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**Using the PSAT/NMSQT  
and Course Grades in  
Predicting Success in the  
Advanced Placement  
Program<sup>®</sup>**

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**WAYNE J. CAMARA  
and ROGER MILLSAP**

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# Introduction

The PSAT/NMSQT, which measures developed verbal and quantitative reasoning, as well as writing skills generally associated with academic achievement in college, is administered each October to over two million students, the vast majority of whom are high school juniors and sophomores. The PSAT/NMSQT is taken by students planning to attend college and serves as a useful preparation for college admission tests such as the SAT®.

A revised PSAT/NMSQT was introduced in October 1993; among its changes were extended reading passages in the verbal section and student-produced response items and use of calculators in the math section. Scores on the PSAT/NMSQT were recentered in 1994 (Camara, in preparation). The verbal and mathematics subtests are quite similar to the SAT I: Reasoning Tests in terms of test content, format, and difficulty. Total testing time has been two hours (two 30-minute sections for verbal and mathematics reasoning), while the SAT requires three hours of testing (two 30-minute sections and one 15-minute section for verbal and mathematics reasoning each, as well as a 30-minute section used for pretesting of items and equating). In 1997, a writing skills measure was added to the PSAT/NMSQT increasing total testing time to 2 hours and 10 minutes and producing three separate scores, each of which is reported on a 20 to 80 scale: (1) verbal reasoning, (2) mathematical reasoning, and (3) writing skills.

Information from this test is used by high school counselors and educators to assist in advising students in college planning and high school course selection. The PSAT/NMSQT is also used in identifying semifinalists for the National Merit Scholarship Corporation. Information from the test can also be very useful for high schools in identifying additional students who may be successful in Advanced Placement (AP) Program® courses, and assisting schools in determining whether to offer additional AP courses.

AP courses provide an opportunity for students to complete college-level studies while still in secondary school and to receive advanced placement, credit, or both, in college. About 50 percent of the nation's 21,265 high schools offer AP courses. The number of courses varies from school to school with an average of more than five courses per school (College Entrance Examination Board, 1996). High schools that offer AP courses are confronted with the need to identify students who may be successful in these courses. As college-level courses, AP courses are intended for students who have already completed relevant secondary school work in the subject and have the skills and motivation to complete college-level course work during their high

school studies. Teacher recommendations, self-nomination, previous courses completed, grades in relevant previous high school courses, discussions with students, and scores on achievement tests are successfully used to varying degrees by schools to identify students for placement in AP courses. However, such procedures may not identify all students who can potentially benefit from AP courses and be successful in those courses.

Haag (1983) examined the relationship of PSAT/NMSQT test scores to performance on several AP Examinations. That study showed that there was a large spread of PSAT/NMSQT scores within each AP grade range, suggesting that students with differing levels of scholastic aptitude have successfully completed AP courses and examinations. However, that study was conducted for only 10 AP Examinations and with relatively small samples of students (less than 500) for the majority of the examinations.

## *Purpose of the Study*

This study attempts to both replicate the earlier study, using all of the AP Examinations,<sup>1</sup> and expand on that study by examining the relationship of other educational indicators in predicting performance on AP Examinations. Several issues not considered in the earlier study were examined in this effort. First, while a strong relationship between PSAT/NMSQT scores and AP Examination grades was found by Haag (1983), additional educational measures may be equally or more effective in predicting success on AP Examinations. For example, a student's previous course work, cumulative GPA, or grades in relevant courses may be related to success in AP Examinations. The basic question is "what combination of variables best predicts performance on AP Examinations?" The relationship of such educational measures to success in AP Examinations were explored for a subset of AP courses, as was the incremental validity contributed by such educational measures and scores from the PSAT/NMSQT.

Second, the time interval between PSAT/NMSQT and AP Examinations, as well as the student's grade level (i.e., sophomore, junior, senior) may also affect the relationship between these measures and the prediction equation. The PSAT/NMSQT is administered nationally in mid-October of each year, primarily to juniors, but also to an increasing proportion of sophomores.<sup>2</sup>

<sup>1</sup> There were 29 AP Examinations in 1995. Additional AP courses and Examinations have been created since then in International English (1997), Statistics (1997), and Environmental Science (1998); these examinations were not included in this study.

