Revisiting the Myth of the Texas Miracle in Education: Lessons about Dropout Research and Dropout Prevention

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(Comments and suggestions welcomed)

Contents

I Introduction

This paper extends an examination of grade enrollment and high school graduation patterns in Texas presented in "The Myth of the Texas Miracle in Education" (Haney, 2000, available at http://epaa.asu.edu/epaa/v8n41/).[1] Using enrollment data from 1975-76 through 1999-2000, I examine the pattern apparent between flunking grade 9 and failure to persist in school to high school graduation. Before focusing on this particular topic, I provide a summary of the "Myth" article, supplemented by new evidence available since publication of that article in August 2000. Additionally, I show the manner in which enrollment data can be used to calculate high school graduation rates in the nation's 100 largest school districts. In the conclusion, I offer suggestions for future research concerning dropouts, dropout prevention, and ways of judging the success of pre-collegiate education. Finally, in closing, I offer brief historical and methodological notes.

In 1979, the Texas legislature passed the Equal Educational Opportunity Act, which established Texas's first state testing program (Office of Technology Assessment, 1987, p. 271). This was the Texas Assessment of Basic Skills (TABS), a survey-type assessment used, without sanctions for test takers, from 1980 to 1985. Following recommendations of a Select Committee on Education (chaired by H. Ross Perot), in 1984 the Texas legislature passed a comprehensive education reform law mandating the most sweeping changes in education in Texas in 30 years (Funkhouser, 1990, p. 3). Among other things, the law established a statewide curriculum (called the Essential

[1] Sincere thanks to Linda McNeil, Steve Kirsch, Holly Eaton, Andrea Rosen, and Mindy Kornhaber for comments on earlier versions of this paper. A writer is especially grateful to people who proffer

Elements), required students to achieve a score of 70 to pass their high school courses, mandated the "no pass, no play" rule (whereby students could not participate in varsity sports if they did not pass high school courses), required teachers to pass a proficiency test; and mandated changes in the statewide testing program (Funkhouser, 1990). Specifically, the 1984 law mandated basic skills testing of students in each odd numbered grade (Funkhouser, 1990, p. 199). The new testing program, called the Texas Educational Assessment of Minimum Skills or TEAMS, was implemented in 1985 and tested students in grades 1, 3, 5, 7, 9 and 11. Under the 1984 law, high school students were required to pass the "exit level" version of TEAMS in order to receive a high school diploma, based on a passing score set by the State Board of Education (Office of Technology Assessment, 1987, pp. 272-75).

In fall 1990, changes in state law required the implementation of a new more challenging testing program. Thus, the Texas Assessment of Academic Skills (TAAS) was phased in to replace the TEAM between 1990-91 and 1992-93. Since then TAAS testing has been the linchpin of educational accountability in Texas, not just for students, but also for educators and schools. Students have to pass the grade 10 or “exit level” version of TAAS in order to graduate high school, and schools are rated as "exemplary," "recognized," "acceptable" or "unacceptable," based on a set of "academic excellence indicators," including TAAS results, dropout rates and student attendance rates (TEA, 1997, p. 159)

By the late 1990s a variety of evidence led a number of observers to conclude that the state of Texas had made near miraculous educational progress on a number of fronts because of this test-based accountability system. Between 1994 and 1998, the percentage

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constructive comments without even being asked to do so.

of students passing all three grade 10 TAAS tests (in reading writing and math) had grown from 52% to more than 70%. Also, the racial gap in TAAS results seemed to have narrowed. Statistics from the Texas Education Agency (TEA) showed that over the same interval dropout rates had declined steadily. Finally, in 1997, release of results from the National Assessment of Educational Progress (NAEP) showed Texas 4th graders to have made more progress on NAEP math tests between 1992 and 1996 than those in any other state participating in state NAEP testing. These developments led to a flurry of praise for the apparent educational progress of the Lone Star State. Among the plaudits for Texas cited in the Myth article were those by Haycock, Palmaffy, Grissmer & Flanagan, the National Education Goals Panel and editorial writers for a number of newspapers, including the *Boston Globe* and *USA Today* (see Haney, 2000, section 3.5 for citations and more detail.)

While I have not attempted to keep track of all commentary on education in Texas, one source perpetuating the myth of the Texas miracle that recently came to my attention is worth mentioning. Skrla, Scheurich & Johnson (2000) have written a report based on research in four fairly large Texas school districts. Based on analysis of district-generated documents, on-site observations and over 200 individual and group interviews, these researchers concluded that these districts have made dramatic changes in "teaching and learning practices in the classroom." Because of "changes in equity beliefs" and "the pursuit of educational equity and excellence," say these authors, these school systems have produced "equitable educational success for literally all the children in their districts" (Skrla, Scheurich & Johnson, 2000, pp. 6, 7, 39.)

II Summary and Update of "The Myth of the Texas Miracle in Education"

Despite such ongoing boosterism, a wide range of evidence indicates that the Texas "miracle" is at best a myth and illusion, if not an outright fraud. As recounted in the Myth article (Haney, 2000), one reason for this conclusion is the TAAS itself. As previously explained: 1) by any of the prevailing standards for ascertaining adverse impact, grade 10 TAAS results continue to show discriminatory adverse impact on Black and Hispanic students in Texas; 2) use of TAAS results in isolation to control award of high school diplomas is a clear violation of professional standards concerning appropriate test use; 3) the passing scores set on TAAS tests were arbitrary, discriminatory, and failed to take measurement error into account; and 4) analyses comparing TAAS reading, writing and math scores with one another and with relevant high school grades raise doubts about the reliability and validity of TAAS scores.

In the Myth article (part 4.3), I suggested that TAAS developers erred in estimating the standard error of measurement on the TAAS because they based their estimates on internal consistency reliability estimates rather than alternate form reliability. While I had located test-retest correlations on the grade 10 TAAS (in the range of 0.30 to 0.50), these were all for restricted ranges of test takers (who retook the test because they failed to pass), and I had found no good way to estimate the extent to which these remarkably low correlations were attenuated due to restriction of range. Nonetheless, based on published literature I suggested that it is common for tests showing internal consistency reliability of 0.90 to have alternate forms reliability in the range of 0.80 to 0.85. Based on this pattern, I suggested that the standard errors of measurement

for TAAS tests were likely on the order of 20 to 40% greater than reported in the TAAS 1996-97 *Technical Manual* (see Haney, 2000, section 4.3).

Now it appears that the TAAS tests are even less reliable than these estimates suggest. In a study of TAAS scores for students in grades 3 through 8 in six Texas districts, Dworkin, at al. (1999, Table 2) report that the correlation between TAAS grade 6 scores in 1997 and grade 7 scores in 1998 were 0.802 for reading and 0.745 for math (corresponding correlations for lower grade levels were even lower). By way of contrast, the alternate form reliability for the Metropolitan Achievement Test (7^{th} edition) reading and math sub-tests has been reported to be 0.89 and 0.90 at grade 7 (and 0.90 and 0.91 at grade 10; Psychological Corporation, 1994, pp. 83-870). Similarly, scores on the Scholastic Aptitude Test (SAT), taken in grades 11 and 12 have been reported to correlate in the range of 0.88 to 0.90 (Angoff, 1971, p. 29). In sum, the TAAS tests appear to even less reliable than estimated in the Myth article and considerably less reliable than better known tests used nationally.

In the Myth article I also showed that the passing scores on TAAS tests were set arbitrarily, and failed to take measurement error into account. Specifically, the passing scores on the three TAAS tests were arbitrarily set at 70% correct, without any evidence having been adduced that such passing scores reliably differentiated among students on any criterion external to TAAS. After the passing scores on TAAS were set in 1991, analysts sought to equate passing scores on new versions of TAAS tests using item response theory scaling (and scaled scores called the Texas Leaning Index or TLI.) So, for the 30 TAAS administrations between fall 1991 and summer 1999, the passing scores on the exit-level version of TAAS varied only slightly, equivalent to 33 or 34 items

correct out of 48 items total on the TAAS reading test and 40 to 42 of 60 items correct on the TAAS math test – equivalent to 69%, 71%, 67%, and 70% correct respectively.

Now, however, according to a memo from Texas Commissioner of Education Jim Nelson, dated October 25, 1999/2000, it is apparent that the passing scores on recent TAAS administrations have been lowered. In the five administrations between fall 1999 and fall 2000, the passing scores on the TAAS reading test varied from 27 to 31 correct, and on the TAAS math from 30 to 39 correct. On the fall 2000 exit level TAAS math test, the passing score was set at 30 out of 60 items correct or 50% – dramatically lower than the roughly 70% correct that was the passing score until 1999. Nelson sought to explain this lowering of the TAAS passing scores by saying that the 1998-99 school year was "the first year that TEKS items were incorporated into the test, along with the EE items" (Nelson, 1999/2000, p. 1). Nelson went on to explain, "I want to be very clear that this year's raw scores will be lower than last year's due to the rigor of the test. That is normal and does not affect the validity of the test. These scores will be equated for difficulty in the same manner used since 1994" (Nelson, 1999/2000, p. 1).

Without having access to technical details on recent changes in TAAS content, I am a bit unsure of what to conclude about these developments. In effect Nelson is saying that the TAAS passing scores in 1999 were lowered in terms of raw scores because more difficult content was included. But at a minimum, Nelson's memo makes two things clear. First is that someone in the Texas Education Agency does not understand the basics of test equating. Formally-speaking, a zero-order requirement for equating two tests is that they be content equivalent (Mislevy, 1992). Second is that the logic of Nelson's argument in 1999/2000 is directly contrary to what the TEA did when the

TEAMS was replaced by the more difficult TAAS in the early 1990s. The passing score on the TEAMS had been set at 70% correct and that was one of the dubious reasons cited for setting the passing score on TAAS at 70% correct. There was no effort to lower the passing score on TAAS to make it "equivalent" to the passing score on TEAMS. In light of this history, one cannot help but wonder what motivations other than those mentioned by Nelson prompted the lowering of TAAS passing scores in 1999 and 2000.

In Part 6 of the Myth article (Haney, 2000), I summarized the views of educators in Texas about TAAS, based on three statewide surveys of educators. These surveys were undertaken entirely independently (by Gordon and Reese; by myself and colleagues; and by Hoffman and colleagues), and surveyed somewhat different populations of educators. General findings from this review were as follows:

1. Texas schools are devoting a huge amount of time and energy preparing students specifically for TAAS.
2. Emphasis on TAAS is hurting more than helping teaching and learning in Texas schools.
3. Emphasis on TAAS is particularly harmful to at- risk students.
4. Emphasis on TAAS contributes to retention in grade and dropping out of school.

Survey results indicated that the emphasis on TAAS is contributing to dropouts from Texas schools not just of students, but also teachers. In one survey, reading specialists were asked whether they agreed with the following statement:

> It has also been suggested that the emphasis on TAAS is forcing some of the best teachers to leave teaching because of the restraints the tests place on decision making and the pressures placed on them and their students.

A total of 85% of respondents agreed with this statement.

In another survey, teachers volunteered comments such as the following: "Mandated state TAAS Testing is driving out the best teachers who refuse to resort to teaching to a low level test!"

