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Academic Red-Shirting Among Children with Learning Disabilities

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The current study examined whether the parental practice of delayed kindergarten entrance, also known as academic red-shirting, was associated with gains in academic achievement among children with learning disabilities. Results indicate no significant differences in the academic achievement among children with learning disabilities who were delayed in their kindergarten entrance and those who entered on time. A discussion of special education intervention services and future research concludes the study.

Keywords: Learning disabilities; delayed entry; academic red-shirting; voluntary retention; kindergarten

Academic red-shirting, also referred to as voluntary retention (Frey, 2005), refers to the practice of delaying a child's entry into school in order to give him or her the developmental benefits of having been left back, thus entering the next grade at an older age. In this sense, academic red-shirting is the polar opposite to social promotion – the practice of promoting a child to the next grade despite failing to achieve certain competencies. The practice of academic red-shirting primarily resides with parents; e.g., a child is not completely lacking in developmental skills to begin school or has not failed his/her grade, but rather his/her parents (and also teachers) feel that it would be in the best interest of the child to delay entry into school. Parents engage in the practice of red-shirting their child for a variety of reasons. The most common reason cited by parents who red-shirt their children appears to be that their child was born in the latter half of the year, thus would be less mature, academically or behaviorally, than his or her peers (Crosser, 1998; Frey, 2005). Other reasons for this practice include, but are not limited to, parents' wanting to give their child a competitive edge in school by having another year to develop (Kagan, 1990) or parents' noticing that their child is lacking in certain areas of development and wanting to give their child an opportunity to catch up (Graue, Kroeger, & Brown, 2003).

Academic red-shirting has been indicated as being associated with better academic achievement (Oshima & Domaleski, 2006; West, Denton, & Germino-Hausken, 2000) or as having no significant effect (Graue & DiPerna, 2000; Lincove & Painter, 2006) for students. This parental practice has also been indicated to benefit in other academic-related areas such as improved social competence and increased confidence in social interactions with peers (Spitzer, Cupp, & Parke, 1995) and more positive feelings about school and their teachers (Stipek & Byler, 2001). Given this evidence from the research literature, it is not surprising that "forty years

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ago, 96% of six-year-old children were enrolled in first grade or above. As of 2005, the figure was just 84%" (Deming & Dynarski, 2008, p. 3). Deming and Dynarski (2008) have noted that these increasing numbers of six-year old children who are not enrolled in the first grade are not being home-schooled or alternatively educated but rather are entering kindergarten. While much research has considered the relationship of academic red-shirting with a variety of school-related variables, empirical research considering these outcomes for children with disabilities, specifically learning disabilities, has been limited.

Datar (2006) studied the effects of delaying kindergarten entrance on a sample of children from the Early Childhood Longitudinal Study (ECLS-K, NCES, 2006), which followed a nationally representative sample of children from Kindergarten through the 5th grade. Datar's (2006) findings suggest that delayed kindergarten entrance is associated with better achievement test scores in both reading and mathematics from the fall semester of kindergarten through the spring semester of 1st grade. Datar (2006) also found similar benefits in achievement test scores for certain subpopulations such as children with lower socioeconomic status, boys, and children with disabilities. With regard to children with disabilities, Datar (2006) found moderate increases in the achievement test scores of children with disabilities compared to children without disabilities who delayed kindergarten entrance. For every one point of gain in reading achievement test scores among children without disabilities who delayed kindergarten entrance, Datar (2006) found approximately 2.6 points of gain in reading achievement test scores among children with disabilities who delayed kindergarten entrance. The effect on math achievement test scores was statistically non-significant for children with disabilities who delayed kindergarten entrance but appeared to be presenting a similar trend to that of the reading achievement test scores.

While the results of Datar's (2006) study indicate positive outcomes associated with delayed kindergarten entrance among children with disabilities, her study did not distinguish its results according to disability. All children with disabilities were analyzed as an aggregate at-risk population. Even within the category of learning disabilities, there is much variation in symptomology and the severity of those symptoms. Across the twelve federal disability categories, the variation in symptoms, severity of symptoms, and outcomes for children with disabilities would be immense as the experience of disability is a highly individualized one (Smart, 2001; Vash & Crewe, 2004). This lack of distinction according to disability presents an opportunity for future research to examine the academic red-shirting phenomenon of delayed kindergarten entrance with respect to disability category and, perhaps, to validation of these findings.

