



# Academic achievement and social behaviors associated with age of entry into kindergarten

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## Abstract

A longitudinal design (kindergarten through third grade) was used to assess the effects of the age at which children entered kindergarten on children's academic achievement, social skills, academic engagement, relationship with teachers, and self ratings of academic skills. The sample was ethnically diverse; all of the over 200 children in the study came from low-income families. Results indicated a modest advantage in academic achievement for children who entered kindergarten at a relatively older age during the first year of school, but this advantage disappeared by third grade. The only advantage found in kindergarten and third grade for children who were relatively old when they entered school was in more positive feelings about their teacher. "Holding out" was rare (less than 1%) in this low-income sample. © 2001 Elsevier Science Inc. All rights reserved.

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## 1. Introduction

The question of the optimal age for children to begin school has long been a subject of debate. The issue has recently taken on greater than usual importance. The increasing pressure for schools to be accountable and the "no social promotion" policies being implemented across the nation are likely to result in escalated demands in kindergarten and an increased focus on basic skills that are assessed by standardized achievement tests. If young children are less prepared to engage in academic work, these policy developments could present real difficulties for children who begin school relatively young.

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In part, as an effort to protect relatively young children from being disadvantaged by rigorous kindergarten standards (and in part in hopes of raising test scores by increasing the average age of children in each grade) there is a trend for states and school districts to require children to be older when they enter kindergarten (Meisels, 1992). More and more, states and districts have moved the fifth birth date for automatic entry into kindergarten to September 1, or even as early as June 1, as is the case in Indiana.

Also as a consequence of current increased school accountability and no-social promotion policies, we may see an increase in the number of children who are “held out” (sometimes referred to as “redshirting”), thus beginning school a year later than the law allows. The pressure schools feel from the increasing emphasis on achievement test scores may lead school personnel to pressure parents to delay the school entry of children who the school believes are not “ready.” There is already considerable evidence that many schools recommend delayed school entry for some children, usually based on performance on readiness tests (Bredekamp & Shepard, 1989; Charlesworth, 1989; Kagan, 1990; Meisels, Steele, & Quinn, 1989). Findings by Walsh, Ellwein, Eads, and Miller (1991) suggest that low-income, relatively young boys are the most likely to be encouraged by schools to delay school entry. Or, parents may themselves decide to hold their children out more and more, if they begin to see that failure to do well in school in the early grades has serious consequences.

Statistics related to the age of school entry do not differentiate between decisions based on school recommendations versus parents’ independent decisions. However, it is clear that the practice of holding out is common. Surveys suggest that about 9% or 10% of parents nationally, delay their children’s entry into kindergarten to a year later than the law would have allowed (Brent, May, & Kundert, 1996; Cosden, Zimmer, & Tuss, 1993; May, Kundert, & Brent, 1995; National Center for Education Statistics, 1997).

In the Brent et al. (1996) study, boys (11%) were more likely to be delayed a year than girls (6%) — a gender difference that has been roughly replicated in other studies (Cosden et al., 1993; May et al., 1995). Caucasians were more likely to be held out than African Americans in the national sample (National Center for Education Statistics, 1997), and more likely than Latinos in a study conducted in California (Cosden et al., 1993). In the national study, as well as others (Cosden et al., 1993; May et al., 1995), the later children were born (and the younger they would have been if they had entered when the law allowed) the more likely they were to be held out. This nationally representative survey did not find a strong association between parents’ socioeconomic status and holding out, but other studies have, with middle-class parents more likely to hold their children out than low-income parents (see Meisels, 1992).

Many teachers support the practice of holding children out as well as a generally later school entry age (National Center for Educational Statistics, 1997). Teachers and other advocates of later school entry, whether by moving the legal birthdate up or by delaying some children’s school entry, typically embrace maturationist notions of development, in which it is assumed that time will make a child more ready for the demands of formal schooling (Frick, 1986).

Educators and researchers who criticize the emphasis on age of entry into kindergarten point out that age is not highly predictive of skills and behavior, at least not in the narrow age range being discussed, and that development is uneven (e.g., there are often “spurts”). Also, moving the birth date for automatic entry into school only affects the group mean, not the

degree of variation in kindergarten children's academic skills and social behavior. Critics are also concerned that delaying entry will exacerbate socioeconomic differences in academic skill levels. They reason that because middle-class families are more likely to have financial resources for an extra year of childcare, children from middle- and upper-income families will be more likely to be held out, and thus older, on average, when they enter school than children from low-income families. Critics of the practice also note that being "overage" for grade is a strong predictor of later dropping out, even when achievement is held constant (Meisels, 1992). And finally, critics of delaying school entry claim that schools need to adjust to the developmental levels of children rather than maintain procrustean standards and expectations that children are required to fit (Bredekamp & Shepard, 1989; Kagan, 1990; Meisels, 1992; Meisels et al., 1989).

