
Maternal and Child Health Bureau

### STAFF

Mary Crane, PhD, LSW

### COUNCIL ON SCHOOL HEALTH EXECUTIVE COMMITTEE, 2007-2008

Robert D. Murray, MD, Chairperson  
Stephen E. Barnett, MD  
Cynthia DiLaura Devore, MD  
Rani S. Gereige, MD, MPH  
Linda M. Grant, MD, MPH  
Jeffrey H. Lamont, MD  
Harold Magalnick, MD  
George J. Monteverdi, MD  
Evan G. Pattishall III, MD  
Michele M. Roland, MD  
Lani S. M. Wheeler, MD

## LIAISONS

Monique Jasmin Collier, MD  
Section on Residents  
Sandy Delack, RN, MEd  
National Association of School Nurses  
Mary Vernon-Smilely, MD, MPH  
Centers for Disease Control and Prevention  
Robin Wallace, MD  
Independent School Health Association

## STAFF

Madra Guinn-Jones, MPH

## REFERENCES

1. Knudsen EI, Heckman JJ, Cameron JL, Shonkoff JP. Economic, neurobiological, and behavioral perspectives on building America's future workforce. *Proc Natl Acad Sci USA*. 2006;103(27):10155–10162
2. Heckman JJ. The economics, technology, and neuroscience of human capability formation. *Proc Natl Acad Sci USA*. 2007;104(33):13250–13254
3. Zuckerman B, Halfon N. School readiness: an idea whose time has arrived. *Pediatrics*. 2003;111(6):1433–1436
4. National Education Goals Panel. *The Goal 1 Technical Planning Subgroup Report on School Readiness*. Washington, DC: National Education Goals Panel; 1991
5. Morgan LJ, Spears LS, Kaplan C. *Making Children a National Priority: A Framework for Community Action*. Washington, DC: Child Welfare League of America; 2003
6. Meisels SJ. Assessing readiness. In: Pianta RC, Cox MJ, eds. *The Transition to Kindergarten*. Baltimore, MD: National Center for Early Development and Learning; 1999:39–66
7. Bentin S, Hammer R, Cahan S. The effects of aging and first grade schooling on the development of phonological awareness. *Psychol Sci*. 1991;2(4):271–274
8. Bickel DD, Zigmond N, Strahorn J. Chronological age at entrance to first grade: effects on elementary school success. *Early Child Res Q*. 1991;6(2):105–117
9. Shonkoff JP, Phillips DA, eds. *From Neurons to Neighborhoods: The Science of Early Childhood Development*. Washington, DC: National Academy Press; 2000
10. Willer B, Bredekamp S. Public policy report: redefining readiness: an essential requisite for educational reform. *Young Child*. 1990;45(5):22–24
11. Gnezda MT, Bolig R. *A National Survey of Public School Testing of Prekindergarten and Kindergarten Children*. Alexandria, VA: National Academy of Sciences; 1988
12. Shepard LA, Taylor GA, Kagan SL. *Trends in Early Childhood Assessment Policies and Practices*. Washington, DC: US Department of Education; 1996
13. Saluja G, Scott-Little C, Clifford RM. Readiness for school: a survey of state policies and definitions. *Early Child Res Pract*. 2000;2(2). Available at: <http://ecrp.uiuc.edu/v2n2/saluja.html>. Accessed January 19, 2006
14. National Association for the Education of Young Children, National Association of Early Childhood Specialists in State Departments of Education. *Early Learning Standards: Creating the Conditions for Success: A Joint Statement of the National Association for the Education of Young Children and the National Association of Early Childhood Specialists in State Departments of Education*. Washington, DC: National Association for the Education of Young Children; 2002
15. West J, Denton K, Germino-Hausken E. *America's Kindergartners: Findings From the Early Childhood Longitudinal Study, Kindergarten Class of 1998–99*. Washington, DC: National Center for Education Statistics; 2001
16. Zill N, West J. *Findings From the Condition of Education 2000: Entering Kindergarten*. Washington, DC: National Center for Education Statistics; 2001