<sup>2</sup> In 1994, 535,000 sophomores and 1,145,000 juniors took the PSAT/NMSQT.

AP Examinations are administered in May of each year. PSAT/NMSQT scores should have a stronger relationship with AP Examinations when completed only seven months earlier (in the same academic year) than when completed 19 months earlier (in the preceding academic year). However, if PSAT/NMSQT scores are to be useful for secondary school placement decisions (such as AP placement) it is the latter relationship that will be of most interest since course scheduling is generally conducted at the end of the school year. However, October scores could be used for AP courses conducted in the spring for schools on a semesterized block schedule. This study examines whether the strength of the relationship between measures varies substantially when the PSAT/NMSQT is administered in the same year or the year preceding AP courses, when placement decisions can be aided.

A third issue is differences based on gender. Does the relationship between PSAT/NMSQT and AP Examination grades differ for males and females? This study further expands upon existing data by using PSAT/NMSQT scores based on changes introduced in 1993 and the recentered scale implemented in 1994.

## Method

This study examined the first two cohorts of students completing the new PSAT/NMSQT in October 1993 and October 1994. Sophomores and juniors completing the PSAT/NMSQT in either 1993 or 1994 were matched against the AP data files for 1993-94 and 1994-95 to determine if they completed one or more AP Examinations. Of the more than 3.5 million sophomores and juniors completing the PSAT/NMSQT in 1993 or 1994, 704,919 (approximately 20 percent) also completed one or more AP Examinations in 1993-94 or 1994-95. Next, records from these students were matched against the SAT I data base to obtain additional background and the high school reported grades and courses completed of these students. Students registering for the SAT I are asked to complete an extensive Student Descriptive Questionnaire (SDQ), which requests detailed information on their background, courses, grades, college and financial plans, and other related issues. This information would be important to supplement the limited student-level data collected through the PSAT/NMSQT and AP registrations. Of the 704,919 students completing both the PSAT/NMSQT and AP Examinations during the specified time periods, 501,469 (71 percent) also completed the SDQ prior to September 1995.

Therefore, two overlapping populations were used for all subsequent analyses. First, the 704,919 students who completed both the PSAT/NMSQT and one or more AP Examinations were used to examine the relationship between these measures. Several scores from the PSAT/NMSQT were correlated with AP Examination grades for each course: (1) Verbal Reasoning, (2) Mathematics Reasoning, (3) Sum of Verbal + Mathematics and (4)  $2 \times$  Verbal + Mathematics (2V+M, the selection index used for determining eligibility for scholarships by the National Merit Scholarship Corporation).<sup>3</sup> The best predictor from the PSAT/NMSQT was then selected for each AP Examination to compute expectancy tables that illustrate the proportion of students within specified score ranges on the PSAT/NMSQT who achieved a grade of  $\geq 3$  or  $\geq 4$  on the AP Examination. AP grades of 3 and 4 were selected for these analyses because nearly all colleges and universities require an AP Examination grade of 3 or 4 for awarding credit and/or advanced placement in college courses.

Seventy-one percent of these students ( $n = 501,469$ ) also completed a SDQ when registering for the SAT by September 1995. In addition to test scores, information on these students' cumulative high school grades, average grades for courses in a subject area (e.g., English, Natural Science), and number of years of high school courses completed or planned to complete in a specific subject (e.g., Spanish, Calculus) or subject area (e.g., mathematics, foreign language) were also considered in correlational analyses and multiple regressions. Finally, several potential groups of students were identified based on their grade level and time between testing. Table 1 illustrates the differences in the cohorts of students completing the PSAT/NMSQT in 1993 and 1994 and the AP Examinations in 1994 and 1995. All PSAT/NMSQT scores are reported on the recentered scale that was introduced in 1994.

The relationship between performance on the PSAT/NMSQT and AP Examinations could be moderated by the time interval (7 or 19 months), the student's grade level (i.e., sophomore, junior, or senior), or an interaction of these two factors. Preliminary analyses were planned to examine the effects of each of these factors using data on a sample of AP Examinations.

<sup>3</sup> Beginning in 1997, the selection index used by the National Merit Scholarship Corporation for determining semifinalists is verbal score + mathematics score + writing skills score (V+M+W).

