



Academic red-shirting and academic achievement among students with ADHD



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ARTICLE INFO

Article history:

Available online 21 October 2015

Keywords:

ADHD
Red-shirting
Achievement

ABSTRACT

Academic red-shirting via voluntary delayed school entry is a debatable practice for students but has been argued a potentially viable practice for children with a range of disabilities by providing students “the gift of time.” The current study ($n = 21,409$) indicated that children with ADHD ($n = 1057$) were more likely to be red-shirted as compared to children without ADHD ($n = 20,352$). We examined the academic trajectories of those children with ADHD who were red-shirted versus children with ADHD who were not red-shirted. Results revealed no meaningful association of red-shirting with academic achievement across time. We subsequently examined the relationship of red-shirting and academic achievement among children with ADHD who received medication ($n = 426$) versus children with ADHD who did not receive medication ($n = 631$). Among children with medicated ADHD, the negative association of red-shirting with achievement across time was stronger but medication received was also associated with more severe symptoms of inattention across time, which may account for this relationship. Academic red-shirting does not appear to be especially beneficial for students with ADHD (medicated or not) in terms of academic achievement across time.

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Academic red-shirting or voluntary delayed school entry is a decision that many parents make for their child based upon a variety of factors. With an increase in academic standards and a decrease in social promotion, states have looked to increasing the kindergarten age as a strategy to improve student achievement. In the United States, state entrance age cutoffs have been consistently increasing since the 1970s (Elder & Lubotsky, 2009), with 43 states currently requiring a child's fifth birthday to have occurred on or before September 1, six of which setting the cutoff at or before August 1 (National Center for Education Statistics, 2015). While the literature debates the value of academic red-shirting for typically developing students (Huang & Invernizzi, 2012; Martin, 2009), some would argue that this practice may be effective for certain special populations such as children with attention problems. For instance, the likelihood for being diagnosed with Attention-Deficit/Hyperactivity Disorder (ADHD) in kindergarten more than doubles for older kindergartners as compared to younger kindergartners (Evans, Morrill, & Parente, 2010) and the probability of repeating kindergarten, first grade, or second grade is higher when children with ADHD are a year younger than their kindergarten peers (Elder & Lubotsky, 2009).

With such concerns, parents' use of red-shirting for academic purposes is not surprising. Red-shirting, or the practice of delaying the start of kindergarten to better ensure children's social, physical and cognitive readiness, has developed into a regular practice over the past several decades. It is estimated that between 7 to 12 percent of kindergarten students are red-shirted (Datar, 2006). Red-shirting has been typically practiced by White, middle-class parents of boys. Although some have speculated that red-shirting is a means to give struggling students “the gift of time” to develop cognitively and/or socially (Graue & DiPerna, 2000; Taylor & Fiorini, 2011), others have found evidence that red-shirting may also be used to give children better relative standing within their class (Bassok & Reardon, 2013). Educated parents likely recognize that behavioral and academic judgments are based on comparisons to peers rather than absolute standards of performance, thus red-shirting may be perceived as providing an academic edge to their children (Deming & Dynarski, 2008).

Parents of children diagnosed with ADHD may be more concerned about their children's kindergarten readiness than providing an academic edge, as ADHD is a disorder that affects the development of the executive functions related to inhibitory processes (Barkley, 1997; Crosbie et al., 2013; Hart et al., 2014) and working memory (Holmes et al., 2014; Martinussen, Hayden, Hogg-Johnson, & Tannock, 2005). There are pronounced improvements in executive functioning that occur between the ages of three and five (Willoughby, Wirth, Blair, & Family Life Project Investigators, 2012). Visual working memory has also been found to double between the

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ages of 5 and 10 (Riggs, McTaggart, Simpson, & Freeman, 2006). Thus, red-shirting may seem especially advantageous for children with ADHD who experience delays and deficits in such functions. However, an investigation into the longitudinal effects of red-shirting on children with ADHD has yet to be conducted.

Studying children with ADHD can be challenging as symptom severity can be related to medication status. Although Graziano, Geffken, and Lall (2011) found that symptom severity was similar regardless of medication status, others have found that children without medication display more severe symptoms (The MTA Cooperative Group, 1999). If medication is effectively addressing symptoms, then children may be more likely to benefit from red-shirting. Because close to 40% of children diagnosed with ADHD do not receive medication therapy (Center for Disease Control and Prevention, 2005), the study of red-shirting by medication status appears warranted. The purpose of the current study was to examine the relationship of academic red-shirting with ADHD and medication received for ADHD. To achieve this purpose, we examined three research questions. First, we examined whether students with ADHD were significantly more likely to be academically red-shirted as compared to students without ADHD. Second, we examined the relationship between academic red-shirting and reading and mathematics achievement across time among students with ADHD while statistically controlling for socioeconomic status. Third, we compared the reading and mathematics achievement across time of students with ADHD whose parents reported their child taking medication for ADHD versus taking no medication for ADHD.