In Part 7 of the Myth article, among other things, I examined SAT scores for Texas students as compared with national results. Evidence indicates that at least as measured by performance on the SAT, the academic learning of secondary school students in Texas has not improved since the early 1990s, at least as compared with SAT-takers nationally. Indeed results from 1993 to 1999 on the SAT-M indicate that the learning of Texas student has deteriorated relative to students nationally (and this result holds even after controlling for percentage of high school graduates taking the SAT).

Part 7 also revisited NAEP results for Texas. Results for eight state NAEP assessments conducted between 1990 and 1998 were reviewed. Because of the doubtful meaningfulness of the NAEP achievement levels, NAEP results for Texas and the nation were compared in terms of NAEP scaled scores. In order to compare NAEP results with those from TAAS, the "effect size" metric (from the meta-analysis literature) was employed. This review of NAEP results from the 1990s showed that grade 4 and grade 8 students in Texas performed much like students nationally. On some NAEP assessments Texas students scored above the national average and on some below. In the two subject areas in which state NAEP assessments were conducted more than once during the 1990s, there is evidence of modest progress by students in Texas, but it is much like the progress evident for students nationally. Reviewing NAEP results for Texas by ethnic group, we see a more mixed picture. In many comparisons, Black and Hispanic students show about the same gain in NAEP scores as White students, but the 1998 NAEP reading

results indicate that while grade 4 reading scores of White students in Texas improved since 1992, those of Black and Hispanic students did not improve between1992 and 1998. More generally, however, the magnitudes of the gains apparent on NAEP for Texas fail to confirm the dramatic gains apparent on TAAS. Gains on NAEP in Texas are consistently far less than half the size (in standard deviation units) of gains on state TAAS assessments. These results indicate that the dramatic gains on TAAS during the 1990s are more illusory than real. It is worth adding that this same conclusion was reached in a RAND report by Klein, Hamilton, McCaffrey & Stecher (2000) as a result of their examination of state NAEP results for Texas.

III Patterns of Grade Enrollment Progress and High School Completion in Texas

In pages above, I summarized many of the major portions of the August 2000 "Myth of the Texas Miracle in Education" article (Haney, 2000). One major portion not yet treated is analyses of grade enrollment data for Texas. The reason is that this line of inquiry is particularly relevant to the overall topic of this conference, namely dropout research. Before describing enrollment analyses, let me first explain why they were undertaken; namely, because dropout statistics reported by the TEA are untrustworthy.

3.1 Problems in TEA Dropout Statistics

As mentioned above, the TEA had reported that dropout rates were decreasing in Texas during the 1990s. However, in 1998 when I began studying what had been happening in Texas schools, I quickly became suspicious of the validity of the TEA-reported dropout data. At least one independent organization in Texas had previously challenged TEA's "dropout calculation methodology" (TRA, 1998, p. 2). Moreover, two

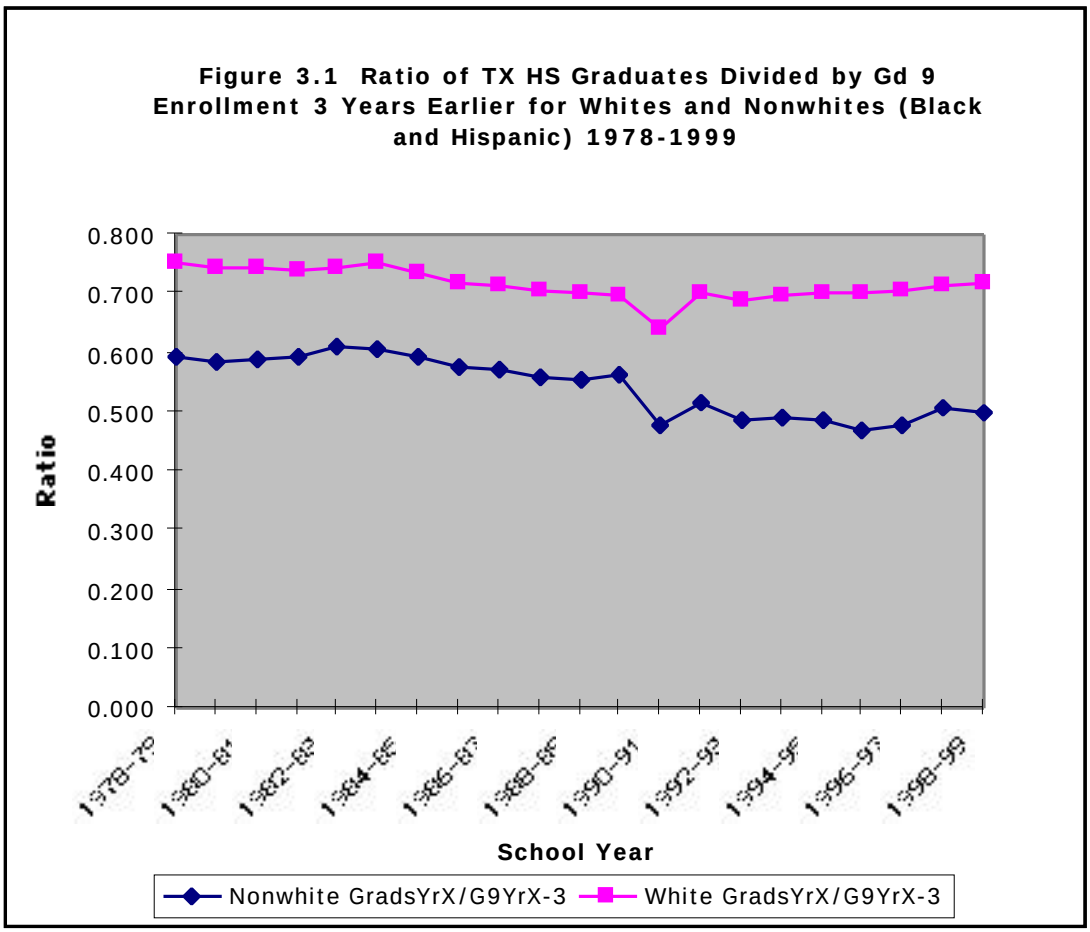
independent sources were reporting substantially higher rates of dropouts (or attrition) or, conversely, lower rates of high school completion than would be implied by TEA dropout data (Fassold, 1996; IDRA, 1996). Additionally, I subsequently learned that a November 1999 report from the Texas House Research Organization, *The Dropout Data Debate*, recounts that "In 1996, the State Auditor's Office estimated that the 1994 dropout numbers reported by the Texas Education Agency (TEA) likely covered only half of the actual number of dropouts" (p. 1). The report goes on to recount numerous problems in TEA's approach to calculating dropout rates including changing rules over time in how to define dropouts, relying on district reports of dropouts, while at the same time, beginning in 1992-93 to use dropout rate as a key factor in TEA's accountability ratings of districts, and apparent fraud in district reporting. The TEA developed a system for classifying school leavers in dozens of different ways and many types of "leavers" are not counted as dropouts. Indeed in 1994, the TEA started classifying students who "met all graduation requirements but failed to pass TAAS" as non-dropout "leavers."

3.2 Enrollment Progression Analyses

Hence, in order to examine independent evidence on patterns of high school completion in Texas and possible effects of TAAS on grade enrollment patterns and high school completion, I assembled data on the numbers of White, Hispanic and Black students enrolled in every grade (kindergarten to grade 12) in Texas over the last two decades.[2]

[2] In the Myth article, I explain how these data were assembled and checked for accuracy. Also, at the time of completion of this article, enrollment data were only available through the 1998-99 school year. Enrollment data are now available for the 1999-2000 school year, but not yet data on high school graduates. Note too that appendix 7 of the Myth article (Haney, 2000) provides the source data on grade

In a first set of analyses, I simply took the numbers of White, Black and Hispanic



Texas high school graduates by year and divided each of these numbers respectively by the number of White, Black and Hispanic students enrolled in grade nine three years earlier. The resulting ratios show the proportion of grade nine students for each ethnic group who progress on time to high school graduation three-and-a-half years later. Without describing all analyses undertaken along these lines, Figure 3.1 shows one illustrative result.

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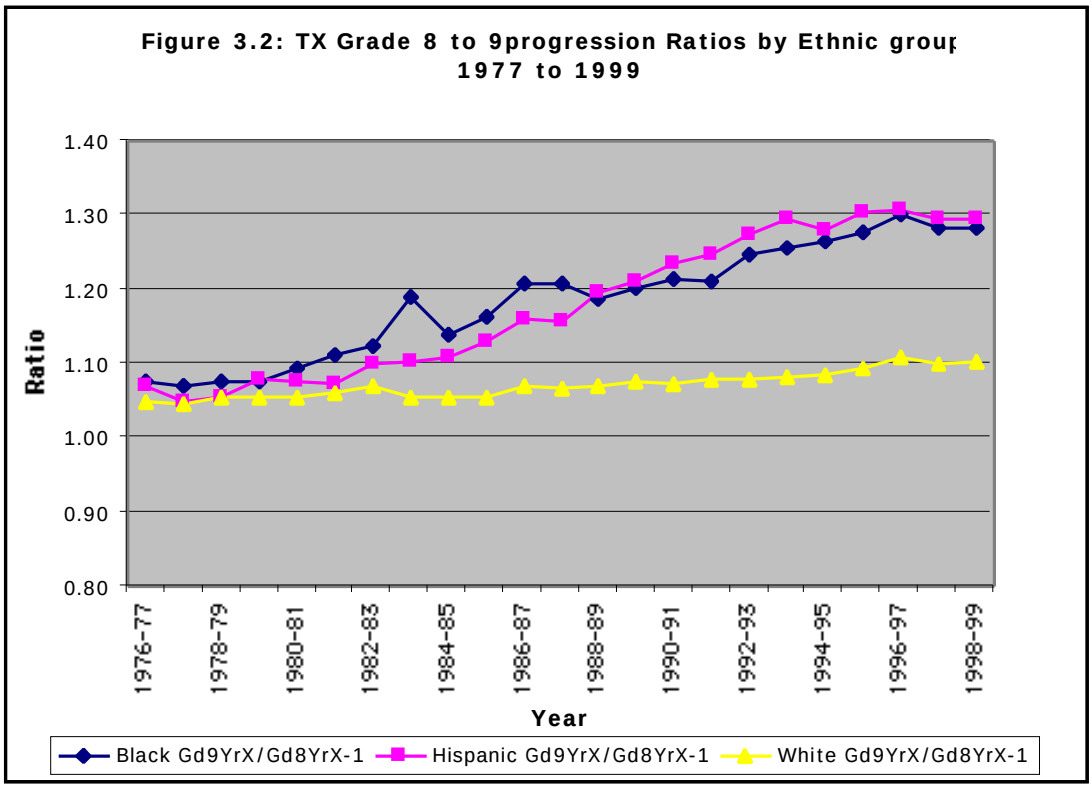
enrollments in Texas.