TABLE 1

**Cohort of Students Completing AP Examinations in 1994 and 1995**

<i>Cohort</i>	<i>PSAT/NMSQT Date/Grade Level</i>	<i>AP Date/Grade Level</i>	<i>Graduating Class</i>	<i>Time Interval Between PSAT/NMSQT and AP</i>
1a	Oct. 1993/ Jr.	May 1994/Jr.	1995	7 months
1b	Oct. 1993/Jr.	May 1995/Sr.	1995	19 months
2a	Oct. 1993/Soph.	May 1994/Soph.	1996	7 months
2b	Oct. 1993/ Soph.	May 1995/Jr.	1996	19 months
2c	Oct. 1994/Jr.	May 1995/Jr.	1996	7 months
3	Oct. 1994/Soph.	May 1995/Soph.	1997	7 months

## Analyses and Results

### *Strength of the Relationship Between AP Examination Grades and PSAT/NMSQT Scores*

Product-moment correlations were computed between the four possible scores from the PSAT/NMSQT and each AP Examination. Table 2 reports results from these correlational analyses conducted on the entire population of students completing both measures. There is a strong and consistent relationship between PSAT/NMSQT scores and AP Examination grades for nearly all courses.

The highest correlations between the PSAT/NMSQT scores and AP grades vary by AP Examination. Table 2 illustrates that 2V+M and PSAT/NMSQT math each correlate most strongly with grades from eight AP Examinations. PSAT/NMSQT verbal has the strongest relationship with four AP Examinations and V+M has the strongest relationship with five examinations. Table 3 provides an overview of correlations across AP Examinations. The PSAT/NMSQT 2V+M scale is not included in Table 3 because it was determined that fewer score scales should be employed in developing expectancy tables in order to reduce the probability of error and confusion among test users.

Table 3 shows that the relationships between four of the 29 AP Examinations and PSAT/NMSQT test scores are too low to be useful. Two of these four AP Examinations are language tests. It is very probable that correlations based on the total sample of students completing AP Examinations in language are low because a substantial proportion of these students may be native speakers.<sup>4</sup>

<sup>4</sup> For German language and Spanish language exams, we do not provide expectancy tables. For French language, the correlation is lower than other AP subject areas. This effect might also reduce the correlations for Spanish and French literature.

If correlations were computed on only those students reporting English as their primary language it is likely results would be similar to those found across other AP Examinations. Of the remaining 25 AP Examinations, 17 examinations have a correlation of greater than .50 with one PSAT/NMSQT scale, with median and mean correlations across all examinations of .52 or higher. Sample sizes ranged from 1,588 (French literature) to 190,512 (U.S. History) and averaged 33,078 across all examinations.

TABLE 2

### **Correlations of PSAT/NMSQT Scores with AP Examination Grades**

<i>AP Art History</i>					
<i>PSAT/NMSQT Score</i>	<i>Mean (sd)</i>	<i>Total</i>	<i>Male</i>	<i>Female</i>	
Verbal Score	52.501 (10.468)	.484	.446	.509	
Math Score	55.880 (10.588)	.360	.352	.392	
V + M	108.381 (18.630)	.476	.452	.506	
2V + M	160.882 (28.306)	.493	.462	.520	
n	—	6,039	2,236	3,803	
<i>AP Biology</i>					
<i>PSAT/NMSQT Score</i>	<i>Mean (sd)</i>	<i>Total</i>	<i>Male</i>	<i>Female</i>	
Verbal Score	52.062 (10.215)	.540	.510	.568	
Math Score	57.680 (10.196)	.568	.527	.577	
V + M	109.741 (18.096)	.625	.586	.641	
2V + M	161.803 (27.562)	.610	.573	.630	
n	—	72,241	32,733	39,508	
<i>AP Calculus AB</i>					
<i>PSAT/NMSQT Score</i>	<i>Mean (sd)</i>	<i>Total</i>	<i>Male</i>	<i>Female</i>	
Verbal Score	51.301 (10.018)	.369	.368	.382	
Math Score	61.093 (8.349)	.558	.539	.561	
V + M	112.394 (16.082)	.520	.505	.524	
2V + M	163.695 (25.462)	.473	.463	.481	
n	—	94,114	48,987	45,127	
<i>AP Calculus BC</i>					
<i>PSAT/NMSQT Score</i>	<i>Mean (sd)</i>	<i>Total</i>	<i>Male</i>	<i>Female</i>	
Verbal Score	56.485 (10.954)	.325	.328	.336	
Math Score	68.234 (7.046)	.509	.490	.498	
V + M	124.720 (15.734)	.454	.445	.453	
2V + M	181.205 (26.182)	.409	.404	.413	
n	—	20,204	12,752	7,452	

