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An Addendum to the Math Placement Tests: Relationships to Mathematics Course Performance, Mathematics Course Selection, and Other Predictors of Academic Achievement

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An Addendum to
The Math Placement Tests:
Relationships to Mathematics Course
Performance, Mathematics Course Selection,
and Other Predictors of
Academic Achievement

Report 1991-06a

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Introduction

The sample of students whose records were analyzed in the Math Placement Test study published by the Office of Institutional Assessment and Testing earlier this month contained very few students who had taken the Basic Algebra level of the placement test. Therefore, another sample of students was drawn to in order to investigate the relationship of Basic Algebra Test scores to final mathematics course grade and to predict the probability a student has of passing (receiving a grade of C- or better) Math 102 or Math 151 depending upon the score he or she earned on the Basic Algebra Test.

Relationship of Basic Algebra Test Score to Course Grade and Other Predictors of Academic Achievement

The sample consisted of 287 Western Washington University students who had taken the Basic Algebra Test and enrolled in a mathematics course at Western. Scores on the Basic Algebra Test ranged from a low of 5 to a high of 45, with an average score of 23.34. The majority of these students enrolled in Math 102 (259 out of 287 or 90.2 percent). Another 25 students enrolled in Math 151 (8.7 percent). One student enrolled in Math 103 and two enrolled in Math 197.

Students who took the Basic Algebra Test had WPCT-Q scores ranging from 28 to 69, with an average score of 44.59. The SAT-M scores of these students ranged from 280 to 610, with an average of 419.

Both WPCT-Q and SAT-M were moderately positively correlated with the Basic Algebra Test. The relationship between a student's Basic Algebra Test score and his or her WPCT-Q score was $r = .49$. The relationship between a student's Basic Algebra Test score and his or her SAT-M was $r = .55$.

High school grade point averages of students who took the Basic Algebra Test ranged from 2.12 to 3.70, with an average high school GPA of 2.98. Scores on the Basic Algebra Test had a relatively weak, though statistically significant, positive relationship with high school GPA ($r = .18$).

Students Who Took the Basic Algebra Test and Enrolled in Math 102

The ability of various indicators of academic achievement, including Basic Algebra Test score, WPCT-Q score, SAT-M score, and high school GPA, to predict final course grade in Math 102 was investigated. WPCT-Q emerged as the best predictor of final Math 102 grade ($R^2 = .22$). Basic Algebra Test score significantly improved the accuracy of prediction of final grade to $R^2 = .44$. The combination of WPCT-Q and Basic Algebra Test

score accounted for 44 percent of the variability in final Math 102 grade.

Students Who Took the Basic Algebra Test and Enrolled in Math 151

The ability of a student's Basic Algebra Test score, WPCT-Q score, SAT-M score, and his or her high school GPA to predict his or her final course grade in Math 151 was assessed. None of these indicators of academic achievement significantly aided the prediction of final Math 151 grade.

Probability of Receiving a Passing Grade

Students Who Took the Basic Algebra Test and Enrolled in Math 102

Of the 259 students in our sample who took the Basic Algebra Test and enrolled in Math 102, 40.5 percent received a passing grade of C- or better. The other 59.5 percent either received a failing grade or withdrew from the course.

Although the current cut-off score on the Basic Algebra Test for admission into Math 102 is 16, 34 students in our sample enrolled in Math 102 with a lower placement test score. The percentage of these students who passed the course was less than 25 percent. Students who scored between 16 and 18 on the test had only a 28.2 percent chance of passing Math 102. The probability of passing Math 102 hovers around 25 percent until Basic Algebra Test scores reach 25 to 27, at which point 52.7 percent of students earned passing grades. It is not until the 34 through 36 score interval that the percentage of students passing Math 102 reaches an acceptable level (70.6 percent earned a grade of C- or better, see Figure 1). Based on these analyses, the current cut-off score of 16 is too low resulting in too many students failing to successfully complete the course.

