Differential Developmental Pathways of High School Dropouts and Graduates

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ABSTRACT. The authors examined the developmental pathways between high school graduates and dropouts. The authors obtained official school data via a random sample of 119 students enrolled across 4 cohorts. The authors postulated 2 research questions: (a) Do differences exist in the developmental pathways of high school graduates in comparison with high school dropouts? (b) If differences do exist in the developmental pathways of high school graduates in comparison with high school dropouts, when and across which variables do these differences occur? Multiple *t* tests demonstrated differences between high school graduates and dropouts as early as kindergarten. Further, the developmental progression of graduates and dropouts diverged over time, regardless of which subject data was studied.

Keywords: absenteeism, at-risk students, developmental pathway, high school dropouts, high school graduates

Without doubt, the No Child Left Behind Act (NCLB; Heckman & Krueger, 2003) has generated a profusion of research and inquiry regarding high school dropouts and the methodology by which dropout rates are measured (Bryk, 2003; Kaufman, 2000; Losen, 2004; Swanson, 2003). Although researchers differ in their method of calculating dropout rates, they agree that approximately every 9 seconds a student decides to permanently leave high school prior to graduation (Children's Defense Fund, 2002). Such a premature departure from high school has required policymakers to address the educational, economic, and civic impact of dropouts on society (Card, 2001; Heckman, Heinrich, & Smith, 2002; Heckman & Krueger, 2003; U.S. Census Bureau, 2002).

Currently, a major thrust of research regarding high school dropouts has centered on the identification of and interventions for at-risk students with a propensity to drop out of school (Bailey & Stegelin, 2003; Hickman & Garvey, 2006; Smink & Schargel, 2004). Educational and community leaders and policymakers have incorporated available research and crafted a myriad of intervention programs and strategies targeted toward this audience (Currie, 2001; Kemple & Herlihy, 2004; Smink & Schargel). Unfortunately, many of these efforts have failed to demonstrate effectiveness or have proven ineffective at significantly lowering the dropout rate across school, district, and state levels (Alexander, Entwisle, & Kabbini, 2001; Crowder & South, 2003; Hickman & Garvey, 2006; Rumberger, 2004).

The inability of educators, researchers, and program designers to effectively reduce the number of students dropping out of school may be grounded in their approach to understanding dropouts (Beatty, Neisser, Trent, & Heubert, 2001). More specifically, the driving force of research and dropout intervention programs has been tailored toward secondary education (Alexander, Entwisle, & Horsey, 1997; Alexander et al., 2001). This narrow focus assumes an educational vacuum in a student's life from kindergarten through eighth grade. However, adolescents have a myriad of other factors that influence their development and that are outside the education system. Consequently, educators and researchers may be overlooking the human ecology of students before matriculation to high school (Barnett, 1995; Henderson & Mapp, 2002; Miedel & Reynolds, 1999; Piaget, 1952). Further, research regarding high school dropouts tends to use designs aimed at understanding relations between specific variables (e.g., Warren, 2002), discriminating variables between dropouts and graduates (e.g., Barrington & Hendricks, 1989), and predicting which variables are related to dropouts (e.g., Fry, 2003). As Smink and Schargel (2004) of the National Dropout Prevention Center noted, one of the greatest challenges in educational research is documenting long-term outcomes of early childhood educational experiences.

In the present study, we provide evidence that strengthens the high school dropout literature by examining the differential developmental pathways of high school graduates and dropouts across each grade level of their academic tenure and across all variables recorded in their academic history. We theorized that early in their developmental pathways those students who eventually drop out of high

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school begin to look markedly different from their counterparts who graduate from high school.

Understanding High School Dropouts and Graduates

Much of the existing body of research regarding high school dropouts has focused on antecedents related to secondary education. However, it seems inherent that the genesis of academic failure begins earlier than high school in a student's educational development (Henderson & Mapp, 2002; Hickman & Garvey, 2006; Miedel & Reynolds, 1999). In other words, evidence suggests students' academic outcomes in high school are built on the educational foundations they developed prior to high school and are compounded by demographic, familial, and behavioral factors (Astone & McLanahan, 1994; Barnett, 1995; Campbell & Ramey, 1994).

Academic Factors

Educators have established that the child's shift from home life to school is an important transition (Early, Pianta, Taylor, & Cox, 2001; Pyle, 2002; Zill & West, 2000). The shift from home child to school child is crucial for helping the child create an academic identity (Alexander et al., 1997). Although the child possesses differentiated capabilities as derived from genetics, school, community, and home life (Astone & McLanahan, 1994; Barnett, 1995; Campbell & Ramey, 1994; Hickman & Garvey, 2006), the American schooling process typically relies on traditional Socratic and 18th-century hierarchical models (Goodman, 1999). Hence, a child usually develops a sense of self in school settings that is mechanized and bureaucratic, with many prepackaged developmental expectations and interventions that are useful for sorting types of students.

Indicators of students who eventually drop out of high school tend to appear in the 1st years of a child's academic career (Lehr, Sinclair, & Christenson, 2004). Because of the differential experiences that children encounter during their first 5 years of life, it is probable that not all children enter kindergarten with similar developmental strengths that are helpful for subsequent academic success. Thus, the question is this: When does the pathway between graduates and dropouts begin to look markedly different? Various researchers have found that the level of reading at third grade is a strong predictor of students who drop out of high school (Christenson & Thurlow, 2004; Lehr et al., 2004). Therefore, third grade has received notable attention as a possible critical period for the propensity to drop out of high school (Lehr et al.). Many educators and researchers believe that by third grade, if actions are not taken to correct academic deficits, students can enter an academic downward spiral that eventually forms an unnavigable pathway that leads to dropping out of school (Christenson & Thurlow; Hickman & Garvey, 2006; Lehr et al.).