<b>AP Chemistry</b>					
<b>PSAT/NMSQT Score</b>	<b>Mean (sd)</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>	
Verbal Score	53.184 (10.500)	.443	.436	.460	
Math Score	62.015 (9.417)	.586	.559	.587	
V + M	115.199 (17.542)	.580	.559	.586	
2V + M	168.383 (27.334)	.542	.525	.553	
n	—	44,581	25,995	18,586	

<b>AP Comparative Government and Politics</b>					
<b>PSAT/NMSQT Score</b>	<b>Mean (sd)</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>	
Verbal Score	54.008 (9.871)	.476	.457	.497	
Math Score	58.413 (10.421)	.370	.325	.392	
V + M	112.421 (17.949)	.477	.443	.497	
2V + M	166.429 (27.029)	.490	.461	.510	
n	—	6,157	3,296	2,861	

<b>AP Computer Science A</b>					
<b>PSAT/NMSQT Score</b>	<b>Mean (sd)</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>	
Verbal Score	51.494 (10.832)	.409	.412	.428	
Math Score	61.113 (9.454)	.551	.540	.555	
V + M	112.607 (17.813)	.541	.540	.543	
2V + M	164.101 (27.927)	.504	.504	.511	
n	—	8,308	6,429	1,879	

<b>AP Computer Science AB</b>					
<b>PSAT/NMSQT Score</b>	<b>Mean (sd)</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>	
Verbal Score	56.393 (10.727)	.422	.428	.437	
Math Score	66.917 (8.276)	.508	.502	.567	
V + M	123.310 (16.564)	.525	.525	.562	
2V + M	179.703 (26.765)	.496	.499	.523	
n	—	5,809	5,098	711	

<b>AP English Language</b>					
<b>PSAT/NMSQT Score</b>	<b>Mean (sd)</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>	
Verbal Score	52.192 (9.864)	.654	.661	.641	
Math Score	55.799 (10.550)	.490	.514	.469	
V + M	107.991 (18.076)	.643	.659	.630	
2V + M	160.183 (27.144)	.666	.678	.652	
n	—	63,408	38,686	24,722	

<b>AP English Literature</b>					
<b>PSAT/NMSQT Score</b>	<b>Mean (sd)</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>	
Verbal Score	52.851 (9.48)	.668	.654	.682	
Math Score	56.856 (10.315)	.464	.458	.501	
V + M	109.707 (17.616)	.631	.626	.659	
2V + M	162.559 (26.343)	.662	.654	.685	
n	—	126,072	45,950	80,122	

<b>AP European History</b>					
<b>PSAT/NMSQT Score</b>	<b>Mean (sd)</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>	
Verbal Score	54.646 (9.849)	.512	.497	.530	
Math Score	57.531 (10.059)	.416	.383	.425	
V + M	112.178 (17.463)	.528	.500	.542	
2V + M	166.824 (26.509)	.538	.514	.552	
n	—	58,491	28,411	30,080	

<b>AP French Language</b>					
<b>PSAT/NMSQT Score</b>	<b>Mean (sd)</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>	
Verbal Score	55.266 (10.610)	.349	.294	.376	
Math Score	59.383 (10.429)	.247	.181	.283	

V + M	114.648 (18.877)	.333	.266	.367	
2V + M	169.914 (28.794)	.347	.283	.379	
n	—	13,834	4,217	9,617	

<b>AP French Literature</b>					
<b>PSAT/NMSQT Score</b>	<b>Mean (sd)</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>	
Verbal Score	58.084 (10.669)	.442	.427	.456	
Math Score	61.426 (9.839)	.313	.263	.362	
V + M	119.510 (18.346)	.425	.392	.458	
2V + M	177.595 (28.345)	.441	.413	.468	
n	—	1,588	462	1,126	