17. Denton K, West J. *Children's Reading and Mathematics Achievement in Kindergarten and First Grade*. Washington, DC: National Center for Education Statistics; 2002. Available at: <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2002125>. Accessed January 19, 2006
18. Rathburn A, West J. *From Kindergarten Through Third Grade: Children's Beginning School Experiences*. Washington, DC: National Center for Education Statistics; 2004. Available at: <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2004007>. Accessed January 19, 2006
19. American Academy of Pediatrics, Committee on School Health, Committee on Early Childhood, Adoption, and Dependent Care. The inappropriate use of school "readiness" tests. *Pediatrics*. 1995;95(3):437–438
20. Farran DC, Shonkoff JP. Developmental disabilities and the concept of school readiness. *Early Educ Dev*. 1994;5(2). Available at: <http://readyweb.crc.uiuc.edu/library/1994/farran.html>. Accessed January 19, 2006
21. National Center for Education Statistics. Elementary and secondary education. In: *Digest of Education Statistics*. Washington, DC: National Center for Education Statistics; 2001. Available at: <http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2002130>. Accessed January 19, 2006
22. Halle T, Zaff J, Calkins J, Margie NG. *Background for Community-Level Work on School Readiness: A Review of Definitions, Assessments, and Investment Strategies, Part II: Reviewing the Literature on Contributing Factors to School Readiness*. Washington, DC: Child Trends; 2000. Available at: [www.childtrends.org/Files/LIT\\_REVIEW\\_DRAFT7.pdf](http://www.childtrends.org/Files/LIT_REVIEW_DRAFT7.pdf). Accessed January 19, 2006
23. Bryant EB, Walsh CB. *States Use Indicators of School Readiness to Improve Public Policies for Young Children*. New York, NY: National Center for Children in Poverty; 2005
24. Rhode Island KIDS COUNT. *Getting Ready: National School Readiness Indicators Initiative: A 17-State Partnership: Executive Summary*. Providence, RI: Rhode Island KIDS COUNT; 2005. Available at: [www.rikidscount.org/matriarch/Documents/Getting%20Ready%20-%20Full%20Report.pdf](http://www.rikidscount.org/matriarch/Documents/Getting%20Ready%20-%20Full%20Report.pdf). Accessed April 17, 2007
25. American Academy of Pediatrics, Council on Children With Disabilities, Section on Developmental Behavioral Pediatrics, Bright Futures Steering Committee, Medical Home Initiatives for Children With Special Needs Project Advisory Committee. Identifying infants and young children with developmental disorders in the medical home: an algorithm for developmental surveillance and screening. *Pediatrics*. 2006;118(1):405–420
26. Weitzman M. Low income and its impact on psychosocial child development. In: Tremblay RE, Barr RG, Peters RDeV, eds. *Encyclopedia on Early Childhood Development*. Montreal, Canada: Centre of Excellence for Early Childhood Development; 2003:1–8. Available at: [www.child-encyclopedia.com/pages/PDF/Low\\_income.pdf](http://www.child-encyclopedia.com/pages/PDF/Low_income.pdf). Accessed January 19, 2006
27. Currie J. Early childhood education programs. *J Econ Perspect*. 2001;15(2):213–238
28. Devaney BL, Ellwood MR, Love JM. Programs that mitigate the effects of poverty on children. *Future Child*. 1997;7(2):88–112
29. Lee VE, Brooks-Gunn J, Schnur E, Liaw FR. Are Head Start effects sustained? A longitudinal follow-up comparison of disadvantaged children attending Head Start, no preschool, and other preschool programs. *Child Dev*. 1990;61(2):495–507
30. Bracey GW. Investing in preschool. *Am Sch Board J*. 2003;190(1):32–35
31. Karoly LA, Bigelow JH. *The Economics of Investing in Universal*