Perhaps the noticeable deficit in third grade is a culmination of students' attendance. Researchers have clearly demonstrated that attendance in kindergarten is highly predictive of attendance at higher levels of education (Lehr et al., 2004). For example, Alexander et al. (1997) found that dropouts averaged 16 days of absenteeism in kindergarten compared with 10 days of absenteeism for graduates. This 6-day differential in absenteeism between graduates and dropouts increased the likelihood of dropping out by 30% (Alexander et al., 1997). Absenteeism in kindergarten has been linked to students' future academic attachment, identity, and success orientation (Rush & Vitale, 1994).

Erikson (1963) noted that a child must eventually go beyond taking initiative in the classroom. Rather, a child must learn to master academics, language, and social interactions (Erikson). The lack of academic and social mastery appears to be an integral factor mediating low self-efficacy during a child's academic experiences (Schunk & Pajares, 2001). Low academic self-efficacy with poor attendance and poor grades may eventually place a child on the pathway to dropping out of school (Alexander et al., 1997; Lehr et al., 2004; Schunk & Pajares). Perhaps the lack of academic mastery and success leads children to feel as if they do not belong in school (Anderman, 2003). The more students feel that they do not belong in school, the more school may become less inviting and rewarding (Anderman). Researchers have found that the earlier that children experience academic failure and find school uninviting and unrewarding, the less likely they are to become successful and academically engaged later in their academic experiences (Alexander et al., 1997; Anderman).

To combat low academic self-efficacy that accompanies a lack of academic mastery and success, educators often retain or hold back a student to repeat a specific grade. One rationale behind grade retention is that a child's deficits can be corrected. However, an increasing body of research indicates that retention may not be the best answer and may prove deleterious to a student's academic success (Hauser, Pager, & Simmons, 2004; Roderick, Byrk, Jacob, Easton, & Allensworth, 1999). Further, retention tends to be an extension of preexisting academic failure. When students are retained in elementary grades, they are at greater risk for future academic failure, including the propensity to drop out of school (Rush & Vitale, 1994). Moreover, academic gains from retention tend to disappear or see a washout effect several years later (Allensworth, 2004; Jimmerson, Anderson, & Whipple, 2002; Roderick et al., 1999; Stearns & Glennie, 2006). In a 10-year longitudinal study of a large mentoring program, Hickman and Garvey (2006) found that students retained in elementary school significantly earned lower grades, experienced more disciplinary problems, performed below grade level, scored lower on standardized tests throughout their educational tenures, and dropped out of school more often than did students who were not retained.

Problem Behavior Factors

Researchers have shown clearly that problematic adolescents tend to be identified early by teachers, parents, peers, and therapists as students with a propensity to drop out of high school (Kazdin, 1995). In a sample of more than 700 students, Hickman and Garvey (2006) found that the average age of entrance to a mentoring program was 14.68 years (*SD* = 1.41 years) for those students who dropped out of school compared with 15.44 years (*SD* = 1.41 years) for those students who graduated. Further, during high school, graduates were suspended for 1.51 days (*SD* = 5.51 days), whereas dropouts were suspended for 6.20 days (*SD* = 11.11). Such age differences support previous research and demonstrate that children who are identified as problematic earlier in adolescence are more at risk for academic failure (Kazdin; Moffitt, 1993).

Although dropouts tend to experience heightened levels of disciplinary problems in school settings, such behaviors appear to originate outside the classroom. Patterson, DeBaryshe, and Ramsey (1989) documented the antisocial progression of problem behavior. More specifically, problem behavior typically originates with poor parental disciplining during the first 5 years of life. On entering kindergarten, children reared by ineffective parents begin to exhibit conduct-disorder behavioral problems. As a result, children who exhibit these problems are rejected by their peers and consequently develop a detachment from school, because they find school academically and socially unrewarding. During early adolescence, rejected children begin to congregate with each other for support, forming delinquent peer groups. Last, as this developmental progression unfolds, adolescents develop the propensity to drop out of high school (Patterson et al., 1989).

Gluek's (cited in Sampson & Laub, 1993) 50-year longitudinal study of delinquent and nondelinquent adolescents showed this pattern. More specifically, adolescent boys who demonstrated delinquent and conduct-disorder behavioral problems were 17 times more likely to drop out of high school compared with boys who did not engage in such problems. Moreover, this outcome was mediated by family process variables such as familial environment and interactions, parental monitoring, and parental acceptance or rejection.

Family Factors

Without doubt, family influences a child's academic, social, and emotional development (Alexander et al., 2001; Andrews & Hickman, 1998; Henderson & Mapp, 2002; Hickman & Crossland, 2005; Pena, 2000). A recent study conducted by the Educational Policy Studies Laboratory (EPSL; 2004) surveyed a statewide sample of parents and asked, "What do you think is the single biggest reason high school students drop out of school before finishing their education?" (p. 25). Of respondents, 30% indicated that "home background" and "lack of parental involvement" were primary reasons why students drop out of high school, making "family environment" the modal response (p. 34). Moreover, 82% of parent-respondents indicated psychosocial factors as reasons for dropping out of high school (EPSL).

Researchers have linked a myriad of familial factors to high school dropouts. For example, students who have older siblings who drop out of high school tend to drop out of high school at higher rates than do students who do not have such siblings (Janosz, LeBlanc, Boulerice, & Trembley, 1997). Students who come from families with lower socioeconomic status (SES) tend to experience higher dropout rates and lower graduation rates than do students who come from families with higher SES (Heckman & Krueger, 2003; Orfield, 2004). For example, the Western Interstate Commission for Higher Education (WICHE; 2003) found that the national high school graduation rate was 79.19% for students from families whose income exceeded $100,000 per year, 77.06% for those of $50,000–100,000 per year, 74.75% for those of $20,000–49,999 per year, and 72.49% for those of less than $20,000 per year.

