

# the condition of education 2004



## INDICATOR 8

# Students' Reading and Mathematics Achievement Through 3rd Grade

The indicator and corresponding tables are taken directly from *The Condition of Education 2004*. Therefore, the page numbers may not be sequential.

Additional information about the survey data and supplementary notes can be found in the full report. For a copy of *The Condition of Education 2004* visit the NCES web site (<http://nces.ed.gov/pubsearch/pubsinfo.asp?pubid=2004077>) or contact ED PUBs at 1-877-4ED-PUBS.

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# Early Childhood Outcomes

## Students' Reading and Mathematics Achievement Through 3rd Grade

*Children without family risk factors, such as poverty, experienced a larger gain in reading and mathematics mean scale scores than their peers from the start of kindergarten through 3rd grade.*

The Early Childhood Longitudinal Study, Kindergarten Class of 1998–99 collects information on a cohort of children who began kindergarten in fall 1998 and follows them through spring 2004, when most will have completed grade 5. The study assesses children’s achievement in reading, mathematics, and general knowledge as they progress through school. From fall 1998 through the end of 3rd grade in spring 2002, children’s average reading scale score increased 81 points, from 27 to 108. The corresponding increase in mathematics was 63 points, from a scale score of 22 in fall 1998 to 85 in spring 2002<sup>1</sup> (see supplemental table 8-1).

The number of family risk factors (household below poverty level, non-English primary home language, mother’s highest education less than a high school diploma/GED, and single-parent household) is negatively associated with children’s achievement gains in reading and mathematics. As the number of family risk factors increased, children experienced smaller gains from the start of kindergarten through the end of 3rd grade in both subject areas. For example, children with no family risk factors had an average gain of 84 points in reading, compared with

a 73-point gain among children with 2 or more family risk factors (NCES 2004–007).

Also, Black children demonstrated smaller gains in reading and mathematics than White, Hispanic, and Asian/Pacific Islander children. Multivariate analysis shows the same patterns of differences after accounting for differences in the number of family risk factors as well as other selected characteristics (i.e., sex, kindergarten program type, and types of schools attended) (NCES 2004–007, p. 20). While race/ethnicity is related to the number of family risk factors (Zill and West 2001, p. 18), after accounting for the factors examined here, race/ethnicity and the number of family risk factors are independently related to children’s gains in reading and mathematics.

At the start of kindergarten in both reading and mathematics, Black children had lower mean achievement scores than other racial/ethnic groups, and children with family risk factors had lower achievement scores than their peers with fewer risk factors. These achievement gaps grew wider from the start of kindergarten in fall 1998 to the end of 3rd grade in spring 2002.

<sup>1</sup>The fall kindergarten to spring 3rd-grade reading scale gains ranged from 16 to 125 points, with a mean of 81 points and a standard deviation of 16.8 points, and the mathematics scale gains ranged from 17 to 104 points, with a mean of 63 points and a standard deviation of 13.7 points.

<sup>2</sup>Family risk factors include living below the poverty level, primary home language was non-English, mother’s highest education was less than a high school diploma/GED, and living in a single-parent household, as measured in kindergarten. See supplemental note 1 for more information on mother’s education and poverty.

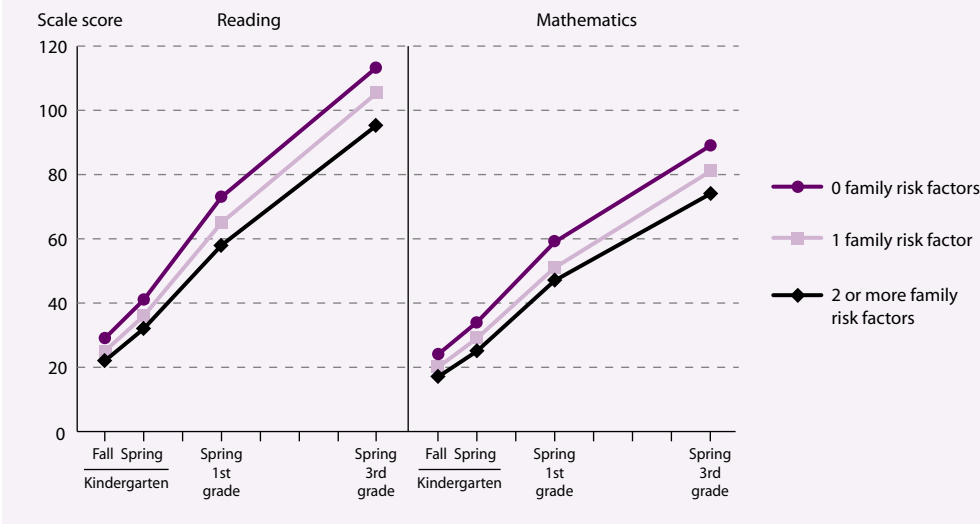
NOTE: The findings are based on children who entered kindergarten for the first time in fall 1998 and were assessed in fall 1998, spring 1999, spring 2000, and spring 2002. Estimates reflect the sample of children assessed in English in all assessment years (approximately 19 percent of Asian children and approximately 30 percent of Hispanic children were not assessed). The Early Childhood Longitudinal Study, Kindergarten Class of 1998–99 (ECLS-K) was not administered in spring 2001, when most of the children were in 2nd grade. Although most of the sample was in 3rd grade in spring 2002, 10 percent were in 2nd grade, and about 1 percent were enrolled in other grades. See supplemental note 3 for more information on ECLS-K.

