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ABSTRACT

Some parents have chosen to delay their children's enrollment in kindergarten by a year because of individual differences in the pace and pattern of children's development. In other situations, some schools recommend delaying a child's school entry based on "readiness" testing or require that some kindergartners attend kindergarten for a second year. Data from the 1993 and 1995 National Household Education Surveys show that about one child in seven either entered kindergarten late or was required to repeat kindergarten. The surveys found similarities between these two categories of children, but also some notable differences pertaining to ge.. .er, race, and developmental delays. The surveys found striking differences in later school performance (in grades one and two) between children who were held out of kindergarten and children who repeated kindergarten. The performance of those who had been held out of kindergarten was found to be better in first and second grade than that of children who entered kindergarten at the prescribed age. In contrast, those who were required to repeat kindergarten were doing worse than their first- and second-grade peers. First- and second-graders in 1993 who had repeated kindergarten were more likely than children who had not repeated kindergarten to receive negative feedback from their teachers. When demographic, socioeconomic, and developmental factors were taken into account, the differences in school performance were reduced, but remained significant in the 1993 survey. In the 1995 survey, however, controlling for these background factors essentially eliminated the differences between student who were held out and other first- and second-graders. The same was true of performance differences between the students who had been retained and other students. The surveys did not find evidence that children who may have been at increased risk of experiencing difficulties in school benefited from (or were harmed by) delayed kindergarten entry. The same was true of kindergarten retention. (Interview items from both years, analyses, and

logistic regression model coefficients are appended. Contains 44 references.)
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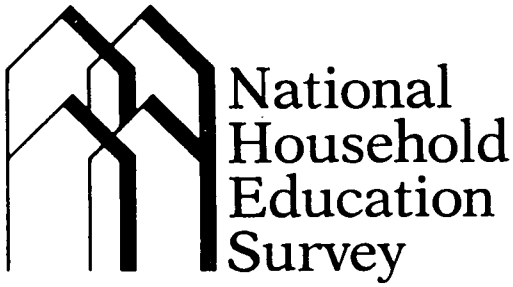

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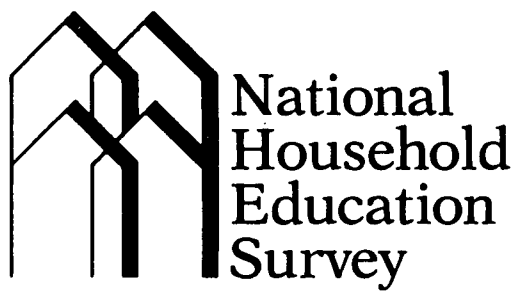

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Highlights

Data from the 1993 and 1995 National Household Education Surveys show that about one child in seven in the U.S. either entered kindergarten late or was required to repeat kindergarten. Children usually enter kindergarten late because their parents hold them out until they are more mature. Children usually repeat kindergarten because they are required to do so by the school system.

- In both surveys, 9 percent of first– and second–graders had experienced delayed entry into kindergarten, as reported by parents. The percentage of first– and second–graders who were reported to have been retained in kindergarten was 6 percent in 1993 and 5 percent in 1995.

The surveys found that there were similarities between the kinds of children who experienced delayed entry or kindergarten repetition, but also some notable differences.

- Delayed kindergarten entry was more common among first– and second–graders who had birthdays late in the year (July through December), and who were thus relatively young at the time they were eligible to enter kindergarten, than among children born in the earliest months of the year (January through March).

- Boys were reported to have been held out of kindergarten more often than girls have. Boys were also more likely to have been retained in kindergarten.

- Black, non-Hispanic children were less likely than white, non-Hispanic children to have been held out of kindergarten until they were older.

- First– and second–graders who had developmental delays were more likely than those without developmental difficulties to have repeated kindergarten were.

The surveys found striking differences in the later school performance of children who were held out of kindergarten in contrast to those who had to repeat kindergarten. The school performance of first– and second–graders who had been held out of kindergarten was found to be better than that of first– and second–graders who entered kindergarten at the prescribed age. In contrast, children who were required to repeat kindergarten were doing worse than other first– and second–graders. Specifically:

- In 1993, first– and second–graders who had been held out of kindergarten until they were older were less likely than other children to receive negative feedback from their teachers concerning their academic performance or conduct in class. In 1995, the delayed entry students were less likely than students who entered kindergarten on time to have repeated first or second grade.

- First– and second–graders in 1993 who had repeated kindergarten were more likely than children who had not repeated to receive negative feedback from their teachers. Also,

first– and second–graders in 1995 who repeated kindergarten had more school performance problems than children who did not repeat.

When demographic, socioeconomic, and developmental factors were taken into account, the differences in school performance were reduced, but remained significant in the 1993 survey. In the 1995 survey, however, controlling for these background factors essentially eliminated the differences between students who were held out and other first– and second–graders. The same was true of the performance differences between the students who had been retained and other students.

The surveys did not find evidence that children who may have been at increased risk of experiencing difficulties in school benefited from (or were harmed by) delayed kindergarten entry to a greater degree than other children. The same was true of kindergarten retention. Specifically, for young male children and children who had developmental delays, neither delayed kindergarten entry nor kindergarten retention were found to have significant relationships with first and second grade school performance or adjustment.

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Introduction

The age at which children start formal schooling varies across countries and has changed over time in this country. Starting school with first grade at age six used to be the norm, whereas now most children go to kindergarten at age five (West et al. 1992). However, the five-year-olds in today's kindergarten classes are older than the kindergarten pupils of the past. Whereas it used to be standard practice to require kindergartners entering in September to have turned five by the following December or January, it has become increasingly common for schools to require children to have turned five by September or October, or even earlier (Meisels 1992; Walsh 1989; and Shepard and Smith 1986). Another difference is that most of the children entering kindergarten nowadays have had prior experience with preschool programs or center-based childcare (West, Hausken, and Collins 1993). This was not the case in the past.

The findings of developmental psychology do not demonstrate that one age of school entry is inherently preferable to another. No matter where the age of entry is set, educational systems have to deal with the fact that children vary in their rates and patterns of development. Because rates of development are so rapid in the preschool and early elementary years, disparities between different children of the same chronological age can be striking. One 5–year–old may be reading fluently, while another can identify only a few letters of the alphabet. There can also be marked differences within the same child across different domains of development; such as when a kindergartner is able to count objects and solve simple math problems, but cries or hits other children when frustrated in group situations.

For the most part, schools have handled children's differences in developmental levels from a "maturational readiness" approach (Kagan 1990). From this perspective, schools expect children to have reached a certain standard of physical, intellectual, and social development before starting kindergarten. Thus, whether or not children are deemed "ready for school" in the fall of the year in which they turn five is determined to a great extent by the social demands of the kindergarten classroom and the cognitive demands of the kindergarten curriculum. All young children are "ready to learn," but not all children are prepared to concentrate on a task for extended periods of time, hold a pencil properly, identify most of the letters of the alphabet, or take turns and share things with other children (Zill et al. 1995). If kindergarten programs demand these capabilities, some 5–year–olds will not be able to cope with them. If demands are less stringent, and the school is prepared to deal with considerable variation in children's social and cognitive development, the proportion of "five's" that will have a fruitful kindergarten experience may be greater. However, not all early elementary programs may have the resources,

or the philosophical inclination, to provide the individual attention that may be required for a child who is well behind–or well ahead of–most other children in social maturity or intellectual accomplishment.

The use of delayed school entry and kindergarten retention to deal with individual differences in children's early development

Given the individual differences in the pace and pattern of children's development, some parents have chosen to delay their children's enrollment in kindergarten by a year (Meisels 1992; Bredekamp and Shepard 1989; and Shepard and Smith 1986). The rationale is that the additional year will give children who have late birthdays or are somewhat behind their age-mates in social, motor, or academic skills extra time to mature. Hence, they will be better prepared to perform as expected in the classroom. Other times, parents' motivation for delaying school entry is frankly competitive—even though the child may be capable of handling the demands of kindergarten, they want to give him or her an edge over other pupils, both during the kindergarten year and in later grades (Kagan 1990; and Smith and Shepard 1987). There are also situations in which schools make recommendations to parents about delaying children's entry into kindergarten, based on "readiness" testing done before school entry (Kagan 1990; Bredekamp and Shepard 1989; Charlesworth 1989; and Meisels, Steele, and Quinn 1989). Results from a 1988 survey of state education officials across the country suggest that from 10 to 50 percent of children who are age-eligible to start kindergarten are held out or placed in developmental kindergarten classes at least in part because of poor performance on readiness tests (Gnezda, Garduque, and Shultz 1991).[1]

One way schools have dealt with kindergartners who are considerably less advanced than other children of the same age is to require these children to attend kindergarten for a second year, or go into a "developmental" class (Bredekamp and Shepard 1989; and Charlesworth 1989). The theory behind this practice is that it permits the child more time to develop capabilities that he or she will need to function effectively in first grade, when both the social and academic demands will be tougher than those in kindergarten (Byrnes 1989; and Smith and Shepard 1987). Another hope is that by changing the reference group to one composed of younger children or others who are relatively slow in their development, the child's comparative position will shift

[1] Unfortunately, the report that cites these results gives no indication as to where most states fall in this relatively wide range of 10 to 50 percent. However, the report also indicates that the survey found wide variation in the types of readiness tests used by states and the cutoff scores used to determine passing and failing.

from the bottom of the heap to the middle of the pack (Smith and Shepard 1987). There is also the expectation that young children will be less likely to feel stigmatized by being held back than would older children who may have a better understanding of the social connotations of retention and stronger ties to their age–mates (Bredekamp and Shepard 1989; and Smith and Shepard 1987). Of course, part of the rationale for having children repeat grades is that it will be of benefit to the other children in the class, the ones who do not have to repeat (Smith and Shepard 1987). It is argued that these children will be able to get more attention from the first–grade teacher and advance more rapidly, because the teacher will not have to spend a lot of time trying to control the behavior of socially immature pupils, or providing remedial instruction to pupils who are far behind the rest of the class academically.

All of these arguments in favor of delayed kindergarten entry and kindergarten retention are predicated on the notion that children must be capable of successfully completing the established kindergarten curricula, rather than the idea that schools should be flexible in their efforts to teach children with varying abilities at each grade level (Kagan 1990; Bredekamp and Shepard 1989; and Charlesworth 1989). This ideology is reflected in school districts' institution of minimum competency standards at each grade level, which in turn, encourage the use of delayed entry and retention practices for children who do not measure up to the standards (Meisels, Steele, and Quinn 1989; and Rose et al. 1983). However, a growing body of research suggesting that these practices are ineffective, or even harmful, has rekindled the debate about their use.

Criticisms of these practices

Both the practice of delaying entry into kindergarten and that of retaining children in kindergarten have been criticized, though on somewhat different grounds. A point made by critics of both practices is that development is very fluid in the preschool and early elementary years, and obtaining reliable assessments of children's progress is more difficult than in the later elementary grades. A child's standing relative to others of the same age is only weakly prognostic of later achievement (Cardon, Fulker, and DeFries 1992; and McCall 1987). A child who is somewhat behind may experience a developmental spurt during kindergarten or first grade, and be up with or even ahead of most age–mates by third or fourth grade. Thus, delayed entry or kindergarten retention may not really be necessary.

Critics of delayed entry note that this practice augments educational differences between children of higher and lower socioeconomic levels (Meisels 1992; Kagan 1990; Bredekamp and

Shepard 1989; Smith and Shepard 1987; and Shepard and Smith 1986). For instance, parents who are socioeconomically advantaged have more leeway to voluntarily postpone their children's kindergarten enrollment because they have more job flexibility and the financial resources to make alternative childcare or early education arrangements for their children. Parents who have less education and lower incomes may have little choice but to put their children into kindergarten at the earliest possible age, if only because of the low-cost childcare that full-day, publicly supported kindergarten provides. Thus, when an affluent family voluntarily delays the entry of their son or daughter into kindergarten, it means that the educational and economic advantages that the child already enjoys are compounded by the child being older and more mature than his or her counterpart from a lower-socioeconomic status (SES) family. Alternatively, when children from lower-SES families are denied entry into kindergarten based on readiness testing, these children who may benefit the most from structured learning environments are instead being turned away. Furthermore, holding children out of kindergarten, whether as a result of readiness testing or parental decisions, overlooks research findings indicating that being overage for one's grade is one of the most powerful predictors of dropping out of high school (Meisels 1992). However, it is not clear from existing research whether affluent children held out of kindergarten until they are older are at risk of dropping out of school in the same way that other overage students (e.g., as a result of readiness placement, or retention) may be (Meisels 1992).

Opponents of delayed kindergarten entry also argue that this practice leads to an upward shift in teachers' expectations, which may be unrealistic and unfair for younger pupils who enter school at the prescribed time (Meisels 1992; Bredekamp and Shepard 1989; Meisels, Steele, and Quinn 1989; Walsh 1989; and Shepard and Smith 1988a). By removing younger children and poor performers from the regular grade progression, older and more academically able students set the standards in kindergarten and first– and second–grade classrooms. When some children who are entering kindergarten on time are still four-years-old, while other children are entering kindergarten at age six, the age disparity in the classroom could be as much as a year and a half. Inasmuch as every month of age brings noticeable gains in children's accomplishments during the preschool and early elementary years, the older children will tend to set the pace and establish the norms, whereas those who entered when eligible may appear to be "behind." These opponents to delayed kindergarten entry also argue that having a highly structured, academic curriculum to accommodate older students is developmentally inappropriate for young children and contrary to the original conception of what kindergarten ought to be.

Those who argue against the practice of kindergarten retention note that pupils who are required to spend a second year in kindergarten rarely receive special instruction in the areas in which they are experiencing difficulty. Instead, they usually get the same curriculum over again, though perhaps with a different teacher. Critics point out that the efficacy of retention has not been demonstrated in controlled studies; indeed, the preponderance of available evidence suggests that it is not effective (Meisels 1992; Holmes 1989; Shepard 1989; Gredler 1984; and Rose et al. 1983). Some also argue that early grade retention, like delayed kindergarten entry, may even have negative repercussions into the high school years, in so far as being older than one's classmates is associated with a higher likelihood of dropping out of school (Meisels 1992; Nason 1991; Bredekamp and Shepard 1989; and Shepard and Smith 1988b).

Opponents of kindergarten retention contend that being required to repeat a grade is stigmatizing, for young as well as older children (Nason 1991; Shepard 1989; and Shepard and Smith 1988b). Even if other children do not treat such pupils with disdain, they are often categorized as "slow learners" by the school system, and this can work to their detriment in later grades. A final criticism is that retention falls disproportionately on children from low-income and minority family backgrounds (Meisels 1992; and Shepard and Smith 1988b).

The need for better data about delayed entry and retention

There has been lively debate about the wisdom of delayed entry into kindergarten and kindergarten retention, and some school systems have modified their practices as a result. However, the debate has occurred in the absence of a solid body of evidence about delay and retention, especially evidence based on large and representative samples of schoolchildren. Key questions, such as how widespread these practices are, and which children are most affected by them, remain unanswered. Also not determined is what the implications of these practices are for the early elementary school performance and adjustment of the children involved. This report is intended to remedy this lack, at least in part.

Data source

This report is based on data from the National Household Education Survey (NHES). The NHES is a nationwide telephone survey of probability samples of households; the survey is conducted by Westat for the National Center for Education Statistics in the U.S. Department of Education. Different modules and rounds of the survey have focused on different educational issues, from early childhood program participation to adult education. The data used in the

present report are from the 1995 and 1993 rounds of the survey, and are based on reports by parents of first– and second–grade pupils. More information on the NHES data is provided in later sections of this report.