Researchers have also found that family mobility plays a role in the academic development of children (Astone & McClanahan, 1994; Rumberger & Larson, 1998; Sampson & Laub, 1993; Swanson & Schneider, 1999). Families who experience multiple transitional moves have children with greater difficulties in adjusting academically, socially, and emotionally to new school environments (Astone & McClanahan; Rumberger & Larson; Swanson & Schneider). Further, students who experience multiple transitional moves during their academic tenure appear less attached and engaged in school than do their counterparts who do not experience such moves (Astone & McClanahan; Rumberger & Larson; Sampson & Laub; Swanson & Schneider). Despite a plethora of research confirming that a child's family is essential to academic success, educators and researchers struggle to connect family and school when addressing children's educational needs (Smink & Schargel, 2004).

Given the aforementioned research, we consider warranted a study that enables researchers to longitudinally compare the developmental pathways of dropouts and graduates at each grade level during their academic careers across specific academic courses, grades, standardized tests, familial factors, language, behavior, and county juvenile court data. In the present study, we sought to advance the literature by comparing dropouts' and graduates' entire academic, familial, and behavioral histories.

Research Questions

We postulated two research questions for this exploratory study: (a) Do differences exist in the developmental pathways of high school graduates compared with high school dropouts? (b) If differences do exist in the

developmental pathways of high school graduates compared with high school dropouts, when and across which variables do these differences occur?

Method

Participants

Participants in this study were students enrolled in the 2002–2005 cohorts. A *cohort* is a group of students who start kindergarten in a given year and are tracked over time to graduating or dropping out of high school. In this study, we examined graduates and dropouts from the 2002–2005 cohorts. Students from these cohorts started kindergarten between 1990 and 1993.

We obtained official school data via a purposive random sample of 119 students enrolled across four cohorts (2002–2005) from a school district located in northeastern Arizona. More specifically, we randomly sampled 60 graduating students from the 2002–2005 cohorts and 60 dropout students from the 2002–2005 cohorts. We dismissed 1 dropout student from the study, because there was no data in the academic file for that individual. Female participants constituted 49.2% of the sample, and male participants constituted 50.8% of the sample. The ethnic distribution of the participants included White American (77.8%), Latino (15.7%), and Native American (6.5%) students, in distributions similar to those of both school and district demographics.[1] Although 60 students graduated from high school, 59 students who dropped out of school did so between their sophomore and junior years (M = Grade 10.58, SD = Grade 0.970). Mean family household income for families living within school boundaries was $29,500, which was representative of the district median family household income.

Procedure

After the sampling procedure, we examined the contents of the students' academic historical files. Each file contained report cards, progress reports, letters to parents, attendance records, disciplinary infractions, family background variables (e.g., family size, siblings, parental occupation), standardized test scores, high school transcripts, credit hours earned, and the date when the students dropped out or graduated from school. In addition, we obtained official county juvenile court records for students in the sample.

For consistency, we examined core subjects from kindergarten through 12th grade or the time of drop-out. For kindergarten through 6th grade, we examined writing, English, mathematics, reading, spelling, social studies, and science grades. For 9th grade through 12th grade, core courses included English and mathematics because these tend to be the primary indicators of academic success. In addition, these subjects represented two of the three components of the state high school exit exam. We performed secondary analysis of core classes such as sciences and social studies courses during the 9th-grade year to gain an understanding of each student's academic background as he or she entered high school.

Course performance evaluations varied across grades. For example, all grades in kindergarten were recorded as satisfactory, needs improvement, and unsatisfactory. We assigned numeric values for these nomenclatures (i.e., *satisfactory* = 0, *needs improvement* = 1, *unsatisfactory* = 2). Many students' course performance grades in Grades 1–2 had been recorded in a similar fashion. However, some students' course performance grades in Grades 1–2 had been recorded in Arabic scale (i.e., A, A−, B+, B, B−, C+, C, C−, D, D+, D−, and F). We recoded these grades into a grade point value (i.e., A = 4.0, A− = 3.7, B+ = 3.3, B = 3.0, B− = 2.7, C+ = 2.3, C = 2.0, C− = 1.7, D+ = 1.3, D = 1.0, D− = 0.7, and F = 0.0) and converted them to a grade point average (GPA). Thus, we recorded all students' course performance grades for 3rd–12th grades in Arabic scale and converted to GPA.

Measures

We took course performance grades from official report cards and transcripts. We measured variables and obtained them via official school and county juvenile court records. Variables included (a) specific course grades, (b) GPA, (c) core classes, (d) proficiency test scores, (e) grade retention, (f) absenteeism, (g) family and demographic variables, and (h) county juvenile court records.

Specific course grades and GPA. We calculated grades from qualitative and Arabic forms as discussed in the Procedure section.

Ninth-grade total core courses. We determined core classes on the basis of primary academic indicators as discussed in the Procedure section.

Stanford Achievement Test. Stanford Achievement Proficiency Tests (Walsh & Betz, 2001) given to students in Grades 1–9 are designed to measure students' achievement in word-study skills, reading comprehension, vocabulary, listening comprehension, spelling, language, concepts of numbers, mathematical applications and computations, and social sciences. Normal curve equivalent (NCE) scores range from 1–99, with a mean of 50. NCE scores have shown reliability and validity; they are required scores for federal and state projects evaluating data for educational projects and programs (Walsh & Betz). We selected total NCE reading, math, and language scores for analyses because these indexes tend to be predictors of academic success. Because students transfer in and out of various schools, many standardized tests scores are not transferred to a student's file when they depart from one school to another. Consequently, not enough data from Stanford scores in Grades 1–4 were available. Hence, only Stanford scores for Grades 5–9 yielded sufficient data for comparative analyses.