From her analysis of the association of delayed kindergarten entrance with academic achievement through the 1st grade, Datar (2006) concluded that "an extra year out of school compensates, to a large extent, for the disadvantage presented by disabilities" (p. 56). While academic red-shirting may help a child who happens to be behind in certain areas of development, there is little evidence to suggest that an extra year out of school will, in and of itself, compensate, *to a large extent,* the effects of a disability. Having a disability is rather a lifelong experience that does not self-correct as is the case with many childhood developmental issues. A child may be aca-

demically red-shirted because his/her parents feel that s\he is behind in one or more areas, which may be the result of having a learning or other type of disability, but the practice of red-shirting by itself does not function as an intervention for having any disability.

Future research should re-examine the association of delayed kindergarten entrance with academic achievement with specific respect to children with learning disabilities and across time. As the ECLS-K contains six time points of data collected from a nationally representative sample of children, the availability of this data set presents an opportunity for researchers to re-examine this association. In her study, Datar (2006) utilized two of these six data points analyzing data collected from the 1998 fall semester of kindergarten to the 2000 spring semester of first grade. Results from the analysis of these two time points may suggest initial gains in achievement for children with disabilities who delay kindergarten entrance, but these gains associated with red-shirting would appear unlikely to persist across time.

The purpose of the current study was to examine the association of delayed kindergarten entrance with reading and mathematics achievement test scores among children with learning disabilities across time. To achieve the purpose of the current study, a sample of children diagnosed as having a learning disability from the ECLS-K was utilized and examined across the six time points of data collection according to delayed kindergarten entrance. In conducting the current study, we examined two research questions. The first research question asked whether children with learning disabilities who have delayed kindergarten entrance have significantly better mathematics achievement across time compared to children with learning disabilities whose kindergarten entrance was not delayed. The second research question asked whether children with learning disabilities who have delayed kindergarten entrance have significantly better reading achievement across time compared to children with learning disabilities whose kindergarten entrance was not delayed.

Method

Sample

The sample consisted of children selected from the Early Childhood Longitudinal Study-Kindergarten (ECLS-K), Kindergarten through 5th grade database. The ECLS-K represents a nationally representative sample of kindergarteners who started school during the 1998–1999 academic school year. The ECLS-K followed a sample of 17,565 children entering kindergarten in the fall semester of 1998 across (1) the spring semester of 1999; (2) the fall semester of 1999; (3) the spring semester of 2000; (4) the spring semester of 2002; and (5) the spring semester of 2004 completing in fifth grade. With the application of the appropriate weight, this sample of 17,565 students represents some 3,823,589 children across the nation beginning kindergarten in the fall semester of 1998. The sample consisted of an approximately equal gender distribution. With regard to ethnicity, 56.3% (n = 9,891) of parents of the children reported to be White, non-Hispanic; 14.2% (n = 2,494) reported to be African American;. 17.4% (n = 2,680) reported to be of Hispanic origin; and 6.5% (n = 1,075) reported to be Asian.