<b>AP Latin Literature</b>					
<b>PSAT/NMSQT Score</b>	<b>Mean (sd)</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>	
Verbal Score	57.138 (9.995)	.463	.441	.488	
Math Score	61.700 (9.440)	.410	.396	.460	
V + M	118.838 (17.108)	.497	.476	.538	
2V + M	175.976 (26.383)	.498	.475	.533	
n	—	2,041	1,021	1,020	

<b>AP Latin Vergil</b>					
<b>PSAT/NMSQT Score</b>	<b>Mean (sd)</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>	
Verbal Score	56.585 (10.039)	.478	.471	.487	
Math Score	61.058 (9.623)	.417	.416	.450	
V + M	117.643 (17.349)	.508	.503	.529	
2V + M	174.227 (26.663)	.510	.504	.527	
n	—	3,878	2,042	1,836	

<b>AP Macroeconomics</b>					
<b>PSAT/NMSQT Score</b>	<b>Mean (sd)</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>	
Verbal Score	52.901 (10.223)	.472	.457	.501	
Math Score	60.109 (10.121)	.521	.487	.531	
V + M	113.061 (17.990)	.561	.534	.578	
2V + M	165.923 (27.453)	.544	.520	.564	
n	—	12,424	7,288	5,136	

<b>AP Microeconomics</b>					
<b>PSAT/NMSQT Score</b>	<b>Mean (sd)</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>	
Verbal Score	52.993 (10.123)	.459	.458	.466	
Math Score	60.421 (9.918)	.523	.501	.530	
V + M	113.414 (17.655)	.557	.543	.561	
2V + M	166.406 (27.018)	.536	.525	.541	
n	—	9,926	5,831	4,095	

<b>AP Music</b>					
<b>PSAT/NMSQT Score</b>	<b>Mean (sd)</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>	
Verbal Score	53.002 (10.994)	.336	.340	.329	
Math Score	58.340 (11.006)	.466	.448	.480	
V + M	111.342 (19.740)	.447	.436	.452	
2V + M	164.343 (29.999)	.417	.411	.418	
n	—	2,487	1,225	1,262	

<b>AP Physics B</b>					
<b>PSAT/NMSQT Score</b>	<b>Mean (sd)</b>	<b>Total</b>	<b>Male</b>	<b>Female</b>	
Verbal Score	53.138 (10.491)	.374	.377	.398	
Math Score	62.726 (8.796)	.520	.501	.513	
V + M	115.864 (16.812)	.505	.496	.512	
2V + M	169.003 (26.609)	.466	.461	.480	
n	—	19,846	12,822	7,024	



<i>AP Physics C: Mechanics</i>				
<i>PSAT/NMSQT Score</i>	<i>Mean (sd)</i>	<i>Total</i>	<i>Male</i>	<i>Female</i>
Verbal Score	55.074 (10.800)	.410	.407	.449
Math Score	66.193 (8.376)	.594	.570	.617
V + M	121.266 (16.906)	.556	.541	.584
2V + M	176.340 (27.106)	.510	.499	.543
n	—	9,784	7,183	2,601
<i>AP Physics C: Electricity and Magnetism</i>				
<i>PSAT/NMSQT Score</i>	<i>Mean (sd)</i>	<i>Total</i>	<i>Male</i>	<i>Female</i>
Verbal Score	56.481 (10.746)	.335	.345	.398
Math Score	67.971 (7.760)	.476	.448	.532
V + M	124.452 (16.209)	.461	.443	.509
2V + M	180.934 (26.386)	.426	.412	.475
n	—	4,887	3,728	1,159
<i>AP Psychology</i>				
<i>PSAT/NMSQT Score</i>	<i>Mean (sd)</i>	<i>Total</i>	<i>Male</i>	<i>Female</i>
Verbal Score	51.027 (9.878)	.558	.538	.567
Math Score	55.241 (10.681)	.499	.487	.516
V + M	106.267 (18.234)	.595	.580	.607
2V + M	157.295 (27.313)	.599	.582	.609
n	—	11,581	4,186	7,395
<i>AP Spanish Literature</i>				
<i>PSAT/NMSQT Score</i>	<i>Mean (sd)</i>	<i>Total</i>	<i>Male</i>	<i>Female</i>
Verbal Score	47.838 (13.024)	.313	.309	.326
Math Score	51.773 (13.399)	.229	.224	.262
V + M	99.611 (24.864)	.287	.284	.311
2V + M	147.449 (37.365)	.301	.297	.320
n	—	4,041	1,333	2,708
<i>AP U.S. Government and Politics</i>				
<i>PSAT/NMSQT Score</i>	<i>Mean (sd)</i>	<i>Total</i>	<i>Male</i>	<i>Female</i>
Verbal Score	52.315 (9.822)	.558	.536	.583
Math Score	57.080 (10.425)	.467	.418	.485
V + M	109.395 (17.928)	.577	.539	.598
2V + M	161.710 (26.928)	.587	.554	.601
n	—	34,679	17,158	17,521
<i>AP U.S. History</i>				
<i>PSAT/NMSQT Score</i>	<i>Mean (sd)</i>	<i>Total</i>	<i>Male</i>	<i>Female</i>
Verbal Score	53.900 (9.354)	.551	.528	.575
Math Score	58.972 (9.839)	.414	.366	.431
V + M	112.872 (16.853)	.548	.510	.567
2V + M	166.771 (25.422)	.566	.532	.586
n	—	190,512	87,524	102,988