This figure shows the ratio of the number of Texas high school graduates divided by the number of grade nine students three years earlier for White and Nonwhite (that is Black and Hispanic) students. What this figure shows is that during the three-year period of 1990-93 in which the TAAS exit test requirement was phased in, the gap in this ratio for White and Nonwhite students widened substantially. Specifically, during the period 1978 through 1989, the average gap in the ratios graphed in Figure 3.1 was 0.146. However, the average gap in the ratios for Whites and Nonwhites since the TAAS exit test requirement was fully implemented in 1992-93 has been 0.215. This indicates that the TAAS exit test has been associated with a 50% increase in the gap in progression from grade 9 to high school graduation for Nonwhite students as compared with White students.

In order to understand these results better, I next calculated grade to grade progression ratios of the number of students enrolled in one grade divided by the number of students enrolled in the previous grade in the previous year, separately for the Black, Hispanic and White ethnic groups. Altogether 858 such calculations were computed – 13 grade transitions (from kindergarten to grade 1, etc., to grade 12 to high school graduation) for 22 years and three ethnic groups. Again, without trying to recap all results from these analyses, shown in Figure 3.2 are some of the most interesting.

What this figure shows is that over the last 20 years, the grade 9/grade 8 progression ratio for Black and Hispanic students has risen dramatically, while the comparable rate for White students increased only slightly. The data also reveal that before the mid-1980s, the grade9/grade8 progression ratios for Black and Hispanic students were only slightly higher than those for Whites. These results clearly indicate

that since 1992 progress from grade 9 to high school graduation has been stymied for Black and Hispanic students not after grade 10 when they first take the TAAS exit test, but in grade nine before they take the TAAS exit test. These results clearly suggest the possibility that after 1990-91, when TAAS was first implemented, schools in Texas have increasingly been failing students, disproportionately Black and Hispanic students, in grade nine in order to make their grade 10 TAAS scores look better.



At the same time, it is apparent from Figure 3.2 that the higher rates of grade 9 failure of Black and Hispanic students, as compared with White students, did not begin with TAAS. The results indicate that the grade9/grade8 progression ratios for minorities

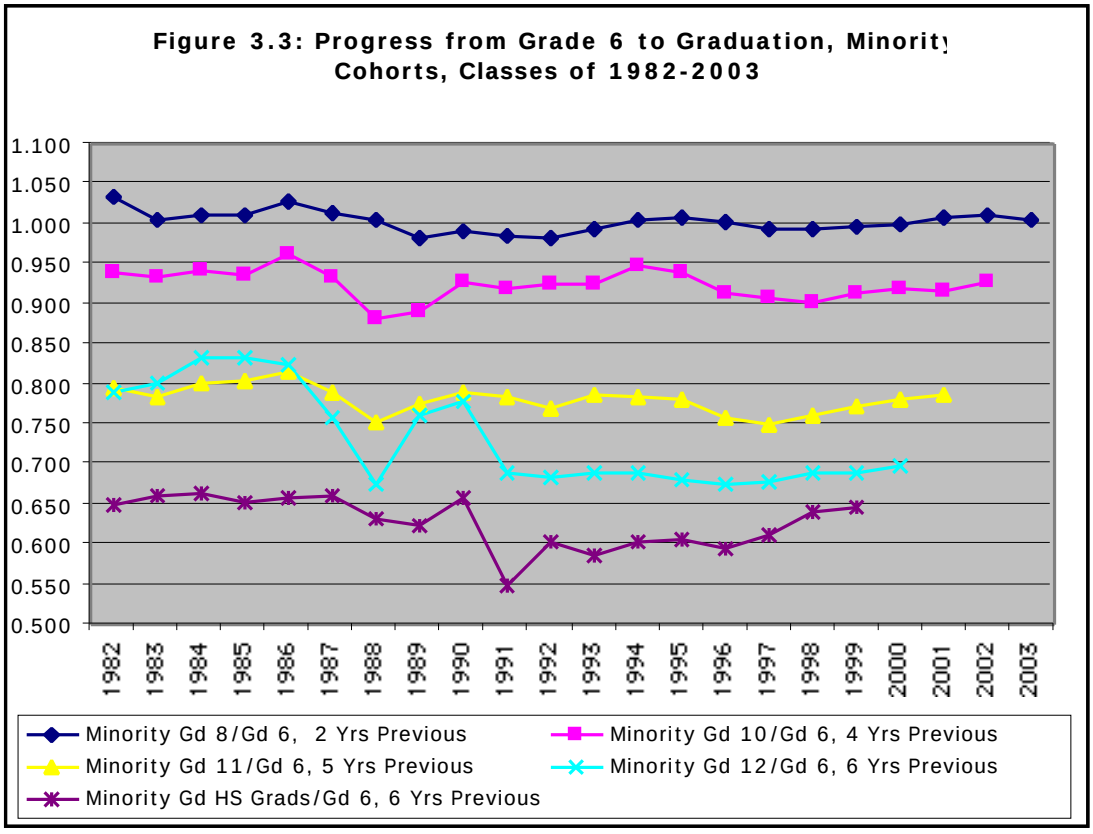
began to diverge from those of White students in Texas in the 1980s, before TAAS and even before TEAMS (as previously explained, the Texas state test that preceded TAAS). In an historical sense then, TAAS and TEAMS testing could not have directly caused the steady increase since the early 1980s in the proportions of Black and Hispanics failed in grade 9. But the first statewide testing program in Texas, the TABS, did begin in 1980, just about when the ratio of minority ninth graders to eighth graders began its upward climb, compared to the relative stability of this ratio for White students. Whatever the historical cause, the fact that by the end of the 1990s 25-30% of Black and Hispanic students, as compared with only 10% of White students, were being failed in grade 9, instead of being promoted to grade 10, makes it clear that the apparent diminution in the racial gap in TAAS grade 10 pass rates is in some measure an illusion. Through the 1990s, progressively smaller proportions of minority students ever even made it to grade 10 to take the exit level TAAS test.

The sharp increase in grade 9 failure rates suggested a need to revisit the question of rates of progress toward high school graduation. This is because the grade 9 to high school graduation progress ratio may have been lowered because of the increasing numbers of students "bunching up" in grade 9.

Hence a number of additional analyses were undertaken, examining the rates of progress from grades 6, 7, and 8 to high school graduation, six, five and four years later, respectively. For economy of presentation, here I present only one set of results showing rates of progress from grade 6 to high school graduation six years later for minority, that is, Black and Hispanic, students. These are presented for cohorts labeled by their

expected year of high school graduation. The cohort class of 1999, for example, would have been in grade 6 in 1992-93.

Figure 3.3 shows the progress of minority (Black and Hispanic) cohorts from grade 6 to grades 8, 10, 11, 12 and high school graduation. As can be seen, over the last 20 years, for minority cohorts, close to 100% of grade 6 students progressed to grade 8 two years later. For minority grade 6 cohorts the rates of progress to higher grades were lower – for cohorts of the classes of 1982-86 about 80% of Black and Hispanic students progressed on time from grade 6 to grades 11 and 12 and about 65% graduated.



For minority cohorts of the classes of 1987 to 1990, there were mostly declines in rates of progress. Initially sharper declines were apparent in rates of progress to grades 10, 11, and 12, but the cohorts of the 1989 and 1990 classes showed some rebounds in rates of progress to grades 10, 11 and 12 (and for the 1990 cohort to graduation). These patterns are associated with implementation of the first Texas high school graduation test, the TEAMS from 1985 to 1990.

In 1991, the initial year of TAAS testing, the grade 6 to high school graduation ratios fell precipitously; from 1990 to 1991, the ratio fell from 0.65 to 0.55 for minorities. From 1992 to 1996, this ratio held relatively steady for minorities at about 0.60. Since 1996, there have been slight increases in the high school graduation to grade six ratios, for minorities almost back up to 0.65.[3]

Stepping back from specific results represented in Figures 3.3, three broad findings are apparent from these cohort progression analyses. First, the plight of Black and Hispanic students in Texas is not *quite* as bleak as it appeared when looking at grade 9 to high school graduation ratios – which showed only 50% since 1992 progressing from grade 9 to high school graduation. The bottom line in Figure 3.3 indicates that for most classes of the 1990s 60-65% of Black and Hispanic students progressed from grade 6 to graduate on-time six years later (the grade 9 to graduation ratios are lower because of the increasing rates of retention in grade 9).

Second, one of the major features of Figures 3.3 is that the bottom two lines (representing the grade 12 to grade 6, and graduation to grade 6 ratios) tend to converge over the last 20 years. This means that over this period, given that students reach grade

[3] As discussed in section 7.1 of Haney, 2000, the upturn in rates of progress to graduation beginning in 1997 was likely due to the fact that in that year Texas was required by the GED Testing Service to raise

12, they are increasingly likely to graduate. For minority classes of the early 1980s, about 80% were progressing on-time to grade 12, but only about 65% graduating. For minority classes of 1998 and 1999, 68-69% progressed to grade 12 and 64-65% to graduation on time. In other words, a major pattern revealed in this figure is that since high school graduation testing was introduced in Texas in the mid-1980s, larger proportions of students who reach grade 12 do graduate.

The flip side of this pattern is that over this interval, smaller proportions of minority students are progressing as far as grade 12. For minority classes of the early 1980s around 80% progressed from grade 6 to grade 12 six years later, but by the 1990s less than 70% were progressing on time to grade 12. The most obvious reasons for the substantial declines in progress from grade 6 to grade 12 six years later are increased rates of retention in grades before 12 and increased rates of dropping out before grade 12.

This discussion of rates and ratios tends to obscure what is happening – or not happening – to large numbers of children in Texas, so I also examined the grade enrollment data for Texas in one other way. This time I calculated progress from grade 6 to high school graduation 6.5 years later for the Texas high school classes of 1982 to 1999 simply in terms of numbers of students (that is, total numbers of Black, Hispanic and White students).