From these 17,565 children, approximately 968 children had been diagnosed with a learning disability as reported by the parent considered to be the primary caregiver. In performing a 2 x 2 chi-square analysis, results suggest that children with learning disabilities are significantly more likely to have a delayed entrance into kindergarten compared to children without learning disabilities, $\chi^2(1) = 45.55$, $p < .05$, $\phi = .153$. A phi (ϕ) coefficient value of .153 indicates a small but significant association (Green & Salkind, 2007) between delayed kindergarten entrance and a child's having a learning disability. Of these 968 children diagnosed as having a learning disability, approximately 7.95% ($n = 77$) children were enrolled in kindergarten at the age of six years old ($\approx$ 72 months) or older. The variable of age in months at kindergarten entry (P1AGEENT) was utilized to discern these delayed-entry students. None of these children with a learning disability were retained in a subsequent grade. The gender distribution among children with learning disabilities who were red-shirted and those who were not was approximately equivalent to 31.2% ($n = 24$) and 37.0% ($n = 330$) identified as female respectively. With respect to ethnicity among the subsample of children who were delayed in their kindergarten entrance, 66.2% ($n = 51$) were reported to be White; 11.7% ($n = 9$) reported to be African American; 9.1% ($n = 7$) reported to be of Hispanic origin; and 3.9% ($n = 3$) reported to be Asian. The ethnic distribution of the subsample of children who were diagnosed with learning disabilities who were not delayed in their kindergarten entrance was similar: 56.7% ($n = 505$) were reported to be White; 16.3% ($n = 145$) reported to be African American; 8.8% ($n = 78$) reported to be of Hispanic origin; and 4.2% ($n = 37$) reported to be Asian. Among children with learning disabilities who were delayed in their kindergarten entrance, the mean total household reported was approximately $35,003 USD with a standard deviation of $3,576 USD. Among these children with learning disabilities who were not delayed in their kindergarten entrance, the mean total household reported was approximately $34,023 USD with a standard deviation of $3,812 USD.

Measures

All measures were obtained from the ECLS-K (NCES, 2006). To measure academic achievement, IRT-scaled reading and mathematics test scores for each of the six time points of data collection were utilized. IRT (Item Response Theory) scaled achievement test scores represent estimates of a child's score if s/he were to complete the entire battery of the reading and mathematics achievement test items. Both reading and mathematics achievement test items were developed by the ECLS-K as direct cognitive assessments. Detailed information as to the psychometric properties of each scale at each time point can be obtained online from the NCES website (NCES, 2008). Table 1 contains the descriptive statistics for reading and mathematics achievement test scores across the six time points among children with learning disabilities.

Table 1
Descriptive Statistics for Achievement Variables With Sample Sizes of No Delay vs. Delayed Kindergarten Entry Groups

	Reading Achievement	Mathematics Achievement
Fall 1998		
n = 968 vs. *n* = 67	*M* = 29.23	*SD* = 10.97
	M = 22.01	*SD* = 8.98
Spring 1999		
n = 824 vs. *n* = 71	*M* = 38.68	*SD* = 14.04
	M = 30.85	*SD* = 11.34
Fall 1999[1]		
n = 283 vs. *n* = 38	*M* = 46.65	*SD* = 8.88
	M = 38.78	*SD* = 7.32
Spring 2000		
n = 679 vs. *n* = 61	*M* = 63.96	*SD* = 21.05
	M = 51.93	*SD* = 16.97
Spring 2002		
n = 502 vs. *n* = 67	*M* = 110.38	*SD* = 23.98
	M = 85.48	*SD* = 20.51
Spring 2004		
n = 506 vs. *n* = 57	*M* = 134.21	*SD* = 19.84
	M = 109.23	*SD* = 19.13

[1]In Fall 1999, a random 30% of the ECLS-K sample was achieved

Procedure

All analyses were performed in SPSS (*v.* 16.0). Values for missing data on the reading and mathematics achievement test scores were imputed across the six time points, using linear trend at point as the method of estimation requiring that the participants have at least two time points of data collection. Linear trend at point imputes a value for a missing datum based upon the linear regression trend value for that point (e.g., the predicted value). After conducting initial analyses, we did not apply weights. Weights are typically employed to produce accurate population estimates based upon sample characteristics by accounting for sampling errors due to random discrepancies between the true population and sample achieved. Without the application of these weights to adjust for design effects, standard errors are underestimated, given the large nature of the sample. All other things being equal, this underestimation of standard errors lends to an inflated Type I error rate. An over-rejection of the null hypothesis can occur without the application of these weights and the adjustment of design effects. In not applying weights and adjusting for design effects, a researcher could find statistical significance based upon sampling error and the large nature of the sample size, also known as the law of large numbers. As the results of the current study indicated statistical non-significance, the application of weights and the adjustment of design effects would only augment

these results. If results had indicated statistical significance, then the application of weights would be of interest to discern whether this significance was attributable to sampling error and the large sample size.

