Attending Kindergarten and Already Behind: A Statistical Portrait of Vulnerable Young Children

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***O**verview Equal educational opportunity is an enduring goal of American society. Stories of poor kids from rough neighborhoods who succeed in school and in adulthood are staples of both novels and biographies. Indeed, the current focus on "leaving no child behind" demonstrates our society's desire to make success in school the norm for all children.*

However, the unfortunate reality is that even while on the first rung of the educational ladder – kindergarten – many children already lag behind. Some have health problems that impede their ability to learn. Others lack the cognitive skills that are associated with early academic achievement. Some lag behind others in the social and emotional skills that are needed for successful classroom participation. And still other children may be behind in all three of these areas.

Much of the existing published information on young children who are not flourishing in school focuses on a single area, such as cognitive development or health status. Moreover, much of this information is based on a partial set of measures within that single area (such as scores on tests of reading, in the case of cognitive development, or birthweight, in the case of health status). While such information is valuable, it cannot adequately tell us what percentage of children are lagging behind in multiple areas.

This Research Brief addresses that need. It provides a more comprehensive picture of young children attending kindergarten as of 1998-99 who were lagging behind their peers by reporting on the results of recent analyses of a nationally representative survey of kindergartners. The brief covers multiple measures within and across three areas of potential vulnerability: health, cognitive achievement, and social and emotional development. The survey is the Early Childhood Longitudinal Study-Kindergarten Class of 1998-99 (ECLS-K) [see box on page 2 for more information about the ECLS-K].

Through these analyses, Child Trends was able to provide estimates of the total number of children who are lagging behind in one, two, or three of these areas. Why is this important? It's important because if we know about how many vulnerable children actually exist and what their needs are, we will be in a better position to help them "catch up" so that they can develop their full potential as learners, workers, and citizens. We place special emphasis on children lagging behind in more than one area because they are the children who are likely to need substantial extra services.

Readers should note that this brief does not present an analysis of children's "school readiness." School readiness, appropriately measured, focuses on the abilities of children as they enter school for the first time[1] as these abilities interact with the expectations of the school environment. In contrast, this brief focuses on children who are already in kindergarten, with cognitive achievement measured in the spring, when they have already had the benefit of most of the kindergarten year. This group also includes children who are taking kindergarten for the second time. Children's school readiness is also widely conceptualized in terms of five dimensions of young children's development (physical development, language and literacy, other aspects of cognitive development, social and emotional development, and approaches to learning such as motivation and the ability to focus on a task).[2] Here, we combined measures from language and literacy with other aspects of cognitive development and combined approaches to learning, with aspects of social and emotional development.

One striking finding from these analyses is that, although many children lag behind in one area, many fewer lag behind in multiple areas. For example, of the approximately 3.9 million kindergartners in the 1998-1999 school year, 2.2 million lagged behind in at least one area. However, only 610,000 kindergartners lagged behind in at least two areas. The most vulnerable children of all, though, are those who lag behind in all three areas. These triply at-risk children are likely to have the most problems as they try to climb the educational ladder. The "good news" is that this is a relatively small group, constituting only about five percent of the total kindergarten population, or 192,000 children.

Because of the great diversity of the nation's kindergartners and the wide variations in their living conditions and living arrangements, Child Trends also drew on the survey data to analyze the demographic and socioeconomic composition of kindergartners who are lagging behind. These analyses found that several subgroups are overrepresented among kindergartners who trail behind their peers: boys; non-Hispanic blacks; children from educationally disadvantaged, low-income, or single-parent families; and children living in troubled neighborhoods. It should be noted that there is substantial overlap among these groups with, for example, non-Hispanic blacks substantially overrepresented among low-income and single-parent families and among families living in troubled neighborhoods.

THE BIG PICTURE

Child Trends selected the individual measures to create the three areas of potential vulnerability (health, cognitive achievement, and social and emotional development) and established "cut-points" to identify vulnerable children in each area.[5] Each cut-point is a specific score that is used to separate children who are considered to be functioning at or above an age-appropriate level from those who are considered to be lagging behind. Using these cut-points, Child Trends calculated the number and percentage of children who are lagging behind, considering all the measures for each area, and then estimated the degree of overlap of kindergartners across the three areas.[6] The results of these descriptive analyses for the 3.9 million-kindergarten class of 1998-99 are presented below.

- **Health:** About 31 percent of all kindergarten students – or about 1.2 million – had at least one health challenge. This means they were either (1) overweight (beyond the 95th percentile), (2) behind in their motor skills development, or (3) in fair or poor health or had a disability.