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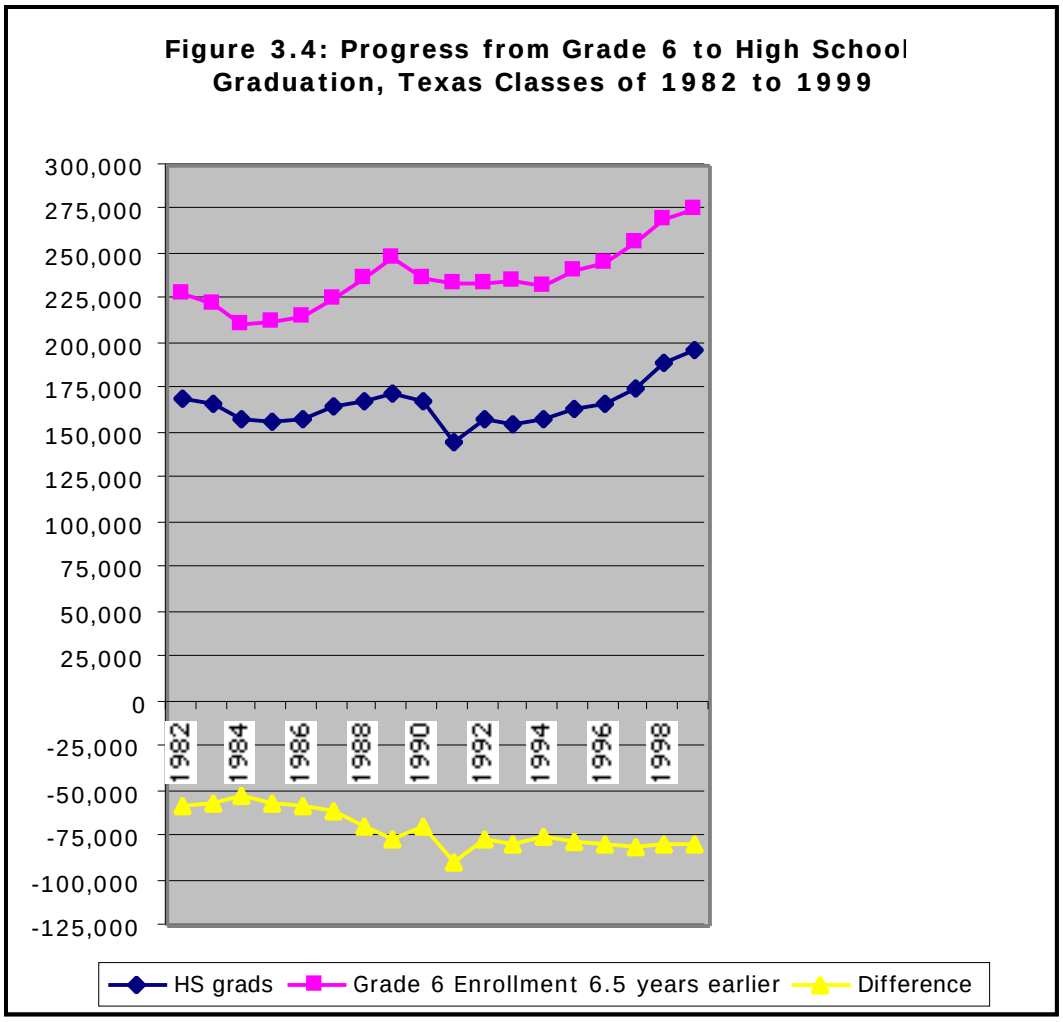
its passing score on the GED for awarding high school “equivalency” diplomas.



Results are shown in Figure 3.4. Also shown in this figure are the differences, that is the numbers of students who do not make it from grade 6 to high school graduation 6.5 years later. As can be seen, the numbers of children lost between grade 6 and high school graduation in Texas were in the range of 50 to 60 thousand for the classes of 1982 to 1986. The numbers of lost children started to increase for the classes of 1986 and 1987 and jumped to almost 90 thousand for the class of 1991. For the classes

of 1992 through 1999, in the range of 75 to 80 thousand children are being lost in each cohort.

Cumulatively for the classes of 1992 through 1999, there were a total of 2,226,003 White, Black and Hispanic students enrolled in grade 6 (in the academic years 1984-85 through 1992-93). The total number graduating from these classes was 1,510,274. In other words, for the graduating classes of 1992 through 1999, 715,729 children in Texas or 32% were lost or left behind before graduation from high school.

After conducting a variety of analyses Texas enrollment data, I reviewed (in part 7 of Haney 2000) five different sources of evidence about rates of high school completion to see if apparent differences in these source could be reconciled. A review of statistics on numbers of students, in Texas and nationally, taking the Tests of General Educational Development (GED) was undertaken. People take the GED tests in order, by achieving passing scores, to be awarded high school "equivalency" degrees. Review of GED statistics indicated that there was a sharp upturn in numbers of young people taking the GED tests in Texas in the mid-1990s. This finding helps to explain why the TEA statistics on dropouts are misleading. According to TEA accounting procedures, if students leave regular high school programs to go into state-approved GED preparation programs, they are not counted as dropouts, regardless of whether they actually take, much less pass, the GED tests.

If we put aside the TEA-reported dropout rates as misleading, differences between other sources of evidence on rates of high school completion in Texas appear reconcilable. NCES reports (based on CPS surveys) indicate that the rate of high school completion among young people in Texas in the 1990s was about 80%. This would

imply a non-completion (or dropout) rate of 20%. Initially this would appear markedly lower than the non-graduation rate of at least 30% derived from my analyses of TEA data on enrollments and graduates. But the CPS surveys count as high school completers those who report receiving regular high school degrees and those who report receiving a GED high school equivalency diplomas.[4] So it seems clear that a convergence of evidence indicates that during the 1990s, slightly less than 70% of students in Texas actually graduated from high school (e.g. 1.51 million/2.23 million = 0.68). This implies that about 1 in 3 students in Texas in the 1990s dropped out of school and did not graduate from high school. (Some of these dropouts may have received GED equivalency degrees, but GED certification is by no means equivalent to regular high school graduation, as discussed below).

In addition to studying enrollment data for Texas, I also examined patterns of failure in grade 9 and high school completion rates among states for which such data are available. Results indicated that there is a strong association between high rates of grade 9 failure and low rates of high school completion. Specifically, results suggested that for every 10 students failed in grade 9, about seven will not complete high school (see Haney, 2000, section 7.2).

The applicability of these results, from across 18 states, to Texas may well be questioned. Fortunately, I have recently received a summary of longitudinal results from Texas that show more clearly what happens to students who fail grade 9 and have to repeat that grade. According to a study released by Texas State Senator Gonzalos Barrientos, in 1992-93 41,344 freshmen high school students repeated the ninth grade in

[4] The CPS survey samples are not large enough to allow derivation of reliable annual results at the state level, much less to estimate separately the numbers of high school graduates and GED recipients. See,

all Texas districts. By 1997-98, 8063 or19.5% of them had graduated from high school and another 6,445 or 15.6% had received GED high school "equivalency" diplomas (Where have all the freshmen gone, 1999). These results indicate that the graduation prospects for students who are flunked in grade 9 in Texas are slightly worse than estimated in the Myth article. Specifically, they suggest that for students who are failed in grade 9, only about one in five will persist in high school until graduation.

3.3 What Happens to Texas High School Graduates

I am of the view that an educational system in which 30% of students overall (and 40% of minorities) do not even graduate from high school is one to be deplored rather than applauded. But clearly people's values in making such judgements may well differ. Some might argue, for example, that having 30% of young people fail to graduate from high school is an unfortunate, but necessary, price to pay for boosting the achievement of those who do finish high school. As one ex-college president in Massachusetts commented recently, in education as in sports, the aphorism "no pain, no gain" should apply.

Hence it is useful to examine what happens to students who do graduate from high school in Texas and go on to college. In doing so, we are in effect addressing the question of whether the huge social cost of having 3 out of 10 young people not even graduate high school might possibly be warranted by improvements in learning for the 7 out of 10 who do.

In section 7.5 of the Myth article, I summarized results of the "college readiness" testing program in Texas from 1989-90 through 1997. This test is called the Texas Academic Skills Program or TASP test. This test is intended to assess whether students

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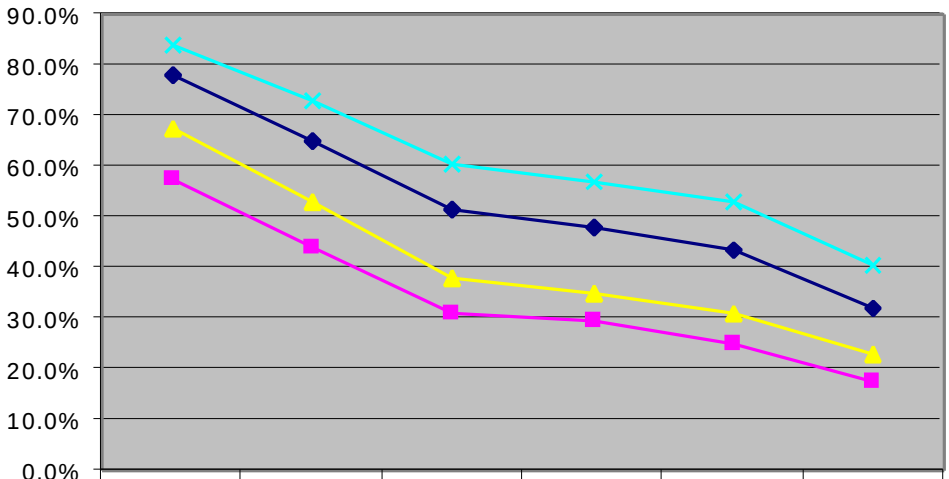
Haney, 2000, section 7.1 for more discussion.

have "the reading, writing and math skills necessary to do college level work." Curiously, the Texas Higher Education Coordinating Board, the Texas agency under whose auspices the TASP has been developed and administered has posted TASP results on its web site (www.thecb.state.tx.us) only through 1994-95. However, thanks to the generous help of Chris Patterson of the Lone Star Foundation (personal communication, March 22, 2000) and Richard Hamner of the Office of Texas State Senator Gonzalos Barrientos (personal communication, October 24, 2000) I have been able to obtain TASP results for the high school classes of 1993 through 1998, disaggregated by ethnicity. These results are shown in Figure 3.5.

Figure 3.5: TASP College Readiness Pass Rates 1993 - 1998 Graduating Classes



	1993	1994	1995	1996	1997	1998
All groups	78.0%	65.2%	51.7%	48.1%	43.3%	31.8%
Black	57.7%	44.2%	31.2%	29.7%	24.9%	17.6%
Hispanic	67.6%	52.9%	37.9%	34.8%	30.9%	23.2%
White	84.2%	73.1%	60.3%	57.0%	53.0%	40.5%

These results indicate that the "college readiness" of Texas students in the high school classes of 1993 through 1998 has fallen precipitously, at least as measured by the

TASP reading, writing and math tests. For the members of the class of 1993, who sought to attend college in Texas and hence had to take the TASP tests, 78% of all students passed the TASP (and 58% and 68% of Black and Hispanic students, respectively). For the members of the high school class of 1998, however, only 31.8% of students overall (and just 17.6% of Black and 23.2% of Hispanic students) passed all three tests. These were students who would have taken the TAAS in 1996 when they were in grade 10. According to the TEA (www.tea.state.tx.us/student.assessment/results/summary/sum96/gxen96.htm, 10/17/2000) 208,858 students took the exit level TAAS in March 1996 and 124,489 passed. According to Texas Higher Education Coordinating Board statistics, 81,159 members of the high school class of 1998, all of whom presumably passed the TAAS (since they graduated from high school), took the TASP tests just two years later, but 55,350 of them failed. As noted in the Myth article (Haney, 2000, section 7.5), "reviewing these results from the TASP testing, and comparing them with results of TAAS testing, the conclusion seems inescapable that something is seriously amiss in the Texas system of education, the TAAS testing program, or the TASP testing program – or perhaps all three."