Research questions

This report uses data from the NHES to address the following research questions:

- How many U.S. children now in first and second grade have experienced delayed entry into kindergarten? How many were required to repeat kindergarten?
- What child and family characteristics are associated with delayed entry and kindergarten retention? Are pupils born later in the year more likely to be delayed or retained? Are boys more frequently delayed or retained than girls? Is there evidence that repetition occurs more frequently to children from minority or lower socioeconomic family backgrounds?
- Are certain child and family characteristics more important than others are as far as their relationships to delayed kindergarten entry and kindergarten retention? Which factors emerge as significant in analyses that examine several characteristics simultaneously?
- What are school performance and adjustment like for first– and second–graders who have been held out of kindergarten until they were older? What are they like for those who have repeated kindergarten? Do children who are behind grade for age appear to do about as well as other children, or do they experience more than their share of difficulties? What do the findings imply for arguments against or in favor of delayed entry and retention?

It is important to point out that this report is not an evaluation of the efficacy of the practices of delaying entry into kindergarten or retaining children in kindergarten. That would require the random assignment of pupils in the survey to experimental and control conditions, or matching pupils on characteristics potentially associated with retention (e.g., sex, race–ethnicity, age, and preschool experience) and then comparing the subsequent school performance of those who had been retained and those who had not been. Instead, in this report multiple logistic regression analyses were used to examine the characteristics of children that are related to delayed entry and retention after other, associated factors were controlled. However, it is likely that there were important differences between retained pupils and other pupils that were not fully represented by the demographic, socioeconomic, and school experience variables that were entered into the multiple regression equations.

This report also examines whether delayed kindergarten entry and kindergarten retention is related to subsequent school performance in the first and second grades. Note that this analysis focuses on the school performance of children who were delayed or retained in kindergarten; it does not look at the possible significance of delayed entry and retention for the achievement of pupils in first and second grade who were *not* held back. That is, it does not examine whether the experience of those not delayed or retained is influenced in any way by having older children present in their classrooms as a result of delayed kindergarten entry or retention.

Before describing the specific measures used in the 1993 and 1995 NHES surveys and the survey findings, we summarize the results of earlier research on the correlates of delayed entry into kindergarten and kindergarten retention.

Summary of Findings of Previous Research

Existing research on child and family factors associated with delayed kindergarten entry and kindergarten retention is relatively meager, especially studies based upon nationally representative samples of children. Nevertheless, the findings of available research are relatively consistent as far as they go. Research on the consequences of delayed entry and retention is more plentiful, and some of this research makes use of study designs that follow the same group of students beyond kindergarten to evaluate whether there are any longitudinal effects of delayed entry or retention. Other studies make use of matched control groups of students (such as those who were considered for retention but not held back) in order to better identify any effects of delayed kindergarten entry or repeating kindergarten. But while these studies have design strengths, they also suffer from methodological weaknesses. Sample sizes are often scanty, so there is insufficient statistical power to detect small but substantively important differences between groups. The samples are rarely representative of the general population of young elementary school students. One can also question whether matching procedures really succeeded in equating pupils who were or were not held back on their prior achievement, or on personality or behavioral factors that may be significant for later performance.

Factors associated with delayed kindergarten entry

Previous research indicates that children who are relatively young when eligible to enter kindergarten and boys are more likely to experience delayed kindergarten entry than are older children and girls. Children from families that are socioeconomically advantaged are also more likely than those from less advantaged families to be held out of kindergarten. Using data from a national sample of children in the 1991 National Household Education Survey, McArthur and Bianchi (1993) found that children who were not black, were relatively young, had a low birth weight, and lived with parents who were at least high school graduates were more likely to have been delayed from starting kindergarten. In a study on a small sample of children from southern California, younger children, boys, and non–Hispanic children tended to be held out of kindergarten more often (Cosden, Zimmer, and Tuss 1993).

In contrast to the research suggesting that children from more socioeconomically advantaged families are voluntarily delayed from entering kindergarten more often than other children, the trend of schools using standardized tests to screen out "unready" children from kindergarten entry suggests a different pattern. Because children who are from ethnic and language minorities and who come from less educated families tend to score lower on these types of tests, these children may also be more apt to be kept from entering kindergarten when age-eligible (Kagan 1990; Bredekamp and Shepard 1989; Meisels, Steele, and Quinn 1989; and Shepard and Smith 1988a).

Factors associated with kindergarten retention

Similar to the findings regarding delayed entry, previous research indicates that relatively young children and boys tend to repeat kindergarten more often than older children and girls. On the other hand, the children found to be required to spend an extra year in kindergarten are more often those from relatively disadvantaged families. Data from the 1991 National Household Education Survey showed that kindergarten retention was more common among children who were male, were black or Hispanic, were born in the later half of the year, who had not attended preschool, who had a physical or learning disability, or who lived with parents with no college education (Collins and Brick 1993; and McArthur and Bianchi 1993).

Using national data from 7– to 17–year–olds in the National Health Interview Survey, Byrd and Weitzman (1994) found that several social and health factors increased the risk of having repeated kindergarten or first grade including living in poverty, being male, having a

mother with less than a high school diploma, having less than two biological parents at home, and having had a low birth weight. A much smaller study also found strong correlations between being male or relatively young and being retained in kindergarten (Mantzicopoulos et al. 1989).

Morrison, Griffith, and Alberts (1997) found that, among kindergartners and first–graders in a western Canadian city, paternal occupation status was reliably lower among retained children than among young first–graders. In other respects, however, these investigators found little evidence that major background differences existed among promoted, held–out, and retained children.

Delayed kindergarten entry and later school performance

Parents usually decide to delay their children's entry into school based on the belief that if children are older, they will do better in school than if they were among the youngest in their class. The research evidence suggests that this may in fact be the case. However, the benefits of being older are not large and may be transitory (Shepard and Smith 1986). This conclusion has been reached by researchers using national samples of children, smaller samples of children from different state and local school districts, cross-sectional approaches that examine students at various grade levels, and longitudinal designs that track the performance of a group of students as they progress through school.

Some studies that have examined the effects of children's ages at kindergarten or first grade entry on their later performance in elementary or secondary school have found tangible but relatively modest effects. For example, Langer and colleagues (1984) studied the effect of delayed entry in a broad grade range of students. In national samples of fourth– and eighth–graders, relative age at first grade entry was found to account for less than 1 percent of the variance in a combined measure of math, science, and reading achievement. Among eleventh–graders, no effect of age at school entry was apparent. However, there was an indication that students who were younger when entering school were more likely to have been retained in a grade.

In a study of students in Kentucky, slightly higher scores on standardized reading, language, and math tests were observed among first– and fourth–graders who were age six

instead of five when they entered first grade (Davis, Trimble, and Vincent 1980).[2] All differences disappeared among eighth–graders, however. In a study of children in Pittsburgh, older age at first grade entry had a small positive effect on math achievement in the first grade. On the other hand, it had no significant effects on first–grade reading achievement, first–grade conduct, reading or math achievement four years later, or the probability of being placed in remedial programs or retained in grade (Bickel, Zigmond, and Strayhorn 1991).

Other studies have found no effects of older age at school entry. For example, in a recent panel study of growth in reading and math test scores among Canadian kindergartners and first–graders, it was found that in itself, entrance age was not a good predictor of growth in reading or math skills during the first grade (Morrison, Griffith, and Alberts 1997). In a study of children in a Delaware school district, Dietz and Wilson (1985) found that age at kindergarten entrance had no significant relationship with kindergarten readiness test scores, or with second– or fourth–grade reading and math achievement test scores. Cameron and Wilson (1990) also found that children who were held out of kindergarten until they were one year older than the minimum eligible age showed no advantages as far as standardized reading and math test performance in the second and fourth grades. One study was able to control for a measure of children's cognitive ability before entering kindergarten while examining the effect of age at entry (Kinard and Reinherz 1986). With this control in place, academic achievement (i.e., reading, math, language, and overall) and school adjustment (e.g., anxiety, hyperactivity, attention, and peer relations) of children at the end of kindergarten, and in third or fourth grades, did not differ by age at kindergarten entry.

As mentioned above, in some of these studies, sample sizes may have been insufficient to detect small but substantively important differences between groups.

Kindergarten retention and later school performance

When children are required to repeat kindergarten or attend a transitional grade before first grade, the intention is to help them bolster their academic or social skills early in order to avoid experiencing problems in later grades. Reviews of the research on the effects of retention and the use of transitional grades (i.e., 2 year kindergarten programs) on later school performance

[2] The authors indicate in this study that children in Kentucky could enter first grade at age 5 if they reached age 6 by December 31. These regulations may have changed since this study was published in 1980.

indicate that neither of these interventions gives children a lasting academic advantage over other children who had experienced problems but were not retained (Meisels 1992; Nason 1991; Holmes 1989; Shepard 1989; Shepard and Smith 1988a; Shepard and Smith 1986; Gredler 1984; and Rose et al. 1983). There is also some evidence that children who were having problems in kindergarten but were "socially promoted" do not experience substantially more difficulties later in school than other children who were promoted without question based on academic merit (Dennebaum and Kulberg 1994). There is virtually no research, however, that looks at the effects on *other* pupils of having a pupil in the class who is socially immature or substantially behind in academic skills.

Mantzicopoulos and Morrison (1992) matched two groups of students on sociodemographic characteristics, their risk of experiencing reading problems, and reading and math achievement test scores in kindergarten. They found that reading and math achievement levels in first and second grade were no different between retained children and promoted children. There were also no differences found with respect to behavior problems. Similar results were found in a study of Colorado first–graders that used comparable matching procedures (Smith and Shepard 1987). When the students who had and who had not been retained in kindergarten were compared, no significant differences were observed with respect to teacher ratings on reading, math, social maturity, self-concept, and attention to schoolwork.

Dennebaum and Kulberg (1994) examined school achievement in the first through third grades for four groups of children in a Rhode Island school district. One group was retained in kindergarten, one was placed in a transitional program before first grade, one was recommended for retention or transitional programs but instead went on to first grade, and one went straight from kindergarten to first grade without question as to their promotion. The results showed that the retained children performed the poorest of the four groups on reading, math, and language tests. They also indicated that those who ignored the recommendation for kindergarten retention performed just as well on the first through third grade tests as did those promoted to first grade without question. Another study of second– through sixth–graders in a New York school made similar comparisons based upon kindergarten retention experiences and found that there were no significant differences in second through sixth grade standardized test scores between retained children and those who disregarded recommendations for retention (May and Welch 1984).

A question that may be raised about all of these studies is whether the matching procedures really produced equivalent groups, given that random assignment was not employed. Another issue in some of the studies is whether the sample sizes were large enough to detect

relatively small but substantively important differences in later achievement or adjustment. On the other hand, Alexander and colleagues (Alexander, Entwisle, and Dauber 1994) argue that findings in previous research indicating no differences between retained students and other students may be reflective of *positive* outcomes for retainees. Their longitudinal study of students in Baltimore focuses on retention in first grade and beyond. Their results suggest that retainees' academic performance is improved during and after the retained year, not reaching the performance levels of promoted students, but narrowing the gap nevertheless. They thus conclude that retention often helps students in the early primary grades.

There is some research that seems to support the notion that children may have lower self-esteem as a consequence of being retained, though not all the research specifically looks at the consequences of being retained in kindergarten (Byrnes 1989; and Shepard and Smith 1988b). In contrast, Alexander, Entwisle, and Dauber (1994) found no negative effects of retention in first grade on students' self-esteem. In fact, they found that academic self-esteem improved during the retained year and held steady during the rest of elementary school, and attribute this to retained students' improved academic performance. The frequent findings cited above of no differences in test scores or behavior suggest that if there are negative effects on self-confidence, they are generally not severe enough to impair academic performance.

Strengths and Limitations of the Present Study

In summary, the results of previous research would not lead us to expect substantial differences in academic performance or adjustment between first– and second–graders who had experienced delayed kindergarten entry or kindergarten retention and those who had not, especially after demographic and socioeconomic factors are statistically controlled. It is important to note, however, that the comparisons made in this report are between pupils who experienced delayed kindergarten entry or retention and other first– and second–grade students in general. It was not possible with the NHES data to compare pupils who had been delayed or retained with other children who were potential candidates for these practices (e.g., they had problems in preschool or kindergarten) but did not experience them. In other words, it was not possible to take into account, or control for, such factors as children's cognitive abilities or social development before school entry or during kindergarten. This would have been desirable, since children who have relatively low ability levels and who exhibit behavioral problems before and during kindergarten would be expected to be rather heavily represented in the delayed and

retained groups *and* to have problems later in school, more so than would other children. Thus, controlling for children's preschool and kindergarten ability levels would have better enabled the analyses to isolate any effect of delayed entry or retention on later school performance, apart from ability problems that children may have had to begin with.

In addition, the measures of school performance and adjustment available in the NHES are somewhat different than those used in the studies discussed above. This should not be considered a limitation of this study; however, it is important to point out that for the most part, the performance measures used in earlier research are students' scores on standardized achievement tests or teacher ratings of pupil behavior and adjustment. In contrast, the 1993 and 1995 NHES measures of school performance and adjustment are derived from parents' reports on their children's standing in class and on various problems their children may be having in school.[3] These measures are described in more detail below.

Given the design of the survey and differences in measurement methods, the NHES data represent a significant expansion of the knowledge base about delayed kindergarten entry and kindergarten retention. They provide a multifaceted statistical profile of the children who have experienced delayed entry and retention, and permit comparisons with a large and nationally representative sample of early elementary schoolchildren. Sample numbers are large enough to provide relatively sensitive detection of possible differences between groups. The measures available in the NHES reflect both academic performance and behavior and adjustment in school, and furnish an important perspective that is often missing from existing research, namely, the parent's.[4]

Data Source: The National Household Education Survey

This report is based on data from the 1995 and 1993 National Household Education Surveys (NHES:95 and NHES:93). The NHES is a national telephone survey of households that collects descriptive data on the educational activities of the noninstitutionalized civilian U.S. population. The primary purpose of the NHES is to study issues of high priority to the U.S.

[3] The NHES data do not include any teacher reports of student performance; however, other studies such as the National Survey of Children have found moderate positive correlations between parent and teacher reports of children's academic standing (Zill and Coiro 1992).

[4] The NHES data were derived from parent interviews. A description of the NHES and the key indicators reported by parents is provided below in the "Data Source" section of the report.

Department of Education on a rotating basis, focusing on topics that cannot be addressed adequately through institution-based studies. Households are selected for the survey using random digit dialing (RDD) methods and data are collected using computer-assisted telephone interviewing (CATI) technology.

The data used in this report were collected from parents or guardians of first– and second–graders. The number of first– and second–graders included in the analyses is 3,071 from the NHES:95 and 4,260 from the NHES:93. The data were weighted to make them representative of the entire population of first– and second–graders in the nation, including those living in households without telephones. Each of the samples represents an estimated population of over 7 million first– and second–graders.

Operational definitions of delayed entry and retention

As defined in the NHES, children who experienced delayed entry into kindergarten are those whose parents enrolled them in kindergarten after the eligible age to start school according to guidelines of their school district.[5] Children who were retained in kindergarten are those who attended two or more years of kindergarten before entering first grade. Parents were asked a general question as to whether their children attended "one or two years of kindergarten," instead of specific questions about kindergarten retention and transitional grade placement. The specific NHES questions used to determine children's delayed entry and retention statuses are shown in appendix B.

First and second grade performance measures

Of primary interest in this report is whether the experiences of delayed entry into kindergarten and retention in kindergarten have repercussions for children's academic performance and adjustment in first and second grades. The measures of performance and adjustment available in the NHES:95 and NHES:93 differ, primarily because these two studies focused on different topical areas: school readiness in 1993 and childcare and early childhood program participation in 1995. While similar performance measures are not available across study years, it was considered advantageous in some respects to have a diverse set of measures so

[5] It is worth noting that this measure of delayed kindergarten entry likely reflects circumstances other than simply parental choice, including state or school district regulations on kindergarten entry or attendance, school readiness testing policies, child care and preschool program availability, and parents' economic or financial situations.

that delayed entry and retention effects could potentially be detected across a variety of student outcomes in the first and second grades.