- **Cognitive achievement:** About 20 percent of all kindergartners – or about 753,000– lagged behind in the cognitive area. This means they were behind in multiple areas of their educational achievement according to standardized test scores and/or teacher ratings.

About the Data Source for This Brief

The Early Childhood Longitudinal Study, Kindergarten Class of 1998-1999 (ECLS-K), sponsored by the National Center for Education Statistics, provides the data used to identify children who are lagging behind in the three areas. The ECLS-K base-year sample was comprised of about 22,000 children enrolled in more than 1,200 kindergarten programs. In the health area, the survey provides information on height and weight, motor skills, general health status, and developmental limitations. In the cognitive area, it provides information on several key areas of learning, including language and literacy, mathematics, and knowledge of the social and physical worlds, based on individual assessments given to children, as well as teacher assessments. In the social and emotional area, it provides information on both positive social behaviors (e.g., ease at participating in activities and good interactions with peers) and problem behaviors (e.g., temper tantrums, fighting, and inability to pay attention), derived from assessments by parents and teachers. The sample children are being followed from kindergarten through fifth grade, with data collected in the fall and spring of the kindergarten year (1998-1999), the fall and spring of first grade (1999-2000), the spring of third grade (2002), and the spring of fifth grade (2004). This brief and the working paper on which it is based[3] draw upon data primarily from the kindergarten year. All 22,000 children in the ECLS-K were included in these analyses, including those who are part-time or full-time kindergartners, who are in private or public school, and who are either enrolled in kindergarten for the first time or who are repeating the grade. [4]

- **Social and emotional development:** About 31 percent of all kindergartners – or about 1.2 million – lagged behind in the social and emotional area. This means they were behind in several behaviors or social skills, according to their parents/and or their teachers.

- **Behind in all three areas:** About 5 percent of all kindergartners – or about 192,000 – lagged behind in all three areas.
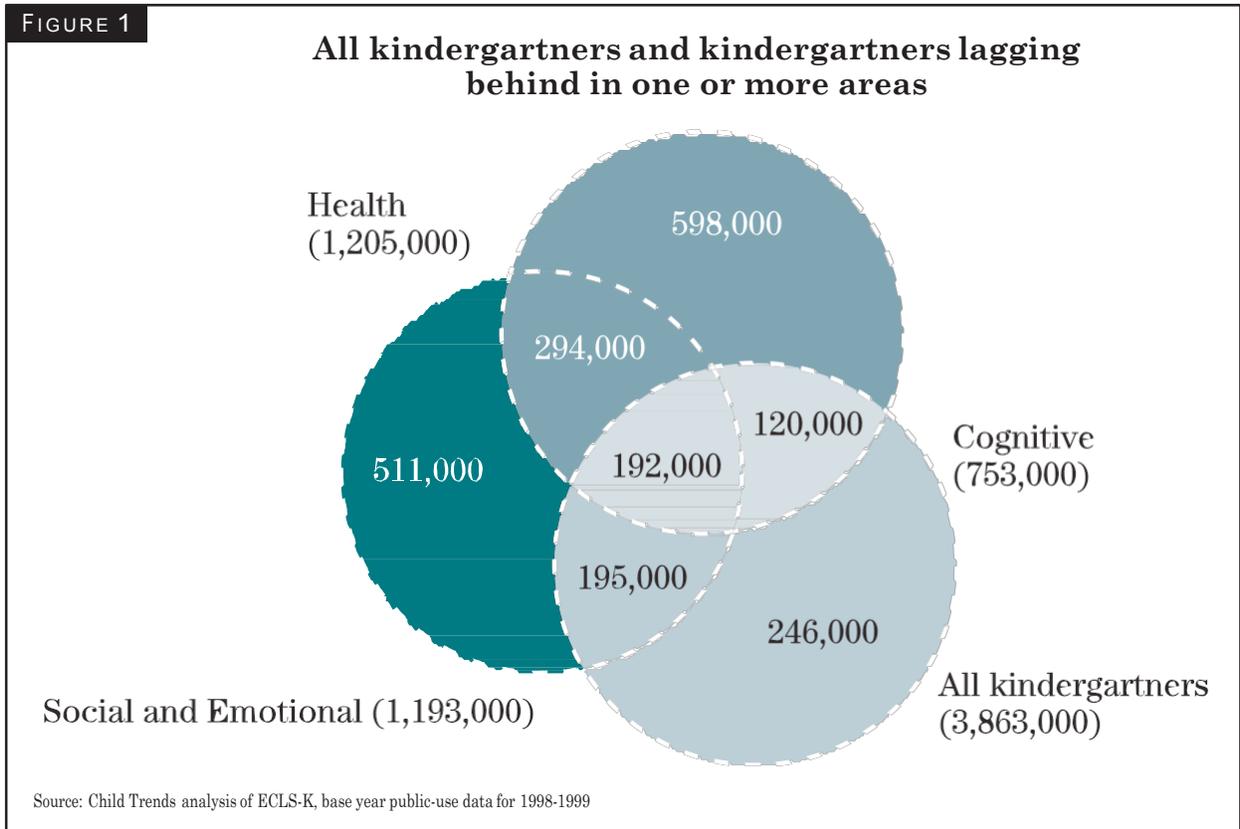
As mentioned previously, many kindergartners who are lagging behind in one area also are lagging behind in one or both of the other two areas. As seen in Figure 1, for example, in 1998-99:

- Of the 1.2 million kindergartners who were estimated to have at least one health problem, only 598,000 were lagging behind *just* in that area. There were 294,000 children with health problems who were also lagging behind in the social and emotional area, but not the cognitive area, and 120,000 children with health problems who were also lagging behind in the cognitive area, but not in the social and emotional area.

- Similarly, of the 753,000 children lagging behind in the cognitive area, only 246,000 were lagging behind *just* in that area. There

were 195,000 children lagging behind in both the cognitive and social and emotional areas who did not have health problems, and, as noted above, 120,000 children with health problems who were also lagging behind in the cognitive area, but not in the social and emotional area.

- Finally, of the 1.2 million kindergartners who were lagging behind in the social and emotional area, only 511,000 were lagging behind *just* in that area.
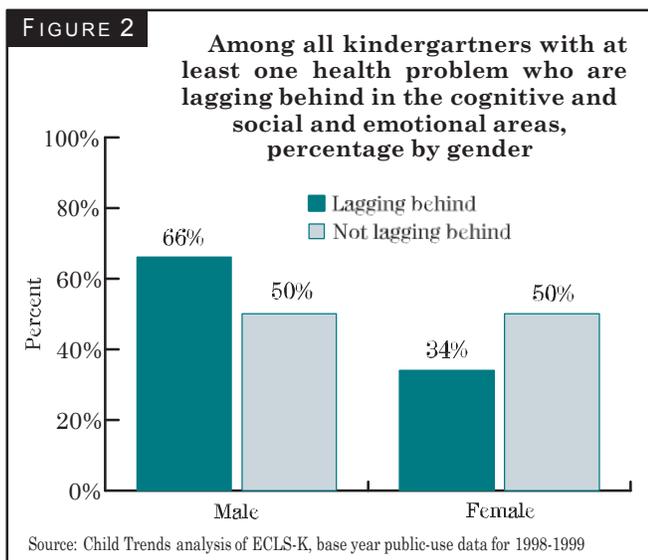
All told, in the 1998-99 school year, 2.2 million (56 percent) of the nation's 3.9 million kindergartners lagged behind in one or more areas. In other words, 1.7 million (44 percent) were not behind in any area. On the other hand, 1.4 million kindergartners lagged in one area (35 percent) and 802,000 kindergartners (21 percent) lagged behind in two or more areas. Only 192,000 (five percent) lagged behind in all three areas. Still, although relatively small in number, the long-term costs of failing to help this group improve these outcomes are likely to be high since research shows lasting consequences for lagging behind early.[7] Again, the reader is reminded that this picture applies to all kindergartners – including repeaters – and is not intended to be a measure of school readiness of entering kindergartners.

FIGURE 1

All kindergartners and kindergartners lagging behind in one or more areas

Health (1,205,000)
598,000
294,000
511,000
192,000
120,000
Cognitive (753,000)
195,000
246,000
Social and Emotional (1,193,000)
All kindergartners (3,863,000)