The ill-health of higher education in Texas is apparent not just in TASP results, and in my view, but also according to other measures and other observers. According to a report prepared by the University of Texas System, *Presentation to the Education Subcommittee of the House Appropriations Committee*, dated February 10, 1999:

> Among Anglos, as well as Hispanics and African-Americans, there are marked declines in the number of students who are prepared academically for higher education, as measured by their scores on the SAT and their rank in high school class. . . . . It is worth emphasizing, therefore, that this is not merely a

> "minority problem," as is sometimes assumed. The decline in the number of Anglos in the educational system is almost as steep as the decline among Hispanics and African-Americans. (University of Texas System, 1999, p. 46)

The report proceeded to discuss a series of three graphs illustrating the problems in the educational "pipeline" supplying the higher education enterprise in Texas. Rather than trying to reproduce these graphs, I have pulled data from them together in a single table, Table 3.1 below.

Table 3.1: College Applicant Pool in Texas, 1996-1997

	Hispanic	African-American	Anglo	Total
18-year-olds	93,145	39,071	156,180	288,396
HS Graduates	54,167	22,844	98,899	175,910
As % of 18-year-olds	58.2%	58.5%	63.3%	61.0%
SAT takers	13,529	7,427	41,373	62,329
As % of 18-year-olds	14.5%	19.0%	26.5%	21.6%
SAT score >900 and in top 40% of HS class	5,870	2,226	27,706	35,802
As % of 18-year-olds	6.3%	5.7%	17.7%	12.4%
SAT score >900 and in top 20% of HS class	3,884	1,356	18,849	24,089
As % of 18-year-olds	4.2%	3.5%	12.1%	8.4%

Source: University of Texas System, Presentation to the Education Subcommittee of the House Appropriations Committee, February 10, 1999, p. 45.

The report does not document the source for its figures on the numbers of 18-year-olds in Texas in 1996-97, but if they are correct, they indicate that the high school graduation rates in Texas may be even worse than estimates derived from my analyses of enrollment data (specifically proportions of grade 6 students graduating from high school 6 .5 years later.)[5] The data in the University of Texas System report indicate that the high

[5] One likely explanation for why high school graduates as percentage of 18-year-olds yields a lower estimate of high school graduation rates than high school graduates as a percentage of grade 6 enrollments six years earlier, namely immigration into Texas, will be discussed further in the final part of

school graduation rate was only 63.3% for White students and less than 60% for Black and Hispanic students. Also, it might be mentioned that 18-year-olds in 1997 would have spent their entire middle- and high-school careers in Texas schools after the TAAS-driven educational reforms were begun in 1990-91.

Rather than commenting further myself on the data shown in Table 3.1, let me simply quote what the University of Texas System report said:

> An examination of these graphs yields the inescapable conclusion that Texas is failing to develop the potential of large segments of its population. . . . It is clear from these graphs that Texas is failing to develop a significant portion of its "human capital" among its Anglo, Hispanic and African-American young people. The loss of so many students from the educational "pipeline" that supplies the Texas higher education enterprise underscores the critical need for enhanced investment in the State's public schools, as well as higher education, if Texans of the 21st century are to be prepared for the challenges of a new era.
>
> The losses from the educational "pipeline" among Hispanic and African-Americans must be of particular concern to Texans because they have a dramatic impact on minority enrollment in higher education, especially at the more competitive and selective institutions. At U. T. Austin for example, the average SAT score for first-time freshmen in fall 1998 is 1228, far above the 900 level selected to illustrate the "pipeline" problem. Also, approximately 46% of U. T. Austin first-time freshmen in fall 1998 were in the top 10% of their high school class. (University of Texas System, 1999, p. 46)

More recently, the National Center for Public Policy and Higher Education. (2000) released *Measuring Up: The State-by-State Report Card for Higher Education.* This study was an attempt to evaluate the status of higher education in the states and to rate each state in terms of student preparation ("How well are students prepared to take advantage of college?"), participation ("Do state residents enroll in college level programs?"), affordability ("How affordable is higher education in each state?"), completion ("Do those who enroll complete their academic and vocational programs?") and benefits ("What economic and civic benefits does each state receive from the

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this paper.

education of its residents?"). Without going into details of how ratings were made in each of these categories (they are available at http://measuringup2000.higher education.org), let me mention simply that Texas received relatively low marks in each category: a C in preparation, a D in participation, a C in affordability, a D+ in completion and a C in benefits. To provide one concrete example, in terms of participation in higher education, the *Measuring Up* report says that for Texas, the percentage of high school freshmen enrolling in college within four years in any state is just 32%, as compared with 54% for the "top states." And as a measure of persistence in higher education, *Measuring Up* reports that in Texas only 41% of first year community college students return for their second year in college, as compared with 64% for the "top states."

Surely there are a variety of ways of judging the success of systems of elementary-secondary education. One of them is how well students finishing high school are prepared for higher education and how successfully they complete programs of higher education. All indicators I have been able to locate (SAT scores, TASP "college readiness" test results, testimony by University of Texas officials and the recent *Measuring Up* report on higher education in the states) suggest that by these measures, the Texas system of pre-collegiate education has not been terribly successful. Indeed, according to three of these sources of evidence (SAT scores, TASP results, and testimony by University of Texas officials), the academic preparation of students going on to higher education in Texas deteriorated over the 1990s. In short, I have been able to find no evidence at all that the huge social cost of having 3 out of 10 students in Texas during the 1990s fail even to graduate from high school might be justified by improvements in the learning and academic preparation of those who do.

IV Conclusions

The preceding section of this paper, discussing what happens to students who do graduate from high school in Texas, may seem somewhat removed from the focus of this conference, namely how to get accurate estimates of the extent of the dropout problem in the United States and how to prevent students from leaving school before graduation. Hence, in conclusion let me explain why the myth of the Texas miracle in education, and some of the ways I have sought to study what has been happening to students in the Lone Star state, are relevant to research on dropouts and dropout prevention elsewhere.

4.1 Lessons from the Myth of the Texas Miracle

Elsewhere I have described some of the broader lessons of the Texas myth story, concerning, for example notions of accountability, and the hazards of high stakes testing (see Haney, 2000, section 8.3). Here I sum up what I view as lessons from the Texas story for research on dropouts and dropout prevention. First, I observe simply that the Texas myth story surely should remind us of the broader aims of education in our society. The dramatic gains apparent on TAAS in the 1990s are simply not born out by results of other testing programs (such as the SAT, NAEP and TASP). So the Texas story is a sad reminder of what we have seen again and again, namely that when enough pressure is brought to bear on schools via high stakes testing, test scores can be increased. But such increases frequently come at large cost, to the broader learning of students, to the meaningfulness of test results themselves (see for example, Cannel, 1987, 1989; Linn, Graue and Sandes, 1989; Koretz, Linn, Dunbar & Shepard, 1991; Koretz & Barron, 1998) and to the longer term educational welfare of students who do persist in school to graduate from high school. The deterioration of the academic preparation of college-

bound youth in Texas during the 1990s tells us that the costs of ill-conceived test-based accountability schemes fall not just on students who "fail" in such a system but also those who in the short term seem to have succeeded. But perhaps the Texas story tells us most clearly is that quite apart from raising test scores, surely one of the main outcomes of pre-collegiate education is the proportion of students who finish and graduate from high school. By this measure, the Texas system of education, in which only two out of three young people in the 1990s actually graduated from high school, surely should not be deemed a success, much less a miracle.

4.2 Be Wary of Official Dropout Statistics

One very practical lesson from the Texas Myth story is that researchers and policy analysts should be very wary of officially reported dropout statistics. This is not just because of the long recognized problem that different states define dropouts differently; for instance, with regard to the calendar year over which dropouts are counted. Winglee, at al. (2000) provide a summary of such problems and summarize efforts to derive consistent data on dropouts across the states as part of the Common Core of Data (CCD).

Texas, ironically enough, is one of the states which since 1996 has been theoretically in conformance with the CCD definition of dropouts (see Winglee, at al., 2000 pp. 10-11). But what has happened is that since the TEA started in the early 1990s to use dropout rates as one of the key variables in rating schools and districts, these institutions have, shall we say, been reporting dropouts in a manner different than before dropout statistics were used in making accountability ratings.[6] What this suggests is that researchers need to pay attention to the policy contexts in which data are gathered, and

[6] In part 7.1 of the Myth article, I show how TEA dropout statistics correspond quite closely with results of IDRA attrition analyses for 1988-89, but for the 1990s estimates from the two sources diverge sharply.

realize that when data start to be used to make prominent decisions, such as public ratings of schools and districts, the manner in which data are collected and reported may well be affected.

4.3 Distinguish GED diplomas from normal high school graduation

Another important lesson from the Texas Myth story is that researchers and policy-makers should distinguish regular high school graduation from alternative high school "completion," such as via passing the GED tests and receiving a GED high school "equivalency" diploma. The reason for this is that recent research (Cameron & Heckman, 1993; Chaplin, 1999; Murnane, Willet & Tyler, 2000) has shown that receipt of the GED diploma is simply not equivalent to high school graduation in terms of either employment opportunities or likelihood for post-secondary education. Hence, students who leave normal high school programs to enter GED preparation programs, should be counted as dropouts, regardless of whether or not they go on to take and pass the GED.

4.4 Examine grade progression and graduation rates

Another general recommendation flowing from the Texas Myth story is that researchers and policy-makers ought to pay close attention to rates of progress of students through the grades and from key transition grades, such as 6, 8 and 9 to high school graduation. I trust that the summary of the Texas myth story above provides a clear example of why such approaches can be valuable.

But to provide another example, I have examined relevant data from two recent NCES reports of selected statistics on the nation's 100 largest school districts (NCES, 1998, 2000) based on tabulations of CCD data. Specifically, I examined data on the number of high school graduates in 1997-98 and compared these figures with the

numbers of students enrolled in grades 7 to 9 in 1994-95. Thereby one can calculate high school "graduation rates" for each of these districts, as the number of graduates in 1997-98 divided by one third of the grade 7 to 9 enrollment in 1994-95.[7] Results are shown in Table 4.1, with districts sorted in descending order from highest to lowest graduation rate. (Only 96 districts are listed in Table 4.1 because the smallest of the nation's 100 largest school districts changed slightly between 1994-95 and 1997-98.)

[Insert Table 4.1 here]

As can be seen in Table 4.1, six Texas districts are among the two dozen worst in the nation according to this measure of graduation rate. Among the fourteen largest districts in Texas, the Houston Independent School District has the worst graduation rate, 46.7%, with over 45,000 enrolled in grades 7 to 9 in 1994-95, but only 7,400 graduating from high school in 1997-98. The Dallas graduation rate, 49.5% is almost as bad, and Fort Worth, Austin, Aldine and San Antonio all have graduation rates of about 54-55%. The Aldine district, by the way, was one of the four studied by Skrla, Scheurich & Johnson (2000) and which they described as having produced "equitable educational success for literally all the children in their districts" (Skrla, Scheurich & Johnson, 2000, p. 39.) It is hard to fathom how a district with a high school graduation rate of only 54% could conceivably be described as producing "equitable educational success for literally all the children" in the districts.