In the NHES:95 data, school performance and adjustment was tapped by parent responses to four questions: (1) whether the child's school work is ranked at or below the middle of the class; (2) whether teachers or other school personnel have reported that the child is having behavior problems in class; (3) whether teachers or other school personnel have reported that the child is having schoolwork problems; and (4) whether the child has repeated first or second grade.[6] A summary measure was derived by coding whether or not the child had exhibited any of these school–related problems.

For the NHES:93 data analyses, a subset of five items from a series measuring teacher feedback on children's school performance and behavior was used. The five items asked whether the child was reported by teachers to be: (1) not learning up to capabilities; (2) not concentrating or paying attention; (3) acting up in school or disrupting class; (4) restless, fidgeting, or not sitting still; and (5) having trouble taking turns, sharing, or cooperating with others. The 1993 measures were chosen because they have been found in psychometric analyses to form a reliable scale (alpha=0.70) indicating underachievement and inattention or social problems (Vaden-Kiernan et al. 1994). The summary measure of school performance and adjustment used in this report for the 1993 data identified whether or not the child was reported to have had at least one of the five problems listed above.

The actual wordings of the questionnaire items from the NHES:95 and NHES:93 used to create the indicators of children's school performance and adjustment are presented in appendix A.

[6] For the school performance measure indicating having repeated first or second grade, first–graders certainly have a lower probability than second–graders of having repeated, because they have not yet been exposed to the risk of repeating second grade. However, this is not a factor for the other three NHES:95 measures that are also used to evaluate school performance.

Findings

In this section we examine the overall prevalence of delayed entry and retention, as well as child and family characteristics that are related to these experiences, using both the 1995 and 1993 NHES data. This is followed by a presentation of survey findings regarding the questions of whether delayed kindergarten entry and kindergarten retention have consequences for first and second grade school performance and adjustment.

Prevalence of delayed kindergarten entry and kindergarten retention

Table 1 presents estimates regarding the prevalence of delayed kindergarten entry and kindergarten retention among first– and second–graders in 1993 and 1995. In both years, 9 percent of all first– and second–graders were reported to have been held out of kindergarten by their parents. The overall prevalence of kindergarten retention was also similar in the two surveys, affecting 5 percent of pupils in 1995 and 6 percent in 1993.

Factors associated with delay and retention: Bivariate analyses

As shown in table 1, some of the child- and family-related factors found to be associated with delayed kindergarten entry and kindergarten retention in previous research, such as age and sex, were also related to these events in the NHES data.

Child and family characteristics and delayed entry. Children born in the latter half of the year, and thus relatively young at the time they were eligible to enter kindergarten, were more likely to have been held out of kindergarten. In 1993 and 1995, from 11 to 13 percent of children born in July or subsequent months were delayed from entering kindergarten, compared to only 5 or 6 percent of children born in January through June. Data from both survey years also show that delayed kindergarten entry was experienced more often among males than females—11 percent versus 6 percent in 1995, and 10 percent versus 7 percent in 1993.

In 1993, but not in 1995, pupils who had a significant delay in their growth or development were twice as likely as other pupils to have been held out of kindergarten—18 percent of first– and second–graders whose parents reported that they had been diagnosed as

Table 1.— Percentage of first– and second–graders who were delayed entry into kindergarten and who repeated kindergarten, by child and family characteristics: 1993 and 1995

Characteristics	1993					1995				
	Estimated number in thousands	Delayed entry into kindergarten		Repeated kindergarten		Estimated number in thousands	Delayed entry into kindergarten		Repeated kindergarten	
		Percent	s.e.	Percent	s.e.		Percent	s.e.	Percent	s.e.
Total	7,387	9	0.5	6	0.4	7,652	9	0.5	5	0.5
Child's sex										
Male	3,674	10	0.8	7	0.6	3,902	11	0.9	6	0.7
Female	3,713	7	0.7	5	0.5	3,750	6	0.6	4	0.5
Time of year child horn										
1st quarter (Jan-Mar)	1,952	6	1.0	4	0.8	1,872	5	0.7	4	0.7
2nd quarter (Apr-Jun)	1,821	5	0.7	7	1.1	1,885	6	0.9	4	1.0
3rd quarter (Jul-Sep)	1,970	11	1.0	6	0.8	2,062	11	1.3	5	0.9
4th quarter (Oct-Dec)	1,644	13	1.4	6	0.8	1,832	13	1.4	6	1.0
Child's race–ethnicity										
White, non-Hispanic	5,075	9	0.7	5	0.4	5,123	10	0.7	4	0.5
Black, non-Hispanic	1,152	6	1.2	8	1.4	1,193	5	1.0	7	1.5
Hispanic	854	10	1.4	5	1.1	961	9	1.4	5	1.0
Other races	306	5	2.2	7	2.5	375	9	2.2	6	2.0
Doctor has said child developmentally delayed										
Yes	297	18	4.0	18	3.3	400	11	2.7	16	3.4
No	7,090	8	0.5	5	0.4	7,251	9	0.5	4	0.5
Child less than 5 1/2 lhs at hirth										
Yes	523	8	2.1	10	1.8	555	6	1.8	8	1.7
No	6,863	9	0.6	5	0.4	7,097	9	0.6	4	0.5
Child attended center-hased program before entering school										
Yes	5,255	9	0.6	6	0.4	4,924	9	0.7	4	0.4
No	2,131	8	1.0	6	0.9	2,728	8	0.9	6	0.8
Parents in household										
Birth mother & birth father	4,410	9	0.6	5	0.4	4,684	10	0.8	4	0.5
Birth mother & other father[1]	560	8	2.2	7	2.0	559	6	1.8	6	1.7
Birth mother only	1,766	8	1.2	6	0.9	1,745	8	1.1	5	0.7
Birth father[2]	323	7	1.9	6	1.8	316	4	1.5	8	3.0
Adoptive parent[3]	114	22	6.8	14	5.4	101	9	4.1	3	2.3
Other parents	214	7	2.8	14	4.7	247	6	1.9	9	3.4
Parents' highest education										
Less than high school	652	8	1.8	9	2.1	799	8	1.6	6	1.6
High school diploma or equivalent	2,512	8	0.9	7	0.8	2,317	8	0.8	4	0.6
Some college[4]	2,352	8	0.9	4	0.6	2,256	10	1.2	5	0.8
Bachelor's degree or higher	1,870	10	1.1	5	0.6	2,280	9	0.9	5	1.0
Language parents speak most at home										
Both/only parent(s) speak(s)English	6,779	9	0.6	6	0.4	6,984	9	0.6	4	0.5
Parent(s) speak(s) other language	608	8	1.3	7	1.5	668	8	1.5	7	1.6
Household poverty status										
Poor	1,954	9	1.2	8	1.1	1,839	7	1.0	4	0.8
Non-poor	5,433	8	0.6	5	0.3	5,813	9	0.7	5	0.6

[1] Other fathers include step, adoptive, and foster fathers.
[2] This category includes children with birth fathers only and with birth fathers and step, adoptive, or foster mothers.
[3] This category includes children with adoptive mothers or adoptive fathers and no birth parents.
[4] This category includes children with parents who had vocational–technical education after high school.

NOTE: s.e. is standard error.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, spring 1993 and 1995.

being developmentally delayed[1] were held out, compared to 8 percent of those who had never received such a diagnosis. On the other hand, children who had been born at low birth weights were no more likely to have had delayed entry than those born at normal birth weights. This was the case in both 1993 and 1995.

For the other child and family characteristics, there were few significant differences in the percentages of children who experienced delayed kindergarten entry, and any observed differences were inconsistent across the survey years. For instance, unlike some earlier studies (e.g., McArthur and Bianchi 1993, based on the 1991 NHES data), a significant association between delayed kindergarten entry and parents' education level or household poverty status was not found in either 1993 or 1995. Also, differences by race-ethnicity were inconsistent. In 1995, white, non-Hispanic children were twice as likely as black, non-Hispanic children to have entered kindergarten late—10 percent versus 5 percent. In 1993, the percentage of white, non-Hispanic children who were delayed from starting kindergarten (9 percent) was also larger than that for black, non-Hispanic children (6 percent); however, the difference was not statistically significant.

The data from 1993 and 1995 also indicate few differences in delayed entry according to the types of parents in the child's household. The 1993 data suggest that adoptive parents may be more likely to wait until their children are older before entering them in kindergarten; 22 percent of the adoptive children in the survey had delayed kindergarten entries. However, because of the large variance surrounding this estimate, it is not different from the lower estimates observed for children living with one or both of their birth parents.[2] The 1995 data give no indication of an adoptive parent effect on delayed kindergarten entry.

Child and family characteristics and kindergarten retention. Comparable to the findings above for delayed kindergarten entry, the child's sex was found to be correlated with kindergarten retention. Although the difference was not large, boys were retained in kindergarten more often than girls (6 percent versus 4 percent in 1995 and 7 percent versus 5 percent in 1993). Children who had a diagnosed delay in growth or development were also several times more likely to be retained in kindergarten. This was true in both survey years. In 1995, for example,

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[1] Developmental delay is a condition in which children have fallen behind in physical, cognitive, motor, or speech development as compared to what is typical for their age. The measure is based on a question to parents asking, "Has a doctor or other health professional ever told you that (CHILD) was developmentally delayed?"

[2] The number of children with adoptive parents was relatively small (the unweighted number in the sample was 63).

16 percent of the developmentally delayed children were retained, as opposed to 4 percent of other children. Another difference found in both surveys was that having been born at low birth weights doubled the risk of kindergarten retention. For instance, in 1995, 8 percent of low-birth-weight pupils had spent an extra year in kindergarten, whereas the same was true of 4 percent pupils who had been born at normal birth weights.

With respect to the other child and family variables examined in table 1, the differences in kindergarten retention rates that were found were few and inconsistent across survey years. For instance, a few socioeconomic differences in rates of retention were found in the 1993 data, but not the 1995 data. In 1993, children from households below the official poverty level were more likely to have been retained; 8 percent versus 5 percent. Likewise, children whose parents had only a high school degree were more likely to be retained than those whose parents had some college training, but not more likely than those whose parents had bachelor's degrees or higher education levels.

A difference found in the 1995 data, but not the 1993 data, was that first– and second–graders who had attended Head Start or another center-based preschool program were less likely to have been retained in kindergarten than those who had not attended such programs. In 1995, 4 percent of the former group had been retained, versus 6 percent of the latter. However, in 1993, the two groups had similar rates of retention.

Summary. This preliminary examination of the correlates of delayed kindergarten entry and kindergarten retention indicates that the characteristics most consistently related to children's progression into and out of kindergarten are the child's birth date, sex, and developmental status. In contrast, race-ethnicity, family socioeconomic status, family structure, and preschool program participation showed some association with delayed entry or retention, but not consistently.

Given these preliminary results, the analysis presented next uses logistic regression models to examine the effects of these child– and family–related variables simultaneously. Conducting such a multivariate analysis is important, since many of the child and family factors analyzed here may be interrelated. In logistic regression models, the effect of any single child– or family–related variable on the likelihood of having been delayed from starting kindergarten or having been retained in kindergarten can be examined while at the same time controlling for children's statuses on all the other child and family variables in the model. The results of these analyses are discussed next.

Factors associated with delay and retention: Multivariate analyses

Table 2 presents the results of logistic regression models relating the child and family characteristics to delayed entry into kindergarten and to kindergarten retention among first– and second–graders in 1993 and 1995. The results are presented in the form of adjusted odds ratios, which were derived from the coefficients generated by the logistic regression models.[3] Each odds ratio presented may be interpreted as the effect of the corresponding characteristic on the likelihood of experiencing delayed kindergarten entry or kindergarten retention, while taking into consideration the other child and family characteristics included in the model.[4] In general, the results shown in this table parallel those found for the bivariate analyses discussed above.

Factors related to delayed entry into kindergarten. After controlling for the influence of other variables, the following factors were associated with delayed entry in both 1993 and 1995: the child having a birthday late in the year, so that he or she would be relatively young if school entry was on schedule; the sex of the child; and the child's race-ethnicity. The odds of having been held out of kindergarten were from 2.4 to 2.8 times higher for children whose birthdays were in the last quarter of the year (October to December) than for those whose birthdays were in the first quarter (January to March). And the odds were from 1.8 to 2.3 times higher for children with birthdays in the third quarter (July to September) than for those with birthdays in the first quarter. The odds of having been delayed from entering kindergarten were also 1.3 to 1.8 times higher for boys than for girls. The odds for black children experiencing delayed entry were only about half as great as those for white children.

For the other variables examined in the models, there were only a few significant relationships with delayed kindergarten entry. Again, the patterns of association were inconsistent between 1993 and 1995. For example, in 1993 the odds of being held out of kindergarten were 2.3 times higher for children who were developmentally delayed than for other

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[3] See the section entitled "Conversion of Odds Ratios" at the end of this report if interested in obtaining the original coefficients generated by the logistic regression models. Also see Alba (1987) for more information about conversions between logistic regression model coefficients and odds ratios.

[4] For each variable, one category was necessarily omitted from the model so that the odds ratios represent "relative" effects, that is, the effect of each category relative to the omitted category. For example, the omitted category for the race-ethnicity variable is white, non-Hispanic children. Thus, the odds ratio for black, non-Hispanic children represents how much lower (or higher) the likelihood of having been delayed from entering kindergarten (or of having been retained in kindergarten) is for black, non-Hispanic children than for white, non-Hispanic children. Similarly, the odds ratio for Hispanic children is interpreted as the relative likelihood of delayed kindergarten entry or kindergarten retention for Hispanic children as compared to white, non-Hispanic children.

Table 2.— Adjusted odds ratios of delayed entry into kindergarten and kindergarten retention for first– and second–graders, by child and family characteristics: 1993 and 1995

Independent Variables	1993		1995	
	Delayed entry into kindergarten	Repeated kindergarten	Delayed entry into kindergarten	Repeated kindergarten
Child's sex				
Male v. Female	1.34 *	1.42 *	1.77 **	1.65 *
Time of year child born				
2nd quarter (Apr-Jun) v. 1st quarter (Jan-March)	0.71	1.62 †	1.08	1.11
3rd quarter (Jul-Sep) v. 1st quarter (Jan-March)	1.84 **	1.42	2.25 **	1.19
4th quarter (Oct-Dec) v. 1st quarter (Jan-March)	2.41 **	1.28	2.80 **	1.40
Child's race–ethnicity				
Black, non-Hispanic v. White, non-Hispanic	0.63 *	1.32	0.61 *	2.25 **
Hispanic v. White, non-Hispanic	1.36	0.65	1.02	1.08
Other races v. White, non-Hispanic	0.52	1.32	0.88	1.15
Doctor has said child developmentally delayed				
Yes v. No	2.32 **	3.35 **	1.31	4.81 **
Child less than 5 1/2 lbs at birth				
Yes v. No	0.93	1.48 †	0.71	1.43
Child attended center-based program before entering school				
Yes v. No	0.97	0.94	1.19	0.54 **
Parents in household				
Birth mother & other father[1] v. Birth mother & birth father	0.91	1.31	0.49 †	1.34
Birth mother only v. Birth mother & birth father	0.93	0.88	0.80	1.14
Birth father[2] v. Birth mother & birth father	0.77	1.20	0.33 *	1.80
Adoptive parent[3] v. Birth mother & birth father	2.89 **	2.72 *	0.91	0.66
Other parents v. Birth mother & birth father	0.92	1.95	0.57	2.08
Parents' highest education				
Less than high school v. High school diploma/equivalent	1.01	1.13	1.23	0.97
Some college[4] v. High school diploma/equivalent	1.09	0.64 *	1.17	1.13
Bachelor's degree or higher v. High school diploma/equivalent	1.39 *	0.76	0.87	1.21
Parent(s) speak(s) non-English language most at home				
Yes v. No	0.68 †	1.32	0.89	1.99 †
Household in poverty				
Yes v. No	1.34	1.57 *	0.81	0.45 **

[1] Other fathers include step, adoptive, and foster fathers.
[2] This category includes children with birth fathers only and with birth fathers and step, adoptive, or foster mothers.
[3] This category includes children with adoptive mothers or adoptive fathers and no birth parents.
[4] This category includes children with parents who had vocational–technical education after high school.

