The Effects of Academic Redshirting and Relative Age on Student Achievement[*]

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Abstract

Academic redshirting is the act of keeping a child out of school for an additional year before kindergarten. This practice has become prevalent in America as kindergarten standards become more rigorous. There are few examples in the literature of research that explores the differences between children who have been academically redshirted and those who were not. Based on studies about relative age effects in the classroom, the research shows that older children have higher academic achievement than younger children in the same grade. Redshirting provides a particular child with advantages in school by deeming that child one of the oldest in their class. Since most redshirted children have birthdates just before the local cut-off date, these children would be among the youngest in their class had they not been redshirted and would likely experience the negative effects of relative age. Retention does not work to give children the same benefit as redshirting because there are negative emotional impacts on a child that affect school achievement.

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1 Introduction

Since there are very few studies that empirically measure the academic success rates of redshirted children, this integrative literature review includes studies that focused on relative age effects. Relative age effects are the differing experiences and developmental rates that occur between the oldest and youngest children when they are grouped together for school or activity purposes. Redshirting plays a role in relative age effects when parents opt to keep their children out of school for a year. The redshirted children become the oldest rather than the youngest children in the kindergarten classroom.

This literature review will attempt to answer the following research questions:

1. What does the current research say about the academic success of students who have been redshirted?
2. What does the current research say about how relative age in the classroom affects academic success?
3. How does the current research about grade retention affect our conclusions about academic redshirting?
4. Does academic redshirting provide long-term academic advantages for students?

2 Methodology

The studies in this article were found by searching the EBSCO Academic Search Premier Database and Google using keywords "kindergarten redshirting", "relative age effects", and "grade retention". The list was narrowed by choosing articles which had been published in peer-reviewed journals. In this literature review, quantitative studies provide the data to determine the relative academic success between older and younger students. Mixed method studies were chosen that describe the academic success and emotional reactions of students who had been retained in the primary grades.

A study was also included in the history section of this article to provide a more complete picture of academic redshirting and the various reasons the phenomenon has gained in popularity in the United States. This study was not included in the actual analysis of the phenomenon of academic redshirting due to the fact that it was conducted using data more than two decades old and focused on a small geographic area. Those issues make the results hard to generalize to other parts of the United States. However, this oft-cited study provides a more comprehensive basis for many articles written about academic redshirting before 2004. Excluding it would provide an incomplete depiction of how this phenomenon is treated in the literature.

3 History of Redshirting

Academic redshirting is not a new practice. It was used sparingly in the 1970's and grew in popularity in the 1980's (Graue & DiPerna, 2000). In that decade, many researchers cited the increase in older kindergarteners as one of the driving forces behind the increased academic demands of kindergarten. Classrooms with older children afforded teachers the opportunity to hold higher expectations for both behavior and learning skills. Classes with large groups of older children may have been taught at a higher academic level which could have been detrimental to the younger children in class (Graue & DiPerna, 2000; Shepard & Smith, 1988; Yesil-Dagli, 2006). In the 1990's, the prevalence of redshirting continued to grow (Graue & DiPerna, 2000).

Graue and DiPerna's (2000) oft cited research explored several different issues about redshirting. This study had a sample of over 8000 students from the state of Wisconsin. The researchers found many areas of the state where a large percentage of parents were choosing to redshirt their children. Parents are the primary decision makers about whether or not their children enter kindergarten on time. If parents are counseling other parents about delaying kindergarten entry, like-minded parents follow suit. This can create a de facto school policy in communities where a significant percentage of parents choose to redshirt their children merely because other parents are making the same decisions. In areas where more parents are redshirting their children, the older students in class may be affecting the kindergarten curriculum as teachers accommodate the more mature members of the classroom. The larger percentage of older children then drives up the standards of behavior and achievement in the kindergarten classroom (Graue & DiPerna, 2000).