In these six worst Texas districts (Houston, Dallas, Fort Worth, Austin, Aldine, and San Antonio), there were 140,628 students enrolled in grades 7 – 9 in 1994-95. Dividing by three suggests there were 46,843 enrolled in grade 9 in these six districts in

[7] This estimate of grade 9 enrollment, that is, one-third of grades 7 – 9 enrollment, has the virtue of helping to control for the "bunching up" of students in grade 9 such as has been apparent in Texas over

1994-95. But in 1997-98, just 23,470 students, or 50.1%, graduated high school in 1997-98. So in just one class of students in just these six districts over 23,000 students were lost or left behind between grade 9 in 1994-95 and high school graduation in 1997-98

As appalling as these results are, it is only fair to note that there appear to be some large districts with graduation rates far worse than those of large districts in Texas. Incredibly, both Cincinnati and Cleveland show graduation rates of only 26%. Indeed, three of the five worst districts nationwide, all showing graduation rates below 45%, are in Ohio. Surely it is no coincidence that, like Texas, Ohio has a high school graduation test used to hold schools "accountable."

More broadly, all but one of the nation's largest school districts failed to reach the national educational goal of having 90% of students graduate from high school. More than two-thirds of the nation's largest districts have non-graduation rates in excess of 30% -- that is, more than three times the rate implied by the national education goal of 90% graduation.

Independent of the recommendation above that "researchers and policy-makers ought to pay close attention to rates of progress of students through the grades and from key transition grades, such as 6, 8 and 9 to high school graduation," Balfanz and Letgers (2001) with the Center for Social Organization of Schools at Johns Hopkins University undertook just such an analysis (presented at the same conference at which the first version of this paper was presented). Using CCD data, they analyzed the "holding power" or "promoting power" of high schools in the 35 largest cities in the U.S. By holding or promoting power, Balfanz and Letgers refer to the number of grade 9 students who show up in grade 12 three years later. Using CCD data, they examined the holding

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the last two decades.

power of over 600 high schools for two cohorts: one that was in grade 9 in 1989-90 and in grade 12 in 1992-93 and the other in these grades in 1992-93 and 1995-96. Specifically, they identified high schools in these 35 cities with promoting power of less than 50% – that is, schools in which the number of students in grade 12 was less than less than 50% of the number of students in grade 9 three years earlier. They found that high schools with such weak promoting power were concentrated in two geographic regions – northern and mid-western industrial cities, and Texas. Specifically they found that the cities in Texas with high concentrations of high schools with weak promoting power were San Antonio, Fort Worth, Dallas, Houston, Austin and El Paso.

Moreover, Balfanz and Letgers found that the high schools in these Texas cities declined substantially in holding power between the classes of 1993 and 1996. Nationally, of the 600 urban high schools studied by Balfanz and Letgers, between the 1993 and 1996 cohorts there was an increase in schools with weak holding power (that is, less than 50%). The number of schools with weak holding power increased from 236 out of 603 (or 39%) for the class of 1993, to 285 out of 602 (or 47%). But for the six Texas cities, the number of schools with weak holding power increased from 48 out of 88 (or 55%) for the class of 1993, to 61 out of 86 (or 71%%). (See Balfanz & Letgers, Tables 3a and 3b.)

These results are of interest because, though Balfanz and Letgers employed a different measure of progress toward high school graduation than did I (they used grade 12 to grade 9 enrollment ratios, while I used graduates to grade 9 ratios) and focused on different cohorts than did I (they analyzed data for the classes of 1993 and 1996, while my analyses were on the class of 1998), the results of these two sets of analyses largely

converge – Texas has an unusually large number of high schools and school districts in which large proportions of students fail to progress from high school entry to grade 12 and graduation. Moreover, the Balfanz and Letgers results indicate that holding power of Texas high schools in the six large cities included in their sample declined substantially between the early- and mid-1990s.

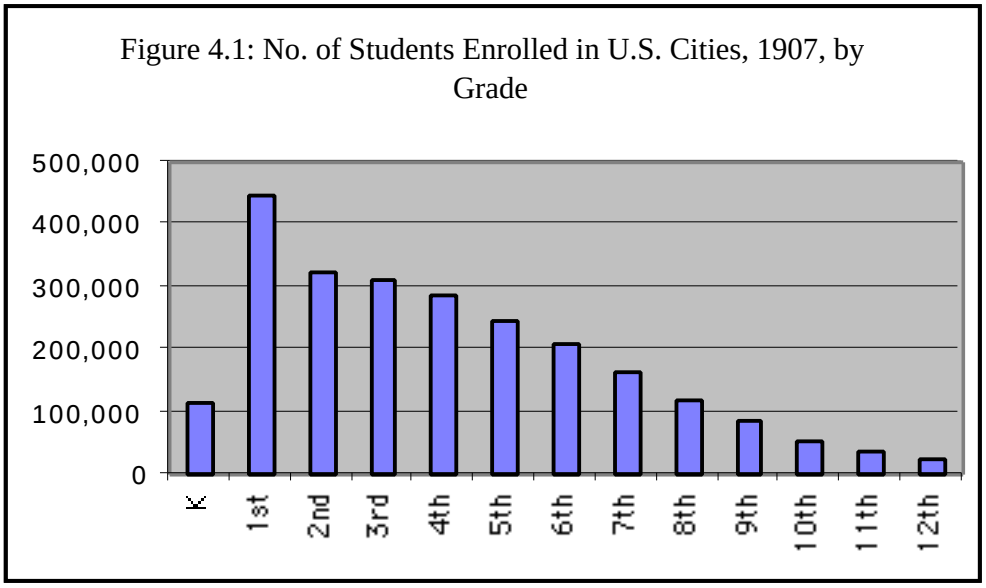
4.5 What can be done to help more students graduate from high school?

What might best be done to help more students graduate from high school? I suggest three things; namely, to stop misusing test results, to find better ways of helping low achieving students besides flunking them and forcing them to repeat the ninth grade, and to set standards for schools which fail students. On the first point, states should clearly stop using standardized test scores to control important decisions about students (such as whether they are promoted from one grade to the next or graduate from high school) irrespective of other evidence, such as course grades and teacher recommendations. Second, given the clear evidence that flunking students in grade 9 dramatically increases the probability of their dropping out of high school before graduation, schools must find better ways of helping low-achieving students other than simply "flunking" them and making them repeat the grade and courses they have already "failed." Finally, to provide schools with incentive to do to this, I suggest that any school that flunks more than 10% of grade 9 students should itself be "flunked" and classified as low-performing. Clearly, any school that flunks more than 10% of grade 9 students is unlikely to contribute to the national goal of having 90% of students graduate from high school.

4.6 An historical note

As an historical note, let me mention Leonard P. Ayres' 1909 book *Laggards in our Schools: A study of retardation and elimination in city school systems*. With support from the Russell Sage Foundation, Ayres had undertaken analyses of the poor progress of students through the grades. He sought to examine the reasons why so few children progressed as far as high school, even though compulsory attendance laws at the time made school attendance optional only around the age of 14. Figure 4.1 shows a graph of data presented in chapter 1 of Ayres' book. Specifically these data show the total numbers of students enrolled in 1907 in each grade in 386 cites with populations of 8000 or more.

Figure 4.1: No. of Students Enrolled in U.S. Cities, 1907, by Grade



E. L. Thorndike (1907) had previously pointed attention to the problem of the "elimination of pupils from school," but Ayres' data showed how widely students lagged behind in school relative to their ages. "For each 1000 pupils in the first grade we find only 263 in the eighth and only 56 in the fourth year of the high school." (p. 14). In his conclusion Ayres wrote:

> If our conception of the mission of the common school is true then the schools must be in some measure reformed, not only on the administrative side, but also through changes in the course of study and in the methods of teaching. It is intolerable that but a small part of the children who enter our schools should stay to complete them. It is not at all likely that the public at large will long be content to continue to support the schools as at present administered if they once fully realize that those schools are not accomplishing what we have for years assumed that they were. (p. 218)

Ayers' *Laggards* is cited for several reasons. First is the historical importance of this small volume, which historian Raymond Callahan has called an "incendiary bomb"(Callahan, 1962, p. 15). Ayres' volume is noteworthy also because his work has been cited by historians of education as a prominent example of what Callahan called the cult of efficiency in education and Tyack (1974) called the search for the one best system of education. Such historians have pointed out that the school efficiency movement was a reflection of the scientific management movement or Taylorism, after its most well-known proponent around the turn of the century, Frederick Taylor. Ayres' data showed that large numbers of students were overage for their grade placement in school, and held that the schools were clearly responsible for this inefficiency.

Perhaps the most important reason for citing Ayres' work is that the situation he described, in 1907, predates the invention of the standardized multiple-choice test. Some observers of high stakes testing at the end of the 20th century have suggested that the ill-effects of such testing derives from the form of testing that now predominates in large-scale testing in the United States, namely standardized multiple-choice testing. They argue that if the tests employed were "performance-based," "authentic," and "worth teaching to," then testing would be less likely to distort teaching, learning, and education generally. But the kinds of tests employed to control grade promotion a century ago, namely written and oral tests, were what now might be called "authentic" or "performance" tests. This historical perspective clearly suggests that the ill-effects of high-stakes testing, as evident in Texas, do not derive exclusively, or even mainly, from the format of testing.[8]

More generally, though the "elimination" of students from school in large districts in the U.S. in the 1990s is not nearly so horrendous as it was in 1907 (except perhaps in Cleveland and Cincinnati), it is worth recalling two passages, from the beginning and end, of Ayres' 1909 volume.

The beginning passage of chapter 2 of Ayres' book reads:

> No standard which may be applied to a school system as a measure of accomplishment is more significant than that which tells us what proportion of the pupils who enter the first grade succeed in reaching the final grade. (Ayres, 1909, p. 8)

[8] An equally instructive historical lesson from the era before multiple-choice testing is available in Brendan Rapple's wonderful (1994) "Payment by Results: An Example of Assessment in Elementary Education from Nineteenth Century Britain." This should not be interpreted as meaning that the format of testing is of no consequence. See, for example, Haney & Russell (1999) and Russell & Haney (2000) for discussion of how low-tech tests are currently short-changing high-tech students and distorting education.

The very final paragraph in Ayres' volume is:

> Success is necessary to every human being. To live in an atmosphere of failure is tragedy to many. It is not a matter of intellectual attainment; not an intellectual matter at all but a moral matter. The boys and girls coming out of school clear-headed and with good bodies, who are resolute, who are determined to do and sure that they can do, will do more for themselves and for the world than those who come out with far greater intellectual attainments, but who lack confidence, who have not established the habit of success, but within whom the school has established the habit of failure. (Ayres, 1909, p. 220)

4.7 A final methodological note

As a final methodological note, let me discuss briefly the relative merits of different ways of gauging students' progress through school. Ayres' analysis of enrollments in 1907 constituted a "cross-sectional" analysis. He simply compared the numbers of students enrolled in grades kindergarten through 12 in a particular year. In contrast, the cohort progression analyses conducted by me and by Balfanz and Letgers are a sort of longitudinal analysis that addresses the question of what proportion of students in grade x in year y in a particular school, (or school district or state) reach grade x + n in year y + n. (or in the case of some of my analyses of statewide data in Texas and CCD data for the nation's largest school districts, what proportion of cohorts progress from a particular grade to high school graduation on time).