** p<.01
* p<.05
† p<.10

NOTE: Odds ratios after controlling for other variables in the table. Tables showing the logistic regression model coefficients are found in appendix C.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, spring 1993 and 1995.

children. In 1995, the effect of having developmental delays also suggested a higher likelihood of delayed entry, but the effect was not statistically significant. Also, 1993 pupils whose parents had college degrees were more likely to have experienced delayed entry into kindergarten than pupils whose parents had less education. Compared to children whose parents had high school educations, the odds of having been held out were about 1.4 times greater among children whose parents were college educated. However, a similar relationship was not found in 1995. A few specific family types also showed associations with delayed entry in 1993 and 1995, but the types were different across these years.[5]

Factors related to kindergarten retention. After controlling for the influence of other variables, only the factors of sex of child and developmental delay were consistently associated with kindergarten retention in both survey years. The odds of boys being retained in kindergarten were 1.4 to 1.7 times higher than those for girls. The odds for children who had a diagnosed developmental delay being retained were 3.4 to 4.8 times higher than the odds for other children. Low birth weight was also marginally significant in 1993, suggesting a higher risk of retention, but the effect was considerably weaker than that for developmental delay. In 1995, the effect of having a low birth weight also suggested a higher risk of retention, but was not statistically significant. The timing of the child's birthday was not related to retention in either survey year.

A few other differences were found, but not consistently across survey years. For instance, in 1995, the odds of black, non-Hispanic children having been retained in kindergarten were more than twice as great as those for white, non-Hispanic children. The pattern was similar in 1993, although the difference was not statistically significant. Also, participation in Head Start or other center-based preschool programs seemed to offer an advantage in 1995, but not in 1993. The odds of repeating kindergarten for children who had taken part in such programs were only about half as great as the odds for children who had not gone to preschool.

In 1993, the odds of repeating kindergarten were only about two-thirds as great for children whose parents had some college as for those whose parents had a high school diploma only. Also in 1993, children in poverty-level households were more likely to have repeated kindergarten; the odds of their having repeated were about 1.6 times as great as the odds among

[5] As indicated earlier, the finding regarding adoptive parents in 1993 should be interpreted with caution due to the relatively small number of children with adoptive parents (the unweighted number in the sample was 63).

children in higher-income households. By contrast, in 1995, parent education was not associated with kindergarten repetition, and poverty status was negatively related to retention.

In 1993, children who lived with adoptive parents also had a greater risk of having repeated kindergarten. The odds of this having occurred were 2.7 times greater for adopted children than for those living with both biological parents.[6] A comparable difference was not observed in 1995 and other family types did not significantly increase (or decrease) the risk of kindergarten retention in either survey year.

Summary. The conclusions to be drawn from these models predicting delayed kindergarten entry and kindergarten retention are generally consistent with those made from previous research that did not have the benefit of using a large nationally representative sample of children. However, some of the inferences to be made are stronger than others. After simultaneously controlling for several child and family characteristics, the effects of the child's sex, race-ethnicity, birth date, and pace of development were relatively strong and consistent. Figure 1 provides a graphical illustration of these relationships from another perspective. This figure shows the prevalence of these characteristics among three groups of children in 1995: those who were delayed from entering kindergarten, those who were retained in kindergarten, and the total sample of first– and second–graders. This figure clearly shows that children who are male, who have late birthdays, and who are white are overrepresented among children who experienced delayed entry, as compared to the total sample of children. For example, among children who were held out of kindergarten until they were older, almost two-thirds (64 percent) were male, but in the total sample of children only half (51 percent) were male. Similarly, those who are male, and who were reported to have been developmentally delayed, are overrepresented among children who experienced kindergarten retention. For example, among children who had been retained in kindergarten, 18 percent were developmentally delayed, compared to only 5 percent in the total sample of children.

Weaker inferences can be drawn regarding the effects of family-related variables. Relatively few significant differences were found regarding these variables and the individual effects of these variables were not consistent across survey years.

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[6] Again, the difference should be interpreted with caution due to the relatively small number of children with adoptive parents (the unweighted number in the sample was 63).

Implications of delayed entry and kindergarten retention for children's school performance

We now examine how children who experienced delayed entry into kindergarten or who were required to spend an extra year in kindergarten were performing and behaving once they got to first and second grade. In the 1993 data, indicators were available concerning parents' reports of receiving negative teacher feedback about the child not learning up to his or her capabilities, inattention and restlessness in class, disruptive behavior in the classroom, and difficulties adjusting to the social requirements of school (taking turns and sharing with others). In the 1995 data, indicators were available from parent reports about the child's ranking in the lower half of the class, schoolwork problems, behavior problems, and being required to repeat first or second grade. The data in table 3 show the bivariate relationships between children's kindergarten entry and retention experiences and these individual indicators of academic performance and adjustment in the early elementary grades. Also shown are associations with summary indicators for each survey year: the proportion of children in each group who received negative feedback on at least one of the five learning or behavior items in 1993, and the proportion who experienced at least one of the four performance or behavior problems asked about in 1995.

Figure 1.—First– and second–grade students who experienced delayed entry into kindergarten , or kindergarten retention, compared with all first– and second–graders, 1995

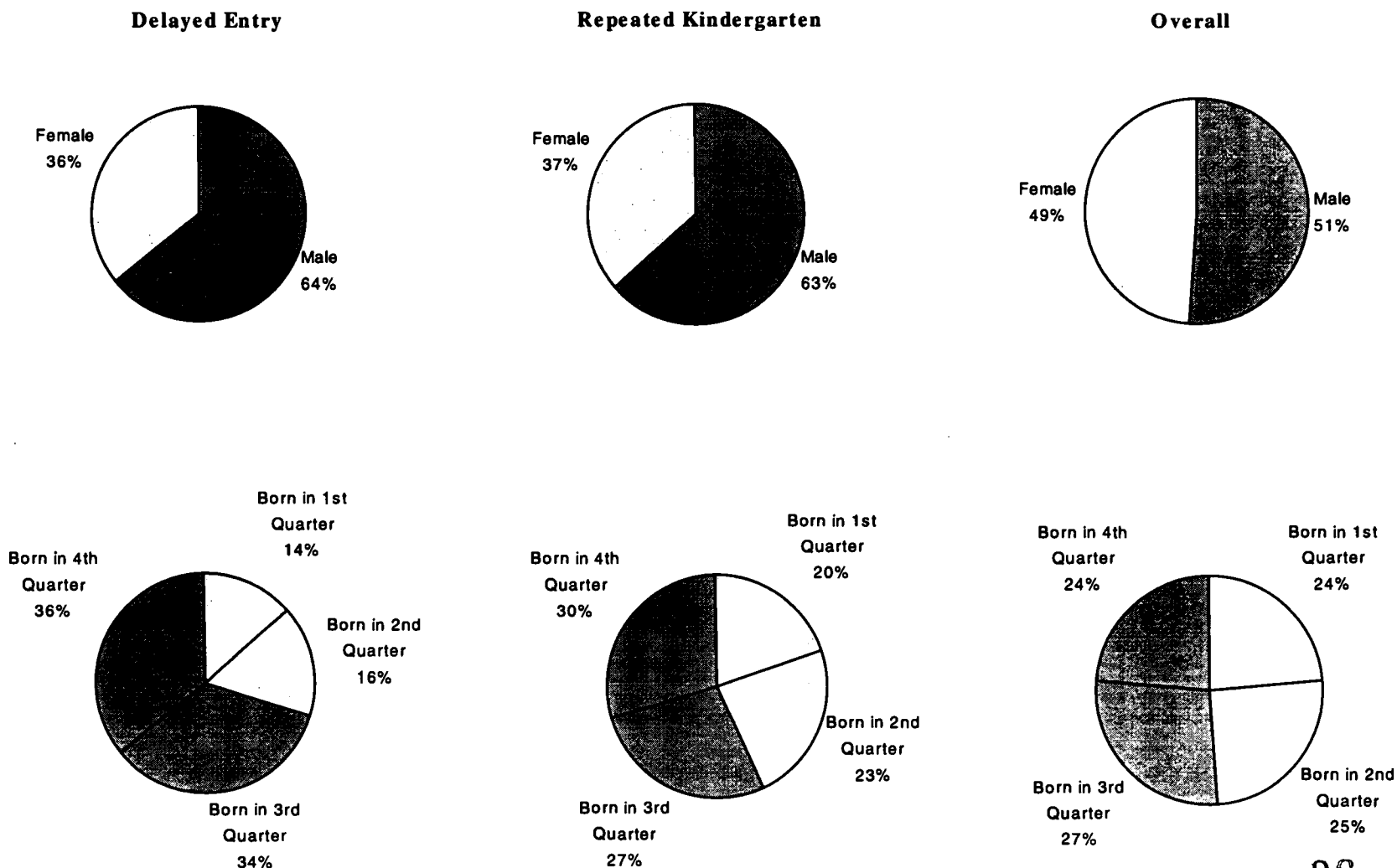
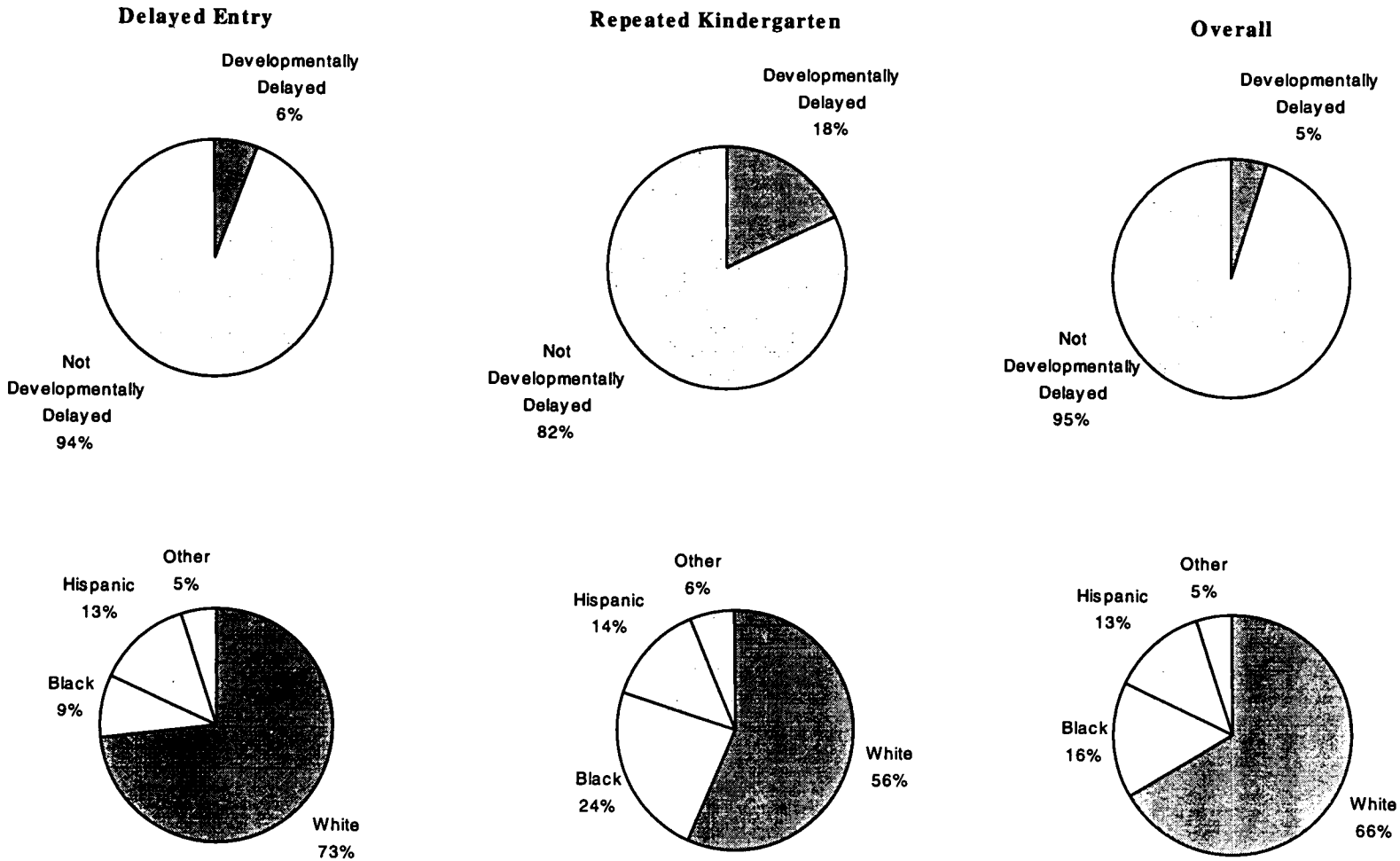


Figure 1.—First– and second–grade students who experienced delayed entry into kindergarten , or kindergarten retention, compared with all first– and second–graders, 1995—Continued



SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, spring 1995.

Table 3.— Percentage of first– and second–graders with school performance problems, by experience with delayed kindergarten entry and kindergarten retention: 1993 and 1995

School performance problems	Delayed entry into kindergarten				Repeated kindergarten			
	Yes		No		Yes		No	
	Percent	s.e.	Percent	s.e.	Percent	s.e.	Percent	s.e.
1993								
Since the beginning of this school year, a teacher has said or written that child...								
Has not been learning up to capabilities	17	1.9	24	0.9	34	4.2	23	0.8
Doesn't concentrate or pay attention for long	25	2.3	30	0.9	40	4.1	29	0.9
Has been acting up or disrupting class	21	2.4	21	1.0	29	3.7	20	1.0
Has been very restless, fidgets	17	2.2	19	0.8	27	3.5	18	0.7
Has been having trouble taking turns or sharing with others	10	1.7	9	0.5	18	3.2	9	0.5
Child received negative feedback on at least one item above	42	2.8	49	0.9	65	3.8	48	0.8
1995								
Compared to others in class, child's schoolwork is around the middle or below	34	3.1	33	0.9	45	4.5	32	0.9
Teacher/school said child having behavior problems	18	2.9	19	0.8	26	4.0	19	0.8
Teacher/school said child having schoolwork problems	21	2.8	21	1.0	29	3.5	20	1.0
Repeated 1st or 2nd grade	2	0.8	4	0.4	5	1.5	4	0.4
Any of 4 problems above	45	3.6	47	1.1	60	4.6	47	1.0

NOTE: s.e. is standard error.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, spring 1993 and 1995.

Delayed entry, kindergarten retention, and school performance: Group differences

Children whose parents held them out of kindergarten for a year were found to be performing as well as or better than first– and second–graders who entered kindergarten at the prescribed age. By contrast, children who were required to repeat kindergarten were doing worse than other first– and second–graders on nearly all the school performance indicators.

Delayed versus on-time kindergarten entry. In 1993, children who were delayed from entering kindergarten tended to receive less negative feedback from teachers. Among children who entered kindergarten at the prescribed time, 24 percent were reported to be not learning up to their capabilities. By comparison, only 17 percent of children who were held out of kindergarten until they were older were so described. Among children who entered kindergarten as soon as they were age-eligible, 30 percent were said to have problems concentrating in class; such problems were reported for a smaller proportion–25 percent–of children who had entered kindergarten later. On the other hand, the timing of kindergarten entry did not have a significant relationship to teacher reports of children acting up in class, being restless or fidgeting, or having trouble taking turns. On the summary indicator for 1993, nearly half of the pupils who entered when age-eligible–49 percent–were reported to have received one or more of the five types of negative teacher feedback. Fewer of the delayed entry pupils–42 percent–received at least one type of negative feedback.