Wisconsin used a September 1st cut-off date for kindergarten entry. The data clearly showed that children with birthdates just before the cut-off had a much higher chance of retention before third grade (Graue & DiPerna, 2000). However, there did not seem to be an advantage in redshirting. Test scores of redshirted children were very similar to children who started school on time. Interestingly, the test scores for children who had failed kindergarten or who had been retained in first or second grade were lower than all the other groups. Graue and Diperna's (2000) study also found that older children had a higher risk of being diagnosed with learning disabilities.

The authors state that in their sample, districts range from 3% to 94% of students who have been redshirted. However, the authors explain that their 94% comes from only one community that had only one kindergarten class. This particular community had effectively changed the district cut-off date through the actions of parents. In Wisconsin communities where large groups of parents who are redshirting just because other parents are redshirting, it is logical to say that some children probably would have not been redshirted if they had lived in communities in a different geographic area.

4 Studies on Redshirting

Few studies have been conducted on redshirted children. From the studies that have examined the effects of academic redshirting, we learn that most redshirted children are Caucasian boys from middle or upper class families whose birthdays fall just before the cut-off date to begin kindergarten (Graue & DiPerna, 2000). Nationally, it is believed that between six and nine percent of students are redshirted each year (Oshima & Domaleski, 2006). With the passage of the No Child Left Behind Act in 2001, there has been a marked increase in the rigor of early elementary grades. Though there is evidence that standards started changing in the early 1970's (Shepard & Smith, 1988), the race to get all children to read on grade level before the third grade has greatly increased what is demanded of kindergarteners in the United States. The trend towards higher expectations in earlier grades has coincided with more parents choosing to redshirt their children across the United States.

Datar (2006) offers a comprehensive study of redshirted children using data from the Early Childhood Longitudinal Study – Kindergarten Class of 1998-1999. An important component of this study is that the researcher calculated the age of the children by counting the number of days between the child's birthday and the school's cut-off date. This methodology allowed data from all over the country to be used since states do not all have the same kindergarten entrance cut-off date.

Datar's (2006) work showed that not only did children who started kindergarten a year later have higher test scores in kindergarten, their subsequent test scores in first and second grade rose at a steeper trajectory than the test scores of other students. The redshirted children started out more advanced and made greater gains in academic performance. Another interesting finding of this study showed that poor children made even larger gains than children from higher socio-economic status homes. "Results suggest that poor and disabled children and boys benefit significantly more from delaying kindergarten entrance, in terms of test score gains especially in reading" (Datar, 2006, p.58).

A second study that used data from the Early Childhood Longitudinal Study – Kindergarten Class of 1998-1999 was conducted by Oshima and Domaleski in 2006. Although the study concerned academic redshirting in a general sense, the researchers did not include any children who had actually been redshirted. The researchers in this study divided the children into groups who had summer birthdays (June, July and August) and those who had fall birthdays (September, October and November) and restricted the data to only those children for whom that year was their first in kindergarten. The summer group represented the youngest children while the fall group constituted the oldest group of children in the study. The researchers randomly picked 3000 children from each group as their sample groups. There was a significant difference in math and science test scores between the two groups from kindergarten through fifth grade with the older students scoring higher. The gaps between the oldest and youngest students decrease over time, but did not completely disappear. In fact, the disparity was still present in eighth grade.

An interesting item to note about Oshima and Domaleski's (2006) study is that the researchers found that age was a stronger predictor of reading and mathematics success than gender or race in the early grades.

Additionally, the study looked not only at test scores, but also at height and found that older kindergarteners were 1.95 inches taller than the younger kindergarteners. Such a considerable height difference would be easily seen in the classroom and shorter children may be viewed by the teacher as being less mature or less skilled in some kindergarten domains (Oshima and Domaleski, 2006). Height of the child is an important factor to note because height has been found to determine a child's chance of retention (Wake, Coghlan, Hesketh, 2000). Oshima and Domaleski (2006) point out that although their study was connected to academic redshirting theoretically, it was not designed to be either for or against redshirting, but simply pointed out the data that show that older children achieve at higher academic levels than younger children even years after kindergarten.