When the 2V+M scale is eliminated, the strongest correlations are between the V+M scale and grades from ten AP Examinations, and the verbal and mathematics scales and seven and eight AP Examinations respectively. In addition, students completing AP Examinations have higher scores on the PSAT/NMSQT mathematics scale than they do on the verbal scale. This finding is consistent across all AP Examinations, including English, humanities, and language examinations, which have substantially stronger relationships with the verbal scale than the mathematics scale. Another distinct pattern that emerges is that correlations between PSAT/NMSQT math scores and AP math and science examinations appear stronger than correlations for AP Examinations where the PSAT/NMSQT verbal scale is the strongest predictor.

## *Strength of the Relationship Between AP Examinations and High School Courses and Grades*

The SDQ data were examined to determine their relationship to performance on specific AP Examinations. Table 4 provides the correlation of high school grades, grades in the subject, and number of courses completed in a subject with AP Examinations. High school grades are negatively coded so correlations with AP are negative.<sup>5</sup> Course grades reflect students' average self-reported grades in a subject area with A = 4, B = 3, C = 2, D = 1, and E/F = 0. Grades are reported separately for six broad subject areas: (1) Arts and Music, (2) English, (3) Foreign and Classical Languages, (4) Mathematics, (5) Natural Sciences (e.g., biology, chemistry, physics), and (6) Social Sciences and History (e.g., psychology, European history, government, economics). The number of courses in each of those six broad areas as well as specific subjects (e.g., algebra, Spanish, computer science) are also reported. For each AP Examination, only correlations with relevant courses and subject areas are reported. For example, on AP Art History, correlations with number of courses and grades in Arts and Music are reported, along with total grades, while correlations with Mathematics and Natural Sciences are not reported.

Overall, correlations of AP Examination grades with the strongest PSAT/NMSQT scores were consistently higher than correlations with high school grades and courses completed. The best predictor from the PSAT/NMSQT had an average correlation of .518 with the respective AP Examinations, while the next best pre-

<sup>5</sup> A+ = 1, A = 2, A- = 3, B+ = 4, B = 5, B- = 6, C+ = 8, C = 9, C- = 10, D = 11, and E/F = 12.