In 1995, children whose entry into kindergarten had been delayed were only half as likely as those entering when age-eligible to have repeated first or second grade—2 percent versus 4 percent. On the other indicators, and on the summary measure, those who were held out of kindergarten performed as well as those who started kindergarten when eligible.

Retained versus non-retained pupils. Children who had been required to spend two years in kindergarten performed significantly worse than their first– and second–grade classmates on all five of the 1993 indicators, and on two of the four 1995 indicators. In 1993, two-thirds of the children who were retained in kindergarten elicited some negative feedback from teachers, compared to half of children who had not been retained. Forty percent of the retained pupils were said to have problems concentrating, more than a third, to be not learning up to their capabilities, and 29 percent, to be acting up or disrupting the class. All of these proportions were 40 to 50 percent higher than those for children who had not been retained in kindergarten. While less than a fifth of the retained pupils were said to have trouble taking turns or sharing with others, this proportion was twice as high as that for non-retained pupils.

In 1995, 60 percent of children who were retained in kindergarten were reported to have at least one school performance problem, whereas 47 percent of children not retained in kindergarten had at least one problem. More of the retained pupils had schoolwork that ranked in the lower half of the class. Nearly 30 percent had their parents contacted by the teacher or school in the last year because of a schoolwork problem, and this percentage was about 40 percent higher than that for non-retained pupils. A quarter of children who had been retained had their parents contacted because of a behavior problem; however, this proportion is not significantly different from that among those not retained. One other positive note was that the proportion who had to repeat first or second grade was comparable among kindergarten retainees and other children.

Summary. The question that remains is the extent to which the observed associations between delayed entry into kindergarten and performance in first and second grades, as well as those between kindergarten retention and elementary school performance, are attributable to the demographic and socioeconomic factors with which delayed entry and retention are correlated. This question can be addressed by using multiple logistic regression analyses. Using such analyses enables one to examine the effects of delayed kindergarten entry and kindergarten retention on early elementary school performance, while at the same time controlling for the child– and family–related factors that have already been found to be associated with children's experiences with kindergarten entry and retention. The next section discusses the results of such analyses.

Delayed entry, kindergarten retention, and school performance: Multivariate analyses

Table 4 shows the results of logistic regression models estimating the effects of delayed kindergarten entry and kindergarten retention on the likelihood of receiving negative teacher feedback among children in 1993 and on the likelihood of experiencing at least one school performance problem among children in 1995. For both the 1993 and 1995 outcome measures, separate regression models were used to examine the effect of delayed entry into kindergarten and the effect of kindergarten retention. For all models, the same child- and family-related characteristics that have been used in the previous analyses are included as control variables. By controlling for these variables, the child and family factors that have been found to be related to the likelihood of delayed kindergarten entry or kindergarten retention are being held constant. Because these child and family variables could also be correlated with the school performance

Table 4.—Adjusted odds ratios of school performance problems for first– and second–graders, by delayed entry into kindergarten, kindergarten retention, and child and family characteristics: 1993 and 1995

Independent Variables	1993		1995	
	Received negative feedback from teacher[1]		Experienced at least one school performance problem[2]	
	Delayed K entry	Repeated K	Delayed K entry	Repeated K
Delayed kindergarten entry Yes v. No	0.69 **	--	0.85	--
Repeated kindergarten Yes v. No	--	1.63 *	--	1.31
Child's sex Male v. Female	2.34 **	2.29 **	1.90 **	1.88 **
Time of year child born				
2nd quarter (Apr-Jun) v. 1st quarter (Jan-March)	1.21 †	1.21 †	1.01	1.01
3rd quarter (Jul-Sep) v. 1st quarter (Jan-March)	1.30 *	1.27 *	1.23	1.22
4th quarter (Oct-Dec) v. 1st quarter (Jan-March)	1.11	1.07	1.05	1.04
Child's race–ethnicity				
Black, non-Hispanic v. White, non-Hispanic	1.65 **	1.65 **	1.68 **	1.68 **
Hispanic v. White, non-Hispanic	1.19	1.20	1.17	1.17
Other races v. White, non-Hispanic	1.13	1.14	0.79	0.79
Doctor has said child developmentally delayed Yes v. No	2.18 **	2.01 *	4.71 **	4.53 **
Child less than 5 1/2 lbs at birth Yes v. No	1.23	1.22	1.20	1.20
Child attended center-based program before entering school Yes v. No	1.38 **	1.38 **	1.01	1.02
Parents in household				
Birth mother & other father[3] v. Birth mother & birth father	1.58 **	1.58 **	1.40 †	1.42 †
Birth mother only v. Birth mother & birth father	1.80 **	1.82 **	1.30 *	1.30 *
Birth father[4] v. Birth mother & birth father	2.61 **	2.61 **	1.39	1.39
Adoptive parent[5] v. Birth mother & birth father	2.69 **	2.51 **	1.88 †	1.90 †
Other parents v. Birth mother & birth father	3.06 **	2.97 **	2.64 **	2.64 **
Parents' highest education				
Less than high school v. High school diploma/equivalent	0.99	0.99	1.31	1.30
Some college[6] v. High school diploma/equivalent	0.83 *	0.84 †	0.87	0.87
Bachelor's degree or higher v. High school diploma/equivalent	0.66 **	0.65 **	0.49 **	0.49 **
Parent(s) speak(s) non-English language most at home Yes v. No	1.06	1.06	1.11	1.09
Household in poverty Yes v. No	1.12	1.09	1.28 †	1.30 †

[1] This is a composite measure indicating whether the child has elicited feedback on at least one of the following negative aspects of school performance—not learning up to capabilities, doesn't concentrate, acts up or disrupts class, restless and fidgets, has trouble taking turns or sharing.

[2] This is a composite measure indicating whether the child has had one of the following school performance problems—child's schoolwork ranked among the middle or below classmates, teacher has reported behavior problems, teacher has reported schoolwork problems, child has repeated first or second grade.

[3] Other fathers include step, adoptive, and foster fathers.

[4] This category includes children with birth fathers only and with birth fathers and step, adoptive, or foster mothers.

[5] This category includes children with adoptive mothers or adoptive fathers and no birth parents.

[6] This category includes children with parents who had vocational–technical education after high school.

** p<.01; * p<.05; † p<.10; -- not applicable

NOTE: Odds ratios after controlling for other variables in the table. Tables showing the logistic regression model coefficients are found in appendix C.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, spring 1993 and 1995.

measures, controlling for them allows for a better examination of whether the experiences of delayed entry or retention have any association with children's later school performance, above and beyond any effects that child and family factors may have on school performance. As before, the results are presented in the form of adjusted odds ratios.

Delayed kindergarten entry and later school performance. The results from 1993 indicate that having been delayed from entering kindergarten has significant effects on the likelihood of receiving negative feedback from teachers, even after controlling for the child's age, the child's sex, the child's race-ethnicity, the presence of a developmental delay, the child's birth weight, the parents' education level, household poverty status, the number and type of parents with whom the child was living, the language spoken in the home, and whether the child attended a center-based preschool program. In 1993, first– and second–graders who had been held out of kindergarten until they were older were significantly less likely than other children to elicit negative feedback from teachers. The odds of getting negative feedback were about two-thirds (0.69 times) as high among children who were held out of kindergarten as those among children who had not been.

In contrast, the logistic regression analyses with the 1995 data indicated that delayed entry into kindergarten was not significantly related to school performance problems in the first and second grades. Although the direction of the delayed entry effect was negative, suggesting that delayed entry was reducing the likelihood of achievement problems, the effect was not statistically significant.

Kindergarten retention and later school performance. In 1993, kindergarten retention also showed a significant relationship with teacher feedback. Children who had repeated kindergarten were significantly more likely than children who had not repeated to receive negative feedback from teachers. First– and second–graders who were retained in kindergarten were 1.63 times more likely to get negative feedback from teachers. In contrast, the effect of kindergarten repetition was not significant in the 1995 model. Again, the direction of the effect was consistent with the 1993 analysis—having repeated kindergarten seemed to be associated with an increased risk of achievement problems in first– and second–grade. But the magnitude of the effect was not substantial enough to be statistically significant.

Summary. In 1993, while both the children who were delayed from starting kindergarten and the children who repeated kindergarten were older than their classmates when entering first grade, the former group of children appear to have been faring better as far as school

performance and adjustment were concerned. The children who were older when entering kindergarten were not only doing as well as their younger first– and second–grade classmates, they were doing better, as measured by a scale of negative teacher feedback. In contrast, those who repeated kindergarten were still not doing as well as many of their classmates in the first– and second–grades.

As for children in 1995, we can only infer that those who had experienced delayed entry were doing no worse (but also no better) than their first– and second–grade classmates on the set of school performance indicators examined. This result, though different from the 1993 findings, is not surprising. As noted above, the bivariate comparisons on most of these indicators also showed no difference between those delayed from entering kindergarten and other pupils.

As far as kindergarten retention, the 1995 children who had spent two years in kindergarten appeared to be doing no worse (but also no better) than other first– and second–graders, once the demographic, developmental, and socioeconomic characteristics of the respective groups were taken into account. The bivariate comparisons *did* show the kindergarten repeaters to be doing worse than their classmates as far as their performance on schoolwork, but the multivariate results suggest that the inferior performance is attributable to other characteristics of the children who have repeated, rather than to the fact of having repeated as such. Among these characteristics are a higher incidence of developmental delay, and an overrepresentation of black children in the repeater group. Both of these characteristics were significantly related to achievement problems in the 1995 logistic regression analysis.

Effects of delayed kindergarten entry and kindergarten retention among children at-risk

Apart from the overall association (or lack of association) of delayed entry and kindergarten retention with later school performance, there is the issue of whether these practices have different effects with children who are especially at risk of experiencing difficulties in elementary school. It may be that the children who are most at risk of having problems in school have the most to gain by being a year older when starting kindergarten or by attending kindergarten for an additional year. To explore this possibility, two groups of "at-risk" children were defined with the survey data. One of the risk groups consisted of boys with late birthdays (i.e., who were born between July and December). The other group was comprised of children who have been diagnosed as developmentally delayed. As shown in the previous analyses, these two groups were found to be more likely to have been held out of kindergarten and to have been retained in kindergarten. They were also more likely than other children to exhibit school

performance problems in the early elementary grades. Thus, an additional logistic regression analysis was conducted to examine whether there were any effects of delayed kindergarten entry or kindergarten retention on first– and second–grade performance that were particular to these two specific groups of children. Details on the procedures used in this analyses and the resulting adjusted odds ratios are provided in appendix B, while the general results are described below.

Implications of delayed entry for at-risk children.. The 1993 results suggested that having been held out of kindergarten had no particular greater (or lesser) effect on the likelihood of receiving negative feedback for the at-risk children than for other children. This suggests that relatively young boys and children with histories of developmental delay do not benefit any more from entering kindergarten at an older age than do other children, at least as far as teacher perceptions of their learning and behavior (as reported by parents) are concerned.

The 1995 results were similar; however, there was some indication that for males with late birth dates, entering kindergarten at an older age may be beneficial. More specifically, among young boys, the effect of having been held out of kindergarten largely offset the increased risk of poor performance associated with being a male with a late birth date. However, the delayed entry effect for young males was not statistically significant. Thus, we cannot conclude from the 1995 data that delayed entry is particularly helpful, as far as school performance is concerned, for relatively young boys or for children who have had developmental problems.

Implications of kindergarten retention for at-risk children. In 1993 and 1995, the results also suggested that kindergarten retention did not have a different effect on first– and second–grade performance for the at-risk groups as compared to other children. Thus, it can be said that there was no reliable evidence that having repeated kindergarten had especially beneficial or detrimental implications for the first– and second–grade school performance of young males or children with histories of developmental problems.

Summary and Discussion

There has been a good deal of debate among early childhood educators about the wisdom of delaying the entrance of their children into kindergarten, and about the appropriateness of having children who experience difficulties in kindergarten repeat the grade or attend a transitional class before first grade. Although there have been a number of smaller-scale studies relevant to these issues, estimates have been lacking based on large-scale, nationally representative samples on the overall prevalence of these practices, the characteristics of young people who experience delayed entry into kindergarten or kindergarten retention, and the implications of these practices for school performance and adjustment in the early elementary grades. This report provides such estimates.

The report is based on national probability samples of first– and second–graders whose parents were interviewed concerning their children's preschool and kindergarten enrollment, progress through the grades, and performance and adjustment during the current school year. The data were collected in January through April 1995 and during the same months of 1993, as part of the National Household Education Survey. Parents of 3,071 such pupils were surveyed in 1995 and 4,260 in 1993.

By using data provided by parents, this report provides a unique contribution to the research on the effects of delayed kindergarten entry and kindergarten retention on students' academic performance. Most of the extant research on these issues has used performance measures derived from students' standardized test results or from teachers' evaluations. Since performance outcomes from a variety of perspectives are valuable, whenever possible, it may be useful if future studies on these issues conduct a broader examination of effects on student performance by using data provided by multiple sources, including teachers, students, and parents.

It would also be valuable for future research to have longitudinal data available on these issues. Having such data that reflect children's experiences and abilities through the early elementary grades would allow for stronger inferences to be made about any beneficial or harmful effects that delayed kindergarten entry or kindergarten retention may have on student performance. Data from a forthcoming NCES study, the Early Childhood Longitudinal Study (ECLS), will provide the opportunity for such analyses with a nationally representative sample of children.

Below, the results of this study are summarized and their implications for both proponents and opponents of delayed kindergarten entry and kindergarten retention are discussed.

Overall prevalence of delayed entry and kindergarten repetition

The study found that in 1995 nearly one child in ten (9 percent) had experienced a delayed entry into kindergarten, and one in twenty (5 percent) had had to repeat kindergarten or attend a transitional class before first grade. These proportions projected to nearly 689,000 first– and second–graders nationwide who had experienced delayed entry, and almost 383,000 who had repeated kindergarten. The proportions found in the 1993 survey were very similar to those in 1995.

Characteristics of children who start kindergarten late

Characteristics that were overrepresented among children who had experienced delayed entry into kindergarten were being male, having a late birthday (in the latter half of the year), and being non-black. For example, in 1995, 64 percent of delayed enterers were boys, and 70 percent had birthdays in the second half of the year, and 73 percent were non-Hispanic whites. Only 9 percent were African-American, whereas 16 percent of all first– and second–graders were black.

Unlike previous research, the 1995 survey did not find children of college-educated parents to be especially plentiful among delayed enterers. There was, however, a relatively weak but significant association between having college-educated parents and delayed kindergarten entry in 1993. There was a tendency for children who had had a diagnosed delay in their growth or development to start kindergarten later, but this association was only found in 1993. There was no association between the child being born at a low birth weight and delayed entry in either survey year.

Characteristics of children who repeat kindergarten

Characteristics that were consistently overrepresented among children who had been required to repeat kindergarten were being male and having had a delay in growth or development. For instance, in 1995, 63 percent of kindergarten repeaters were boys and compared to 51 percent of the general population of first– and second–graders. Also, 18 percent of the repeaters had had developmental delays, compared with 5 percent of all first– and second–graders.

Survey results were inconsistent with respect to the other child characteristics and socioeconomic characteristics of the families from which kindergarten repeaters came. For example, the 1993 survey found that repeaters were less likely to come from families in which parents had some college education than from families in which parents had only a high school education or less, and were more likely to come from families with poverty-level incomes than from higher-income families. The 1995 survey did not find a significant association between parent education level and kindergarten repetition, and found that children from poverty-level families were significantly *less* likely to have repeated kindergarten, when other, related factors were taken into account.

Overall patterns of association

Despite the inconsistencies from survey to survey, the overall pattern of results gives some indication that children whose parents delay their entry into kindergarten are a relatively advantaged group in ethnic, developmental, and socioeconomic terms, whereas children who are required to repeat kindergarten are comparatively disadvantaged. At the same time, it is clear that the socioeconomic differences are not as pronounced as has been sometimes suggested in earlier research and commentary on these issues. Both groups contain children drawn from nearly all segments of U.S. society.