These differences in positions are directly relevant to current policy issues concerning the age of entry and school and parental practices of delaying some children's entry. The present study was designed to provide empirical evidence related to these debates.

### *1.1. Previous studies on the effects of kindergarten entry age*

Studies comparing children who vary in the age at which they enter school have focused almost exclusively on academic outcomes. Some studies find that younger children (those who enter kindergarten at age four or who turn five during the summer before kindergarten) do not fare as well academically as older children (see Breznitz & Teltsch, 1989; Karweit, 1988; Sweetland & De Simone, 1987; West, Denton, & Germino-Hausken, 2000). As many studies, however, report no age-of-entry effects (Dietz & Wilson, 1985; Gredler, 1980; Langer, Kalk, & Searls, 1984; May & Welch, 1986), and when initial differences are found, they usually disappear a few years later (Bredekamp & Shepard, 1989; Crone & Whitehurst, 1999; Davis, Trimble, & Vincent, 1980; Kinard & Reinherz, 1986). Two studies found academic advantages of early school entry (Crone & Whitehurst, 1999; Mayer & Knutson, 1999). Studies of delayed and "on-time" entry children also report no differences in children's achievement (Cosden, Zimmer, Reyes, & Gutierrez, 1995). In brief, the weight of the evidence suggests that older children may have a very modest advantage on academic assessments in the early grades of school, if at all, but their advantage is not sustained.

Extant studies, therefore, provide little evidence for the value of delaying children's entry. But the focus in previous studies has been on academic performance, and many children, especially boys, are held out because of concerns about social development and behavior. Teachers, too, have expressed concerns about children's readiness for following rules, working independently and in the context of a large group of peers, and generally exhibiting adaptive "school" behavior. Ironically, social and other school-adjustment factors in kindergarten of older and younger children have not been studied (see Breznitz & Teltsch, 1989, for one exception). Accordingly, the present study includes assessments of children's social competencies and their behavior related to academic activities (which we refer to as "academic engagement").

The study also assesses the effects of age of school entry on children's self-perceptions. We reasoned that if younger children have more academic problems than older children, they might, as previous research has shown, also have relatively low perceptions of their academic

competencies, develop a less positive relationship with their teacher, and enjoy school less (Stipek, 1998).

The study's longitudinal design provided data on children from kindergarten through the third grade. We were therefore able to determine whether any differences evident in kindergarten persisted into the middle elementary school. Because concerns are often greater for boys than for girls, gender differences were also examined.

Most studies conducted on entry age into kindergarten include predominantly middle-class children. Policy issues related to age of entry are particularly critical for low-income children because these children begin school, on average, with relatively low skills (Stipek & Ryan, 1997) and for this and many other reasons, they are at greatest risk for school failure. The sample for the current study is, therefore, comprised of all very low-income children.

Finally, the study was a preliminary attempt to examine redshirting practices in culturally diverse, low-income families. We expected redshirting to be uncommon among low-income families, primarily because an additional year out of school often entails childcare costs that would be more burdensome for low-income than for more affluent families. We suspected, however, that schools might pressure some low-income parents to hold their children out a year for reasons related to academic readiness. To assess these hypotheses directly, we asked parents whether their child entered school a year later than he or she could have, and if so, why.

## **2. Method**

### *2.1. Sample*

The sample included 237 children altogether from three sites: a northeastern rural area in which families and children were predominantly Caucasian, an urban northeast area in which children were predominantly African American, and an urban western area in which children were predominantly Latino. There were 115 boys and 122 girls; 84 were African American, 60 were Latino, and 93 were Caucasian. The children were distributed among more than 80 schools and 150 classrooms.

All children were in families that had low incomes, and most attended schools that served a large proportion of low-income children. The majority (62%) of mothers were not married; 49% were not working. Education was low: 13% of the mothers had less than the equivalent of ninth grade, and 28% went past the ninth grade but did not complete high school. Most (76%) household incomes were below US\$15,000; 21% were below US\$6000. At the beginning of the study, about half of the families were receiving federal assistance (AFDC).

### *2.2. Procedures*

Achievement assessments and child self-ratings were conducted each year in a room in children's schools by a trained research assistant. Assessments were administered in Spanish (by a native-speaking research assistant) to children who were more proficient in Spanish than English.

Teachers completed a questionnaire each year of the study about each participating child in their class. Most (88%) teachers had only one or two participating children in their classroom. Questionnaires were mailed or given to teachers, and returned by mail.