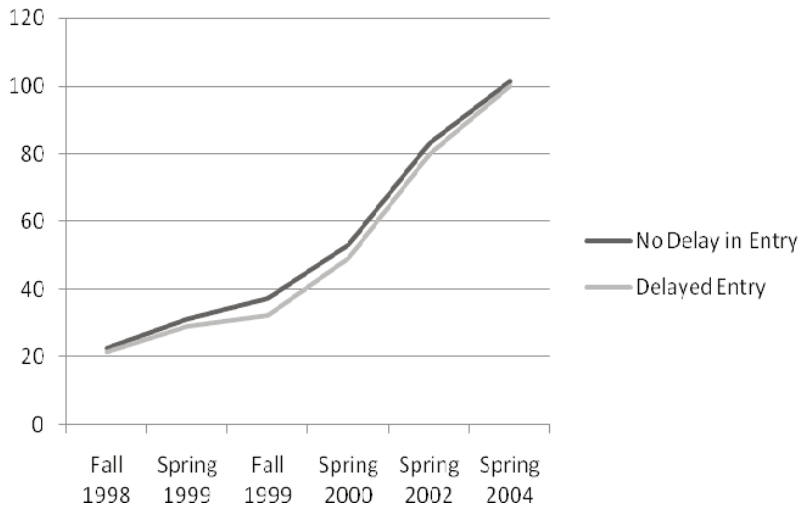
Analysis

To examine the first and second research questions, a 2 (delayed kindergarten entrance vs. not) x 6 (each achievement score across time) repeated measures multivariate analysis of variance (MANOVA) was performed. As the assumption of homogeneity of the observed covariance matrices of the dependent variable being equal across groups was not met (Box's test, $p < .01$), Pillai's Trace (V) was utilized to interpret MANOVA results. Pillai's Trace has been indicated as being robust to violations of this assumption, however less so when groups are not equal (Mertler & Vannatta, 2005). Two measures of effect size were utilized. For each MANOVA performed, eta-squared (η^2), which is a measure of the magnitude of the relationship between independent and dependent variables, has been reported. In evaluating follow-up ANOVAs, Cohen's d was utilized with .20, .50, and .80 or larger indicating small, medium, and large effect sizes respectively (Cohen, 1988).

Results

In examining the first research question, results indicate that children with learning disabilities who were delayed in kindergarten entrance did not have statistically significantly different mathematics achievement test scores across time compared to children with learning disabilities who were not delayed in their kindergarten entrance, $V = .018$, $F(1, 966) = 2.01$, $p = .08$, $\eta^2 = .03$. Figure 1 contains a line graph of the mathematics achievement score means at each time point for children with learning disabilities who were delayed in kindergarten, along with those who were not.

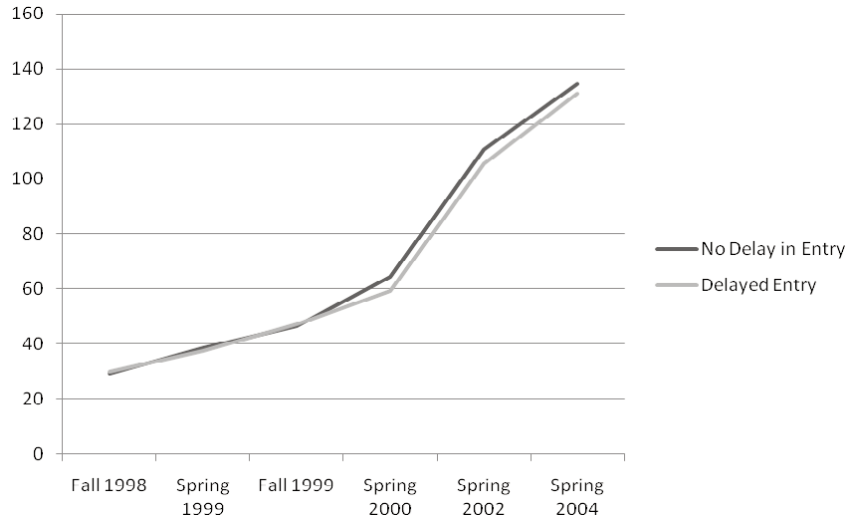
Figure 1. Mathematics achievement scores.