There are three methodological questions that are worth addressing about such analyses.

1. Do cohort progression analyses underestimate rates of progress because some students, while not progressing through the grades "on-time," may still persist in school at a slower pace until they do graduate?

2. How can net migration into or out of a state or school system affect results of cohort progression analyses?
3. How accurately do cross-sectional estimates of grade progress predict results of cohort analyses?

Grade progress on-time vs. slow progress

On this matter, it is clear that analysis of rate of progress for one cohort from one grade to grade 12 or to high school graduation may yield a misleading, or at least incomplete, picture of what is happening in an educational system. This is clear from my experience in analyzing statewide enrollment data for Texas. Initially I had analyzed rates of progress from grade 9 to high school graduation three-and-a-half years later. I was surprised to find that after implementation of TAAS in 1990-91, the apparent rate of progress of minority students from grade 9 to high school graduation fell to less than 50%. But after finding that since the early 1980s, students in Texas, especially minority students, increasingly are being failed to repeat grade, 9, I went back and analyzed rates of progress from grade 6 and 8 to high school graduation. I found that minority rates of progress from grade 6 to graduation on-time fell from about 65% before TAAS to roughly 60% after TAAS.

Just as analysis of progress from one grade, such as 9, to high school graduation may yield an incomplete picture, so too may analyses of progress for a single cohort of students. That is why it is helpful to examine rates of progress over several cohorts of students, for example, as depicted in figure 3.4 above. Such an analysis makes clear that very few students in Texas who are held back in grade between grade 6 and 12 go on to graduate from high school. For if a large portion of students who did not progress on

time since implementation of TAAS in 1990-91, went on to complete and graduate from high school more slowly than normal, the "difference" shown in this figure, that is the numbers of children lost between grade 6 and graduation, would have decreased and not have remained since 1991 in excess of 75,000. Moreover, as previously recounted, of the total of 2.23 million students enrolled grade 6 in Texas in the classes of 1992 through 1999 only 1.51 million or 68% went on to graduate, even though theoretically they would have had, on average more than five years to do so.

Effects of net migration on cohort analyses

Another potential problem with cohort progression analyses is that they implicitly assume a sort of closed system. If there are 1000 students in grade 6 in 1992-93 in a particular school system, we might expect, given normal progress through the grades that 1000 will graduate in 1999-2000. But such an expectation obviously ignores the possible effects of families moving into or out of a particular locale. As pointed out in the Myth article (Haney, 2000, part7.1):

> The results of the cohort progression analyses just summarized assume that between the ages of 12 (grade 6) and 18 (grade 12) there is not net change in the size of the student population in Texas because of immigration (from either other states or countries). If in fact there is a net out-migration, the dropout estimates may be too high. If there is a net in-migration into Texas, the estimates may be too low. (Haney, 2000, part 7.1)

I went on to cite the recent book on the demography of Texas by Murdock, et al. (1997), which had generously been brought to my attention by Angela Valenzeula. Murdock, et al. (1997) report that the annual rates of net migration into Texas during the first half of the 1990s was on the order of 1-2%. When completing the big Myth article, I

did not have time to describe analyses exploring possible effects of immigration, so let me do so here.

Let us suppose that during the 1990's there was a net in-migration into Texas of people in the age range of 12 to 18 years of 1.5% per year – a middle estimate of the range suggested by Murdock, et al. (1997). As just mentioned, there were a total of 2.23 million students enrolled grade 6 in Texas in the classes of 1992 through 1999 and 1.51 million or 68%. went on to graduate. To take immigration into account let us suppose that each cohort of children increases 1.5% each year between grade 6 and 12 (even though by grade 12 many will not be in school.

2.23 million*1.015^6 = 2.23 million*1.0936 =2.44 million

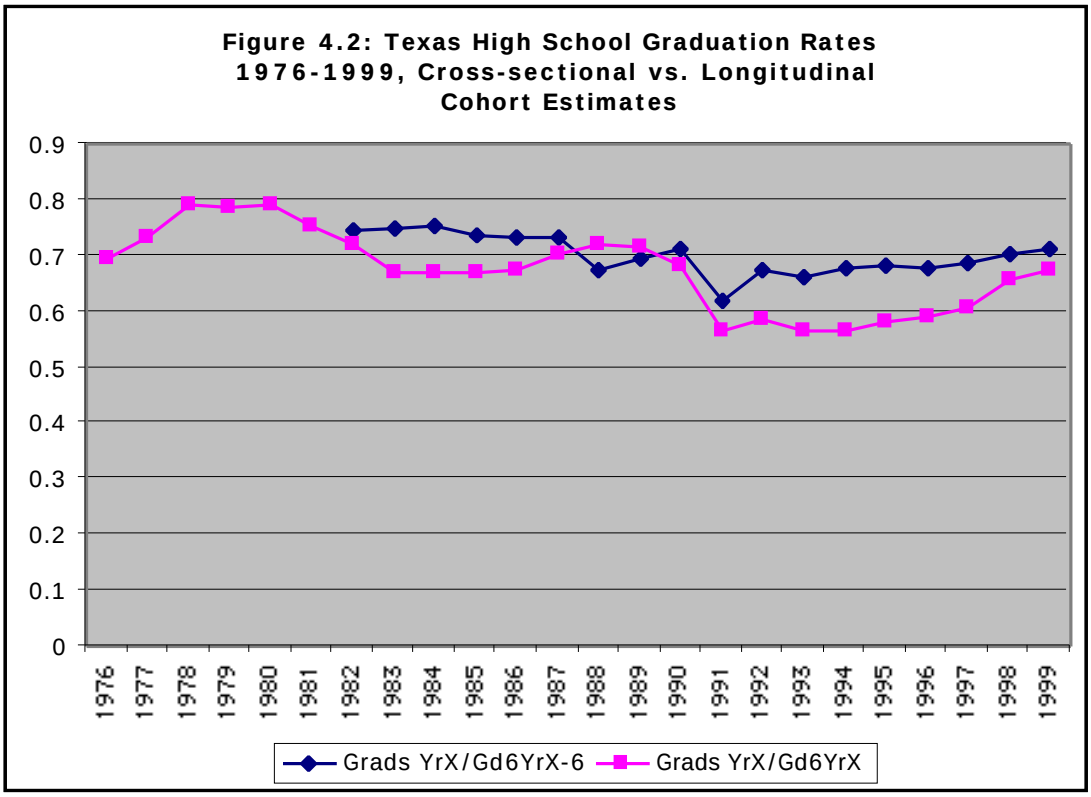
This shows that a grade 6 cohort, assuming annual increase of 1.5% because of immigration would grow by almost 10% over six years. Next, if we divide the 1.51 million graduates in the classes of 1992 through 1999 by 2.44 million, we get 61.9% This suggests that if we adjust cohort progression analyses for net immigration into Texas during the 1990s, we conclude that 62% of young people in Texas during the 1990s were graduating from high school. This result albeit, a product of fairly crude calculations, is quite close to the 61% figure cited by the University of Texas System, as the percentage of 18-year-olds in Texas who were high school graduates in 1996-97. This suggests that less than 2/3 of young people in Texas during the 1990s were actually graduating from high school. More generally this example illustrates the manner in which results of cohort progression analyses may be adjusted for evidence (or assumptions) about net immigration.

Cross-sectional vs. longitudinal cohort analyses

Cohort progression analyses are not terribly complex to carry out. However, assembling data sets for a particular state or school district that allow for such analyses can be tedious and time-consuming. Anyone who has worked with the CCD files, for example, will surely appreciate the work that must have gone into the seemingly simple analyses reported by Balfanz, & Letgers. (2001). Most often enrollment data are much more readily available in a form that allows cross-sectional analyses of enrollment across the grades, of the sort that Ayres undertook nearly a century ago. Thus a methodological question of some practical import arises. How good are results from cross-sectional analyses at estimating results from longitudinal cohort analyses?

I address this question in two sets of analyses. First, given I have 25 years worth of enrollment data from the state of Texas, I address the question of how closely cross-sectional analyses approximate findings from cohort progression analyses. Second, given the manner in which CCD files are reported, I address the extent to which analyses of annual "cross-sectional" CCD data files might approximate the results of cohort progression analyses of CCD annual data file merged across years.

Texas enrollments: Cross-sectional vs. cohort analyses. Given the availability of statewide enrollments in Texas for the last 25 years, I sought to compare how well cross-sectional analyses (specifically, grade 12 enrollments in year X divided by grade 9 enrollments in year X) correspond with cohort progression analyses (specifically, grade 12 enrollments in year X divided by grade 9 enrollments in year X-3).



Results are shown in Figure 4.2. Note first that cross-sectional estimates of graduation rates are available for the entire 24 years, but the longitudinal cohort estimates are available only for 1982 onward (because grade 6 enrollment figures are not available for years prior to the 1975-76 school year). These results indicate that cross-sectional estimates of graduation rates are a reasonably good proxy for cohort progression analyses. Both ways of estimating high school graduation rates show the same broad patterns. Between 1982 and 1990 the high school graduation in Texas was on the order of 70%. According to both measures, the graduation rate nose-dived by about 10% in 1991, but since then has been gradually climbing back toward the pre-1991 level of 70%.

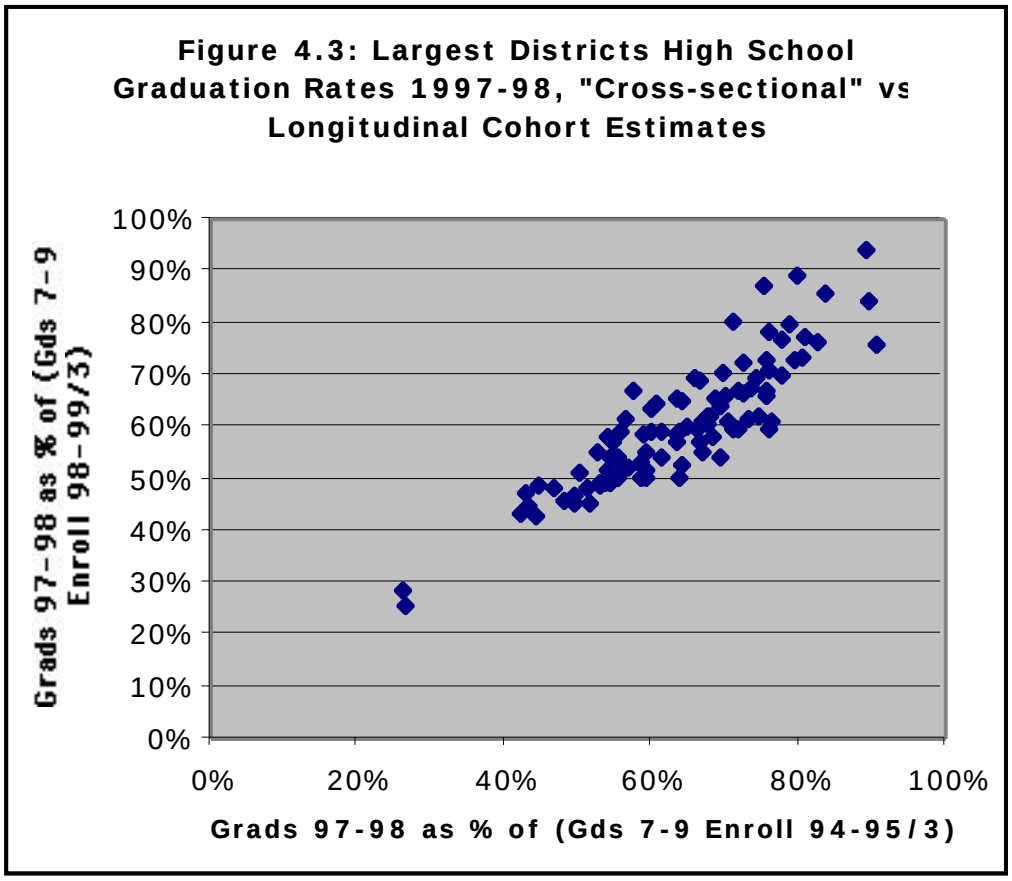
Despite these broad similarities, there are two periods (1983-196 and 1992-1997) in which the cross-sectional estimates of graduation rates yield a notably lower