It is not clear whether the disparities between the survey findings are simply a product of sampling fluctuation, measurement error, or reflect actual changes in the practices of schools with respect to the kinds of pupils who are being delayed from entering kindergarten or retained in kindergarten.[1] For example, it is possible that school policy changes restricting the use of retention among relatively disadvantaged children may have been a factor in the modest socioeconomic differences found between retained children and other children. Another factor that this report was not able to examine was whether state regulations regarding kindergarten entry age play any part in the relationships observed between the chances of being held out of

[1] There is evidence from the methodological research done for the NHES that the bias due to nonresponse might be somewhat more problematic for the 1995 than the 1993 estimates. The response rates were higher for the 1993 survey and analysis suggested that the bias in the estimates for low income populations might have been affected by this more in the 1995 estimates. While the sampling weights used in analyses for both samples underwent statistical adjustments for such nonresponse and undercoverage, the adjustments made in 1995 were necessarily more extensive and may have played some role in attenuating relationships between socioeconomic variables and delayed kindergarten entry or retention. This could be the case even though overall estimates of delayed entry and retention were consistent across survey years.

kindergarten and certain child characteristics, especially children's age. These are issues that may be worth examination in future research.

Implications of delayed kindergarten entry for student performance in elementary school

Children whose parents had held them out of kindergarten for a year were found to be doing at least as well in first and second grade as their younger classmates who had entered school at the prescribed age. On several of the school performance and adjustment measures available in the surveys, they were doing better. Specifically, parents reported that fewer of the delayed enterers were described by teachers as not learning up to their capabilities or as having problems paying attention in class. They were also only half as likely to have had to repeat first or second grade.

Given that most parents who delay their children's kindergarten entry do so because of the child's perceived lack of maturity at the time (McArthur and Bianchi 1993), the survey results suggest that their strategy for bolstering the child's school performance usually has the desired result. During the "held out" year, children will tend to show some improvements in their abilities and development, simply because they will be getting older. However, it is also important to note that children's educational experiences during this extra year will likely not be of equal quality. During the extra year, some parents are able to provide their children with stimulating educational environments at home or to send their children to center-based preschool programs to improve their skills before school entry. But other, less advantaged children who are held out, possibly because of failing school readiness testing, may not have as many opportunities to benefit from preschool program participation or home teaching by parents.

At the least, our findings suggest that the extra year before starting kindergarten is not harmful to the children who are held out. Parents reported that children who are older when they start school seem to perform better than younger students. The multivariate analysis of the 1995 data suggest more modest effects for delayed school entry, but even these findings indicate that the delayed children were doing just as well as their classmates. Nowhere in the survey results is there an indication that the delayed students were doing less well.

While the results suggest that the short run effects of delayed kindergarten entry are potentially beneficial or at least benign for the school performance of the children who enter kindergarten at older ages, the findings also lend support to critics of the practice. These critics contend that delayed entry may put other children who enter school when age-eligible at a

disadvantage, because teachers may expect them to do as well in class as the delayed children who are a full year or more older. Although it was not possible to directly study that issue in this report, the teacher feedback data from the 1993 survey suggest that such unfair comparisons may indeed be taking place in many first– and second–grade classrooms.

Implications of kindergarten retention for student performance in elementary school

The picture was very different for children who had been required to stay in kindergarten for a second year. These children were reported by their parents to be doing worse than their younger classmates on most of the school performance indicators that were available in the two surveys. In 1993, two-thirds of the retained pupils elicited some negative feedback from teachers, whereas the same was true of less than half of the non-retained pupils. The proportions of retained pupils who were described as having problems concentrating, as not learning up to their capabilities, or as acting up and disrupting the class were 40 to 50 percent higher than the comparable proportions for non-retained pupils. Twice as many of the retained pupils were said to have trouble taking turns and sharing with others.

In 1995, 60 percent of children who were retained in kindergarten were reported to have at least one significant school performance problem, whereas the same was true of 47 percent of children not retained in kindergarten. When the comparisons between retained and non-retained students were controlled by multiple logistic regression for the differing characteristics of the two groups, the two surveys produced somewhat disparate results. In the 1993 analysis, children who had been retained in kindergarten still received more negative feedback from teachers than their classmates, even when other characteristics of the retained and non-retained pupils were taken into account. In the 1995 models, retained children did not have significantly more school performance problems than their classmates, once their demographic, developmental, and socioeconomic characteristics were controlled.

Despite these somewhat disparate results, the best that can be said about the school performance of retained pupils is that they are doing less well than most other first– and second–graders, but no worse than would be expected, given their other developmental and background characteristics. There is no indication in the findings of either survey that requiring the children to repeat kindergarten or attend a transitional class has had a beneficial effect on their school performance. Indeed, one might argue from the 1993 findings that repeating kindergarten may have made matters worse. However, another interpretation of the 1993 results is that, in requiring some pupils to repeat kindergarten, the schools have merely identified pupils who are

slated to have further achievement and adjustment problems. According to this argument, the fact of kindergarten repetition does not create the later problems, it is only an indicator of other, underlying disorders in the child's constitution or home environment.

It is also important to reiterate that this study was not able to compare children who had repeated kindergarten with a control group of children who had been recommended for retention but were promoted anyway. As mentioned in the literature review, prior studies that have done this have not found much evidence of either a beneficial or a detrimental effect of kindergarten retention.

Why is the school performance of children whose entry into kindergarten was delayed and of children who were retained in kindergarten so different?

One might ask why there is such an apparent difference between the school performance of children whose entry into kindergarten was delayed and that of children who were required to repeat kindergarten. After all, both groups are older and presumably more mature than most of their classmates. Why does the older age and greater maturity seem to have a beneficial effect for delayed enterers, but not for retained pupils? There are several possible answers to this question, and further research is obviously needed to determine which is correct.

One potential explanation of the disparate outcomes is that the underlying developmental problems of the two groups may be different. Diagnosed developmental delay was a relatively strong and consistent predictor of having been retained in kindergarten, so it may be that kindergarten retainees are more likely to have had more serious and long-lasting birth complications or developmental delays. Another explanation would point to possible differences in social circumstances of the two groups. However, in the 1993 and 1995 NHES data, these differences were not found to be as great as is sometimes claimed. Another factor may be that the choice to delay the school entry of children may testify to a level of parent involvement in the educational process that may be propitious for the child's later achievement.

Still another explanation for the difference in outcomes grows out of the dissimilarity in how and where retention occurs. In order to have a beneficial effect, it may be necessary to intervene before children begin formal schooling and start to have negative classroom experiences. Similarly, others would point to the possible stigmatizing effect of being required to repeat a grade, even in the kindergarten year. Active parent support for the intervention may also be a critical ingredient.

More than one of the above explanations may be valid, at least in part. It is important for education researchers to carry out additional studies of delayed entry and retention that will provide a better understanding of the processes by which these disparate student performance levels evolve. Such understanding may help educators to come up with more effective early interventions that help to make elementary school a "success experience" for all pupils.

Survey Methodology and Data Reliability

The National Household Education Survey (NHES) is a telephone survey conducted by Westat for the U.S. Department of Education's National Center for Education Statistics (NCES). Data collections have taken place in 1991, 1993, 1995, and 1996 during the months of January through April of each year. When appropriately weighted, each sample is nationally representative of all civilian, noninstitutionalized persons in the 50 States and the District of Columbia. The samples were selected using random digit dialing (RDD) methods, and the data were collected using computer-assisted telephone interviewing (CATI) technology.

Data from two separate components of the NHES were used in this report—the 1993 School Readiness (SR) component and the 1995 Early Childhood Program Participation (ECPP) component. The ages of children sampled for these two components are somewhat different. Children aged 3 to 7 years old and children 8 or 9 years old and enrolled in second grade or below were sampled for the SR component of the NHES:93. The ECPP component of the NHES:95 sampled 0- to 10-year-olds in third grade or below. In all, there were 10,888 NHES:93 SR interviews completed and 14,064 NHES:95 ECPP interviews completed. This report is based on subsets of the total sample included in each component, specifically first– and second–graders. The unweighted number of first– and second–graders included in the analyses is 4,260 from the NHES:93 and 3,071 from the NHES:95.

For each of these NHES components, two survey instruments were used to collect the data. The first instrument, a Screener administered to an adult member of the household, was used to determine whether any children of the appropriate ages lived in the household, to collect information on each household member, and to identify the appropriate parent/guardian to respond for the sampled child. If one or two eligible children resided in the household, interviews were conducted about each child. If more then two eligible children resided in the household, two were sampled as interview subjects. Each SR and ECPP interview was conducted with the parent/guardian most knowledgeable about the care and education of each sampled child, usually the child's mother.

Response Rates

Screening interviews were completed with 63,844 households in 1993 and with 45,465 households in 1995. The response rate for the Screener varied somewhat between these two

survey years: 82 percent in 1993 and 73 percent in 1995. However, the completion rate, or the percentage of eligible sampled children for whom interviews were completed, was 90 percent in 1993 and in 1995. The overall response rate (the product of the Screener response rate and interview completion rate) was 74 percent for the 1993 SR component and 66 percent for the 1995 ECPP component.

For both the SR and ECPP components, item nonresponse (the failure to complete some items in an otherwise completed interview) was very low. The item nonresponse rates for most variables in this report were less than two percent. Exceptions to this include nonresponse rates for NHES:93 items measuring parents' language (4 to 5 percent), receipt of a high school diploma among fathers (4 percent), and household income (7 percent); and for the NHES:95 item measuring household income (14 percent). All items from the NHES:95 ECPP and NHES:93 SR components with missing responses (i.e., don't know, refused, or not ascertained) were imputed using an imputation method called a hot-deck procedure (Kalton and Kasprzyk 1986). As a result, no missing values remain.[1]

Data Reliability

Estimates produced using data from the NHES are subject to two types of error, sampling and nonsampling errors. Nonsampling errors are errors made in the collection and processing of data. Sampling errors occur because the data are collected from a sample rather than a census of the population.

Nonsampling Errors

Nonsampling error is the term used to describe variations in the estimates that may be caused by population coverage limitations and data collection, processing, and reporting procedures. The sources of nonsampling errors are typically problems like unit and item nonresponse, the differences in respondents' interpretations of the meaning of the questions, response differences related to the particular time the survey was conducted, and mistakes in data preparation.

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[1] For more information on the imputation procedures used in the NHES:93 and NHES:95, see the following NCES Working Papers: *Unit Response, Weighting, Item Response and Imputation in the 1993 National Household Education Survey* (Brick et al. forthcoming) and *Unit and Item Response Rates, Weighting, and Imputation Procedures in the 1995 National Household Education Survey* (Brick and Broene forthcoming).

In general, it is difficult to identify and estimate either the amount of nonsampling error or the bias caused by this error. For each NHES survey, efforts were made to prevent such errors from occurring and to compensate for them where possible. For instance, during the survey design phase, focus groups and cognitive laboratory interviews were conducted for the purpose of assessing respondent knowledge of the topics, comprehension of questions and terms, and the sensitivity of items. The design phase for each study also entailed several hundred staff hours of CATI instrument testing and pretesting in which several hundred interviews were conducted.

An important nonsampling error for a telephone survey is the failure to include persons who do not live in households with telephones. About 90 percent of all children in the eligible age ranges for the NHES surveys live in households with telephones. Estimation procedures were used to help reduce the bias in the estimates associated with children who do not live in telephone households.[2]

Sampling Errors and Weighting

The sample of telephone households selected for each NHES survey is just one of many possible samples that could have been selected. Therefore, estimates produced from each NHES sample may differ from estimates that would have been produced from other samples. This type of variability is called sampling error because it arises from using a sample of households with telephones, rather than all households with telephones.

The standard error is a measure of the variability due to sampling when estimating a statistic. Standard errors for estimates presented in this report were computed using a jackknife replication method. Standard errors can be used as a measure of the precision expected from a particular sample. The probability that a complete census count would differ from the sample estimate by less than 1 standard error is about 68 percent. The chance that the difference would be less than 1.65 standard errors is about 90 percent, and that the difference would be less than 1.96 standard errors, about 95 percent.

Standard errors for all of the estimates are presented in the tables. These standard errors can be used to produce confidence intervals. For example, an estimated 10 percent of first– and

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[2] For additional information on telephone coverage issues and estimation procedures to correct for coverage biases, see the following NCES Working Papers: *Telephone Coverage Bias and Recorded Interviews in the 1993 National Household Education Survey* (Brick and Tubbs forthcoming) and *Undercoverage Bias in Estimates of Characteristics of Adults and 0- to 2-Year-Olds in the 1995 National Household Education Survey* (Brick forthcoming).

second–grade boys in 1993 were delayed from entering kindergarten. This percentage has an estimated standard error of 0.8 percent. Therefore, the estimated 95 percent confidence interval for this statistic is approximately 8 (i.e., 10 - (1.96 x 0.8)) to 12 (i.e., 10 + (1.96 x 0.8)) percent.

All of the estimates in the report are based on weighting the observations using the probabilities of selection for the sample and other adjustments to partially account for nonresponse and coverage bias. These weights were developed to make the estimates unbiased and consistent estimates of the national totals.

In addition to properly weighting the responses, special procedures for estimating the statistical significance of the estimates were employed because the data were collected using a complex sample design. Complex sample designs, like that used in the NHES, result in data that violate some of the assumptions that are normally required to assess the statistical significance of the results. Frequently, the sampling errors of the estimates from the survey are larger than would be expected if the sample were a simple random sample and the observations were independent and identically distributed random variables.

Replication methods of variance estimation were used to reflect the actual sample design used in each NHES survey. A form of the jackknife replication method was used to compute approximately unbiased estimates of the sampling errors of the estimates in the report. The jackknife methods were used to estimate the precision of the estimates of the reported national totals, percentages, and regression parameters. In addition, chi-squared tests of independence were used to evaluate the statistical significance of the overall association between a child or family characteristic (e.g., race-ethnicity) and having been delayed from entering kindergarten or retained in kindergarten. These chi-squared tests of independence were adjusted for the complex sample design using the procedures described by Rao and Thomas (1989). In essence, these adjustments account for the lack of independent, identically distributed random variables that are usually assumed when chi-squared tests of independence are computed. To test the differences between two categories (e.g., white, non-Hispanic versus black, non-Hispanic), student's t statistic was employed, using unbiased estimates of sampling errors derived by the replication methods mentioned above.

As the number of comparisons at the same significance level increases, it becomes more likely that at least one of the estimated differences will be significant merely by chance, that is, it will be erroneously identified as different from zero. Even when there is no statistical difference between the means or percentages being compared, there is a 5 percent chance of getting a

significant F or *t* value from sampling error alone. As the number of comparisons increases, the chance of making this type of error also increases.

A Bonferroni adjustment procedure was used to correct significance tests for multiple comparisons. This method adjusts the significance level for the total number of comparisons made with a particular classification variable. All the differences cited in this report are significant at the 0.05 level of significance after a Bonferroni adjustment. For example, the total number of comparisons for the race-ethnicity variable is six (i.e., white, non-Hispanic v. black, non-Hispanic; white non-Hispanic v. Hispanic; white, non-Hispanic v. other race; black, non-Hispanic v. Hispanic; black, non-Hispanic v. other race; and Hispanic v. other race). Thus, the significance criteria for each race-ethnicity comparison is adjusted to p=0.0083 (i.e., 0.05 / 6).

Poverty measure

The poverty measure presented in this report was developed by combining information about household composition and household income. In the NHES:93, household income was collected in increments of $5,000 instead of in exact amounts, and therefore the poverty measure is an approximation. The household is considered poor in the 1993 analyses if

- the number of household members is 3 or less and household income is $10,000 or less;
- the number of household members is 4 or 5 and household income is $15,000 or less;
- the number of household members is 6 or 7 and household income is $20,000 or less;
- the number of household members is 8 and household income is $25,000 or less; and
- the number of household members is 9 or more and household income is $30,000 or less.