Source: Child Trends analysis of ECLS-K, base year public-use data for 1998-1999

WITHIN THE BIG PICTURE

Children on the first rung of their school careers but already lagging behind their peers do not constitute a monolithic group. Demographic and socioeconomic analyses can provide insights into differences[8] within the general population of educationally vulnerable young children. Since children lagging behind in all three areas, though a small group, are the most vulnerable of the vulnerable, we examined an expansive list of variables to gain a richer understanding of this group. Highlights from these analyses of data[9] for the 1998-99 kindergarten class are presented below:
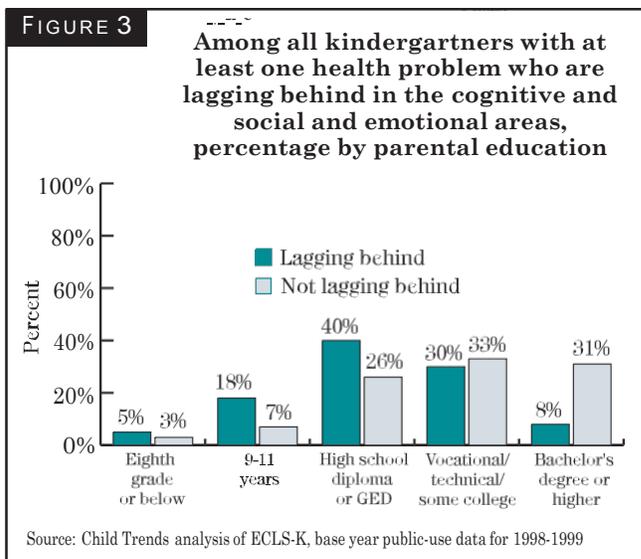
- **Gender.** Boys accounted for two-thirds of the kindergartners who were lagging behind across all three areas – health, cognitive, and social and emotional – but only 50 percent of those who were not lagging behind in all three areas (see Figure 2).

FIGURE 2

Among all kindergartners with at least one health problem who are lagging behind in the cognitive and social and emotional areas, percentage by gender

Source: Child Trends analysis of ECLS-K, base year public-use data for 1998-1999

- **Race/ethnicity.** Non-Hispanic blacks were overrepresented among kindergartners who lagged behind in all three areas. Twenty-seven percent of children who were lagging behind in all three areas were black, while among those not lagging behind, only 16 percent were black. Conversely, non-Hispanic white and Asian/Pacific Islander children were underrepresented among children lagging behind in all three areas. Among those lagging behind in all three areas, 43 percent were non-Hispanic white and one percent were Asian/Pacific Islander, compared with 59 percent and three percent, respectively, among

kindergartners not lagging behind in all three areas. Hispanics were not significantly overrepresented among kindergartners who lag behind in all three areas.

- **Parental education.** Among kindergartners who were lagging behind in all three areas, 63 percent of the parents had a relatively low level of education (a high school diploma, GED, or less) while, among those not lagging behind in all three areas, the percentage was only 36 percent (see Figure 3).

FIGURE 3

Among all kindergartners with at least one health problem who are lagging behind in the cognitive and social and emotional areas, percentage by parental education

Source: Child Trends analysis of ECLS-K, base year public-use data for 1998-1999

- **Household income.** Among kindergartners who were lagging behind in all three areas, 55 percent lived in households with incomes of less than $25,000 a year, compared with 29 percent for those not similarly lagging behind. Conversely, among those lagging behind, only 24 percent lived in households with incomes of $40,000 or higher, compared with 52 percent for other children.

- **Country of birth.** Foreign-born children accounted for a disproportionately small percentage of kindergartners who were lagging behind in all three areas – only one percent of those lagging behind, compared with three percent of those not similarly lagging behind.

- **Family structure.** Children in single-parent families are overrepresented among kindergartners who lag behind in all three areas. Thirty-three percent of children who were lagging behind in all three areas were living with single parents, while among those not similarly lagging behind only 22 percent were living with single parents. Conversely,

45 percent of kindergartners lagging behind in all three areas were living with two biological parents, compared with 65 percent among other children.

- **Neighborhood environment.** Among children lagging behind in all three areas, seven percent lived in neighborhoods in which violent crime was somewhat of a problem or a big problem, according to parent reports, compared with four percent of other children; 20 percent lived in neighborhoods in which selling or using drugs was a problem, compared with 10 percent of other children; 22 percent lived in neighborhoods in which garbage was a problem, compared with 12 percent of other children; and 41 percent lived in neighborhoods in which it is somewhat safe or not at all safe to play outside, compared with 29 percent of other children.

DISCUSSION AND IMPLICATIONS

It should be noted that the measures developed for this work, and the cut-points in these analyses, are not the only possible choices. Representative samples of young children have become available only recently, and analytic procedures are still evolving. We also remind readers that this is a study of kindergarten students (including repeaters), not a study of "school readiness." With these caveats, we believe that the estimates provided here provide new and important information about students early in their academic careers.