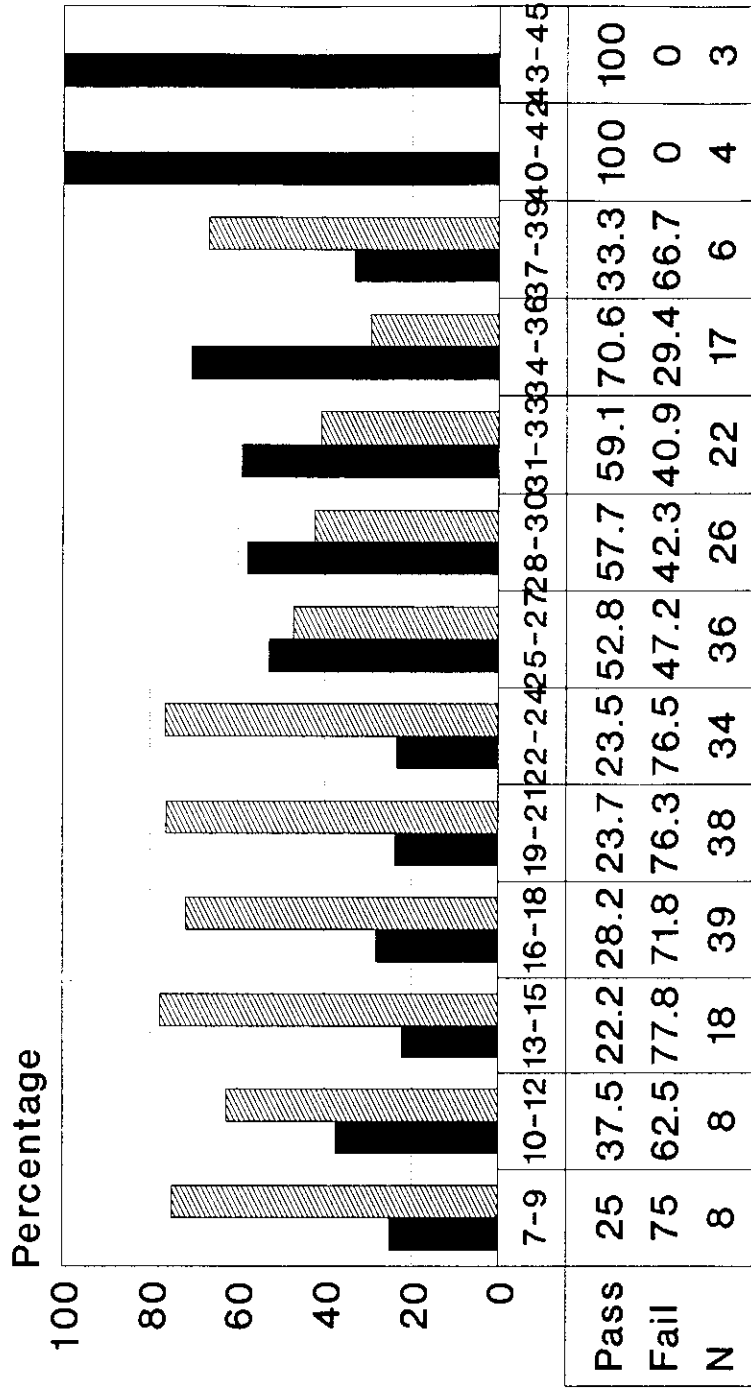
Students Who Took the Basic Algebra Test and Enrolled in Math 151

Of the 25 students in our sample who took the Basic Algebra Test and enrolled in Math 151, 92.0 percent earned a passing grade of C- or better. Only 8.0 percent failed or withdrew from the course.

The current cut-off score on the Basic Algebra Test for admission into Math 151 is 16. The majority of students in our sample who enrolled in Math 151 passed the course, regardless of their score on the placement test (see Figure 2). Those with very low scores were in most cases just as likely to pass the course as others with higher scores. All students whose scores

on the Basic Algebra Test exceeded the cut-off score passed the course.