In the NHES:95, household income was also collected in increments of $5,000; however, exact income to the nearest $1,000 was also collected if the household's poverty status was ambiguous based on the increment reported. In the 1995 analyses, a household is considered poor if

- the number of household members is 2 and household income is less than $10,000;

- the number of household members is 3 and household income is less than $12,000;
- the number of household members is 4 and household income is $15,000 or less;
- the number of household members is 5 and household income is less than $18,000;
- the number of household members is 6 and household income is $20,000 or less;
- the number of household members is 7 and household income is less than $23,000;
- the number of household members is 8 and household income is $25,000 or less; and
- the number of household members is 9 or more and household income is $30,000 or less.

These poverty measures result in 26 percent of first– and second–graders being classified as in poverty in the NHES:93 and 24 percent in the NHES:95. These percentages are similar to the traditional measure of poverty status (Bureau of the Census 1996).

Conversion of Odds Ratios

The odds ratios presented in tables 2 and 4 in the report text, and tables B1 and B2 in appendix B, were derived from the results of logistic regression models. Thus, if one is interested in knowing the coefficients for each variable in these models, they can be derived from the odds ratios that are presented in the tables. To do this, take the natural logarithm of the odds ratio:

ln (odds ratio).

For example, in table 2, the odds of male children having repeated kindergarten compared to female children were 1.42 in 1993. The logistic regression model coefficient from which this odds ratio was obtained was $ln(1.42) = 0.35$. For more information about conversions between logistic regression model coefficients and odds ratios, see Alba (1987). Tables containing the regression model coefficients are found in appendix C.

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Appendix A

NHES:93 and NHES:95 Interview Items

Interview items to determine delayed kindergarten entry and retention status

NHES:93

R56. Most school districts have guidelines about when a child can start school based on his or her date of birth. Did you enroll (CHILD) in (kindergarten/prefirst grade) when (he/she) was old enough based on (his/her) birthdate, or did you wait until (he/she) was older?

WHEN OLD ENOUGH 1
WAITED 2
ENTERED EARLY 3

R66. Did (CHILD) attend one or two years of kindergarten?

ONE 1
TWO 2
THREE OR MORE 3

NHES:95

B2. Most school districts have guidelines about when a child can start school based upon his or her birth date. Did you enroll (CHILD) in kindergarten when (he/she) was old enough based on (his/her) birth date, or did you wait until (he/she) was older?

WHEN OLD ENOUGH 1
WAITED 2
ENTERED EARLY 3

B4. Did (CHILD) attend one or two years of kindergarten?

ONE 1
TWO 2
THREE OR MORE 3

NHES:93 items measuring teacher feedback on children's school performance and behavior

TEACHINT. Here are some things teachers tell parents about how their children are doing in school. For each one, please tell me if a teacher said something like this about (CHILD), or wrote it in a note or on a report card during the school year, even if you didn't agree.

R52. Since the beginning of this school year, has a teacher said or written that...

	YES	NO
a. (CHILD) has been doing really well in school?	1	2
b. (CHILD) has not been learning up to (his/her) capabilities?	1	2
c. *(CHILD) doesn't concentrate, doesn't pay attention for long?*	1	2
d. *(CHILD) has been acting up in school or disrupting the class?*	1	2
e. (CHILD) has often seemed sad or unhappy in class?	1	2
f. *(CHILD) has been very restless, fidgets all the time, or doesn't sit still?*	1	2
g. *(CHILD) has been having trouble taking turns, sharing, or cooperating with other children?*	1	2
h. (CHILD) gets along with other children or works well in a group?	1	2
i. (CHILD) is very enthusiastic and interested in a lot of different things?	1	2
j. (CHILD) lacks confidence in learning new things or taking part in new activities?	1	2
k. It's hard to understand what (CHILD) is saying?	1	2
l. (CHILD) is often sleepy or tired in class?	1	2
m. (CHILD) likes to speak out in class and express (his/her) ideas?	1	2

NHES:95 items measuring children's school performance

C8. Compared to other children in (his/her) class, how would you say (CHILD) is doing in (his/her) schoolwork this year? Would you say (CHILD) is...

Near the top of the class, ... 1
Above the middle of the class, ... 2
Around the middle of the class, ... 3
Below the middle of the class, or 4
Near the bottom of the class? 5

C9. Has (CHILD'S) teacher or school contacted you [or (CHILD'S) (OTHER PARENT/GUARDIAN)] about any behavior problems (he/she) is having in school this year?

YES 1
NO 2

C10. Has (CHILD'S) teacher or school contacted you [or (CHILD'S) (OTHER PARENT/GUARDIAN)] about any problems (he/she) is having with schoolwork this year?

YES 1
NO 2

C11. Since starting first grade, has (CHILD) repeated any grades?

YES 1
NO 2

C12. What grade or grades did (CHILD) repeat? [CODE ALL THAT APPLY.]
[DISPLAY UP TO CURRENT GRADE ONLY.]

FIRST GRADE 1
SECOND GRADE 2
THIRD GRADE 3

Appendix B

Analyses of Delayed Kindergarten Entry and Kindergarten Retention for Children At-Risk of School Problems

Analyses of Delayed Kindergarten Entry and Kindergarten Retention for Children At-Risk of School Problems

This appendix provides information on the logistic regression analyses done to examine whether the effects of delayed kindergarten entry and kindergarten retention on children's later school performance differ between those who are especially at risk of experiencing difficulties in elementary school and other children. In this analysis, two groups of "at-risk" children were defined with the survey data. One of the risk groups consisted of boys with late birthdays (i.e., who were born between July and December). The other group was comprised of children who were reported to have been diagnosed as developmentally delayed.

For each of the risk groups, two new variables were created: one representing being at-risk and also having entered kindergarten at a later age; the other representing being at-risk and also having repeated kindergarten. When entered into logistic regression models these new variables, or "interaction terms," indicate whether or not having been delayed from starting kindergarten or having repeated kindergarten differentially affects the likelihood of poor school performance in the first and second grades, according to whether or not the child is at risk for poor school performance to begin with. For example, the interaction term representing whether the child was male and had a late birthdate and also whether the child was delayed from entering kindergarten indicates whether or not delayed entry has a different effect on school performance for male children with late birthdays than for other children.

Each interaction term (and its component main effect terms) was tested in a separate regression model; thus, there were four logistic models for the 1993 summary school performance indicator, and four models for the 1995 school performance indicator. These models included controls for the demographic, developmental, and socioeconomic variables that were used in other analyses presented in this report. However, the models involving males with late birthdays did not include the separate variables of child's sex and birth date.

Tables B1 and B2 in this appendix present the results of the logistic regression analyses that incorporated the interaction terms. Table B1 presents the results for the 1993 data, in which the dependent variable is receipt of negative feedback from teachers. Table B2 presents the results for the 1995 data, in which the dependent variable is the occurrence of one of the four school performance problems asked about in that survey year. The results are discussed in the "Findings" section of the report.

Table B1.— Adjusted odds ratios for negative teacher feedback for children at risk for delayed kindergarten entry and kindergarten retention: 1993 first– and second–graders

Independent Variables	Received negative feedback from teacher[1]			
	Delayed kindergarten entry models		Kindergarten retention models	
	Male & late birthday	Developmentally delayed	Male & late birthday	Developmentally delayed
At risk				
Male & late birthday v. Other children	1.80 **	--	1.75 **	--
Developmentally delayed v. Not developmentally delayed	--	2.23 **	--	2.03 *
Delayed kindergarten entry				
Yes v. No	0.66 *	0.70 *	--	--
Repeated kindergarten				
Yes v. No	--	--	1.62 *	1.63 *
At risk x Delayed K entry	1.09	0.90	--	--
At risk x Repeated K	--	--	1.25	0.95
Child's sex				
Male v. Female	--	2.34 **	--	2.29 **
Time of year child born				
2nd quarter (Apr-Jun) v. 1st quarter (Jan-March)	--	1.21 †	--	1.21 †
3rd quarter (Jul-Sep) v. 1st quarter (Jan-March)	--	1.30 *	--	1.27 *
4th quarter (Oct-Dec) v. 1st quarter (Jan-March)	--	1.11	--	1.07
Child's race–ethnicity				
Black, non-Hispanic v. White, non-Hispanic	1.60 **	1.65 **	1.60 **	1.65 **
Hispanic v. White, non-Hispanic	1.19	1.19	1.19	1.20
Other races v. White, non-Hispanic	1.17	1.13	1.17	1.14
Doctor has said child developmentally delayed				
Yes v. No	2.29 **	--	2.10 **	--
Child less than 5 1/2 lbs at birth				
Yes v. No	1.19	1.23	1.17	1.22
Child attended center-based program before entering school				
Yes v. No	1.38 **	1.38 **	1.39 **	1.38 **
Parents in household				
Birth mother & other father[2] v. Birth mother & birth father	1.60 **	1.60 **	1.58 **	1.58 **
Birth mother only v. Birth mother & birth father	1.79 **	1.80 **	1.80 **	1.82 **
Birth father[3] v. Birth mother & birth father	2.51 **	2.61 **	2.53 **	2.61 **
Adoptive parent[4] v. Birth mother & birth father	2.75 **	2.72 **	2.51 **	2.51 **
Other parents v. Birth mother & birth father	3.16 **	3.06 **	3.10 **	2.97 **
Parents' highest education				
Less than high school v. High school diploma/equivalent	1.01	0.99	1.01	0.99
Some college[5] v. High school diploma/equivalent	0.84 †	0.83 *	0.85 †	0.84 †
Bachelor's degree or higher v. High school diploma/equivalent	0.67 **	0.66 **	0.67 **	0.65 **
Parent(s) speak(s) non-English language most at home				
Yes v. No	1.07	1.06	1.07	1.06
Household in poverty				
Yes v. No	1.11	1.12	1.08	1.09

[1] This is a composite measure indicating whether the child has elicited feedback on at least one of the following negative aspects of school performance: not learning up to capabilities, doesn't concentrate, acts up or disrupts class, restless and fidgets, and has trouble taking turns or sharing.
[2] Other fathers include step, adoptive, and foster fathers.
[3] This category includes children with birth fathers only and with birth fathers and step, adoptive, or foster mothers.
[4] This category includes children with adoptive mothers or adoptive fathers and no birth parents.
[5] This category includes children with parents who had vocational/technical education after high school.

** p<.01; * p<.05; † p<.10; -- not applicable
NOTE: Odds ratios after controlling for other variables in the table. Tables showing the logistic regression model coefficients are found in appendix C.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, spring 1993 and 1995.

Table B2.— Adjusted odds ratios for experience with at least one school performance problem for children at risk for delayed kindergarten entry and kindergarten retention: 1995 first– and second–graders

Independent Variables	Experienced at least one school performance problem[1]			
	Delayed kindergarten entry models		Kindergarten retention models	
	Male & late birthday	Developmentally delayed	Male & late birthday	Developmentally delayed
At risk				
Male & late birthdate v. Other children	1.70 **	--	1.63 **	--
Developmentally delayed v. Not developmentally delayed	--	5.05 **	--	4.26 **
Delayed kindergarten entry				
Yes v. No	1.05	0.88	--	--
Repeated kindergarten				
Yes v. No	--	--	1.68 *	1.26
At risk x Delayed K entry	0.64 †	0.59	--	--
At risk x Repeated K	--	--	0.57	1.80
Child's sex				
Male v. Female	--	1.90 **	--	1.88 **
Time of year child born				
2nd quarter (Apr-Jun) v. 1st quarter (Jan-March)	--	1.01	--	1.01
3rd quarter (Jul-Sep) v. 1st quarter (Jan-March)	--	1.23	--	1.22
4th quarter (Oct-Dec) v. 1st quarter (Jan-March)	--	1.05	--	1.04
Child's race–ethnicity				
Black, non-Hispanic v. White, non-Hispanic	1.65 **	1.68 **	1.63 **	1.68 **
Hispanic v. White, non-Hispanic	1.20	1.17	1.21	1.17
Other races v. White, non-Hispanic	0.82	0.80	0.82	0.79
Doctor has said child developmentally delayed				
Yes v. No	4.90 **	--	4.66 **	--
Child less than 5 1/2 lbs at birth				
Yes v. No	1.14	1.19	1.14	1.19
Child attended center-based program before entering school				
Yes v. No	1.04	1.01	1.05	1.02
Parents in household				
Birth mother & other father[2] v. Birth mother & birth father	1.39 †	1.40 †	1.40 †	1.40 †
Birth mother only v. Birth mother & birth father	1.31 *	1.30 *	1.30 *	1.30 *
Birth father[3] v. Birth mother & birth father	1.42	1.39	1.42	1.39
Adoptive parent[4] v. Birth mother & birth father	1.90 †	1.90 †	1.90 †	1.90 †
Other parents v. Birth mother & birth father	2.56 **	2.64 **	2.53 **	2.64 **
Parents' highest education				
Less than high school v. High school diploma/equivalent	1.27	1.31	1.27	1.31
Some college[5] v. High school diploma/equivalent	0.86	0.88	0.85	0.87
Bachelor's degree or higher v. High school diploma/equivalent	0.49 **	0.49 **	0.49 **	0.49 **
Parent(s) speak(s) non-English language most at home				
Yes v. No	1.09	1.11	1.07	1.09
Household in poverty				
Yes v. No	1.25	1.28 †	1.26	1.31 †

[1] This is a composite measure indicating whether the child has elicited feedback on at least one of the following negative aspects of school performance: not learning up to capabilities, doesn't concentrate, acts up or disrupts class, restless and fidgets, and has trouble taking turns or sharing.
[2] Other fathers include step, adoptive, and foster fathers.
[3] This category includes children with birth fathers only and with birth fathers and step, adoptive, or foster mothers.
[4] This category includes children with adoptive mothers or adoptive fathers and no birth parents.
[5] This category includes children with parents who had vocational/technical education after high school.

** p<.01; * p<.05; † p<.10; -- not applicable.

NOTE: Odds ratios after controlling for other variables in the table. Tables showing the logistic regression model coefficients are found in appendix C.
SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, spring 1993 and 1995.

Appendix C

Logistic Regression Model Coefficients

Logistic Regression Model Coefficients

Tables 2 and 4 in the report text and tables B1 and B2 in appendix B contain the results of logistic regression models in the form of odds ratios. Included in this appendix are tables containing the regression model coefficients from which these odds ratios were derived. Table C1 corresponds to text table 2; table C2 corresponds to text table 4; table C3 corresponds to appendix table B1; and table C4 corresponds to appendix table B2.

The odds ratios were derived from the coefficients by using the following formula:

$$e^{\beta}$$

where β is the regression model coefficient. For more information about conversions between logistic regression model coefficients and odds ratios, see Alba (1987).[1]

[1] Alba, Richard D. (1987). "Interpreting the Parameters of Log-Linear Models." *Sociological Methods and Research* vol. 16, no. 1, pp.45-77.