*Preschool Education in California*. Santa Monica, CA: Rand Corp; 2005

32. Rolnick R, Grunewald R. *Technical Report: Early Childhood Development: Economic Development With a High Public Return*. Minneapolis, MN: Federal Reserve Bank of Minneapolis; 2003. Available at: <http://minneapolisfed.org/pubs/fedgaz/03-03/earlychild.cfm>. Accessed January 7, 2008
33. Heckman JJ. Skill formation and the economics of investing in disadvantaged children. *Science*. 2006;312(5782):1900-1902
34. Berlin LJ, Brooks-Gunn J, McCarton C, McCormick MC. The effectiveness of early intervention: examining risk factors and pathways to enhanced development. *Prev Med*. 1998;27(2):238-245
35. Brooks-Gunn J, McCarton CM, Casey PH, et al. Early intervention in low-birth-weight premature infants: results through age 5 years from the Infant Health and Development Program. *JAMA*. 1994;272(16):1257-1262
36. McCormick MC, McCarton C, Tonascia J, Brooks-Gunn J. Early educational intervention for very low birth weight infants: results from the Infant Health and Development Program. *J Pediatr*. 1993;123(4):527-533
37. Kotelchuck M, Schwartz JB, Anderka MT, Finison KS. WIC participation and pregnancy outcomes: Massachusetts State-wide Evaluation Project. *Am J Public Health*. 1984;74(10):1086-1092
38. Rush D, Leighton J, Sloan NL, et al. The National WIC Evaluation: evaluation of the Special Supplemental Food Program for Women, Infants, and Children, part VI: study of infants and children. *Am J Clin Nutr*. 1988;48(2 suppl):484-511
39. Vazquez-Seoane P, Windom R, Pearson HA. Disappearance of iron-deficiency anemia in a high-risk infant population given supplemental iron. *N Engl J Med*. 1985;313(19):1239-1240
40. Yip R, Binkin NJ, Fleshood L, Trowbridge FL. Declining prevalence of anemia among low-income children in the United States. *JAMA*. 1987;258(12):1619-1623
41. Meyers AF, Sampson AE, Weitzman M, Rogers BL, Kayne H. School Breakfast Program and school performance. *Am J Dis Child*. 1989;143(10):1234-1239
42. Olds DL, Henderson CR Jr, Kitzman HJ, Eckenrode JJ, Cole RE, Tatelbaum RC. Prenatal and infancy home visitation by nurses: recent findings. *Future Child*. 1999;9(1):44-65, 190-191
43. Centers for Disease Control and Prevention. Community interventions to promote healthy social environments: early childhood development and family housing: a report on recommendations of the Task Force on Community Preventive Services. *MMWR Recomm Rep*. 2002;51(RR-1):1-8
44. High PC, LaGasse L, Becker S, Ahlgren I, Gardner A. Literacy promotion in primary care pediatrics: can we make a difference? *Pediatrics*. 2000;105(4):927-934
45. Mendelsohn AL, Mogilner LN, Dreyer BP, et al. The impact of a clinic-based literacy intervention on language development in inner-city preschool children. *Pediatrics*. 2001;107(1):130-134
46. Weitzman M, Byrd RS, Aligne CA, Moss M. The effects of tobacco exposure on children's behavioral and cognitive functioning: implications for clinical and public health policy and future research. *Neurotoxicol Teratol*. 2002;24(3):397-406
47. Schor EL, Abrams MK, Shea K. Medicaid: health promotion and disease prevention for school readiness. *Health Aff (Millwood)*. 2007;26(2):420-429
48. Helburn SW, Bergmann BR. *America's Child Care Problem: The Way Out*. New York, NY: Palgrave; 2002
49. National Association for the Education of Young Children. *Financing the Early Childhood Education System: NAEYC Policy Brief*. Washington, DC: National Association for the Education of Young Children; 2001. Available at: [www.naeyc.org/ece/pdf/financing-policy-brief.pdf](http://www.naeyc.org/ece/pdf/financing-policy-brief.pdf). Accessed January 19, 2006
50. American Academy of Pediatrics, Committee on Early Childhood, Adoption, and Dependent Care. Quality early education and child care from birth to kindergarten. *Pediatrics*. 2005;115(1):187-191
51. Brenner C, Floyd S, Copeman A. *Seven Things Policy Makers Need To Know About School Readiness: Revised and Expanded Toolkit*. Des Moines, IA: State Early Childhood Policy Technical Assistance Network; 2005
52. Bruner C. *Many Happy Returns: Three Economic Models That Make the Case for School Readiness*. Des Moines, IA: State Early Childhood Policy Technical Assistance Network; 2004



**School Readiness**  
Pamela C. High  
*Pediatrics* 2008;121:e1008  
DOI: 10.1542/peds.2008-0079

**Updated Information & Services**

including high resolution figures, can be found at:  
<http://pediatrics.aappublications.org/content/121/4/e1008>

**References**

This article cites 28 articles, 10 of which you can access for free at:  
<http://pediatrics.aappublications.org/content/121/4/e1008#BIBL>

**Subspecialty Collections**

This article, along with others on similar topics, appears in the following collection(s):  
**Community Pediatrics**  
[http://www.aappublications.org/cgi/collection/community\\_pediatrics\\_sub](http://www.aappublications.org/cgi/collection/community_pediatrics_sub)  
**School Health**  
[http://www.aappublications.org/cgi/collection/school\\_health\\_sub](http://www.aappublications.org/cgi/collection/school_health_sub)  
**Current Policy**  
[http://www.aappublications.org/cgi/collection/current\\_policy](http://www.aappublications.org/cgi/collection/current_policy)  
**Council on Early Childhood**  
[http://www.aappublications.org/cgi/collection/committee\\_on\\_early\\_childhood\\_adopt\\_dept\\_care](http://www.aappublications.org/cgi/collection/committee_on_early_childhood_adopt_dept_care)  
**Council on School Health**  
[http://www.aappublications.org/cgi/collection/council\\_on\\_school\\_health](http://www.aappublications.org/cgi/collection/council_on_school_health)

**Permissions & Licensing**

Information about reproducing this article in parts (figures, tables) or in its entirety can be found online at:  
<http://www.aappublications.org/site/misc/Permissions.xhtml>

**Reprints**

Information about ordering reprints can be found online:  
<http://www.aappublications.org/site/misc/reprints.xhtml>

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™



# PEDIATRICS®

OFFICIAL JOURNAL OF THE AMERICAN ACADEMY OF PEDIATRICS

## **School Readiness**

Pamela C. High

*Pediatrics* 2008;121:e1008

DOI: 10.1542/peds.2008-0079

The online version of this article, along with updated information and services, is located on the World Wide Web at:

<http://pediatrics.aappublications.org/content/121/4/e1008>

Pediatrics is the official journal of the American Academy of Pediatrics. A monthly publication, it has been published continuously since 1948. Pediatrics is owned, published, and trademarked by the American Academy of Pediatrics, 141 Northwest Point Boulevard, Elk Grove Village, Illinois, 60007. Copyright © 2008 by the American Academy of Pediatrics. All rights reserved. Print ISSN: 1073-0397.

American Academy of Pediatrics

DEDICATED TO THE HEALTH OF ALL CHILDREN™