### 2.3. Measures

#### 2.3.1. Sixty months

At 60 months children were individually administered the Peabody Picture Vocabulary Test (PPVT) in their home. The PPVT is an assessment of expressive language (commonly used as an indicator of intelligence; Dunn & Dunn, 1981).<sup>2</sup>

#### 2.3.2. Achievement tests

Children completed math and literacy assessments in the spring of their kindergarten year (or in the spring of first grade, for the age-matched sample, discussed below), and again in third grade. The age-adjusted math assessments measure children's counting abilities and familiarity with numbers (items from the Peabody Individual Achievement Test — Revised (PIAT-R), Markwardt, 1989), their strategies for solving word problems (Carpenter, Ansell, Franke, & Fennema, 1993; Carpenter, Fennema, & Franke, 1996), and their calculation abilities (calculation subscale of the WJ-R, Woodcock & Johnson, 1990). Four composite variables were created from the items in the math assessment: counting/early number tasks, problem solving, pencil/paper calculations, and geometric items. These composite variables were standardized within grade and averaged to create one total math score for this study.

The literacy test assessed children's skills for reading and writing, comprehension, and verbal fluency (Saunders, in press). Items in the literacy assessment were combined to form six composite variables; letter/sound identification, word reading, overall reading, writing, oral comprehension, and verbal fluency. These composite variables were standardized within grade and averaged to create one total literacy score for this study.

#### 2.3.3. Child self-ratings

**2.3.3.1. Feelings about the teacher.** Children answered three questions about their feelings about their relationship with their teacher using a 1–5 Likert scale (How much does your teacher care about you? How does your teacher feel about you? How do you feel about your teacher?). Alpha coefficients were .73 for kindergartners, .79 for first graders and .66 for third graders.

**2.3.3.2. Feelings about school.** Children answered three questions related to their feelings about school, also using a 1–5 Likert scale (How much do you like school? How do you

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<sup>2</sup> Sixty-month PPVT scores were made available to the authors by Abt Associates, which had previously assessed the same sample of children as part of an assessment of a federal family-support program.

feel when you are at school? How much fun are things at school?). Alpha coefficients were .51, .63, and .61 for kindergartners, first, and third graders, respectively.

*2.3.3.3. Perceptions of academic skills.* Children answered four questions about their literacy skills (How much do you know about reading? How good at reading are you? How much do you know about letters? How good are you at writing?). Alpha coefficients were .61, .71, and .76, respectively, for kindergartners, first, and third graders.

Children answered three questions about their math skills (How much do you know about math? How good are you at math? How good are you at learning something new in math?). The alpha coefficients were .69 for kindergartners and first graders, and .78 for third graders.

#### *2.3.4. Teacher ratings*

*2.3.4.1. Academic performance.* Teachers rated children's academic performance in math and reading ("Please rate the child's reading/math-related skills") and their expectations for children's performance in math and reading next year ("How well do you expect the child to do next year in reading/math?"). A five-point response scale (1 = *well below children this age*, 2 = *below children this age*, 3 = *about average*, 4 = *above children this age*, 5 = *well above children this age*) was used for all of these items. The associations between questions pertaining to current performance and expectations for the next year were very high ( $\alpha$  = .95, .91, and .93, for kindergarten, first-, and third-grade math, respectively, and .94, .92, and .91 for reading in these three grades, respectively). The performance and expectations items were therefore averaged to create one academic performance score in reading and another score for academic performance in math.

*2.3.4.2. Social competence.* The scale measuring teachers' perceptions of children's social competence was adapted from the Child Behavior Scale (Ladd & Profilet, 1996). Items use a three-point response format (doesn't apply, applies sometimes, and certainly applies). The measure has items which fall into six categories (supported by a factor analysis): (1) aggressive behavior with peers (e.g., "fights with other children," "aggressive child"); (2) prosocial behavior (e.g., "offers help/comfort when others are upset," and "seems concerned when other children are distressed"); (3) asocial behavior (e.g., "likes to be alone" and "solitary child"); (4) exclusion by peers (e.g., "excluded from peers' activities," and "not chosen as a playmate by peers"); (5) anxious/fearful (e.g., "is worried," "appears miserable"), and (6) hyperactive ("restless, doesn't keep still," "inattentive"). In previous research, the subscales were associated with teachers' perceptions of the quality of their relationships with children (Ladd & Profilet, 1996). In this study all items from the six subscales were combined to form one social competence scale (with the negative scores reversed); reliabilities ( $\alpha$ s) were, respectively: kindergarten, .69; first grade, .73; third grade, .74.

*2.3.4.3. Academic engagement.* Four items (works independently, seeks challenges, accepts responsibility, appears tuned in) from the self-directed learner subscale of the Teacher Rating

Scale of School Adjustment (TRSSA) were used to assess teachers' perceptions of the quality of children's engagement in academic tasks (Birch & Ladd, 1998; Ladd, Birch, & Buhs, 1999). All items have a three-point response scale (doesn't apply, applies sometimes, and certainly applies). Reliabilities for the present study were high (kindergarten  $\alpha=.87$ , first grade  $\alpha=.85$ , and third grade  $\alpha=.83$ ).