1. Evaluation of delayed kindergarten entry

Understanding whether red-shirting truly has any value tends to be a longitudinal question. While the youngest children in kindergarten may be at greater risk for psychiatric diagnosis (Deutsch, 2001), the oldest children in later grades are more likely to drop out (Cook & Kang, 2013). These findings suggest that the benefits of red-shirting may diminish as children advance through the school years. For example, Datar (2006) analyzed children's academic progress while considering age variation and state kindergarten entry requirements through the first two years in school using data from the Early Childhood Longitudinal Study-Kindergarten Class (ECLS-K) and found significant advantages for older students. Children's test scores at kindergarten entry were not only significantly higher when children started a year older, but their academic growth trajectory was also steeper (Datar, 2006). Oshima and Domaleski (2006) found similar results using the same ECLS-K dataset but carried out their analyses through the children's fifth grade school year. Their analyses revealed initial advantages that quickly tapered off between first and third grades. Although differences were still present at fifth grade, the difference was near zero in the middle school years.

Stipek and Byler (2001) found similar results in their summary of the literature between 1980 and 2000 and reported "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" (p. 177). Stipek and Byler (2001) reported that initial and later academic benefits were limited and identified studies that did not support academic advantages for delayed entry (e.g., Cosden, Zimmer, Reyes, & Gutierrez, 1995; May & Welch, 1986). Using a sample of children from low income backgrounds divided by their age at kindergarten entry, Stipek and Byler also found only a modest advantage for relatively older children's mathematics and literacy skills at the end of their kindergarten year. Interestingly, the children's teachers did not identify the older children as more academically engaged than those who were younger. Also, these academic advantages were not present at third grade. Stipek and Byler (2001) found similar evidence when comparing 54 children in the kindergarten sample matched to 54

children in first grade based on similar birthdays (e.g., children of the same age who were in different grades). They found only a slight advantage for the first grade students on the mathematics assessment but no significant differences were noted for literacy.

2. Understanding red-shirting

The aforementioned research raises questions about the longitudinal academic advantages of red-shirting or voluntary delayed entry, but it is limited by investigations based on age of kindergarten entry or comparisons of children in the same grade with early and late birth months (Datar, 2006). The majority of studies have identified delayed entry students by comparing age to the age cutoff dates for kindergarten entry or to the start of the school year not based on whether the parents actually made the choice to red-shirt their child. This approach ignores the influence of confounding variables, such as disabilities and developmental delays which would likely lead to a slower growth rate regardless of entry age. The variation in school cutoff dates for entry across states also complicates this approach, as Datar (2006) found differences, although not statistically significant, in the amount of per student expenditure based on minimum entrance age requirements.

Comparing older and younger children in the same grade also suffers from limitations as the approach incorrectly treats red-shirting as being on a continuum. A child purposely withheld from school entry likely has a qualitatively different experience in school than a child who is simply the youngest in the class or the oldest depending on birth month. For example, teachers tend to believe that school readiness is maturational and not influenced by parents and teachers (Graue & DiPerna, 2000; Smith & Shepard, 1988), which could lead to positive expectations for children given the "gift of time." Additionally, red-shirting is a practice typically employed by higher income parents of boys whereas retention occurs more frequently in children from low socioeconomic backgrounds (Mendez, Kim, & Ferron, 2015), and teachers' attitudes toward boys from higher socioeconomic status (SES) families tend to be more positive in comparison to boys from low SES families (Auwarter & Aruguete, 2008). Higher SES parents may also be more likely to choose red-shirting because they have the resources to invest in continued preschool education and associated educational activities, and the benefits of which would likely carry over into the early school years.

Elder and Lubotsky (2009) evaluated such carry-over effects using the ECLS-K and National Educational Longitudinal Survey of 1988 (NELS:88) data and found evidence to support that prekindergarten preparation accounts for entrance age effects on academic performance rather than kindergarten learning. Elder and Lubotsky first pointed out that differences in mathematics and literacy estimates between on-time and delayed entry kindergartners are observed very early in the kindergarten year or before any significant learning in kindergarten could have occurred. Second, they found these early advantages to be more pronounced for children from higher socioeconomic backgrounds. Finally, they noted that the fading away of academic advantages by third grade suggests the effects are likely not due to older children's ability to learn more quickly, as widening gaps would be expected as these children advance through school. Elder and Lubotsky (2009) concluded that their "estimates clearly indicate that children's reading and math abilities increase much more quickly once they begin kindergarten than they would have increased during the same time period if they delayed kindergarten entry" (p. 645). Thus, a longitudinal examination is warranted to minimize these immediate carry-over effects of these parental investments.

Elder and Lubotsky (2009) further explored the implications of raising the overall average age of children in a kindergarten class and found evidence to support that teachers and parents make judgments on retention and behavioral referrals based on children's

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