FIGURE 1 : BASIC ALGEBRA TEST
Test score intervals and course # 102

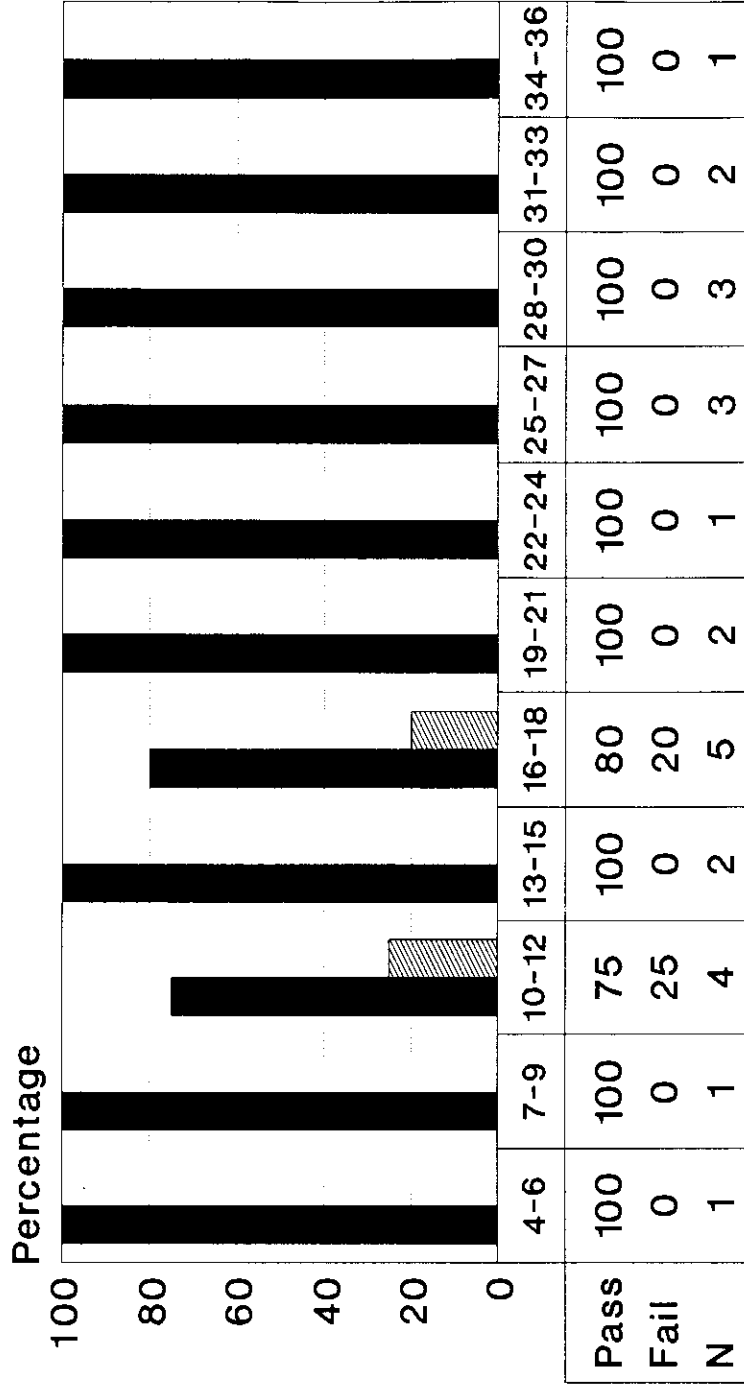


Score intervals

Pass Fail

*current cut-off score is 16

FIGURE 2 : BASIC ALGEBRA TEST
Test score intervals and course # 151



Score intervals

■ Pass ▨ Fail

*current cut-off score is 16