Post hoc power analyses indicate an acceptable level of statistical power achieved with a 1-β value of .99 for a repeated-measures MANOVA with $\alpha = .05$ as the level of significance and $\eta^2 = .03$ as the measure of effect size. All statistical power analyses were performed in *G* Power (Faul, Erdfelder, Lang, & Buchner, 2007). As these results were statistically non-significant, values for effect sizes are not reported. The results of follow-up univariate analyses of variance indicate that children with learning disabilities who were delayed in their kindergarten entrance did not have significantly different mathematics achievement at any of the time points, compared to children with learning disabilities who were not delayed in their kindergarten entrance.

In examining the second research question, results indicate that children with learning disabilities who were delayed in kindergarten entrance did not have statistically significantly different reading achievement test scores across time, compared to children with learning disabilities who were not delayed in their kindergarten entrance, $V = .009$, $F(1, 966) = 1.381$, $p = .22$, $\eta^2 = .02$. Figure 2 contains a line graph of the reading achievement score means at each time point for children with learning disabilities who were delayed in kindergarten along with those who were not.

Figure 2. Reading achievement scores.



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different reading achievement at any of the time points, compared to children with learning disabilities who were not delayed in their kindergarten entrance. Table 2 contains the descriptive statistics for each group across mathematics and reading achievement.

In conducting growth analyses to examine whether slopes were significant, it appears that both reading and mathematics achievement scores had positive, significant linear slopes when we examined all children with learning disabilities in the ECLS-K sample. When we examined the reading achievement of children with learning disabilities who were delayed entry and those who were not, the slopes remained positive and significant for a linear trend. When we examined the mathematics achievement of children with learning disabilities who were delayed entry and those who were not, the slopes remained positive and significant for a linear trend also. These trends for reading and mathematics achievement scores can also be readily viewed from the line graphs in Figures 1 and 2.

Discussion

The results of the current study indicate that delayed kindergarten entrance was not associated with better academic achievement for children with learning disabilities across time. In examining the longitudinal relationship between delayed kindergarten entrance and academic achievement, results indicate no significant association among children with learning disabilities across time or at each of the six time points. The results of the current study are derived from a large, nationally representative, and community-based data set (e.g. ECLS-K), which suggests the generalizability of our findings. In this study, a large sample size provided sufficient statistical power in performing analyses, where post hoc statistical power achieved was calculated indicating an acceptable level of statistical power. The use of a nationally representative and community-based data set provided a sample with distributive characteristics that reflect the population studied over that of a convenient sample suggesting the further generalizability of results. In sum, these results suggest that delayed kindergarten entrance or red-shirting should not be viewed as associated with better academic achievement for children with learning disabilities.

The practice of delayed kindergarten entrance may help children in certain circumstances (Oshima & Domaleski, 2006; West, Denton, & Germino-Hausken, 2000). This parental practice is indeed well-intentioned and may well function as a *head start* for many students (Datar, 2006). The results of the current study, however, indicate that delayed kindergarten entrance as academic red-shirting is not associated with better academic achievement among children with learning disabilities. Results from previous research would suggest that children with disabilities would benefit academically from the practice of delayed kindergarten entrance (Datar, 2006). The results of the current study suggest that children with learning disabilities do not benefit academically from the practice of delayed kindergarten entrance across time with a total of six time points of data collection. In this sense, academic red-shirting does not appear to function as an intervention, in and of itself, that will compensate for a child having a learning disability. The practice of academic red-shirting, by itself, should not be considered an intervention for a child with a learning disability.