The findings presented in this *Research Brief* have important implications for service providers who design programs to help vulnerable children "catch up." Beyond the ranks of service providers, the issue of overlapping educational vulnerabilities among the nation's youngest students has implications for policy makers, philanthropists, community activists, school system employees, parents, and other members of the general public who share a common concern of wanting to see *all* of America's children achieve in school – and in life. In this light, one encouraging finding presented in this brief is that, in spite of the relatively large percentage of kindergartners lagging behind in one area who also lag behind in a second area, relatively few lag behind in all three areas. Thus, the need for highly specialized programs to help children who face challenges in all three areas is relatively small – which is not to suggest that the need does not exist. Indeed, programs designed to help vulnerable children overcome problems in one or even two areas may not

be effective for those who are triply at-risk, so more innovative (and perhaps, costly) approaches may be required for this group.[10]

Service providers in programs designed to improve school performance of young children may find other information presented in this brief especially relevant to their work. For example, they should expect that a disproportionate percentage of the clients served by these programs would be boys, in keeping with our finding that boys are at special risk for lagging behind in three areas of development. This finding will not be "news" to some. Both recent news media coverage and government reports have drawn attention to the male-female school achievement gap.[11]

Similarly, service providers are unlikely to be surprised by the finding that children in disadvantaged households also are overrepresented among kindergartners lagging behind in multiple areas. This finding is in sync with accumulating research on the negative consequences of growing up poor and/or in a single-parent family with a less-educated parent.[12] It may also suggest that providers of services to kindergartners who are lagging behind should screen these kindergartners' families for eligibility for programs that support low-income families.[13]

One result from the survey data that may surprise some people is the lack of evidence showing that young children born outside the United States lag behind their U.S.-born peers.[14] In fact, the data show that foreign-born children are *underrepresented* among kindergartners lagging behind in all three areas of potential vulnerability. (According to analysis of the ECLS-K, three percent of young children lagging behind cognitively were born outside the U.S., while only two percent of young children not lagging behind were born outside the U.S., but this difference is not statistically significant. However, young, foreign-born children are *less* likely to have health problems.)

Taken together, the results of Child Trends' analyses of the survey data on the nation's kindergartners may be useful to communities planning the levels of services that need to be provided to their young children. The overall implication of these analyses is that vulnerable children require different levels of services depending upon their different needs. Most children who are not lagging behind in any area probably do not require special services.[15] Children who are lagging behind in a single area presumably need enhanced services, but mainly those targeted at deficiencies in that single area. Children who lag

behind in multiple areas presumably need the highest level of services, especially because a disproportionate percentage of these children also face the daunting challenges associated with living in disadvantaged families and neighborhoods. Fortunately, children requiring the highest level of services constitute the smallest group. While the size of this group suggests that addressing its needs will be a manageable task, effective strategies will require careful consideration of the nature of the challenges this group faces and of how to address multiple challenges simultaneously.

This *Research Brief* draws heavily from "A Portrait of Vulnerable Children in Kindergarten," a working paper by Richard Wertheimer, Ph.D., and Tara Croan that was originally submitted to the William and Flora Hewlett Foundation in October 2002. The paper is available on the Child Trends Web site, www.childtrends.org. The authors thank Michael Wald of Stanford University and Martha Zaslow, Ph.D., and Tamara Halle, Ph.D., of Child Trends for their contributions to the development of this brief, and Jerry West, Ph.D., at the National Center for Education Statistics of the U.S. Department of Education for his careful review of the text.

Editor: Harriet J. Scarupa

Endnotes

[1]Kagan, S. L., Moore, E., & Bradekamp, S. (1995). *Reconsidering children's early development and learning: Toward common views and vocabulary.* Washington, DC: National Education Goals Panel Goal 1 Technical Planning Group; National Education Goals Panel. (1997). *Getting a good start in school.* Washington, DC: Author.

[2]Child Trends. (2001, October). *School readiness: Helping communities get children ready for school and schools ready for children* (Research brief). Washington, DC: Author.

[3]Wertheimer, R., & Croan, T. (2002). *A portrait of vulnerable children in kindergarten.* Washington, DC: Child Trends.

[4]Including kindergarten repeaters is consistent with our decision not to focus on school readiness. Thus, our sample is representative of *all* kindergartners and includes a higher proportion of vulnerable children than would a sample that excludes them.

[5]In general, in each of the three broad domains, children were deemed as lagging behind if they were lagging behind in one-third (or the nearest approximation to one-third) of the major components comprising the domain.

In the health domain, we used height and weight in order to create a body mass index (BMI) of the child to determine if the child was overweight. We coded children as overweight if their BMI was in the 95th percentile or above for gender and age – the Centers for Disease Control and Prevention established cut-off point for overweight. We also used both fine and gross motor skills in order to assess the psychomotor development of the child. For the fine motor skills,

scores ranged from zero to nine (one point for each of the figures copied and up to two points each for building a gate with blocks and drawing a person). For gross motor skills, the scores ranged from zero to eight (up to two points for each of the four tasks). Thus, the composite motor skills score ranged from zero to 17. After discarding the tasks that were too easy for kindergartners and considering the number of points allocated to those tasks, a cut-point of seven or fewer points was established to be classified as lagging behind on psychomotor skills.