Table C1.— Logistic regression models relating delayed entry into kindergarten and kindergarten retention to child and family characteristics for first– and second–graders: 1993 and 1995

Independent Variables	1993				1995			
	Delayed entry into kindergarten		Repeated kindergarten		Delayed entry into kindergarten		Repeated kindergarten	
	β	s.e.	β	s.e.	β	s.e.	β	s.e.
Intercept	-3.02 **	0.24	-3.41 **	0.26	-3.10 **	0.23	-3.56 **	0.25
Child's sex (male)	0.29 *	0.14	0.35 *	0.16	0.57 **	0.15	0.50 *	0.19
Time of year child born								
1st quarter (Jan-Mar)	--	--	--	--	--	--	--	--
2nd quarter (Apr-Jun)	-0.34	0.25	0.48 †	0.25	0.08	0.24	0.10	0.31
3rd quarter (Jul-Sep)	0.61 **	0.20	0.35	0.22	0.81 **	0.18	0.17	0.31
4th quarter (Oct-Dec)	0.88 **	0.21	0.25	0.26	1.03 **	0.20	0.34	0.26
Child's race–ethnicity								
White, non-Hispanic	--	--	--	--	--	--	--	--
Black, non-Hispanic	-0.46 *	0.23	0.28	0.24	-0.50 *	0.22	0.81 **	0.26
Hispanic	0.31	0.23	-0.43	0.37	0.02	0.26	0.08	0.32
Other races	-0.65	0.49	0.28	0.39	-0.13	0.29	0.14	0.40
Doctor has said child developmentally delayed	0.84 **	0.26	1.21 **	0.25	0.27	0.32	1.57 **	0.32
Child less than 5 1/2 lbs at birth	-0.07	0.32	0.39 †	0.23	-0.34	0.37	0.36	0.31
Child attended center-based program before entering school	-0.03	0.15	-0.06	0.17	0.17	0.17	-0.62 **	0.21
Parents in household								
Birth mother & birth father	--	--	--	--	--	--	--	--
Birth mother & other father[1]	-0.09	0.35	0.27	0.36	-0.71 †	0.39	0.29	0.36
Birth mother only	-0.07	0.20	-0.13	0.19	-0.22	0.19	0.13	0.20
Birth father[2]	-0.26	0.32	0.18	0.34	-1.11 *	0.48	0.59	0.51
Adoptive parent[3]	1.06 **	0.37	1.00 *	0.45	-0.09	0.60	-0.41	1.10
Other parents	-0.08	0.43	0.67	0.41	-0.56	0.49	0.73	0.49
Parents' highest education								
Less than high school	0.01	0.28	0.12	0.29	0.21	0.32	-0.03	0.42
High school diploma or equivalent	--	--	--	--	--	--	--	--
Some college[4]	0.09	0.18	-0.44 *	0.21	0.16	0.18	0.12	0.25
Bachelor's degree or higher	0.33 *	0.16	-0.28	0.18	-0.14	0.17	0.19	0.27
Parent(s) speak(s) non-English language most at home	-0.38 †	0.23	0.28	0.37	-0.12	0.30	0.69 †	0.37
Household in poverty	0.29	0.18	0.45 *	0.19	-0.21	0.22	-0.79 **	0.29
F (20,41)	5.24 **		3.42 **		--		--	
F (20,31)	--		--		3.52 **		5.84 **	

[1] Other fathers include step, adoptive, and foster fathers.

[2] This category includes children with birth fathers only and with birth fathers and step, adoptive, or foster mothers.

[3] This category includes children with adoptive mothers or adoptive fathers and no birth parents.

[4] This category includes children with parents who had vocational–technical education after high school.

* p<.01; * p<.05; † <.10; -- not applicable

NOTE: b = unstandardized regression coefficient
s.e. is standard error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, spring 1993 and 1995.

Table C2.— Logistic regression models relating school performance problems to delayed entry into kindergarten and kindergarten retention for first– and second–graders: 1993 and 1995

Independent Variables	1993				1995			
	Received negative feedback from teacher[1]				Experienced at least one school performance problem[2]			
	β	s.e.	β	s.e.	β	s.e.	β	s.e.
Intercept	-1.10 **	0.14	-1.12 **	0.13	-0.66 **	0.14	-0.68 **	0.14
Delayed kindergarten entry	-0.37 **	0.13	--	--	-0.16	0.17	--	--
Repeated kindergarten	--	--	0.49 *	0.19	--	--	0.27	0.22
Child's sex (male)	0.85 **	0.07	0.83 **	0.07	0.64 **	0.07	0.63 **	0.08
Time of year child born								
1st quarter (Jan-Mar)	--	--	--	--	--	--	--	--
2nd quarter (Apr-Jun)	0.19 †	0.10	0.19 †	0.11	0.01	0.14	0.01	0.14
3rd quarter (Jul-Sep)	0.26 *	0.11	0.24 *	0.12	0.21	0.13	0.20	0.13
4th quarter (Oct-Dec)	0.10	0.11	0.07	0.11	0.05	0.15	0.04	0.15
Child's race–ethnicity								
White, non-Hispanic	--	--	--	--	--	--	--	--
Black, non-Hispanic	0.50 **	0.12	0.50 **	0.12	0.52 **	0.13	0.52 **	0.13
Hispanic	0.17	0.13	0.18	0.13	0.16	0.16	0.16	0.16
Other races	0.12	0.20	0.13	0.20	-0.23	0.21	-0.23	0.22
Doctor has said child developmentally delayed	0.78 **	0.26	0.70 *	0.27	1.55 **	0.28	1.51 **	0.28
Child less than 5 1/2 lbs at birth	0.21	0.13	0.20	0.13	0.18	0.20	0.18	0.20
Child attended center-based program before entering school	0.32 **	0.07	0.32 **	0.07	0.01	0.10	0.02	0.10
Parents in household								
Birth mother & birth father	--	--	--	--	--	--	--	--
Birth mother & other father[3]	0.46 **	0.16	0.46 **	0.16	0.34 †	0.19	0.35 †	0.19
Birth mother only	0.59 **	0.12	0.60 **	0.12	0.26 *	0.12	0.26 *	0.12
Birth father[4]	0.96 **	0.19	0.96 **	0.19	0.33	0.26	0.33	0.25
Adoptive parent[5]	0.99 **	0.32	0.92 **	0.33	0.63 †	0.36	0.64 †	0.36
Other parents	1.12 **	0.29	1.09 **	0.29	0.97 **	0.34	0.97 **	0.34
Parents' highest education								
Less than high school	-0.01	0.15	-0.01	0.15	0.27	0.19	0.26	0.19
High school diploma or equivalent	--	--	--	--	--	--	--	--
Some college[6]	-0.19 *	0.09	-0.18 †	0.09	-0.14	0.10	-0.14	0.10
Bachelor's degree or higher	-0.42 **	0.11	-0.43 **	0.10	-0.71 **	0.10	-0.71 **	0.10
Parent(s) speak(s) non-English language most at home	0.06	0.14	0.06	0.14	0.10	0.22	0.09	0.22
Household in poverty	0.11	0.11	0.09	0.11	0.25 †	0.15	0.26 †	0.14
F (21,40)	15.11 **		16.58 **		--		--	
F (21,30)	--		--		17.46 **		16.18 **	

[1]This is a composite measure indicating whether the child has elicited feedback on at least one of the following negative aspects of school performance: not learning up to capabilities, doesn't concentrate, acts up or disrupts class, restless and fidgets, and has trouble taking turns or sharing.

[2]This is a composite measure indicating whether the child has had one of the following school performance problems: child's schoolwork ranked among the middle or below classmates, teacher has reported behavior problems, teacher has reported schoolwork problems, and child has repeated first or second grade.

[3]Other fathers include step, adoptive, and foster fathers.

[4]This category includes children with birth fathers only and with birth fathers and step, adoptive, or foster mothers.

[5]This category includes children with adoptive mothers or adoptive fathers and no birth parents.

[6]This category includes children with parents who had vocational–technical education after high school.

** p<.01; * p<.05; † p<.10; -- not applicable

NOTE: b = unstandardized regression coefficient
s.e. is standard error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, spring 1993 and 1995.

Table C3.— Logistic regression models relating negative teacher feedback for children at risk to delayed kindergarten entry and kindergarten retention: 1993 first– and second–graders

Independent Variables	Received negative feedback from teacher[1]							
	Delayed kindergarten entry models				Kindergarten retention models			
	β	s.e.	β	s.e.	β	s.e.	β	s.e.
Intercept	-0.69 **	0.10	-1.10 **	0.14	-0.73 **	0.10	-1.13 **	0.14
At risk (male & late birthdate)	0.59 **	0.09	--	--	0.56 **	0.09	--	--
At risk (developmentally delayed)	--	--	0.80 **	0.27	--	--	0.71 *	0.28
Delayed kindergarten entry	-0.41 *	0.16	-0.36 *	0.14	--	--	--	--
Repeated kindergarten	--	--	--	--	0.48 *	0.20	0.49 *	0.20
At risk x Delayed K entry	0.09	0.28	-0.11	0.55	--	--	--	--
At risk x Repeated K	--	--	--	--	0.22	0.33	-0.05	0.69
Child's sex (male)	--	--	0.85 **	0.07	--	--	0.83 **	0.07
Time of year child born								
1st quarter (Jan-Mar)	--	--	--	--	--	--	--	--
2nd quarter (Apr-Jun)	--	--	0.19 †	0.10	--	--	0.19 †	0.11
3rd quarter (Jul-Sep)	--	--	0.26 *	0.12	--	--	0.24 *	0.12
4th quarter (Oct-Dec)	--	--	0.10	0.10	--	--	0.07	0.11
Child's race–ethnicity								
White, non-Hispanic	--	--	--	--	--	--	--	--
Black, non-Hispanic	0.47 **	0.12	0.50 **	0.12	0.47 **	0.12	0.50 **	0.12
Hispanic	0.17	0.12	0.17	0.13	0.17	0.12	0.18	0.13
Other races	0.16	0.20	0.12	0.20	0.16	0.20	0.13	0.20
Doctor has said child developmentally delayed	0.83 **	0.25	--	--	0.74 **	0.26	--	--
Child less than 5 1/2 lbs at birth	0.17	0.13	0.21	0.13	0.16	0.13	0.20	0.13
Child attended center-based program before entering school	0.32 **	0.07	0.32 **	0.07	0.33 **	0.08	0.32 **	0.07
Parents in household								
Birth mother & birth father	--	--	--	--	--	--	--	--
Birth mother & other father[2]	0.47 **	0.16	0.47 **	0.16	0.46 **	0.16	0.46 **	0.16
Birth mother only	0.58 **	0.12	0.59 **	0.12	0.59 **	0.12	0.60 **	0.12
Birth father[3]	0.92 **	0.20	0.96 **	0.19	0.93 **	0.20	0.96 **	0.19
Adoptive parent[4]	1.01 **	0.29	1.00 **	0.30	0.92 **	0.31	0.92 **	0.33
Other parents	1.15 **	0.28	1.12 **	0.29	1.13 **	0.28	1.09 **	0.29
Parents' highest education								
Less than high school	0.01	0.15	-0.01	0.15	0.01	0.15	-0.01	0.15
High school diploma or equivalent	--	--	--	--	--	--	--	--
Some college[5]	-0.17 †	0.09	-0.19 *	0.09	-0.16 †	0.09	-0.18 †	0.09
Bachelor's degree or higher	-0.40 **	0.10	-0.42 **	0.11	-0.40 **	0.10	-0.43 **	0.10
Parent(s) speak(s) non-English language most at home	0.07	0.13	0.06	0.14	0.07	0.13	0.06	0.14
Household in poverty	0.10	0.10	0.11	0.11	0.08	0.10	0.09	0.11
F (19,42)	14.52 **		--		16.47 **		--	
F (22,39)	--		14.31 **		--		15.67 **	

[1]This is a composite measure indicating whether the child has elicited feedback on at least one of the following negative aspects of school performance: not learning up to capabilities, doesn't concentrate, acts up or disrupts class, restless and fidgets, and has trouble taking tums or sharing.
[2]Other fathers include step, adoptive, and foster fathers.
[3]This category includes children with birth fathers only and with birth fathers and step, adoptive, or foster mothers.
[4]This category includes children with adoptive mothers or adoptive fathers and no birth parents.
[5]This category includes children with parents who had vocational–technical education after high school.

** p<.01; * p<.05; † p<.10; -- not applicable

NOTE: b = unstandardized regression coefficient
s.e. is standard error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, spring 1993 and 1995.

Table C4.— Logistic regression models relating experience with at least one school performance problem for children at risk to delayed kindergarten entry and kindergarten retention: 1995 first– and second–graders

Independent Variables	Experienced at least one school performance problem[1]							
	Delayed kindergarten entry models				Kindergarten retention models			
	β	s.e.	β	s.e.	β	s.e.	β	s.e.
Intercept	-0.41 **	0.11	-0.67 **	0.14	-0.42 **	0.10	-0.68 **	0.14
At risk (male & late birthdate)	0.53 **	0.11	--	--	0.49 **	0.11	--	--
At risk (developmentally delayed)	--	--	1.62 **	0.32	--	--	1.45 **	0.29
Delayed kindergarten entry	0.05	0.19	-0.13	0.18	--	--	--	--
Repeated kindergarten	--	--	--	--	0.52 *	0.24	0.23	0.24
At risk x Delayed K entry	-0.44 †	0.26	-0.53	0.71	--	--	--	--
At risk x Repeated K	--	--	--	--	-0.56	0.41	0.59	1.03
Child's sex (male)	--	--	0.64 **	0.07	--	--	0.63 **	0.08
Time of year child born								
1st quarter (Jan-Mar)	--	--	--	--	--	--	--	--
2nd quarter (Apr-Jun)	--	--	0.01	0.14	--	--	0.01	0.14
3rd quarter (Jul-Sep)	--	--	0.21	0.13	--	--	0.20	0.13
4th quarter (Oct-Dec)	--	--	0.05	0.15	--	--	0.04	0.15
Child's race–ethnicity								
White, non-Hispanic	--	--	--	--	--	--	--	--
Black, non-Hispanic	0.50 **	0.13	0.52 **	0.13	0.49 **	0.12	0.52 **	0.13
Hispanic	0.18	0.16	0.16	0.16	0.19	0.16	0.16	0.16
Other races	-0.20	0.21	-0.22	0.21	-0.20	0.21	-0.23	0.22
Doctor has said child developmentally delayed	1.59 **	0.29	--	--	1.54 **	0.29	--	--
Child less than 5 1/2 lbs at birth	0.13	0.20	0.17	0.20	0.13	0.20	0.17	0.20
Child attended center-based program before entering school	0.04	0.10	0.01	0.10	0.05	0.10	0.02	0.10
Parents in household								
Birth mother & birth father	--	--	--	--	--	--	--	--
Birth mother & other father[2]	0.33 †	0.19	0.34 †	0.19	0.34 †	0.19	0.34 †	0.19
Birth mother only	0.27 *	0.12	0.26 *	0.12	0.26 *	0.12	0.26 *	0.12
Birth father[3]	0.35	0.25	0.33	0.25	0.35	0.25	0.33	0.25
Adoptive parent[4]	0.64 †	0.36	0.64 †	0.36	0.64 †	0.36	0.64 †	0.36
Other parents	0.94 **	0.33	0.97 **	0.34	0.93 **	0.33	0.97 **	0.34
Parents' highest education								
Less than high school	0.24	0.19	0.27	0.19	0.24	0.19	0.27	0.19
High school diploma or equivalent	--	--	--	--	--	--	--	--
Some college[5]	-0.15	0.10	-0.13	0.10	-0.16	0.10	-0.14	0.10
Bachelor's degree or higher	-0.71 **	0.10	-0.71 **	0.10	-0.72 **	0.10	-0.71 **	0.10
Parent(s) speak(s) non-English language most at home	0.09	0.22	0.10	0.22	0.07	0.22	0.09	0.22
Household in poverty	0.22	0.14	0.25 †	0.15	0.23	0.14	0.27 †	0.15
F (19,32)	14.85 **		--		17.02 **		--	
F (22,29)	--		15.91 **		--		14.68 **	

[1]This is a composite measure indicating whether the child has elicited feedback on at least one of the following negative aspects of school performance: not learning up to capabilities, doesn't concentrate, acts up or disrupts class, restless and fidgets, and has trouble taking turns or sharing.

[2]Other fathers include step, adoptive, and foster fathers.

[3]This category includes children with birth fathers only and with birth fathers and step, adoptive, or foster mothers.

[4]This category includes children with adoptive mothers or adoptive fathers and no birth parents.

[5]This category includes children with parents who had vocational–technical education after high school.

** p<.01; * p<.05; † p<.10; -- not applicable

NOTE: b = unstandardized regression coefficient; s.e. is standard error.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Household Education Survey, spring 1993 and 1995.

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