

THE TOOLBOX REVISITED

Paths to Degree Completion from High School Through College

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Table 5. Bachelor's degree attainment rate by highest level of mathematics reached in high school by 1982 and 1992 12th-graders

<u>Level of math</u>	Class of 1982		Class of 1992	
	Percentage reaching this level of math	Earned bachelor's	Percentage reaching this level of math	Earned bachelor's
Calculus	5.2 (0.36)	82.1 (2.45)	9.7 (0.54)	83.3 (2.72)
Precalculus	4.8 (0.37)	75.9 (2.43)	10.8 (0.65)	74.6 (2.04)
Trigonometry	9.3 (0.51)	64.7 (2.32)	12.1 (0.81)	60.0 (3.32)
Algebra 2	24.6 (0.75)	46.4 (1.54)	30.0 (1.08)	39.3 (2.31)
Geometry	16.3 (0.65)	31.0 (1.92)	14.2 (0.87)	16.7 (1.87)
Algebra 1	21.8 (0.69)	13.4 (1.33)	16.5 (0.92)	7.0 (1.24)
Pre-algebra	18.0 (0.66)	5.4 (1.19)	6.7 (0.53)	3.9 (1.34)

NOTES: Standard errors are in parentheses. The columns for level of math may not add to 100.0 percent due to rounding.

SOURCES: National Center for Education Statistics: High School & Beyond/Sophomore Cohort (NCES 2000-194) and NELS:88/2000 Postsecondary Transcript Files (NCES 2003-402 and Supplement).

The balance of the table takes each level of high school mathematics, and runs a logistic regression *for that level*, with bachelor's degree completion as the dependent variable, and SES quintile as the sole control. For the class of 1982, reaching calculus in high school increased the odds of earning a bachelor's degree by a very impressive 8.18 to 1. For the class of 1992, the odds ratio for calculus was still in the same range at 7.52 to 1. The parameter estimates for the calculus line are almost identical (2.102 versus 2.018). These are consistent results.

When one looks at the columns in table 7 for the class of 1982, one notices that the sign of the parameter estimate moves from negative to positive territory between geometry and Algebra 2, and the value of the parameter estimate rises above 1.0 between Algebra 2 and trigonometry. The odds ratio more than doubles in each of those steps, but only in the step between Algebra 2 and trigonometry (the "one step beyond") is the parameter also positive. For the class of 1992, all those relationships move up one rung on the "math ladder," principally because a higher percentage of this group (than the percentage for the class of 1982) reached precalculus or calculus while a lower percentage failed to get as far as Algebra 2. The critical boundary for math momentum now lies firmly beyond Algebra 2.

But therein lies the rub, for not everyone has the chance to reach beyond Algebra 2. Differential lack of opportunity-to-learn was a major theme in the original *Tool Box* and is just as prominent a theme in this study of a cohort a decade later. Table 6 illustrates this unhappy situation. It asks what proportion of students—by race/ethnicity and socioeconomic status quintile—attended high schools that offered key math courses beyond Algebra 2.