From the parent reports, we used the overall health rating of the child. The possible response categories for the parent rating of the child's overall health were: 1) excellent, 2) very good, 3) good, 4) fair, and 5) poor. If the parent categorized their child in *fair* or *poor* health *or* with at least one limiting condition, they were classified as having a health problem.

Respondents were coded as having a health problem if they were behind in one out of three measures (consistent with the "one-third" rule described above). Thus, if a child was behind in any one of the three components, we would consider them to have problems with their health

For the cognitive domain, we used both direct and indirect measures of cognitive achievement. The direct measures are one-on-one assessments and include scores on language and literacy (reading), mathematics, and knowledge of the physical and social worlds (referred to as "general knowledge"). The reading items were designed to measure vocabulary, comprehension, and basic skills such as letter recognition. The mathematics questions were designed to measure problem solving, conceptual knowledge, and procedural knowledge. The general knowledge portion was designed to assess science and social studies comprehension, such as children's ability to form questions about the natural world and conceptual understanding of scientific facts. From the five available types of direct cognitive test scores, we used the "proficiency probability scores" from the spring of kindergarten. The indirect cognitive measures are teachers' evaluations of children's skills and achievement in each of the three areas assessed in the direct measures, targeted to a specific grade level.

For the direct measures, we selected two measures of reading skills—beginning sounds and ending sounds—and two measures of mathematics skills—relative size and ordinality-sequence—as skills that spring kindergartners could be expected to have mastered.

Our approach was to analyze the spring kindergarten scores in terms of their ability to predict to an assessment of reading skills and mathematics skills by first-grade teachers. A rating by the first-grade teacher of far below average or below average was required to be classified as lagging behind in spring of first grade. We began the analysis by grouping together the far below average students with the below average students (as assessed by their first-grade teacher) into one group—termed "far below average or below average"—and similarly grouping the remaining students into an "average, above average, or far above average group." We then calculated the cumulative number of students in each of these two groups with test scores below various levels. As a start, we picked 0.0, .05, .10, .20, ...90, .95, 1.00 as our levels. Next, we considered each level as a potential cut-point between students whose scores indicated they would perform poorly (i.e., below or far below average) by spring of first grade and those who would not. At each level, we calculated the number of students who would be misclassified if that level were chosen as the cut-point. Students were considered to be misclassified if their score was below the potential cut-point, but their teacher assessment in the first grade was, nonetheless, average or higher; or if their score was above the potential cut-point, but their teacher assessment in the first grade was below average or lower.

For each variable, the general pattern was that, as the potential cut-point was increased, the percentage of misclassified students at first declined and then increased. By a process of successive approximation, we determined the potential cut-point with the lowest percentage misclassified.

The resulting test score cut points that represented the lowest percentage misclassified overall were:

- beginning sounds = .301 (19.9 percent misclassified),
- ending sounds = .103 (20. percent misclassified),
- relative size = .450 (14.8 percent misclassified), and
- ordinality-sequence = .048 (15.8 percent misclassified).

For the indirect measures, teacher ratings of the student's proficiency in certain skills were used to assess kindergartners' cognitive achievement. The skills that we decided to examine for reading were:

1) uses complex sentence structure,
2) understands and interprets a story or other text read to him/her,
3) easily and quickly names all upper-and lower-case letters
of the alphabet, and
4) produces rhyming words.

For mathematics, we decided to examine:

1) sorts, classifies, and compares math materials by various rules and attributes,
2) orders a group of objects,
3) shows an understanding of the relationship between quantities, and
4) solves problems involving numbers using concrete objects.

All of the general knowledge questions were used. The response categories for the indirect teacher assessments were: 1) not yet, 2) beginning, 3) in progress, 4) intermediate, and 5) proficient. Kindergartners were classified as lagging behind in each skill if they received ratings of not yet or beginning by their teacher. Our reasoning was that children who were rated as not yet or beginning clearly have not made substantial progress towards mastering the skill. The decision to count kindergartners rated as in progress or intermediate as not lagging behind was more difficult. On the one hand, these children have made substantial progress towards proficiency. But, on the other hand, they have not yet achieved it. While this decision arguably could have gone either way, we decided that, when the decision was not clear-cut, we would choose the option that led to a smaller percentage of kindergartners being classified as lagging behind.