*2.3.4.4. Relationship with children.* Teachers also rated the quality of their relationships with individual children, using items from the conflict and closeness subscales of Pianta's Student Teacher Relationship Scale (STRS; Pianta, 1996; Pianta & Steinberg, 1992; Pianta, Steinberg, & Rollins, 1995). Five items from each subscale were used in the current study. The conflict subscale ( $\alpha=.89$ ,  $.91$ , and  $.92$  for kindergartners, first-, and third-grade children in this study, respectively) includes items such as "this child and I always seem to be struggling with each other," and "this child easily becomes angry with me." The closeness subscale ( $\alpha=.79$ ,  $.86$ , and  $.82$  for kindergarten, first-, and third-grade children in this study, respectively) contains items such as "I share an affectionate, warm relationship with this child," and "this child openly shares his/her feelings and experiences with me." In previous research, scores based on the closeness scale have been associated with children's social skills and school adjustment (Birch & Ladd, 1998; Pianta & Steinberg, 1992).

#### *2.3.5. Parent question*

During year 1 of the study, when children were in the second or third grade, parents were asked whether the child began school as soon as the law allowed or whether his or her school entry was delayed a year. If the parent (usually the mother) indicated that school entry had been delayed, she was asked why. As a check on parent reports, we identified the children who entered school a year later than they could have, using the school birthday cutoff and the child's birthday. Thus, for example, if a child turned six in October after entering kindergarten in a school in which children could begin kindergarten if they turned five by December 1, the child was counted as a "delayed entry." Five children were identified by our analysis as holdouts, four boys and one girl. These five holdouts were not included in subsequent analyses.

### **3. Results**

#### *3.1. Gender and ethnicity*

Children were first divided into three age groups: (1) *old* ( $n=77$ ; turned six by December 31 of the year they entered kindergarten); (2) *intermediate* ( $n=98$ ; turned five by May 31, before they entered kindergarten); and (3) *young* ( $n=62$ ; turned five after May 31 and before they entered kindergarten or in the fall after entering kindergarten). No child turned five after December 31 of the year they entered kindergarten. The mean age of entry for the oldest group was 71.24 months (S.D.=2.14); the mean for the intermediate group was 66.00 months (S.D.=1.39); and the mean for the youngest group was 60.35 months (S.D.=2.04).

Two separate chi-square analyses were conducted to determine whether girls and boys or children from the three primary ethnic groups were distributed disproportionately among the three age-of-entry groups. The analysis assessing gender differences was not significant,  $\chi^2(2) = 1.51$ , but ethnicity differences were significant,  $\chi^2(2) = 25.15$ ,  $P < .001$  (see Table 1). The ethnicity difference is most likely explained by differences in the school cutoff dates among the three sites. The northeastern urban and the northeastern rural sites required children to turn five by September 1 to enter kindergarten, whereas the cutoff date for the western site was not until December 1. Consequently, Latinos were disproportionately represented in the youngest group.

Gender by age-of-entry group analyses of variance (ANOVA) showed no significant interaction effects. Contrary to our hypotheses, there was no evidence that age of entry affected boys and girls differently. Gender, therefore, was not included as an independent variable in the analyses reported below.

### 3.2. PPVT

The next analysis was conducted to determine whether there were differences in PPVT scores at 60 months associated with children's age of kindergarten entry. A one-way ANOVA comparing the children in the three groups was not significant,  $F(2,217) = 0.21$  (means for young, intermediate, and old age-of-entry groups were 86.91, 86.01, and 85.29, respectively).

#### 3.2.1. Child outcomes associated with age of school entry

*3.2.1.1. Kindergarten.* All child outcomes — including achievement test scores, child self-ratings and teacher ratings — were compared at the end of children's kindergarten year for children who entered kindergarten at a relatively young, intermediate, or old age. Although children's PPVT scores at 60 months did not vary significantly by age-of-entry group, they were covaried in all analyses to eliminate any possible confounding of cognitive competency levels at school entry.

One-way ANCOVAs on standardized achievement test scores showed modest but significant age-of-entry group effects for both literacy and math scores (see Table 2). The oldest children's standardized scores for both sets of tests were significantly higher than the youngest children's scores (literacy:  $F(2,203) = 4.04$ ,  $P < .05$ ; math:  $F(2,203) = 3.03$ ,  $P < .05$ ).

The oldest children reported significantly better relationships with their teacher than the intermediate-age children and the youngest children,  $F(2,203) = 4.66$ ,  $P < .01$ .