"graduation rate" than the for cohort progression analyses. For these years the cross-sectional estimates are more than 5% lower than those resulting from cohort progression analyses. Since both kinds of estimates use the same numerator, that is the number of Texas high school graduates in a particular year, it is obvious what causes these divergences – namely, the grade 6 enrollment numbers used in the dominator. In both of these periods (as may be seen by looking at Figure 3.4), grade 6 enrollments were growing at a fairly fast pace, and this growth causes cross-sectional estimates of graduation rates to be lower than those derived from cohort progression analyses.

Large district enrollments: Cross-sectional vs. cohort analyses. Having addressed the issue of how well cross-sectional estimates of graduations rates approximate those from cohort progression analyses for the state of Texas, let us now address the same question regarding the nation's 100 largest school districts with information derived from the Common Core of Data (CCD) files. These files are available on the web site of the National Center for Education Statistics and have been summarized in a series of reports on the largest school districts in the nation, recently tilted *Characteristics of the 100 Largest Public School Districts in the United States* (NCES, 1998, 2000). It is worth noting that although these districts comprise less than 1% of the school districts in the United States, they enroll more than 20% of students nationally.

The NCES *Characteristics of the 100 Largest Public School Districts in the United States* reports typically report grade enrollments for a particular academic year and the number of high school graduates for the previous year. Given this pattern, the question I sought to address was how well the NCES quasi- cross sectional reports (enrollments in year X compared with graduates in year X-1) compare with cohort

progression analyses (graduates in year X compared with enrollments in grade 9 in year X-3).



Results are shown in Figure 4.3. They suggest that "cross-sectional" estimates are a reasonably good proxy for longitudinal cohort estimates (the correlation between the two estimates is 0.88). However for particular cases, the two estimates of graduation rates can vary substantially. A case in point is the right-most case shown in Figure 4.3. This is the case of Montgomery County for which the "cross-sectional" estimate yields a value of 76.86%, while the longitudinal cohort result is 90.75% – a difference of almost 15%. The reason for this discrepancy is that the population of Montgomery County is

growing. The number of students in grades 7-9 in Montgomery County in 1994-95 was 24,505, but in 1998-99 the corresponding number was 29,316.

In sum, I have argued that in evaluating school systems one index worth paying attention to is the rate at which students graduate from high school. Comparisons of cross-sectional versus longitudinal estimates of high school graduation rates, both for Texas and for the nation's 100 largest districts, suggest that cross-sectional estimates are a reasonably good proxy for longitudinal estimates. However, when school populations are growing, the cross-sectional estimates will yield underestimates of the high school graduation rate.

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Table 4.1: High school graduates 1997-98 as percentage of average enrollment grades 7 to 9 1994-95 in the 100 largest school districts

	Name of reporting district	State	Enrollment 1994-95 Grades 7 to 9	Number of 1997–1998 graduates	Grads 97-98 as % of (Gds 7-9 enroll. 94-95/3)
1	Montgomery County Public Schools	MD	24,505	7,413	90.75%
2	Fairfax County Public Schools	VA	30,452	9,087	89.52%
3	Davis School District	UT	14,060	4,177	89.13%
4	Jordan School District	UT	17,018	4,742	83.59%
5	Chesterfield County Public Schools	VA	11,322	3,110	82.41%
6	Prince Georges County Public Schools	MD	27,043	7,287	80.84%
7	Baltimore County Public Schools	MD	22,309	5,984	80.47%
8	Alpine School District	UT	10,787	2,863	79.62%
9	Prince William County Public School	VA	10,678	2,822	79.28%
10	San Francisco Unified	CA	14,133	3,708	78.71%
11	Northside Independent School District	TX	13,693	3,549	77.76%
12	San Juan Unified	CA	11,124	2,875	77.54%
13	Wake County Schools	NC	17,220	4,388	76.45%
14	Gwinnett County School District	GA	18,847	4,775	76.01%
15	Ysleta Independent School District	TX	11,300	2,860	75.93%
16	Garden Grove Unified	CA	9,387	2,373	75.84%
17	Cobb County School District	GA	18,997	4,796	75.74%
18	Jefferson (KY) County	KY	20,171	5,080	75.55%
19	Seattle	WA	9,716	2,445	75.49%
20	Granite School District	UT	19,153	4,801	75.20%
21	Cypress—Fairbanks ISD	TX	11,595	2,883	74.59%
22	Boston School District	MA	13,122	3,246	74.21%
23	North East Independent School District	TX	10,746	2,631	73.45%
24	Fort Bend Independent School District	TX	11,171	2,722	73.10%
25	Jefferson (CO) County R—1	CO	20,171	4,879	72.56%
26	Hawaii Department of Education	HI	43,021	10,369	72.31%
27	Mesa Unified School District	AZ	14,985	3,592	71.91%
28	Washoe County School District	NV	9,983	2,391	71.85%
29	Fulton County School District	GA	12,009	2,844	71.05%
30	Nashville—Davidson County SD	TN	16,909	4,004	71.04%
31	Long Beach Unified	CA	16,685	3,916	70.41%
32	Anne Arundel County Public Schools	MD	16,921	3,943	69.91%
33	Knox County School District	TN	11,998	2,781	69.54%
34	Clark County School District	NV	35,259	8,165	69.47%
35	Greenville County School District	SC	13,453	3,110	69.35%
36	Virginia Beach City Public Schools	VA	18,173	4,151	68.52%
37	Arlington Independent School District	TX	11,437	2,607	68.38%
38	Shelby County School District	TN	10,508	2,385	68.09%
39	Guilford County Schools	NC	13,039	2,934	67.51%
40	Lee County School District	FL	11,881	2,671	67.44%
41	Charlotte—Mecklenburg Schools	NC	19,254	4,298	66.97%
42	Seminole County School District	FL	13,251	2,950	66.79%
43	Albuquerque Public Schools	NM	21,494	4,771	66.59%
44	Cumberland County Schools	NC	10,665	2,367	66.58%
45	Escambia County School District	FL	10,083	2,229	66.32%
46	Memphis City School District	TN	26,084	5,736	65.97%
47	Anchorage School District	AK	10,630	2,296	64.80%
48	El Paso Independent School District	TX	15,833	3,387	64.18%
49	Broward County School District	FL	45,143	9,637	64.04%
50	De Kalb County School District	GA	20,601	4,374	63.70%
51	Orange County School District	FL	27,516	5,840	63.67%
52	Brevard County School District	FL	15,419	3,259	63.41%
53	Mobile County School District	AL	16,348	3,451	63.33%
54	San Diego City Unified	CA	28,116	5,928	63.25%
55	Volusia County School District	FL	13,578	2,769	61.18%
56	Portland School District 1J	OR	11,906	2,427	61.15%
57	East Baton Rouge Parish School Board	LA	14,169	2,858	60.51%
58	Puerto Rico Dept of Education	PR	149,907	29,891	59.82%
59	Wichita	KS	10,727	2,137	59.77%
60	Palm Beach County School District	FL	30,927	6,112	59.29%
61	Garland Independent School District	TX	10,006	1,973	59.15%
62	Sacramento City Unified	CA	10,982	2,162	59.06%
63	Tucson Unified District	AZ	14,489	2,843	58.87%
64	Denver County	CO	13,430	2,627	58.68%
65	Polk County School District	FL	17,564	3,430	58.59%
66	Dade County School District	FL	73,829	14,401	58.52%
67	District of Columbia Public Schools	DC	15,198	2,905	57.34%

68	Los Angeles Unified	CA	136,134	25,843	56.95%
69	Caddo Parish School Board	LA	12,844	2,417	56.45%
70	Orleans Parish School Board	LA	19,757	3,676	55.82%
71	City of Chicago School District 29	IL	89,499	16,567	55.53%
72	Minneapolis	MN	9,799	1,810	55.41%
73	Buffalo City School District	NY	9,730	1,797	55.41%
74	Philadelphia City School District	PA	49,172	8,991	54.85%
75	Hillsborough County School District	FL	35,328	6,393	54.29%
76	San Antonio Independent School District	TX	13,992	2,528	54.20%
77	Aldine Independent School District	TX	11,028	1,986	54.03%
78	Jefferson Parish School Board	LA	13,789	2,482	54.00%
79	Austin Independent School District	TX	16,985	3,042	53.73%
80	Fresno Unified	CA	17,960	3,180	53.12%
81	Santa Ana Unified	CA	10,697	1,891	53.03%
82	Detroit City School District	MI	37,566	6,573	52.49%
83	Duval County School District	FL	27,385	4,703	51.52%
84	Fort Worth Independent School District	TX	16,623	2,834	51.15%
85	Pinellas County School District	FL	28,460	4,744	50.01%
86	Dallas Independent School District	TX	34,302	5,659	49.49%
87	New York City Public Schools	NY	229,507	37,851	49.48%
88	San Bernardino City Unified	CA	11,133	1,778	47.91%
89	Houston Independent School District	TX	47,598	7,421	46.77%
90	Baltimore City Public School System	MD	27,593	4,103	44.61%
91	Milwaukee School District	WI	21,949	3,247	44.38%
92	Columbus City School District	OH	15,285	2,207	43.32%
93	Atlanta City School District	GA	14,584	2,087	42.93%
94	Oakland Unified	CA	11,581	1,633	42.30%
95	Cleveland City School District	OH	17,859	1,581	26.56%
96	Cincinnati City School District	OH	12,520	1,096	26.26%

Sources:

U.S. Department of Education. National Center for Education Statistics. Characteristics of the 100 Largest Public Elementary and Secondary School Districts in the United States: 1995-96, NCES 98-214, by Beth Aronstamm Young. Washington DC: 1998. Appendix G.

U.S. Department of Education, National Center for Education Statistics. Characteristics of the 100 Largest Public Elementary and Secondary School Districts in the United States: 1998-1999, NCES 2000-345, by Beth Aronstamm Young. Washington DC: 2000. (Table 3.)