SOURCE: Rathbun, A, and West, J. (forthcoming). *From Kindergarten Through Third Grade: Children’s Beginning School Experiences* (NCES 2004–007), tables A-4 and A-5. Data from U.S. Department of Education, NCES, Early Childhood Longitudinal Study, Kindergarten Class of 1998–99 (ECLS-K), Longitudinal Kindergarten-First Grade Public-Use data file and Third Grade Restricted-Use data file, Fall 1998, Spring 1999, Spring 2000, and Spring 2002.

FOR MORE INFORMATION:  
Supplemental Notes 1,3  
Supplemental Table 8-1  
NCES 2001–035



**EARLY READING AND MATHEMATICS PERFORMANCE: Children’s reading and mathematics scale scores for fall 1998 first-time kindergartners from kindergarten through 3rd grade, by family risk factors: Fall 1998, spring 1999, spring 2000 and spring 2002<sup>2</sup>**



## Students' Reading and Mathematics Achievement Through 3rd Grade

**Table 8-1. Children's reading and mathematics mean scale scores for fall 1998 first-time kindergartners from kindergarten through 3rd grade, by selected characteristics: Fall 1998, spring 1999, spring 2000, and spring 2002**

Characteristic	Fall kindergarten	Spring kindergarten	Spring 1st grade	Spring 3rd grade	Total gain from fall kindergarten to spring 3rd grade
<b>Reading</b>					
<b>Total</b>	<b>27</b>	<b>39</b>	<b>69</b>	<b>108</b>	<b>81</b>
Sex					
Male	26	38	67	107	80
Female	28	39	70	110	83
Race/ethnicity <sup>1</sup>					
Asian/Pacific Islander	30	43	75	111	81
Black	25	34	61	98	73
White	28	40	71	112	84
Hispanic	24	36	65	105	81
Other	25	36	63	101	76
Number of family risk factors <sup>2</sup>					
0 factors	29	41	73	113	84
1 factor	25	36	65	105	79
2 or more factors	22	32	58	95	73
<b>Mathematics</b>					
<b>Total</b>	<b>22</b>	<b>32</b>	<b>55</b>	<b>85</b>	<b>63</b>
Sex					
Male	22	32	56	86	65
Female	22	32	55	83	62
Race/ethnicity <sup>1</sup>					
Asian/Pacific Islander	23	34	56	88	65
Black	18	26	47	73	55
White	23	34	58	89	65
Hispanic	19	29	52	82	63
Other	20	29	51	80	61
Number of family risk factors <sup>2</sup>					
0 factors	24	34	59	89	65
1 factor	20	29	51	81	61
2 or more factors	17	25	47	74	57

<sup>1</sup>Black includes African American, Pacific Islander includes Native Hawaiian, and Hispanic includes Latino. Racial categories exclude Hispanic origin.

<sup>2</sup>Family risk factors include living below the poverty level, primary home language was non-English, mother's highest education was less than a high school diploma/GED, and living in a single-parent household, as measured in kindergarten. See *supplemental note 1* for more information on mother's education and poverty.