Table 1  
Number of children in each age-of-entry group, by ethnicity

| Age of entry | Caucasian ( $N = 93$ ) | African American ( $N = 84$ ) | Latino ( $N = 60$ ) |
|--------------|------------------------|-------------------------------|---------------------|
| Young        | 15 (16%)               | 20 (24%)                      | 27 (45%)            |
| Intermediate | 35 (38%)               | 37 (44%)                      | 26 (43%)            |
| Old          | 43 (46%)               | 27 (32%)                      | 7 (12%)             |



Table 2  
Mean scores in kindergarten and third grade, by age of entry

|                          | Kindergarten ( <i>N</i> =237) |                     |                     | Third Grade ( <i>N</i> =148) |                   |                   |
|--------------------------|-------------------------------|---------------------|---------------------|------------------------------|-------------------|-------------------|
|                          | Young                         | Intermediate        | Old                 | Young                        | Intermediate      | Old               |
| <i>Achievement test</i>  |                               |                     |                     |                              |                   |                   |
| literacy                 | − 0.20 <sup>a</sup>           | 0.07 <sup>b</sup>   | 0.12 <sup>b</sup>   | − 0.02                       | − 0.01            | − 0.02            |
| math                     | − 0.38 <sup>a</sup>           | − 0.21 <sup>b</sup> | − 0.16 <sup>b</sup> | 0.01                         | − 0.01            | − 0.03            |
| <i>Child ratings</i>     |                               |                     |                     |                              |                   |                   |
| feelings about teacher   | 4.29 <sup>a</sup>             | 4.16 <sup>a</sup>   | 4.66 <sup>b</sup>   | 4.59 <sup>a</sup>            | 4.61 <sup>a</sup> | 4.84 <sup>b</sup> |
| feelings about school    | 4.35                          | 4.33                | 4.39                | 4.36                         | 4.35              | 4.47              |
| literacy skills          | 3.71                          | 3.64                | 3.41                | 4.31                         | 4.22              | 4.35              |
| math skills              | 4.13                          | 4.01                | 3.86                | 4.25                         | 4.19              | 4.38              |
| <i>Teacher ratings</i>   |                               |                     |                     |                              |                   |                   |
| literacy                 | 2.72                          | 2.85                | 2.75                | 2.53                         | 2.87              | 2.65              |
| math                     | 2.85                          | 2.87                | 2.88                | 2.76                         | 2.87              | 2.90              |
| social competence        | 1.77                          | 1.76                | 1.82                | 1.85                         | 1.80              | 1.84              |
| engagement               | 2.36                          | 2.41                | 2.26                | 2.10                         | 2.13              | 2.21              |
| close relationship       | 3.97                          | 4.03                | 4.08                | 3.89                         | 3.75              | 3.75              |
| conflicting relationship | 1.70                          | 1.62                | 1.83                | 1.92                         | 1.93              | 1.83              |

Means are adjusted for covariate; achievement test scores are standardized; different superscripts indicate means that are significantly different from each other,  $P < .05$ .

Age of entry was not significantly associated with any other child self-rating, or with any of the teacher ratings of children's academic performance, social competence, academic engagement, or their relationships with other children.

*3.2.1.2. Third grade.* Identical analyses were conducted to examine the long-term effects of the age of kindergarten entry on children at the end of third grade. The achievement advantage the older kindergartners had on the literacy and math achievement tests in kindergarten disappeared by third grade. The only significant finding for all of the child outcome variables was for children's reports regarding their feelings about their teacher; children who were in the oldest group when they entered kindergarten still, in third grade, reported a closer relationship with their teacher than the intermediate and younger kindergarten-entry groups,  $F(2,203) = 3.20$ ,  $P < .05$  (see Table 2 for means).

### *3.2.2. Comparisons of children matched on age but in different grades*

A matched sample of 54 pairs of children who were the same age but in different grades (kindergarten versus first grade) was created as another strategy to assess the immediate and long-term effects of school entry age. Children were all matched on birth date (within 8 weeks), and most were matched on gender and ethnicity. All but three matches came from within the same site. Thus, we compared 54 kindergartners to 54 first graders who were the same age. The first graders had entered kindergarten a year younger than the kindergartners in the matched sample.

Analyses of variance, controlling for PPVT scores at 60 months, were computed for all child outcome variables at kindergarten or first grade (when children were the same age, but in different grades), and then again at third grade (when children were a year apart in age, but in the same grade). The children who entered school a year younger (were in first grade at the first time of testing) were achieving at a significantly higher level in math,  $F(1,90)=12.46$ ,  $P<.001$ , but not in literacy,  $F(1,90)=1.23$ , than children who entered school a year older (were in kindergarten, but the same age as the first graders; see Table 3 for means). The first graders also had higher perceptions of their skills in both math,  $t(106)=-2.46$ ,  $P<.01$ , and literacy,  $t(106)=-4.84$ ,  $P<.001$ . No other child outcome variables showed significant differences.

