

# Ready for School

## Can Full-Day Kindergarten Level the Playing Field?

**R**ecent research has shown that the skills and knowledge that children have upon entering school is predictive of later achievement. As a result, there has been increased focus on school readiness of children entering kindergarten, where school readiness is broadly defined to encompass both academic aspects of development, such as literacy and cognitive skills, as well as nonacademic aspects such as social, emotional, and physical health. Recognizing that children from disadvantaged backgrounds often lag behind their more advantaged peers with respect to cognitive and social-emotional skills, some policymakers advocate the provision of full-day kindergarten as a means of leveling the playing field. Proponents of full-day kindergarten argue that the extended time in these programs can be used to increase students' readiness at first grade and beyond. They also point to studies that show academic benefits of full-day kindergarten participation through the end of first grade. However, critics point to the costs of implementing full-day kindergartens and to the uncertainty about longer-term benefits of full-day kindergarten.

A new RAND report helps inform this debate by examining how children's skills and knowledge at kindergarten entry and attendance at full-day kindergarten affect achievement in later grades and whether full-day kindergartens foster the development of school readiness. It addresses two main research questions:

(1) What is the relationship between children's school readiness skills at kindergarten entry and reading and mathematics achievement through the fifth grade?

(2) What kindergarten program factors predict the development of nonacademic school readiness skills? In particular, is attendance at a full-day program related to nonacademic school readiness?

### Abstract

For children who enter school unready to learn, policymakers have been looking to full-day kindergarten as a way to level the playing field. Using longitudinal survey data on a nationally representative sample of children, this RAND study examined issues related to school readiness and the effect of full-day kindergarten on student performance. Both academic and nonacademic school readiness skills at entry to kindergarten were significantly related to reading and mathematics achievement in fifth grade. As with earlier studies, the study finds that full-time kindergarten programs may not enhance achievement in the long term.

### Methods

The study conducted a longitudinal analysis using data from the Early Childhood Longitudinal Study, Kindergarten Class of 1998–1999 (ECLS-K), a nationally representative sample of entering kindergarten students in 1998 and 1999. The study analyzed data from 7,897 students and their parents, teachers, and school leaders, collected during five waves: fall of kindergarten, spring of kindergarten, first grade, third grade, and fifth grade. Several different kinds of outcomes for children were reported:

- fine and gross motor skills performance at kindergarten entry
- teacher-reports of students' numerical and literacy skills at kindergarten entry
- mathematics and reading achievement at each wave
- teacher-reports of students' nonacademic readiness skills along five dimensions:
  - Approaches to learning (i.e., dispositions toward learning)
  - Self-control
  - Interpersonal skills
  - Internalizing problem behaviors (measured by a scale indicating presence of anxiety, loneliness, low self-esteem, and sadness)
  - Externalizing problem behaviors (measured by a scale indicating acting-out behaviors such as getting angry, arguing, and fighting).

Teachers also provided information on teaching practices, experience, and class size. Parents provided information about the child's home background, and school leaders provided information about school context variables, such as percent of minority students.

## **Findings**

### **There Were Large Differences in Academic Achievement and School Readiness at Kindergarten Entry Continuing Through Fifth Grade Among Racial/Ethnic Groups.**

On average, white and Asian students entered kindergarten with the highest scores in both reading and mathematics, whereas on average Hispanic and black students demonstrated the lowest achievement scores. Reflecting what other studies have found, the achievement gaps in mathematics and reading between these groups became more pronounced over time, with white and Asian students on average scoring approximately three-fourths of a standard deviation higher than Hispanics and nearly one standard deviation higher than blacks by the end of fifth grade.

On average, teachers evaluated white and Asian students as being most socially and emotionally prepared for kindergarten in terms of approaches to learning, self-control, and interpersonal skills. Teachers rated black students as having, on average, the poorest interpersonal skills, dispositions toward learning, and self control. Black students were also more likely to exhibit problem behaviors, showing a tendency to engage in negative externalizing behaviors.