There is a third study that used the Early Childhood Longitudinal Study – Kindergarten Class of 1998-1999. Lin, Freeman and Chu (2009) found that the older a child was at the beginning of kindergarten, the higher his reading and mathematics scores proved to be. The oldest group of children also made the largest gains in reading and mathematics during the kindergarten year. The trend continued in the upper elementary grades, though the differences between the oldest and youngest students were not as pronounced as in kindergarten. The researchers also examined the gains made by each age group during each year. For the first two years, the oldest group made the most gains in reading and mathematics achievement. In third grade, the trend reversed and the youngest group of students made the most gain, although the gains were similar in all age groups. In fifth grade, the trend continued with the younger children making more gains in test scores while the oldest cohort showed fewer gains.

Closer examination of the test scores revealed that the group with the oldest students had a much higher mean test score than the youngest group of students. The data showed that the younger groups may have made larger academic gains because they had more of a gap in learning to overcome in order to catch up to the older students in their grade. The data analyzed by Lin, Freeman and Chu (2009) clearly showed that older children had higher test scores in reading and mathematics at the end of fifth grade. Though the younger children gained in academic achievement, they did not catch up to the higher academic levels of the older children.

Another study by Yesil-Dagli (2006) concurs with the research that younger children score lower than their older counterparts. In both math and reading, the older children, whether they started school on time or were redshirted, consistently scored higher in reading and mathematics than the younger children in the same cohort. The effect remained even after controlling for ethnicity, gender and socio-economic status. However, this study found that by third grade, the effect of being younger was greatly diminished. An interesting part of this study was the differences in genders of ethnic groups, especially the ones who had been redshirted. Caucasian boys who had delayed kindergarten entry scored better than Caucasian girls who had done the same. But for African-American students, the effect was reversed. The girls who had been redshirted scored higher than the boys (Yesil-Dagli, 2006).

5 Studies on Relative Age

Relative age is the age of a child compared to the age of all the other children in their class. This is a fairly new area of research and was first documented in the area of sports. In 1985, a group of researchers found that an overwhelming number of professional hockey athletes had birthdays that occurred in the first part of the year (Barnsley & Thompson, 1988). As they delved into the issue, they discovered that for Canadian youth hockey leagues, the cut–off date for each age group was December 31. Therefore, those children with birthdays close to, but after the cut-off, would be almost a whole year older than the athletes whose birthdays occurred at the end of the year. At the age of five years old, eleven months represents a huge proportion of their lives and that age difference can account for a noticeable difference in playing ability. It is soon after this beginning age that children are chosen to participate on more competitive hockey teams. Barnsley and Thompson. (1988) found that the birthdates of these chosen athletes occurred most often within the first four months after the cut-off date. The children chosen for the elite teams were most likely bigger and more coordinated because they were 5% to 18% older than their peers. The coaches may have confused normal child development patterns with hockey talent (Barnsley & Thompson, 1988).

However, the researchers found the same pattern of birthdays within professional hockey leagues. If professional hockey players were selected based on natural talent, the birthdates within the league should be more uniformly dispersed throughout the year. The researchers propose that after these older players were placed on elite teams, they practiced more, played more games and were exposed to better coaching. The researchers conclude that it was not that the children were more talented as much as they were chosen to develop their hockey skills more fully (Barnsley & Thompson, 1988).

This same phenomenon has been documented in other sports such as soccer and in different countries around the world. In the study done by Helsen, Van Winckel, and Williams (2005), the researchers pointed out that those children who felt as if they were successful in soccer tended to practice more and gained more skill. Those who were less successful dropped out because they felt that they were not talented in soccer, so they decided to stop playing the sport.