Identical analyses were repeated for children's third-grade scores. (Note that for these analyses the children were all in the same grade, but differed by a year in age.) The achievement advantage in math shown by the first graders over same-aged peers in kindergarten was not apparent when all of the children were in the third grade. Likewise, there were no significant differences in the two groups on the achievement tests, child self-ratings, or teacher ratings. Thus, by third grade, children who entered kindergarten an entire year apart in age did not differ significantly on any of the variables we measured. (See Table 3 for means.)

Table 3  
Mean scores for age-matched kindergartners and first graders

|                          | Kindergarten or first grade <sup>a</sup> (N=54) |                     | Third grade <sup>b</sup> (N=45) |       |
|--------------------------|---|---------------------|---------------------------------|-------|
|                          | Old (kindergarten)                              | Young (first grade) | Old                             | Young |
| <i>Achievement test</i>  |   |                     |                                 |       |
| literacy                 | 0.06  | 0.21                | -0.07                           | 0.13  |
| math                     | -0.13   | 0.35                | 0.17                            | 0.00  |
| <i>Child ratings</i>     |   |                     |                                 |       |
| feelings about teacher   | 4.73  | 4.41                | 4.84                            | 4.77  |
| feelings about school    | 4.39  | 4.26                | 4.47                            | 4.27  |
| literacy skills          | 3.41  | 4.33                | 4.35                            | 4.07  |
| math skills              | 3.86  | 4.39                | 4.38                            | 3.95  |
| <i>Teacher ratings</i>   |   |                     |                                 |       |
| literacy                 | 2.61  | 2.74                | 2.62                            | 2.81  |
| math                     | 2.89  | 2.90                | 2.83                            | 2.80  |
| social competence        | 1.82  | 1.75                | 2.34                            | 1.80  |
| engagement               | 2.26  | 2.39                | 2.04                            | 2.20  |
| close relationship       | 4.12  | 3.91                | 3.85                            | 3.94  |
| conflicting relationship | 1.90  | 1.69                | 1.81                            | 1.82  |

Means are adjusted for covariate.

<sup>a</sup> Children who entered school a year younger were tested in first grade; children who entered school a year older were tested in kindergarten. "Old kindergartners" and "young first graders" were the same age at the time of testing.

<sup>b</sup> All children are in the third grade; "old" are a year older than "young."

### 3.2.3. *Redshirting*

Only five of the children in the entire sample were identified as entering school a year later than they could have. For four of these children, parents claimed that they held their child out because: (1) the child had a hearing impairment, (2) the child started kindergarten but the teacher asked the parent to wait a year because of behavior problems; (3) the parent did not feel the child was ready because he was easily distractible and had a short attention span; and (4) the child had emotional and behavioral problems (and currently has an IEP). (The parent of the fifth child was not interviewed.)

## 4. Discussion

### 4.1. *Age of school entry*

The data from this study of very low-income children are consistent with findings of most previous studies, which show that children who enter kindergarten relatively young initially perform less well academically than their older peers. However, the age-of-entry effects on achievement in this, as in most previous studies, disappeared within a few years of elementary school.

There was no evidence for age-of-entry effects on teachers' ratings of children's social skills, engagement in academic tasks, or their relationship with their teachers. Even in kindergarten, when older children performed better on our achievement tests than younger children, teachers did not rate the older children higher on academic performance. This study, therefore, showed no effects of age of entry that were discernable by teachers, either initially or later, when children were in the third grade.

Only the findings of children's feelings about their teachers showed a persistent advantage for the older children. Teachers did not differentiate older from younger children on any dimension studied, suggesting that children's feelings about their teachers were probably not based on teachers' differential perceptions of them. Perhaps older children were given more responsibilities or more autonomy, simply for being older, which engendered a perception of being valued or cared about more by the teacher. This finding clearly needs further investigation to enable any informed interpretation. Note also that even though the older children claimed to have relatively more positive feelings about their teacher than the younger children, all children had mean scores above 4.0 on a five-point scale. The practical significance of this statistically significant difference is, therefore, questionable.

Rather than putting children at a disadvantage, the study showed at least some short-term benefits of entering school at a relatively young age. The matched sample analyses revealed that children who were in the first grade scored much higher on the mathematics assessment than children who were in kindergarten, even though they were the same age. The most reasonable explanation for this finding is that the first graders had the benefit of more instruction in mathematics than the kindergartners.

These findings are consistent with two previous studies that have compared children at the same age with different levels of school exposure (Crone & Whitehurst, 1999; Mayer &

Knutson, 1999). Mayer and Knutson (1999) found in their analyses of boys ages 8 to 11 in the National Longitudinal Survey of Youth, that starting school a year later reduced a boy's PIAT reading score, on average, by 7.9 points (0.67 of a standard deviation). Findings of eventual benefits of early entry suggest that a small advantage in biological age and the extra general experience enjoyed by relatively older children is overcome, in time, by the more potent effects of instruction.