### **Better Academic and Nonacademic School Readiness Skills at Kindergarten Entry Were Associated with Higher Mathematics and Reading Scores by Fifth Grade.**

Having greater numerical/literacy skills and more developed fine motor skills on entry to kindergarten were significantly associated with later higher test scores. Higher levels of externalizing behavioral problems on entry were negatively associated with eventual mathematics and reading achievement.

The effect of some nonacademic skills differed across the two subjects. Having better dispositions toward learning in kindergarten was associated with later higher mathematics achievement and having more internalizing behavior problems was negatively associated with mathematics achievement, but these skills were unrelated to eventual reading performance. Conversely, having more developed gross motor skills was negatively associated with later reading achievement, but was unrelated to mathematics scores.

### **Early Nonacademic School Readiness Skills Helped Explain the Later Black-White Achievement Gap in Reading but Not in Mathematics.**

Even after taking into account school readiness skills at kindergarten entry, racial/ethnic differences in mathematics achievement were evident in later school years. Results indicate that, on average, after controlling for school readiness skills, whites trailed Asians in mathematics but outperformed blacks, Hispanics, and students of other races. In reading, much of the difference in the black-white reading achievement gap in later school years was attributable to differences in their nonacademic readiness skills at kindergarten entry.

### **Attendance in a Full-Day Kindergarten Program Had Little Effect on Reading Achievement but Was Negatively Associated with Mathematics Achievement and the Development of Nonacademic School Readiness Skills.**

There was little difference in the reading achievement of students attending full-day or half-day kindergarten programs as they progressed through school. However, in mathematics, attendance in a full-day kindergarten program was negatively associated with later fifth-grade performance when the nonacademic readiness skills of students were taken into account.

Children who participated in a full-day kindergarten program demonstrated lower levels of nonacademic readiness skills through the fifth grade, including poorer dispositions toward learning, lower self-control, and worse interpersonal skills than children in part-day programs. Children in full-day programs also showed a greater tendency to engage in externalizing and internalizing problem behaviors than did children in part-day programs.

### **Home Background Variables Were Important in the Development of Nonacademic School Readiness Skills.**

Children whose parents were more involved with schools and who came from higher-income families demonstrated better approaches toward learning, more self-control, and better social skills at fifth grade. They also were less likely to exhibit problem behaviors. Engagement in extracurricular activities was also positively predictive of dispositions toward learning, and was negatively related to internalizing behavior problems. Taken together, these findings support the hypothesis that family resources help foster nonacademic readiness skills.

## Implications

This study reinforces the findings of earlier studies that suggest full-day kindergarten programs may not enhance achievement in the long term. Furthermore, this study raises the possibility that full-day kindergarten programs may actually be detrimental to mathematics performance and to nonacademic readiness skills. However, the authors warn that these findings should be interpreted carefully because they have not accounted for potential self-selection bias; so it is possible that some of the findings are driven by unobserved characteristics.

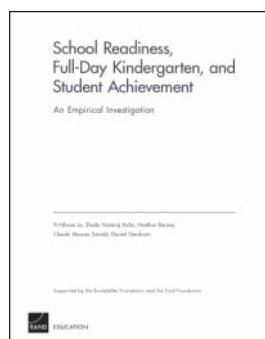
Investments in the development of nonacademic school readiness skills may not only raise overall achievement, but they may also narrow the achievement gap between minority and white students. Current full-day kindergar-

ten programs do not affect nonacademic skills, but perhaps redesigned early-education programs could improve nonacademic skills that ultimately translate into improved academic achievement.

Ultimately, policymakers' decisions about where they should direct funds need to be guided by a cost-benefit analysis that compares investments in full-day kindergarten programs with investments in other potential interventions—such as those that promote nonacademic readiness skills. A program of research that involves a better understanding of how full-day programs and nonacademic skills may influence outcomes, as well as the associated costs of each type of intervention, would provide a strong foundation for future decisions about effective programs. ■

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