In addition, we used the overall teacher ratings in the spring of kindergarten. The three questions (i.e., language/literacy, mathematics, general knowledge) were identical to the spring of first grade overall ratings that were used for predictive purposes in the direct cognitive section. Similarly, students rated by their teacher as far below average and below average in the spring of kindergarten were classified as lagging behind.

Our first step in creating an overall cognitive index was to combine the various available scores and ratings into like subgroups. From the direct child assessment scores, we created separate language/literacy and mathematics dummy variables. For language/literacy, if the respondent was lagging behind in both beginning sounds and ending sounds, they were coded as lagging behind in a "direct language/literacy" scale. Similarly, for mathematics, if the respondent was lagging behind in both relative size and ordinality-sequence, the respondent was lagging behind in a "direct math" scale.

For the indirect teacher assessments of specific skills, a "two-thirds" rule was employed within each subject area to create dummy variables. That is, if the respondent was lagging behind in two out of three of the items composing a single subject area, the respondent was classified as lagging behind. The consensus of our Child Trends' child development group was that requiring children to be behind on all of the measures was too stringent a definition of lagging behind and that requiring children to lag behind in at least two-thirds of the measures was more reasonable. Thus, for language/literacy, a respondent was classified as lagging behind in a newly created "indirect language/literacy" index if they were behind in three out of four teacher assessments (the closest approximation to two-thirds for four items). Likewise, for mathematics, a respondent was classified as lagging behind in an "indirect math" index if they were behind in three out of four items. For general knowledge, a respondent was classified as lagging behind in an "indirect general knowledge" index if they were behind in three out of five. The overall teacher ratings of children in each of three subject areas were also used.

Consequently, we had eight resulting components:

1. direct language/literacy;
2. indirect language/literacy;
3. overall rating of language/literacy;
4. direct math;
5. indirect math;
6. overall rating of math;
7. indirect general knowledge; and
8. overall rating of general knowledge.

Kindergartners were classified as lagging behind in overall cognitive achievement if they were behind in three out of the eight components (the nearest approximation to the "one-third" rule).

Data on the socioemotional development of children in the study were from both parents and teachers, who used a frequency scale to report on how often the child demonstrates certain behaviors or social skills. The social rating scale (SRS) given to the parent has five scales, assessing his or her child's socioemotional development in the home environment.

▪ The Approaches to Learning Scale (Parent SRS) includes six items that rate the child's creativity, responsibility, concentration, persistence, interest in a variety of things, and eagerness to learn.

▪ The Self-Control Scale (Parent SRS) has five items that rate the child's ability to control his or her behavior (e.g., frequency with which child fights, argues, throws temper tantrums, gets angry).

▪ The Social Interaction Scale (Parent SRS) includes three items assessing children's ease in joining play, ability to make and keep friends, and positively interacting with peers.

▪ The Impulsive/Overactive Scale (Parent SRS) consists of two items that ask about children's impulsivity and activity level.

▪ The Sad/Lonely Scale (Parent SRS) has four items that ask the parent about children's difficulties with being accepted and liked by others, sadness, loneliness, and low self-esteem.

Teachers were also asked about the student's social skills and behaviors in five scales. The questions contained in the teacher SRS are similar to the parent SRS. However, they are more tailored to the school and classroom environment.

▪ The Approaches to Learning Scale (Teacher SRS) includes six items that measure the child's attentiveness, task persistence, eagerness to learn, learning independence, flexibility, and organization.

▪ The Self-Control Scale (Teacher SRS) consists of four items about the child's ability to respect the property rights of others, control his or her temper, accept peer ideas for group activities, and respond appropriately to peer pressure.

▪ The Interpersonal Skills Scale (Teacher SRS) has five items that rate the child's skill in forming and maintaining friendships, getting along with people who are different, comforting or helping other children, expressing feelings, opinions, and ideas in positive ways, and showing sensitivity to the feelings of others.

▪ The Externalizing Problem Behaviors Scale (Teacher SRS) includes five items assessing the frequency with which the student argues, fights, gets angry, acts impulsively, and disturbs ongoing activities.

▪ Finally, the Internalizing Problem Behavior Scale (Teacher SRS) consists of four items addressing the child's anxiety, loneliness, low self-esteem, and sadness.

The individual items are not made available for either the parent or teacher SRS. Only the mean scores for each of the five teacher scales and five parent scales were provided. However, it was possible to approximate the responses to the individual items by simply knowing the overall mean score on each scale and how many items are in the scale, given that we know the possible response categories. We developed two methods for this approximation – one for positive scales (e.g., good social interaction) and one for negative scales (e.g., externalizing problem behaviors).