Grade retention. We measured grade retention by examining official school records of students' lack of advancement to the next grade level and coded it as *retained* (0) or *not retained* (1). Schools recorded yearly what grade level the student had completed and what grade the student was enrolled in over the student's academic tenure. Examining such records, we were able to deduce for Grades K–8 at what grade, if any, and how many times a student was retained.

Absenteeism. We measured absenteeism by examining official school records of the days when a student missed school at each grade level from kindergarten through eighth grade. We estimated absenteeism as one-quarter day, one-half day, three-fourths day, and 1 full day missed from school. Days absent were recorded regardless of whether they were excused or unexcused.

Family and demographics. We examined several family and personal demographic variables from official student records. Because numerous family situations existed, students were dichotomized as coming from *biologically intact* (0) and *other* (1) family structures. Student birth certificates were used to determine birth location, and students were dichotomized as *Arizona born* (0) and *non-Arizona born* (1). Family sibling information included the number of participants' siblings and older siblings. Ethnicity was dichotomized as *Caucasian* (0) and *non-Caucasian* (1). Gender was coded as *male* (0) and *female* (1). Free or reduced lunch and Title 1 services participants were coded as *yes* (0) or *no* (1), respectively. All familial variables were derived from official school records.

County juvenile court records. We provided a list of study participants to the county juvenile court. The county juvenile court provided records for adjudicated youth in the study, regardless of whether they graduated or dropped out. The county juvenile court annotated age, date adjudicated, and type of sentence (i.e., diversion program, standard or intense probation). The data was coded as *not adjudicated* (0) and *yes, adjudicated* (1).

Results

The sample size varied at each grade level and across all variables, because of missing data. Therefore, we used descriptive statistics to examine mean differences when sample size ($n \leq 30$) limited generalization and inferential statistics to examine mean differences when sample size ($n > 30$) enabled generalization. Independent t tests were used to examine mean differences between the two levels of the independent variable (i.e., high school dropouts and graduates) and the dependent variables (i.e., specific course grades, GPA, proficiency test scores, grade retention, family and demographic variables, absenteeism, core classes that participants took in freshman year, and county juvenile court records) across all grades (K–12) or the point of drop-out. We used and indicated effect sizes with the following formula: $r^2_{pb} = (t)^2/(t)^2 + df$ = effect size (Heiman, 2002). Last, we used Satterthwaite's (Freed, Ryan, & Hess, 1991) correction formula for nonhomogenous populations when necessary and indicate its use in the following sections with an asterisk.

Grades K–12 Academic Course Evaluations

We report course performance in Grades K–2 in qualitative and GPA forms, as discussed in the Procedure section, whereas we report all course performance in Grades 3–12 in GPA form.

Grades K–2 academic course performance. Qualitative performance differences between dropouts and graduates appeared to exist as early as kindergarten. For example, kindergarten reading performance grades for high school dropouts ($M = 0.60$, $SD = 0.83$) were significantly lower than those of kindergarten reading for high school graduates ($M = 0.06$, $SD = 0.23$), $t(49) = 3.37$, $p < .001$, $r^2_{pb} = 0.19$.* Kindergarten writing performance for high school dropouts ($M = 0.29$, $SD = 0.61$) was significantly lower than kindergarten writing performance for high school graduates ($M = 0.00$, $SD = 0.00$), $t(44) = 3.00$, $p < .01$, $r^2_{pb} = .23$.* Last, kindergarten mathematics performance for high school dropouts ($M = 0.43$, $SD = 0.76$) was significantly lower than kindergarten mathematics performance for high school graduates ($M = 0.06$, $SD = 0.84$), $t(46) = 2.588$, $p < .05$, $r^2_{pb} = .13$. Although we could not draw inferential differences, it was apparent that as early as kindergarten, differences in spelling and English course performance existed between dropouts and graduates (see Table 1).

TABLE 1. Qualitative Course Performance for Grades K–2

		Reading		Writing		Mathematics		Spelling		English	
Group	Grade	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Dropouts	K	0.60	0.83	0.29	0.61	0.43	0.76	0.17	0.41	0.33	0.82
	1	0.25	0.62	0.07	0.26	0.00	0.00	0.22	0.67	0.20	0.63
	2	0.20	0.56	0.00	0.00	0.08	0.28	0.00	0.00	0.64	2.40
Graduates	K	0.06	0.23	0.00	0.00	0.06	0.84	0.00	0.00	0.00	0.00
	1	0.13	0.42	0.03	0.19	0.04	0.19	0.04	0.20	0.09	0.29
	2	0.03	0.16	0.00	0.00	0.00	0.00	0.06	0.25	0.03	0.17

Note. Satisfactory = 0; needs improvement = 1; unsatisfactory = 2.

Grades 1–8 academic course performance. GPA performance differences between dropouts and graduates appeared to exist as early as first grade in reading, spelling, English, writing, and mathematics courses. Descriptive statistics indicate that this trend continued through eighth grade across all course subjects. Inferential statistics supported this trend at various grades when sample size allowed generalization with confidence. For example, third-grade reading performance for high school dropouts ($M = 2.57$, $SD = 0.77$) was significantly lower than third-grade reading performance for high school graduates ($M = 3.23$, $SD = 0.69$), $t(56) = -3.25$, $p < .01$, $r^2_{pb} = .16$ (see Figure 1). Fourth-grade mathematics performance for high school dropouts ($M = 2.75$, $SD = 0.86$) was significantly lower than fourth-grade mathematics performance for high school graduates ($M = 3.27$, $SD = 0.85$), $t(65) = -2.32$, $p < .05$, $r^2_{pb} = .08$ (see Figure 2). Fourth-grade social studies performance for high school dropouts ($M = 2.80$, $SD = 0.49$) was significantly lower than fourth-grade social studies performance for high school graduates ($M = 3.31$, $SD = 1.00$), $t(64) = -2.62$, $p < .01$, $r^2_{pb} = .10$. Fourth-grade science performance was significantly lower for high school dropouts ($M = 2.60$, $SD = 0.50$) than fourth-grade science performance for high school graduates ($M = 3.31$, $SD = 0.76$), $t(58) = -3.76$, $p < .001$, $r^2_{pb} = .20$. Sixth-grade English performance was significantly lower for dropouts ($M = 2.40$, $SD = 0.99$) than sixth-grade English performance for high school graduates ($M = 3.17$, $SD = 0.81$), $t(74) = -3.66$, $p < .001$, $r^2_{pb} = .15$ (see Figure 3).