Table 2
Achievement Descriptive Statistics by Kindergarten Entry

	Reading Achievement	Cohen's *d*	Mathematics Achievement	Cohen's *d*
Fall 1998				
No Delay in Entry	*M* = 29.31, *SD* = 10.81	*d* =.04	*M* = 22.57, *SD* = 8.47	*d* =.14
Delayed Entry	*M* = 29.84, *SD* = 12.67		*M* = 21.42, *SD* = 7.95	
Spring 1999				
No Delay in Entry	*M* = 38.68, *SD* = 13.97	*d* =.09	*M* = 31.33, *SD* = 10.78	*d* =.21
Delayed Entry	*M* = 37.31, *SD* = 14.81		*M* = 29.02, *SD* = 11.12	
Fall 1999[1]				
No Delay in Entry	*M* = 46.52, *SD* = 8.86	*d* =.05	*M* = 37.45, *SD* = 12.62	*d* =.24
Delayed Entry	*M* = 46.99, *SD* = 9.09		*M* = 32.11, *SD* = 10.10	
Spring 2000				
No Delay in Entry	*M* = 64.38, *SD* = 20.95	*d* =.24	*M* = 53.29, *SD* = 15.91	*d* =.27
Delayed Entry	*M* = 59.07, *SD* = 21.67		*M* = 49.28, *SD* = 13.58	
Spring 2002				
No Delay in Entry	*M* = 110.82, *SD* = 20.95	*d* =.12	*M* = 82.81, *SD* = 21.45	*d* =.13
Delayed Entry	*M* = 105.37, *SD* = 23.98		*M* = 79.84, *SD* = 23.24	
Spring 2004				
No Delay in Entry	*M* = 134.48, *SD* = 19.61	*d* =.16	*M* = 101.33, *SD* = 22.63	*d* =.06
Delayed Entry	*M* = 131.11, *SD* = 22.28		*M* = 99.89, *SD* = 24.53	

In kindergarten, special education intervention identification and intervention services are often delayed to permit children to have the benefit of an extra year of development and avoid early, misapplied labels (Litty & Hatch, 2006). Thus, delaying kindergarten entrance of a child who may have a learning disability would actually appear to be counter-intuitive since a child would typically not receive special education services upon entering kindergarten anyway. Since kindergarten is often a no-man's land for special education identification and intervention services, parents would actually be further delaying special education identification and intervention services for their child with a learning disability. From this lack of kindergarten special education services, it is not surprising that of children with learning disabilities entering on time or delayed did not have significantly different academic achievement scores across time as neither group would have probably received special education intervention services regardless of age of kindergarten entry.

Several limitations emerged in conducting the current study. For instance, information as to the age in which a child was diagnosed as having a learning disability was not collected from parents. In this sense, parents who had their children diagnosed with a learning disability earlier may have been able to provide intervention services to their children earlier, compared to other children with learning disabilities. As a limitation to the current study, future research should consider age of identification of a child's having a learning disability as a variable in future analyses. Future research should also consider examining those children diagnosed with a learning disability at one time point, who are then later declassified from or exit special education services. In the current study, parental response as to whether their child was diagnosed as having a learning disability was utilized. The public-use ECLS-K data file does not contain further information as to what special education services were received by the child once diagnosed as having a learning disability. As a result, the public-use ECLS-K data file does not include information as to whether the child was declassified from any special education services. The restricted-used ECLS-K data file would have to be obtained through the NCES licensing procedures to conduct this future study.

In conclusion, the current study examined how the parental practice of delayed kindergarten entrance as academic red-shirting was associated with academic achievement among children with learning disabilities. Future research should examine the association of delayed kindergarten entrance with respect to other important outcome variables for children with learning disabilities such as social interaction skills or classroom behavior problems. Both reading and mathematics academic achievement may, in fact, be influenced by these other important outcome variables as possible mediators and moderators in relationship to delayed kindergarten entrance for children with learning disabilities. Additionally, future research should also re-examine this association between delayed kindergarten entrance and academic achievement for children with disabilities other than learning disabilities to determine whether this non-significant trend continues for other categories of disability. Even within the category of learning disability, future research should consider re-examining this relationship with respect to type of symptoms.

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