For positive scales, we used often and very often as a guideline for not lagging behind and never and sometimes as a guideline for lagging behind. That is, if we had known what the responses on the individual items were, we would have coded responses of never and sometimes as lagging behind. We then examined all of the permutations of possible responses, based on the number of items contained in each of the positive scales. Next, we calculated the lowest possible score to still be counted as not lagging behind and the highest possible combination of scores to still be counted as lagging behind, employing the "two-thirds" rule described in the previous section. For example, on a 3-item positive scale, the highest possible combination of scores to still be counted as lagging behind was a two, two, and a four (sometimes, sometimes, and very often). Finally, a respondent was coded as lagging behind if his or her mean score on a positive scale—the score provided to us—was less than or equal to the average of the previous two calculations.

For negative scales, we used never as a guideline for not lagging behind and sometimes, often, and very often as a guideline for lagging behind. Given parents' generally favorable perceptions of their children, we reasoned that children rated as sometimes on negative items are exhibiting problem behaviors at least part of the time and therefore should be included in the lagging behind category. Therefore, a response of sometimes may indicate a genuine problem.

Examining the permutations of all of the possible responses, we then determined the highest possible score to still be counted as not lagging behind and the lowest possible combination of scores to still be counted as lagging behind, again employing the "two-thirds" rule. A respondent was classified as lagging behind on a negative scale if his or her mean score on a negative scale—again the score provided to us—was greater than or equal to the average of the two calculations.

After completing this process, we then had ten (five parent and five teacher) dummy variables for the socioemotional domain. Using the one-third rule, a child was classified as lagging behind if the child was behind in three out of ten of the socioemotional scales.

[6]It should be noted that different methodologies can produce different cut-points and estimates. See for example, Hair, E., Halle, T., Terry-Humen, T., & Calkins, J. (2003, April). Naturally occurring patterns of school readiness: How the multiple dimensions of school readiness fit together. Paper presentation at the biennial meeting of the Society for Research in Child Development, Tampa, FL.

[7]A review of the literature (Wertheimer & Croan, 2003) reveals that many children who are lagging behind their peers in early childhood have problems that persist through childhood and some even into adulthood. For example, within the health domain, being overweight

or obese as an adult has been linked to childhood weight in a number of studies. Of particular relevance to the kindergarten age, Dietz notes that several sources of data suggest that between the ages of 5 and 7 may be a "critical period" for the development of adult obesity and its complications. See Dietz, W. H. (1994). Critical periods in childhood for the development of obesity. *American Journal of Clinical Nutrition, 59*: 955-959.

[8]All the differences referred to in this brief are statistically significant at p < .05.

[9]For more complete results of these analyses, including a full set of tables, see the full paper. It should be noted that many of these risk factors are correlated with one another and these analyses are descriptive rather than causal.

[10]Sameroff, A.J., Seifer, R., Barocas, R., Zax, M. & Greenspan, S. (1987). Intelligence quotient scores of 4-year-old children: Social-environmental risk factors. *Pediatrics* Vol. 79, No. 3, pp. 343-350.

[11]See, for example: Denton, K. &West, J. (2002). *Children's reading and mathematics achievement in kindergarten and first grade.* U.S. Department of Education, National Center for Education Statistics (NCES 2002-125). Washington, DC: U.S. Government Printing Office; this document is also available at http://nces.ed.gov/pubs2002/2002125.pdf. As an example of media coverage, see: CBS Worldwide Incorporated. (2002). *The gender gap: Boys lagging.* Retrieved July 14, 2003, from http://www.cbsnews.com/stories/2002/10/31/60minutes/printable527678.shtml

[12]See, for example: Duncan, G., & Brooks-Gunn, J., (Eds). (1997). *The consequences of growing up poor.* New York: Russell Sage Foundation. See also: Moore, K.A., & Redd, Z. (2002, November). *Children in poverty: Trends, consequences, and policy options* (Research brief). Washington, DC: Child Trends; and Wertheimer, D. (2003, May). *Poor families in 2001: Parents working less and children continue to lag behind* (Research brief). Washington, DC: Child Trends.

[13]Examples include Food Stamps, Medicaid, the State-Children's Health Insurance Program (S-CHIP), and the Women, Infants and Children (WIC) program, as well as food distribution, tutoring, and other programs operated by private charities and community organizations.

[14]Foreign-born kindergartners do appear slightly overrepresented among those lagging behind cognitively, but the difference is not statistically significant.

[15]This is not to say that they couldn't *benefit* from special services. For example, gifted and talented children may benefit greatly from special services, and sometimes they may not thrive without these services. Moreover, some problems may be detectable in a clinical setting but not by the diagnostic tools available in ECLS-K.

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