Grades 9–12 academic course performance. Overall GPA performance differences between high school dropouts and graduates were evident as early as the first semester of the ninth-grade year. For example, ninth-grade first-semester overall GPA for high school dropouts ($M = 1.27$, $SD = 0.99$) was significantly lower than ninth-grade first-semester overall GPA for high school graduates ($M = 2.75$, $SD = 0.83$), $t(98) = -8.079$, $p < .001$, $r^2_{pb} = .40$. These differences between dropouts and graduates remained significant for every semester and grade level throughout the tenure of high school students (see Figure 4).

Grade 9 Total Core Courses

Significant differences existed in total core courses taken during the ninth-grade year between high school dropouts

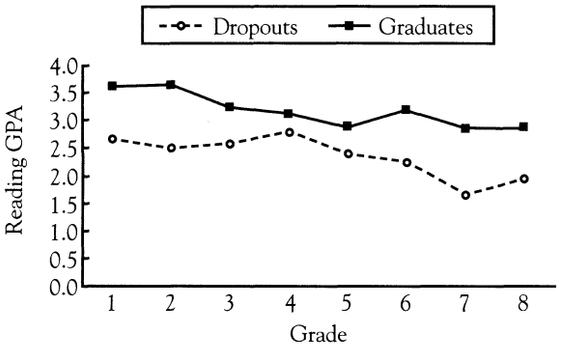

FIGURE 1. Reading performance for Grades 1–8. GPA = grade point average.

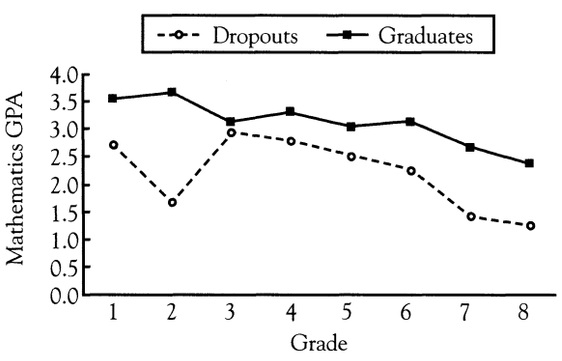

FIGURE 2. Mathematics performance for Grades 1–8. GPA = grade point average.

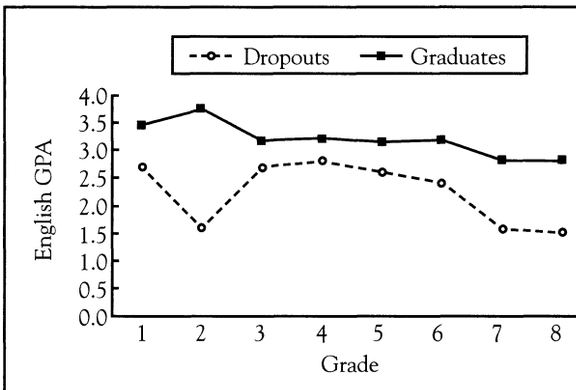

FIGURE 3. English performance for Grades 1–8. GPA = grade point average.

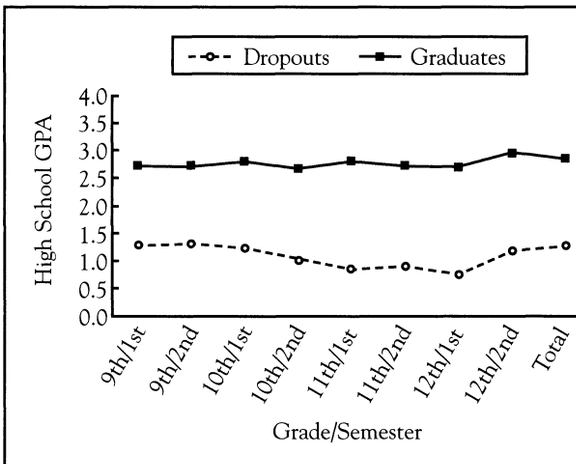

FIGURE 4. High school performance by grade and semester. GPA = grade point average.

and graduates. For example, high school dropouts took significantly more core courses (M = 6.02, SD = 1.90) during their ninth-grade year in comparison with high school graduates, who took significantly fewer core courses during their ninth-grade year, (M = 4.36, SD = 1.74), $t(100) = -4.58$, $p < .001$, $r^2_{pb} = .12$.

Stanford Achievement Tests

We observed differences in Stanford Achievement Test scores in fifth-grade total NCE reading and total NCE mathematics scores between high school graduates and dropouts. These differences were inferentially supported in sixth grade because total NCE reading scores were significantly lower for high school dropouts (M = 43.27, SD = 17.75) than for high school graduates (M = 54.37, SD = 14.64), $t(41) = -2.17$, $p < .05$, $r^2_{pb} = .10$ (see Figure 5). In addition, sixth-grade total NCE mathematics scores for high school dropouts (M = 38.22, SD = 10.88) were significantly lower than for high school graduates (M = 53.45, SD = 18.15), $t(42) = -2.89$, $p < .01$, $r^2_{pb} = .17$. Significant differences in total NCE reading and total NCE mathematics scores between dropouts and graduates existed through ninth grade (see Figure 6).