To illustrate a possible scenario in school, consider what happens when children enter school as the oldest students in class. They are usually more emotionally mature then the younger children and have more behaviors conducive to school success such as being able to pay attention for longer periods of time, being able to sit still for longer periods of time and having better fine motor skills. It is possible that these children are chosen for inclusion into the higher reading and/or math groups. This is where the hockey effect provides an apt comparison. The upper level readers are challenged more and they gain more skills in that one year than the children who proceed at a slower pace. They are also more likely possess self-confidence because of their success in school and that confidence breeds more success. These children are also more likely to be placed in the higher reading groups in later years and the cycle continues to repeat.

In recreational sports, it is not an important issue if the youngest child on the team eventually stops playing hockey or soccer and chooses some other activity. However, if the same phenomenon is happening to children in school when it comes to reading or mathematics, the lesser-skilled child may put less effort into learning and trying to catch up with their more academically advanced peers. If relative age affects other parts of life such as school success, it could have detrimental effects to those students who are by no fault of their own the youngest students in class.

Cobley, McKenna, Baker, & Wattie (2009) found that relative age effects can be observed in secondary school. The researchers studied a particular school in England and found that older students had higher academic achievements in all subjects. There were also a higher percentage of older students in the gifted and talented program while a large percentage of the younger children in each grade were utilizing learning support programs similar to the special education program in the United States. Cobley et al. (2009) state:

5.1

It is highly probable that providing an advantaged learning environment to this group will also result in superior endpoints in other areas of endeavor (e.g., occupation). In comparison, relatively younger members of a cohort may be more likely to develop negative attitudes and behavior toward education, with self-competence and esteem problems the result of their experiences in secondary education. (p. 526-527)

Bedard and Dhuey (2006) conducted a detailed analysis of the relative age effect using data from Trends in International Mathematics and Science Study (TIMSS). They studied different types of educational systems, including those where all children enter school at the same time and move on to the next level regardless of ability. The researchers found evidence that younger children score lower on both the fourth and eighth grade TIMMS assessment. The differences in test scores are quite substantial. From Bedard and Dhuey (2006):

5.2

To put this in perspective, this translates into a 4-12 percentile disadvantage for eleven months of relative age. While the age premium enjoyed by the oldest students declines between grades four and eight, there remains a 0.8-2.6 point difference, or 2-9 percentiles, between the oldest and the youngest students at the eighth grade level. These results clearly show the persistence of relative age into adolescence, and are therefore suggestive of a longer run impact. (p. 3)

Bedard and Dhuey (2006) also showed that in both Canada and the United States, older students are more likely to take the SAT or ACT and they are more likely to be enrolled in a four year university after graduating from high school. These students were also more likely to complete college preparatory classes while still in high school. Bedard and Dhuey (2006) echo the findings of Cobley et al.(2009) about the presence of relative age effects in education. Relative age effects can determine long-term school success, including whether or not a child attends college. The practice of sending children to school based on an arbitrary cut-off date is creating the difference between older and younger students who end up in the same classes. Bedard and Dhuey (2006) urge educators to pay more attention to the effects of relative age in the classroom. If children from low socio-economic families also end up being youngest students in class, then they are at a disadvantage because of relative age effects, less preschool experience and less acquisition of school readiness skills before kindergarten (Bedard & Dhuey, 2006).

Martin, Foels, Clanton and Moon's (2004) study included a large number of Caucasian students in twenty-eight counties in the state of Georgia. The cutoff date was September first, so children born in the summer would constitute the youngest group of students in any cohort. The researchers found that children with summer birthdays were more likely to be retained or redshirted. The study does not treat redshirted children differently than retained children, but it does show some interesting things about children born in the summer. The youngest group of children had the highest percentage of individuals who had been diagnosed with learning disabilities. When Martin and his co-authors looked at achievement levels of each group of children, the youngest group had the lowest scores on the Iowa Test of Basic Skills. Surprisingly, that was true whether they included or excluded the group of retained students. The authors also bring up the idea that young children are not as physically and emotionally mature as their class counterparts who were born in other times of the year. Martin et al. (2004) say:

5.3

It posits that the youngest children in a grade cohort may be at a social disadvantage to others in the given grade with regard to physical stature, physical strength and skills, social skills, and perhaps aspects of cognitive maturity. This hypothesis holds that the cumulative effect of these relative disadvantages is lowered self-esteem, resulting in lower task involvement in school and poorer achievement (Pellegrini, 1992). (p. 308)

Martin et al.(2004) give more credibility to their findings by pointing out that Diamond (1983) found similar results in Hawaii when their cut-off date was January 1st and the youngest group was born in the late fall. That fact is important in this particular study because the researchers discuss other factors that may be the cause of lower achievement due to psychological disorders such as autism and schizophrenia and that those factors may be related to the time of year in which the child was born (Martin et al., 2004).

The studies on the effects of relative age in the classroom show that there is a correlation with higher test scores and older students. However, these differences in age may affect other facets of a student's life in addition to academic performance. Leadership roles may also be based on age. In the study by Dhuey and Lipscomb (2008), the researchers found that older students occupied more leadership roles in high school than younger students within the same grade. They found that age was the determining factor regardless of other factors including socio-economics and height at the age of 16. Dhuey and Lipscomb (2008) conclude their study by calling for more research to be done to determine how relative age effects factor into students learning leadership skills but that there does seem to be some preliminary correlation between leadership and age.

6 Studies on Retention

If relative age effects can cause some children to acquire more skills than others, what effect does retention have on children? Retention is when a child fails to achieve certain academic standards and is forced to repeat a grade of school. Most of the research concerning what happens when children repeat a grade show that not only does the practice cause lasting harmful emotional effects, it does not increase student achievement.

The children most likely to be retained in the first four years of school qualify for free and reduced lunch, come from minority ethnicities, have summer birthdays, are male and among boys, shorter children are more likely to be retained (Wake et al., 2000).

If the child suddenly becomes one of the older children in class, then the data might be expected to show similar outcomes for grade retention as we have seen in academic redshirting and relative age effects. However, the research on retention paints a different picture.

Frederick and Hauser (2006) conducted a study to see how retention rates have changed over the last three decades. They found that though there are few studies that prove that retention has a positive effect on school achievement, the rates of retention have been rising. In fact, public policy seems to ignore the research and calls for more children to be retained if they can not meet academic standards. From Frederick and Hauser (2006):

6.1

Despite these negative or weak findings, the popular sentiment in America is that schools and teachers need to be more accountable to ensure that children progress at appropriate rates (National Education Goals Panel, Goal #8, The National Commission on Excellence in Education, 1983). Many politicians, including Presidents Clinton and Bush, have made direct pleas to end social promotion (Bush 2004; Clinton 1999). Hauser (2004, 2005) warns that the annual testing in third through eighth grades mandated by the No Child Left Behind Act (US Congress 2002) may increase the incidence of test-based retention. (p. 4)

Jimerson (2001) performed a meta-analysis of retention studies over a period of twenty years. He found that any increase in achievement by a retained student was short-lived and existed only when the child was learning material that had been presented to him before. Once the child began to learn new material (usually the subsequent year), the child again began to struggle and fall behind. The effects were not only in academics. Jimerson (2001) found:

6.2

Overall, the retained students had lower levels of academic adjustment at the end of 11th grade, were more likely to drop out of high school by age 19, were less likely to receive a diploma by age 20, were less likely to be enrolled in a postsecondary education program, received lower education/employment status ratings, were paid less per hour, and received poorer employment competence ratings at age 20 in comparison to a group of low-achieving students. (p. 422)

The emotional and social effects of being retained are so pervasive that many children never recover. They have a negative attitude toward school and lower self-esteem (Carlton & Winsler, 1999). Carlton and Winsler's (1999) article also showed that retained children performed worse on standardized tests than those children who were socially promoted. It would seem that though retention is a prevalent practice in the United States, there are few studies that can show a positive outcome for the students who have been retained. Instead of retained students catching up to their peers and continuing the increase in academics, any gains are temporary (Jimerson, 2001).