TABLE 3

## Correlations of AP Examinations with PSAT/NMSQT Scores

<i>AP Examination</i>	<i>sample size</i>	<i>PSAT/NMSQT V</i>	<i>PSAT/NMSQT M</i>	<i>PSAT/NMSQT V + M</i>
Art History	6,039	<b>.4838</b>	.3599	.4764
Biology	72,241	.5398	.5678	<b>.6246</b>
Calculus AB	94,114	.3689	<b>.5584</b>	.5197
Calculus BC	20,204	.3247	<b>.5087</b>	.4539
Chemistry	44,581	.4431	<b>.5858</b>	.5797
Comparative Government & Politics	6,157	<b>.4758</b>	.3704	<b>.4767</b>
Computer Science A	8,308	.4089	<b>.5508</b>	.5410
Computer Science AB	5,809	.4224	<b>.5083</b>	<b>.5247</b>
English Language	63,408	<b>.6537</b>	.4897	.6425
English Literature	126,072	<b>.6678</b>	.4641	.6311
European History	58,491	<b>.5120</b>	.4157	<b>.5282</b>
French Language	13,834	<b>.3494</b>	.2465	.3326
French Literature	1,588	<b>.4423</b>	.3128	.4249
German Language*	3,064	<b>.1196</b>	.0365	.0878
Latin Literature	2,041	<b>.4631</b>	.4100	<b>.4968</b>
Latin Vergil	3,878	<b>.4776</b>	.4167	<b>.5075</b>
Macroeconomics	12,424	.4718	<b>.5212</b>	<b>.5614</b>
Microeconomics	9,926	.4585	<b>.5232</b>	<b>.5569</b>
Music	2,487	.3361	<b>.4660</b>	.4471
Physics B	19,846	.3735	<b>.5199</b>	.5051
Physics C: Mechanics	9,784	.4099	<b>.5940</b>	.5561
Physics C: Electricity and Magnetism	4,887	.3516	<b>.4761</b>	.4610
Psychology	11,581	<b>.5583</b>	.4991	<b>.5948</b>
Spanish Language*	34,904	-.0063	-.0919	-.0545
Spanish Literature	4,041	<b>.3134</b>	.2287	.2874
Studio Art: Design*	4,026	.0899	<b>.1359</b>	.1269
Studio Art: Drawing*	1,892	.1182	<b>.1792</b>	.1667
U.S. Government and Politics	34,679	<b>.5581</b>	.4668	<b>.5772</b>
U.S. History	190,512	<b>.5513</b>	.4137	.5475

\* Correlations too low to be useful.

Bold number indicates highest correlation among PSAT/NMSQT scores.

Boxed number indicates one preferred model for estimating expected grades on AP Examinations from PSAT/NMSQT V, M, or V+M.

dictor was total high school grades with a mean correlation of only .267 for the same 25 AP Examinations.

The correlation of total grades was strongest for AP Psychology (.392), AP Biology (.345), AP Art History (.315), and two AP Economics Examinations (.303 and .299); however this was still well below the correlation with PSAT/NMSQT scores. The correlation of high school grades had moderate, but typically lower correlations with performance on a number of AP Examinations; correlations over .25 or more were found for 10 of the 29 areas.<sup>6</sup> The number of high school courses in related subjects had the lowest overall correlations with

AP Examinations. Most correlations were below .10 with no practical significance, and only Spanish courses and Art and Music courses related to AP Examination grades in those two subjects at .20 or above.

<sup>6</sup> The 10 areas included: AP Psychology, Government and Politics, U.S. History and European History (correlating with Social Science grades); AP Biology, Chemistry, and Physics C: Mechanics (correlating with Natural Science grades); AP Computer Science (correlating with Math grades); AP English Language and English Literature (correlating with English grades).