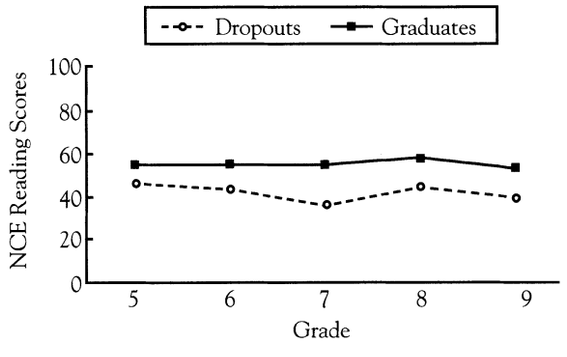

FIGURE 5. Normal Curve Equivalent (NCE) total reading scores for Grades 5–9.

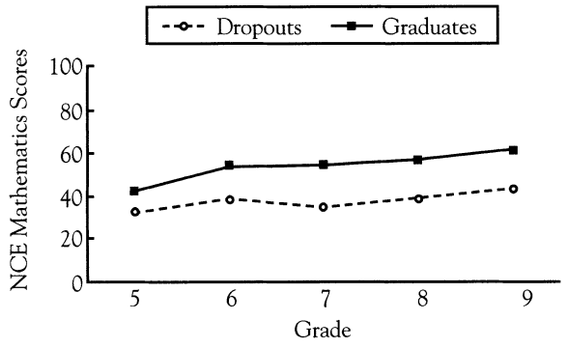

FIGURE 6. Normal Curve Equivalent (NCE) total mathematics scores for Grades 5–9.

Grade Retention

Significant differences existed in grade retention between high school dropouts and graduates. More specifically, high school dropouts were significantly more likely to have been retained (M = .62, SD = .49) in comparison with high school graduates (M = .94, SD = .24), $t(77) = -5.69$, $p < .001$, $r^2_{pb} = .30$.*

Absenteeism

We observed differences in absenteeism as early as kindergarten between high school graduates and dropouts. However, first-grade absenteeism for high school dropouts (M = 12.06, SD = 6.48) was significantly higher than first-grade absenteeism for high school graduates (M = 8.96, SD = 5.10), $t(60) = 1.97$, $p < .05$, $r^2_{pb} = .06$. This trend continued through elementary school and became even more divergent during middle school. For example, eighth-grade absenteeism for high school dropouts (M = 19.49, SD = 11.13) was significantly higher than eighth-grade absenteeism for high school graduates (M = 9.54, SD = 6.01), $t(72) = 3.63$, $p < .001$, $r^2_{pb} = .15$ (see Figure 7).

Family and Demographics

Significant differences existed in ethnicity. More specifically, dropouts were significantly more likely to be non-White (M = 0.88, SD = 1.39) in comparison with graduates (M = 0.29, SD = 0.80), $t(106) = 1.82$, $p < .01$, $r^2_{pb} = .03$.* There were no significant differences in family structure, place of birth, gender, siblings, free and reduced lunch, and Title 1 variables between high school dropouts and graduates (see Figure 8).

County Juvenile Court Records

No significant differences existed between high school dropouts' and graduates' being placed in juvenile diversion programs. However, significant differences did exist in the

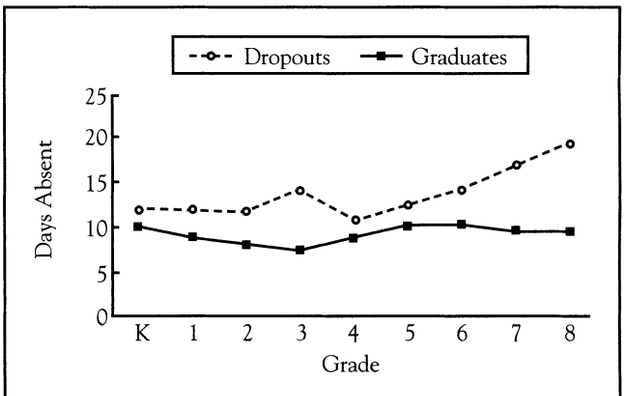

FIGURE 7. Days of absenteeism for Grades K–8.

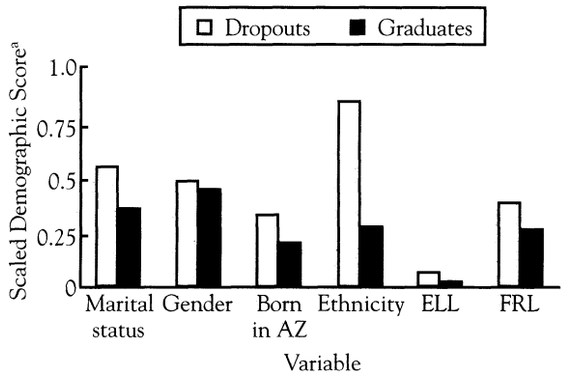

FIGURE 8. Family and demographic variables. [a]0 = married, female, born in AZ, Caucasian, not an English-language learner (ELL), no free and reduced lunch; 1 = divorced, male, not born in AZ, not Caucasian, ELL, free and reduced lunch (FRL).

levels of juvenile probation placement. For example, dropouts were significantly more likely to be placed on standard juvenile probation ($M = .24$, $SD = .43$) in comparison with graduates ($M = .05$, $SD = .22$), $t(115) = 3.21$, $p < .01$, $r^2_{pb} = .08$.* Moreover, dropouts were significantly more likely to be placed on intense juvenile probation ($M = .12$, $SD = .33$) in comparison with graduates ($M = .00$, $SD = .00$), $t(115) = 2.41$, $p < .01$, $r^2_{pb} = .05$ (see Figure 9).