Retention is included in the redshirting debate because some parents think that if their child does not perform well in kindergarten, then their child can simply repeat kindergarten and catch up. If that hypothesis was true, then the data should show an increase in test scores for retained children. The data fail to support the idea of a child repeating kindergarten will increase the child's academic achievement (Jimerson, 2001).

7 Literacy Concerns

The literature show that relative age plays a factor in student achievement, especially in the first three grades of elementary school. This should be a concern to educators since the arbitrary assignment of children to be the youngest or oldest in each class is dependent on district-mandated cut-off dates. If relative age relegates the youngest students to arbitrarily being academically and socially disadvantaged, it is the

school's responsibility to ameliorate those effects. Literacy research offers some valuable insights about how relative age effects could cause long-term educational literacy issues in the lives of children.

The field of education research is replete with studies on literacy. Some researchers say you can predict who will be a poor student in high school by looking at their literacy skills in the first grade. From Foster and Miller's (2007) work on the literacy gap:

7.1

Juel (1988) found an 88% probability of being a poor reader in the fourth grade if a student is identified as a poor reader in the first grade. Shaywitz and colleagues (1999) and Francis, Fletcher, Shaywitz, Shaywitz, and Rourke (1996) showed the students who had been identified as having significant reading problems in the elementary grades continued to have significant deficits in high school. (p. 171)

Foster and Miller (2007) also discuss the Matthew effect which refers to the phenomenon that children who enter school with many pre-reading skills acquire more complex literacy skills as they get older. The children who enter kindergarten without these same skills do not gain more complex skills as quickly and begin to fall farther and farther behind their peers. In terms of literacy skills, the "rich get richer - poor get poorer" (Foster & Miller, 2007, p 174). The researchers also state that intervention strategies for struggling readers after the 4th grade help only 13% of those struggling students. Starting school with few reading skills becomes, for many students, an insurmountable problem, and schools must work much harder in the early grades to help these students catch up. Foster and Miller (2007) found that socio-economic status of the child is a further indicator of reading skills:

7.2

There is a growing body of literature that suggests that school readiness is primarily a function of socio-economic resources (e.g. Roscigno, 2000; Roscigno & Ainsworth-Darness, 1999; Blair, Blair & Madamba, 1999; Levine & Eubanks, 1990). Foster (2001) showed that the greatest contributing factor to school readiness was the socioeconomic status of the child's family. (p. 175)

Children from homes with lower socio-economic status usually are not redshirted. Redshirting is an expensive option when both parents work or when the child comes from a single-parent household. An extra year outside of public education represents an extra year of daycare or preschool costs. Impoverished students will typically be younger than the other children in class. Since they are also entering school with fewer literacy skills than their peers (Foster & Miller, 2007), they are already behind their peers in terms of academics on the first day of kindergarten.

8 Conclusions

The studies on relative age effects show a distinct difference between the oldest and the youngest child in the class. Academic redshirting changes a child's birth order in class by putting them in the oldest group of students rather than the youngest group. The parent of a redshirted child is essentially choosing to which group their child will belong. To illustrate the decision, take a child with a July 31st birthday who lives in a district where the kindergarten cut-off is August 1st. That child could legally start school at the age of 5. However, if his parents chose to do so, he could wait a year and start kindergarten at the age of 6. The first scenario would most likely result in the child being the youngest one in his class, if not the youngest student in the whole grade. The second scenario would make him one of the oldest in his class. This is a difficult issue to study since a child either is kept out a year or is not. Once a child is redshirted, the decision cannot be reversed (Oshima & Domaleski, 2006).

The research conducted concerning relative age provide evidence that simply being older compared to a child's classmates increases the potential for higher reading and math skills (Datar, 2006; Diamond, 1983; Lin, Freeman & Chu, 2009; Oshima & Domaleski, 2006;Yesil-Dagli, 2006) and lessens the child's risk of being retained in elementary school (Martin et al., 2004). Retaining a child after kindergarten does not have the same effect as redshirting and may do more harm in the long run (Carlton & Winsler, 1999; Jimerson, 2001).