The advantage of an extra year of schooling was not seen in our literacy achievement measure given at first grade. Perhaps the extra year of schooling influenced math more than literacy competencies because children received more opportunities to develop their literacy than their math skills at home. Even though they did not score significantly higher on the literacy test, first graders rated their literacy as well as their math skills higher than children the same age who were in kindergarten. Thus, they perceived themselves to be more competent in both subject areas. These advantages of the early entry in math achievement and perceived competence were no longer found when both groups of children were in the third grade. However, the third grade data provided no evidence that the younger children were disadvantaged by their early school entry.

#### *4.2. Holding out*

Very few of these low-income children began school a year later than they could have according to the law or district policies. The five children out of more than 200 in the sample is far below the roughly 10% estimated nationally. The findings of this study suggest, as some other studies have, that this practice is less likely to occur among low- than among middle- and high-income families. In only one case was the delay specifically recommended by the school. Most of the children in this study attended schools that serve predominantly low-income children. It is possible that under these circumstances, children perceived to be at risk of poor school achievement are less likely to be "counseled" to delay entry because there are so many.

If middle-class families are more likely to delay their child's school entry by a year, children from low-income families are, on average, younger than middle-class children. The findings from this study suggest that younger age was not found to have negative consequences on the achievement measures used in this study. But differential rates of delay may have negative effects on low-income children if teachers begin to ratchet up the academic expectations and demands to accommodate the older, predominantly middle-class children, especially in schools serving an economically heterogeneous population of children.

#### *4.3. Policy implications*

The findings of this study are consistent, whether the analyses compare children in the same grade who entered school at different ages or in different grades but the same age. Moreover, the sample included only children who are at high risk of school failure, and thus of most concern to policy makers.

The findings provide no support for moving back the cutoff date for school entry to increase the average age of children when they begin school. Even if the goal is to improve children's performance on achievement tests, policies that result in a slightly older school population are not likely to pay off. If anything, the findings suggest the value of earlier rather than later school entry. We suggest focusing on other strategies for addressing the needs of children at risk of school failure for which there is empirical support, including early childhood educational programs and improving instruction after children begin school.

To be sure, this study followed children only through the third grade, and we cannot be sure that negative effects of being relatively young do not emerge later. The findings are also limited in their ability to guide the decisions made by individual parents. For example, a young child might be disadvantaged by entering school in a community in which holding out is common and the average age of children entering kindergarten is usually high, creating a greater discrepancy than most of the younger children in our study experienced.

As a policy matter, however, concerns about the academic demands of kindergarten can be addressed by adjusting the skill level required and pace of instruction to the needs of the children in a particular classroom, whatever their age. Also, much is known about effective strategies for teaching young children, and any changes proposed in the academic demands placed on children in kindergarten must be assessed in the context of this knowledge.

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## References

- Birch, S., & Ladd, G. (1998). Children's interpersonal behaviors and the teacher-child relationship. *Developmental Psychology*, *34*, 934–946.
- Bredenkamp, S., & Shepard, L. (1989). How best to protect children from inappropriate school expectations, practices, and policies. *Young Children*, *44*, 14–24.
- Brent, D., May, D., & Kundert, D. (1996). The incidence of delayed school entry: a twelve-year review. *Early Education and Development*, *7*, 121–135.
- Breznitz, Z., & Teltsch, T. (1989). The effect of school entrance age on academic achievement and social-emotional adjustment of children: follow-up study of fourth graders. *Psychology in the Schools*, *26*, 62–68.
- Carpenter, T., Ansell, E., Franke, M., & Fennema, E. (1993). Models of problem solving: a study of kindergarten children's problem solving processes. *Journal for Research in Mathematics Education*, *24*, 428–441.
- Carpenter, T., Fennema, E., & Franke, M. (1996). Cognitively Guided Instruction: a knowledge base for reform in primary mathematics instruction. *Elementary School Journal*, *97*, 3–20.
- Charlesworth, R. (1989). "Behind" before they start?: deciding how to deal with the risk of kindergarten "failure". *Young Children*, *44* (3), 5–13.