Discussion

The purpose of this research was to examine the developmental pathways between high school graduates and dropouts. More specifically, we postulated two research questions. First, do differences exist in the developmental pathways of high school graduates compared with high school dropouts? The findings of the study saliently demonstrated differences between graduates and dropouts. More specifically, dropouts significantly performed lower on all course performance grades and standardized tests

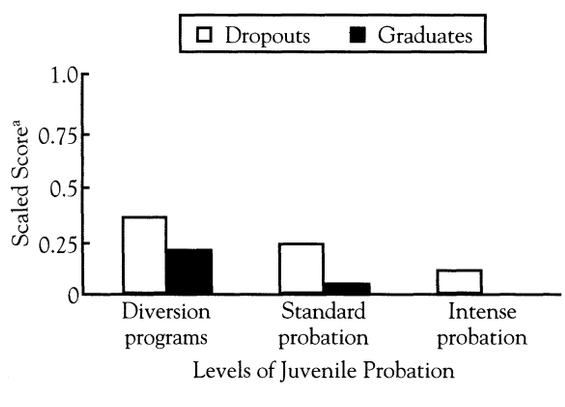

FIGURE 9. County juvenile court records. [a]0 = no; 1 = yes.

and demonstrated significantly heightened levels of grade retention, absenteeism, and behavior problems than did graduates.

The second research question postulated was this: If differences do exist in the developmental pathways of high school graduates compared with high school dropouts, when and across which variables do these differences occur? It appeared that the origins of differences between high school graduates and dropouts occurred as early as kindergarten. Students who dropped out of school had exhibited lower academic performance in kindergarten than had their peers who graduated in course subjects such as reading, writing, spelling, mathematics, and English. Moreover, these differences in course performance grades achieved by graduates and dropouts persisted across their developmental pathways from kindergarten to graduation or dropping out of school. For example, in early childhood, graduates tended to achieve more satisfactory course performance grades in comparison with dropouts, regardless of subject. As children began to earn grades in the Arabic system for Grades 3–8, this pattern persisted as graduates achieved higher course performance grades compared with course performance grades achieved by dropouts, regardless of subject. As their developmental progression unfolded and more classes such as science and social studies were introduced to their existing repertoire of courses, the gap between course performance grades of dropouts and graduates widened during middle school, regardless of subject.

Similar patterns persisted as students matriculated from middle school to high school. Further, this widening gap between graduates and dropouts, which became apparent in middle school, widened more in high school. Not only did graduates earn better performance grades in core subjects such as English and mathematics, but they also took significantly more advanced classes. All graduates took English 4 and achieved on average a 2.26 GPA (SD = 1.17) for this course. Conversely, dropouts on average did not take or complete English 2. Further, dropouts achieved on average a 0.76 GPA (SD = 1.07) for the highest English class completed. Apparent differences existed in mathematics courses. We coded courses *prealgebra* (0), *algebra* (1), *geometry* (2), *algebra 2* (3), and *trigonometry or higher* (4). The highest mathematics class that graduates took was on average math 2.22 (SD = math 1.55), in comparison with dropouts who took on average math 0.31 (SD = math 0.65). Further, graduates achieved on average a 2.04 GPA (SD = 1.20) for the highest mathematics class completed in comparison with dropouts, who achieved on average a 1.02 GPA (SD = 1.16) for the highest mathematics course completed. This trend persisted for standardized testing, as Stanford Achievement total NCE reading scores and total NCE mathematics scores were differentially evident as early as fifth grade and persisted across their developmental pathways through ninth grade.

Grade retention differences were evident between graduates and dropouts. First, dropouts were more likely to be

retained than graduates. Second, the majority of dropouts in this study were retained at least once during their academic tenure. Last, graduates were retained mostly between Grades K–1 (M = 0.5, SD = 0.7) in comparison to dropouts, who were retained mostly between Grades 5–6 (M = 5.86, SD = 3.16). This study showed that graduates and dropouts came to kindergarten with differential capabilities. Perhaps the decision to retain students early between Grades K–1 was educators' attempt to cultivate academic success and confidence, which enabled these students to overcome the developmental pathway of dropouts.

Descriptive and inferential statistics indicated clear deficits for dropouts in comparison with graduates in every course subject from Grades K–12. Perhaps a factor in the differences in course performance grades between graduates and dropouts was related to their attendance records. Differences in absenteeism between high school dropouts and graduates appeared as early as kindergarten and became significantly different as early as first grade. Even more alarming, dropouts missed on average 124 days (SD = 33.85 days) in Grades K–8. This absence amounted to missing three quarters of an academic year in seat time and instructional guidance alone. Perhaps this finding sheds light on the progression of diverging pathways over time between graduates and dropouts.

With respect to students' familial and demographic variables, there were no significant differences between graduates and dropouts for gender, siblings, family structure, birthplace, or SES factors, including free and reduced lunch benefits or Title 1 services. Practical differences for the aforementioned variables were apparent between dropouts and graduates. Significant differences between graduates and dropouts were found for students' ethnicity: Dropouts were significantly more likely to be non-White than were graduates. This finding supports a history of research placing minority students at risk for increased rates of dropping out of high school (Greene, 2002; National Center for Educational Statistics, 2007; Orfield, Losen, Wald, & Swanson, 2004).

County juvenile court data revealed differences between dropouts and graduates: Dropouts were significantly more likely to be placed on probation or intense probation in comparison with graduates. Further, students' academic files revealed that graduates were first identified as being behaviorally problematic on average in Grade 6.25 (SD = 3.27), whereas dropouts were first identified as being behaviorally problematic on average in Grade 4.66 (SD = 3.12). This finding supports much research that links early problem behavior to a life-persistence course of academic and problem behaviors (Kazdin, 1995; Moffit, 1993; Sampson & Laub, 1993).

Conclusion and Implications

The results of this study are limited to students from northeastern Arizona. However, the ethnic background of the sample was similar to that of state demographics, and family income was representative of the state median family income. Consequently, the findings of this study may allow generalization because of the similarity of the sample to state demographics.