Every year, parents struggle with the decision of whether or not they should academically redshirt their child. With few studies on the phenomenon available, parents approach the decision with emotion, distress and limited facts on the phenomenon. Few studies have been published in mainstream media about academic redshirting or relative age effects. Parents need to understand the current research so that they can make a better informed decision concerning their own child. Parents need to know about the data that show that younger children have lower test scores (Datar, 2006; Diamond, 1983; Lin, Freeman & Chu, 2009; Oshima & Domaleski, 2006;Yesil-Dagli, 2006), less probability of attending college (Bedard & Dhuey, 2006) and fewer leadership roles in high school (Dhuey & Lipscomb, 2008).

9 Implications for Educators

Principals of elementary schools should be advised about the research on relative age effects. Many educators see older children as a bonus for their school since those children are usually more mature and have advanced academic skills. The prevalence of academic redshirting may continue to rise because the increased rigors in elementary school may cause more parents to hold back their young children. The greater mean age of kindergarteners would take an even larger toll on children who are the youngest in their grade or come from impoverished environments. Schools need to be aware of how the older students can affect the academic environments of the youngest children. More research in this area is needed to help us understand what can be done to raise the academic achievement of the youngest children in a cohort.

Principals in particular should find practical ways to help parents and students deal with this phenomenon. They could encourage parents of children with birthdays close to the cut-off date to consider redshirting their child and advise them that repeating kindergarten does not provide the same advantages. Kindergarten teachers should examine their current readiness tests to make sure that maturity issues could be found in time for parents to consider academic redshirting as a viable option. Principals could schedule kindergarten orientation and placement testing in the spring semester to allow time to counsel parents on viable options for students at risk. Teachers should be aware of the differences in academic achievement based on relative age and carefully consider instructional techniques that close the gap between the oldest and youngest students in their classrooms. A child who is both young and impoverished may need to have additional support.

Moreover, the research clearly shows that redshirting is advantageous for the individual child. But educators face a challenge to balance the needs of the individual child with the needs of all the children in a classroom. If redshirting remains a middle-to-upper class practice, then the phenomenon allows affluent children to also become the older children in class. Educators could reasonably expect a deeper divide in the achievement gap between affluent and impoverished children. Academic redshirting works for the individual child who is redshirted but someone must be the youngest in class. And the youngest child should not be penalized with lower academic achievement because their parents are unaware of the advantages of redshirting or are unable to keep their child out of school for an additional year because of financial issues. Though redshirting is a personal decision, educators can no longer ignore its role in relative age effects. For the parent who is struggling with this decision, the research is clear. It is better for a child to be the oldest in class than the youngest in class.