- Cosden, M., Zimmer, J., Reyes, C., & Gutierrez, M. (1995). Kindergarten practices and first-grade achievement for Latino Spanish-speaking, Latino English-speaking, and Anglo students. *Journal of School Psychology, 33*, 123–141.
- Cosden, M., Zimmer, J., & Tuss, P. (1993). The impact of age, sex, and ethnicity on kindergarten entry and retention decisions. *Educational Evaluation and Policy Analysis, 15*, 209–222.
- Crone, D., & Whitehurst, G. (1999). Age and schooling effects on emergent literacy and early reading skills. *Journal of Educational Psychology, 91*, 614.
- Davis, B., Trimble, C., & Vincent, D. (1980). Does age of entrance affect school achievement? *Elementary School Journal, 80*, 133–143.
- Dietz, C., & Wilson, B. (1985). Beginning school age and achievement. *Psychology in the Schools, 22*, 93–94.
- Dunn, L. M., & Dunn, L. M. (1981). *Peabody Picture Vocabulary Test — Revised*. Circle Pines, MN: American Guidance Service (Form L).
- Frick, R. (1986). Viewpoint 1. In support of academic redshirting. *Young Children, 41*, 9–10.
- Gredler, G. (1980). The birthday effect: fact or artifact? *Journal of Learning Disabilities, 13*, 239–242.
- Kagan, S. L. (1990). Readiness 200: rethinking rhetoric and responsibility. *Phi Delta Kappan, 72*, 272–279.
- Karweit, N. (1988). Quality and quantity of learning time in preprimary programs. *Elementary School Journal, 89*, 119–123.
- Kinard, E. M., & Reinhertz, H. (1986). Birthdate effects on school adjustment: a longitudinal study. *Journal of Educational Research, 79*, 366–372.
- Ladd, G., Birch, S., & Buhs, E. (1999). Children's social and scholastic lives in kindergarten: related spheres of influence? *Child Development, 70*, 1373–1400.
- Ladd, G. W., & Profilet, S. M. (1996). The Child Behavior Scale: a teacher-report measure of young children's aggressive, withdrawn, and prosocial behaviors. *Developmental Psychology, 32*, 1008–1024.
- Langer, P., Kalk, J., & Searls, D. (1984). Age of admission and trends in achievement: a comparison of Blacks and Caucasians. *American Educational Research Journal, 21*, 61–78.
- May, D., Kundert, D., & Brent, D. (1995). Does delayed school entry reduce later grade retentions and use of special education services? *Remedial and Special Education, 16*, 288–294.
- May, D., & Welch, E. (1986). Screening for school readiness: the influence of birthday and sex. *Psychology in the Schools, 23*, 100–105.
- Mayer, S., & Knutson, D. (1999). Does the timing of school affect how much children learn? In: S. Mayer, & P. Peterson (Eds.), *Earning and learning: how schools matter* (pp. 79–102). Washington, DC: Brookings Institution Press.
- Meisels, S. (1992). Doing harm by doing good: iatrogenic effects of early childhood enrollment and promotion policies. *Early Childhood Research Quarterly, 7*, 155–174.
- Meisels, S., Steele, D., & Quinn, K. (1989). *Testing, tracking, and retaining young children: an analysis of research and social policy*. A commissioned paper prepared for the National Center for Education Statistics.
- National Center for Education Statistics. (1997). *The elementary school performance and adjustment of children who enter kindergarten late or repeat kindergarten: findings from national surveys*. Washington, DC: U.S. Department of Education (NCES98-097).
- Markwardt, F. (1989). *Peabody Individual Achievement Test*. Circle Pines, MN: American Guidance Service.
- Pianta, R. (1996). Patterns of relationships between children and kindergarten teachers. *Journal of School Psychology, 32*, 15–31.
- Pianta, R., & Steinberg, M. (1992). Teacher-child relationships and the process of adjusting to school. *New Directions for Child Development, 57*, 61–80.
- Pianta, R., Steinberg, M., & Rollins, K. (1995). The first two years of school: teacher-child relationships and deflections in children's classroom adjustment. *Development and Psychopathology, 7* (2), 295–312.
- Saunders, W. (in press). Improving literacy achievement for English learners in transitional bilingual programs. *Educational Research and Evaluation*.
- Stipek, D. (1998). *Motivation to learn: from theory to practice* (3rd ed.). Needham Heights, MA: Allyn and Bacon.
- Stipek, D., & Ryan, R. (1997). Economically disadvantaged preschoolers: ready to learn but further to go. *Developmental Psychology, 33*, 711–723.

- Sweetland, J., & De Simone, P. (1987). Age of entry, sex, and academic achievement in elementary school children. *Psychology in the Schools*, 234, 406–412.
- Walsh, D., Ellwin, M., Eads, G., & Miller, A. (1991). Knocking on kindergarten's door: Who gets in? Who's kept out? *Early Childhood Research Quarterly*, 6, 89–100.
- West, J., Denton, K., & Germino-Hausken, E. (2000). *American kindergartners: findings from the early childhood longitudinal study, kindergarten class of 1998–99, Fall 1998*. Washington, DC: National Center for Education Statistics, U.S. Department of Education (NCES 20-070).
- Woodcock, R. W., & Johnson, M. B. (1990). *Woodcock–Johnson tests of achievement*. Allen, TX: DLM Teaching Resources.