Because of the large scope of this study, and because of the parallel connection to NCLB and educational policy implications, numerous findings and directions could emanate from this research. However, the entire study augmented five topics distinctly: (a) prekindergarten, (b) absenteeism, (c) middle school, (d) ninth-grade core courses, and (e) standardized achievement scores versus actual course performance.

Prekindergarten

A recent trend in educational policy is the provision of all-day kindergarten. Although this is an important step in leveling the SES playing field, little attention has been given to mandating pre-K. Undoubtedly, a germane finding of this study lies in the fundamental origin of differences between graduates and dropouts as they enter kindergarten. Although statistically graduates and dropouts are mostly homogenous groups at this point in their developmental pathways, the blank slate that they were once theorized to be is no longer evident from the genesis of their academic endeavors. Consequently, there appears to be a critical period for academic success prior to matriculation to kindergarten, as dropouts and graduates continue to follow the developmental pathway established in kindergarten across all grade levels. Moreover, the differences established in kindergarten between dropouts and graduates increased across their developmental progression.

Absenteeism

As early as kindergarten, differences existed between graduates and dropouts. That is, dropouts missed more school than did graduates, although not significantly more until first grade. Educational policy experts have mandated compulsory attendance laws with ages varying at the state level. Although legislatures' mandating state laws requiring students in their teens to attend high school may help to lower the dropout rate, this study showed clearly that differences in absenteeism exist as early as kindergarten. With dropouts missing on average 124 days in Grades K–8, it seems that educational policy experts must focus their efforts on creating strategies or mandates for improving student attendance in Grades K–8 as well. As with course performance grades, the gap between absenteeism of dropouts and that of graduates widened across their developmental progressions.

Middle School

As students entered middle school, the divergent gap between graduates and dropouts became statistically more

pronounced across all course performance grades and absenteeism. Consequently, at this point in their developmental pathways, graduates and dropouts were no longer homogenous groups. In other words, as students progressed from kindergarten to middle school, they evolved into two disparate groups. These findings raised questions regarding the actual impact of bridge programs tailored for eighth- through ninth-grade audiences. The underpinnings of bridge programs are aimed at easing the transition from middle school to high school to improve success for academically at-risk students. Although such programs may benefit borderline at-risk youth, the results of this study show that bridge programs may be more beneficial and effective for at-risk children transitioning between prekindergarten and kindergarten.

Grade 9 Core Courses

The culmination of course performance grades and absenteeism over the academic career of dropouts and graduates seemed to solidify with entry into the ninth grade. For example, the first-semester GPA of ninth-grade students who dropped out was significantly lower than the first-semester GPA of ninth-grade students who graduated. This pattern persisted over the developmental progression through graduation or dropping out. One possible secondary catalyst for the significantly lower high school GPA of dropouts may have resided in the differential core course selection of dropouts and graduates in the ninth-grade year. More specifically, dropouts took significantly more core courses than did graduates during their ninth-grade year. Such course selection may have been a mandatory consequence of their preexisting academic shortcomings. To comply with NCLB and prepare for state-mandated exit exams, educators must enroll academically unprepared students in more rigorous and academically demanding core classes such as mathematics and English. What would appear to be catching up or remediating the students who are behind their successful peers may create more pressure for the former students by requiring them to attend more core classes as opposed to allowing them to select noncore classes (e.g., art, music). This practice may actually work against educators by facilitating further academic failure and eventual withdrawal, as students must enroll in core classes that they are not academically prepared to encounter.

Standardized Versus Actual Course Performance Grades

In a secondary analysis of this study's data, we examined the differences between a student's ability on Stanford Achievement tests at fifth grade and the student's actual mathematics course performance at fifth grade. To draw valid comparisons, we used standardized z values. Dropouts achieved $z = -.28$ for total NCE Stanford fifth-grade mathematics and $z = -.35$ for actual fifth-grade mathematics course performance. Conversely, graduates achieved $z = .24$ for total NCE Stanford fifth-grade mathematics and $z = .19$ for actual fifth-grade mathematics course performance. Dropouts achieved $z = -.57$ for total NCE Stanford eighth-grade mathematics and $z = -.73$ for actual eighth-grade mathematics course performance. Conversely, graduates achieved $z = .29$ for total NCE Stanford eighth-grade mathematics and $z = .30$ for actual eighth-grade mathematics course performance.

This finding showed that in fifth-grade mathematics, dropouts performed slightly lower in the classroom in comparison with their standardized testing ability, whereas graduates performed in a similar fashion in the classroom in comparison with their standardized testing ability. As their developmental progression unfolded, graduates achieved with equal rigor on standardized testing and in the classroom, whereas dropouts achieved less in the classroom in comparison with their standardized testing ability. Not only did dropouts decrease in their classroom and standardized performances over time, but also the gap in the classroom performance went farther behind their standardized testing ability.

Dropouts appear to have exhibited differential capabilities in comparison with graduates as early as kindergarten. Such academic deficits from the beginnings of school, academic retention in middle childhood, and absenteeism at critical stages throughout their developmental progression together create a developmental pathway for dropouts from the beginning of their academic career that is distinct from that of students who graduate. Further, the gap between the developmental pathways of graduates and dropouts widens across their developmental progression from early childhood to adolescence. Given the results of this study, researchers should examine students—at various points along their developmental progression—who graduated high school but who were once on the developmental pathway of becoming a high school dropout. What factors or buffers did these students have? What experiences in their lives altered their developmental pathway and prevented them from dropping out of high school?

In closing, it appears that the majority of students do not deviate from the developmental pathway set forth from kindergarten. As students' developmental progression unfolds, not only do they continue down the pathway that they established early, but also they become more entrenched in their initial developmental progression, regardless of pathway. Consequently, children's academic developmental pathways tend to continue and end as they started in kindergarten.

NOTE

1. To maintain confidentiality of participants, we do not reveal data sources for student and district demographics.

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