NOTE: Detail may not sum to totals because of rounding. Estimates reflect the sample of children assessed in English in all assessment years (approximately 19 percent of Asian children and approximately 30 percent of Hispanic children were not assessed). The Early Childhood Longitudinal Study, Kindergarten Class of 1998–99 (ECLS-K) reading and mathematics assessments were not administered in spring 2001, when most of the children were in 2nd grade. Although most of the sample was in 3rd grade in spring 2002, 10 percent were in 2nd grade, and about 1 percent were enrolled in other grades. See *supplemental note 3* for more information on ECLS-K. SOURCE: Rathbun, A, and West, J. (forthcoming). *From Kindergarten Through Third Grade: Children's Beginning School Experiences* (NCES 2004–007), tables A-4 and A-5. Data from U.S. Department of Education, NCES, Early Child Longitudinal Study, Kindergarten Class of 1998–99 (ECLS-K), Longitudinal Kindergarten–First Grade Public-Use data file and Third Grade Restricted-Use data file, Fall 1998, Spring 1999, Spring 2000, and Spring 2002.

## Students' Reading and Mathematics Achievement Through 3rd Grade

**Table S8.** Standard errors for children's reading and mathematics scale scores for fall 1998 first-time kindergartners from kindergarten through 3rd grade, by family risk factors: Fall 1998, spring 1999, spring 2000, and spring 2002

Number of family risk factors	Fall kindergarten	Spring kindergarten	Spring 1st grade	Spring 3rd grade
<b>Reading</b>				
0 factors	0.4	0.5	0.8	0.7
1 factor	0.3	0.5	1.0	0.9
2 or more factors	0.3	0.7	0.9	1.2
<b>Mathematics</b>				
0 factors	0.3	0.4	0.5	0.7
1 factor	0.3	0.5	0.7	0.9
2 or more factors	0.2	0.6	0.6	0.9

SOURCE: Rathbun, A, and West, J. (forthcoming). *From Kindergarten, Through Third Grade: Children's Beginning School Experiences* (NCES 2004-007), tables A-4a and A-5a. Data from U.S. Department of Education, NCES, Early Child Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K), Longitudinal Kindergarten-First Grade Public-Use data file and Third Grade Restricted-Use data file, Fall 1998, Spring 1999, Spring 2000, and Spring 2002.

## Students' Reading and Mathematics Achievement Through 3rd Grade

**Table S8-1.** Standard errors for children's reading and mathematics mean scale scores for fall 1998 first-time kindergartners from kindergarten through 3rd grade, by selected characteristics: Fall 1998, spring 1999, spring 2000, and spring 2002

Characteristic	Fall kindergarten	Spring kindergarten	Spring 1st grade	Spring 3rd grade	Total gain from fall kindergarten to spring 3rd grade
<b>Reading</b>					
<b>Total</b>	<b>0.3</b>	<b>0.5</b>	<b>0.8</b>	<b>0.7</b>	<b>0.4</b>
Sex					
Male	0.4	0.5	0.9	1.0	0.4
Female	0.3	0.5	0.8	0.6	0.4
Race/ethnicity					
Asian/Pacific Islander	0.9	1.4	1.9	1.7	1.1
Black	0.5	0.8	1.0	1.0	0.7
White	0.4	0.5	0.8	0.7	0.3
Hispanic	0.5	0.8	1.1	1.3	0.9
Other	1.2	1.6	2.8	3.5	2.4
Number of family risk factors					
0 factors	0.4	0.5	0.8	0.7	0.3
1 factor	0.3	0.5	1.0	0.9	0.6
2 or more factors	0.3	0.7	0.9	1.2	1.0
<b>Mathematics</b>					
<b>Total</b>	<b>0.3</b>	<b>0.4</b>	<b>0.5</b>	<b>0.6</b>	<b>0.3</b>
Sex					
Male	0.4	0.5	0.7	0.9	0.4
Female	0.3	0.4	0.4	0.6	0.4
Race/ethnicity					
Asian/Pacific Islander	0.9	1.2	1.3	1.4	0.8
Black	0.3	0.6	0.7	1.0	0.8
White	0.4	0.5	0.6	0.7	0.3
Hispanic	0.4	0.7	0.8	1.1	0.7
Other	1.1	1.3	1.7	2.8	1.9
Number of family risk factors					
0 factors	0.3	0.4	0.5	0.7	0.3
1 factor	0.3	0.5	0.7	0.9	0.6
2 or more factors	0.2	0.6	0.6	0.9	0.8

SOURCE: Rathbun, A, and West, J. (forthcoming). *From Kindergarten Through Third Grade: Children's Beginning School Experiences* (NCES 2004-007), tables A-4a and A-5a. Data from U.S. Department of Education, NCES, Early Child Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K), Longitudinal Kindergarten-First Grade Public-Use data file and Third Grade Restricted-Use data file, Fall 1998, Spring 1999, Spring 2000, and Spring 2002.