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Summary of the Literature

Studies on redshirting and student characteristics

Study	Sample information and methodology	Key points
Barnsley & Thompson (1988)	7313 hockey players from the Edmonton Minor Hockey Association in the 1983-1984 season. Methodology of study was Chi-square analysis with alpha = .05.	An overwhelming number of professional hockey players had birthdays in the first part of the year.
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Bedard & Dhuey (2006)	299,330 student scores from 1995 and 1999 TIMSS from countries with unambiguous school cut-off dates. Methodology used econometric models.	Older children scored higher on the fourth and eighth grade TIMMS. Older children were more likely to attend college.
Bedard & Dhuey (2006)	Data from 2001 New Zealand Census on number of adults holding Bachelor's degrees. Methodology was analysis using econometric models.	Older children were more likely to attend college.
Carlton & Winsler (1999)	A view of the literature compared with the Vygotskian sociocultural theory and contemporary development theory.	Children who are retained had a negative attitude toward school and lower self-esteem. Retained children also had the same test scores as the students who were socially promoted.
Cobley, McKenna, Baker & Wattie (2009)	657 students aged 11-14 at a secondary school in North England. 345 male, 312 female. Chi-square analysis and multivariate analysis of covariance with alpha = .05.	Older high school students had higher grades in all subjects. A higher percentage of older students were place in gifted programs.
Datar (2006)	13,818 children in kindergarten for the first time from ECLS-K, 1998-1999 school year. Methodology used multiple regression analysis on test scores at the beginning of kindergarten compared to test scores at the end of first grade.	Children who started kindergarten a year older than their counterparts had higher test scores in Kindergarten and made larger gains in test scores in subsequent years.
Dhuey & Lipscomb (2008)	Data from three nationally representative samples, Project Talent of 1960 (n = 269,249), National Longitudinal Study of the High School Class of 1972 (n = 16,000), and High School and Beyond of 1980-82 (n = 18,000). Econometric models were used for analysis.	Older students occupied more leadership roles in high school.
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Diamond (1983)	154,203 students in Hawaiian Public Schools in 1979-180 between 5 and 20 years old. Methodology for study was correlational analysis with alpha = .05.	Found that the youngest group of children in a grade scored worse on average.
Foster & Miller (2007)	12,621 kindergarten through third grade students from ECLS-K. 61% Caucasian, 14% African-American, 13% Hispanic and 12% all other minority groups. Methodology used analysis of variance and regression analysis with alpha = .01.	Students who entered Kindergarten with more pre-reading skills learned to read much faster than their peers. Many students who start out behind never caught up.
Frederick & Hauser (2006)	864,878 children aged 6 to 17 from repeated cross-sections of national representative samples over 32 years. Methodology used multivariate analyses.	Though few studies show retention works, more students were being retained than in the previous three decades.
Graue & DiPerna (2000)	Representative stratified random sample of 8595 Wisconsin third graders in 1995-1996. Methodology of study included chi-square and regression analysis.	This study was done in an area of the country with high concentrations of redshirted students. Provides the background information for redshirting.
Helsen, Van Winckel & Williams (2005)	2175 soccer players on National Youth Soccer Teams from U-18 to U-15 for the 1999-2000 season. The methods were Kolmogorov-Smirnow test and regression analysis.	Found that children who are good at soccer practiced more and improved their skills. Children who were not as skilled stop playing soccer.
Jimerson (2001)	Meta-analysis using effect sizes of twenty research articles. Categories compared were academic achievement and socioemotional and behavioral adjustment.	Retained students performed better the year they repeated a grade, but fell behind again when they learned new material.
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Lin, Freeman & Chu (2009)	8528 students from ELCS − K-5. Methodology was analysis of variance with results of p<.001.	Found that older children had higher test scores through 5th grade. In the early grades, older children also made larger cumulative gains in achievement.
Martin, Foels, Clanton & Moon (2004)	2007 males and 761 females with test scores from standardized achievement testing in the state of Georgia in the Spring of 2000. Methods were chi-square analysis and comparison of effect sizes.	Children with summer birthdays were more likely to be retained.
Oshima & Domaleski (2006)	3000 students randomly selected from the ECLS − K study. Methodology included effect size comparisons, independent t-tests and regression analysis.	Older students scored higher in math and reading through 5th grade.
Shepard & Smith (1988)	Review of literature about kindergarten curriculum and policy concerning retention, school readiness and escalation of kindergarten learning standards.	Academic standards in kindergarten started becoming more rigorous in the 1970's.
Wake, Coghlan & Hesketh (2000)	Representative cross-sectional sample of 2848 children aged 5 − 12 years in Victoria, Australia. Methodology used was analysis of variance.	Children who were shorter had a higher rate of retention.
Yesil-Dagli (2006)	Data collected from ECLS − K study, with kindergarten reading scores (n = 11,672), kindergarten math scores (n = 11,774), 1st grade reading (n = 6852), 1st grade math (n = 6852), 3rd grade reading (n = 4176), and 3rd grade math (n = 4693). Methodology included a comparison of effect sizes with alpha = 305 and regression analysis.	Found that while older students had higher test scores, by third grade the effect was diminished.

Table 1