TABLE 4

**Means and Correlations of AP Examination Grades with High School Courses and Grades**

	<i>Mean</i>	<i>sd</i>	<i>n</i>	<i>Correlation with AP Score</i>
<b>Art History</b>				
AP Score	3.34	1.15	3,461	1.000
High School Grades*	3.22	1.53	3,366	-0.315
Art Courses	2.49	1.29	3,256	0.101
Art Grades**	3.86	0.37	3,123	0.145
<b>Biology</b>				
AP Score	3.27	1.27	38,315	1.000
High School Grades*	2.69	1.36	37,749	-0.345
Biology Courses	1.76	0.56	36,479	0.083
Natural Science Courses	4.31	1.37	37,859	0.139
Natural Science Grade**	3.70	0.49	37,594	0.330
<b>Calculus AB</b>				
AP Score	2.87	1.31	73,113	1.000
High School Grades*	2.48	1.27	72,185	-0.247
Math Grades**	3.73	0.47	72,042	0.247
Calculus Courses	1.01	0.40	66,370	0.130
Algebra Courses	1.46	0.65	69,332	-0.012
Total Math Courses	5.01	1.63	72,274	0.057
<b>Calculus BC</b>				
AP Score	3.51	1.35	15,229	1.000
High School Grades*	2.16	1.09	14,977	-0.208
Math Grades**	3.86	0.36	14,980	0.227
Calculus Courses	1.22	0.55	14,155	0.044
Algebra Courses	1.39	0.70	14,184	-0.003
Total Math Courses	5.37	2.06	14,986	0.045
<b>Chemistry</b>				
AP Score	3.00	1.29	23,187	1.000
High School Grades*	2.35	1.24	22,867	-0.287
Natural Science Courses	4.54	1.45	22,908	0.143
Natural Science Grades**	3.81	0.42	22,796	0.272
Chemistry Courses	1.78	0.54	22,120	0.108
<b>Comparative Government and Politics</b>				
AP Score	3.03	1.18	4,546	1.000
High School Grades*	2.83	1.46	4,496	-0.254
U.S. Government Courses	0.87	0.42	4,015	0.059
Total Social Science Courses	4.02	1.54	4,491	0.069
Social Science Grades**	3.75	0.46	4,467	0.243
<b>Computer Science A</b>				
AP Score	2.53	1.38	4,215	1.000
High School Grades*	2.91	1.62	4,140	-0.254
Computer Math Courses	0.92	0.95	3,188	0.045
Math Grades**	3.63	0.57	4,132	0.276
Total Math Courses	5.56	2.12	4,173	0.099
<b>Computer Science AB</b>				
AP Score	3.36	1.38	3,053	1.000
High School Grades*	2.70	1.52	3,005	-0.225
Computer Math Courses	1.11	1.03	2,383	-0.018
Math Grades**	3.74	0.50	2,992	0.218
Total Math Courses	5.96	2.22	3,011	0.062

\* Grades are negatively coded (A + = 1, A = 2, A - = 3...D = 11, E/F = 12).

\*\* A = 4, B = 3, C = 2, D = 1, E/F = 0.

<i>English Language</i>	<i>Mean</i>	<i>sd</i>	<i>n</i>	<i>Correlation with AP Score</i>
AP Score	3.06	1.07	27,637	1.000
High School Grades*	2.59	1.36	27,276	-0.279
English Language Courses	3.91	0.31	26,302	0.053
English Language Grades**	3.71	0.48	27,229	0.284
<i>English Literature</i>	<i>Mean</i>	<i>sd</i>	<i>n</i>	<i>Correlation with AP Score</i>
AP Score	3.21	1.09	101,838	1.000
High School Grades*	2.67	1.37	100,457	-0.279
English Literature Courses	3.91	0.33	96,141	0.057
English Literature Grades**	3.72	0.47	100,411	0.259
<i>European History</i>	<i>Mean</i>	<i>sd</i>	<i>n</i>	<i>Correlation with AP Score</i>
AP Score	3.25	1.09	21,198	1.000
High School Grades*	2.75	1.41	20,801	-0.262
European History Courses	1.00	0.41	19,009	0.071
Social Science Grades**	3.75	0.46	20,749	0.276
Total Social Science Courses	4.24	1.57	20,913	0.019
<i>French Language</i>	<i>Mean</i>	<i>sd</i>	<i>n</i>	<i>Correlation with AP Score</i>
AP Score	2.92	1.21	8,673	1.000
High School Grades*	2.66	1.29	8,456	-0.147
French Courses	3.84	0.47	8,122	-0.031
Language Grades	3.79	0.43	8,472	0.176
<i>French Literature</i>	<i>Mean</i>	<i>sd</i>	<i>n</i>	<i>Correlation with AP Score</i>
AP Score	3.26	1.30	1,045	1.000
High School Grades*	2.80	1.28	999	-0.224
French Courses	3.85	0.49	953	-0.020
Language Grades**	3.79	0.42	1,004	0.152
<i>Latin Vergil</i>	<i>Mean</i>	<i>sd</i>	<i>n</i>	<i>Correlation with AP Score</i>
AP Score	2.97	1.28	1,795	1.000
High School Grades*	2.56	1.30	1,747	-0.299
Latin Courses	3.73	0.53	1,692	0.103
Language Grades**	3.79	0.43	1,753	0.219
<i>Latin Literature</i>	<i>Mean</i>	<i>sd</i>	<i>n</i>	<i>Correlation with AP Score</i>
AP Score	2.89	1.33	1,073	1.000
High School Grades*	2.62	1.28	1,038	-0.226
Latin Courses	3.77	0.50	999	0.088
Language Grades**	3.79	0.44	1,043	0.178
<i>Macroeconomics</i>	<i>Mean</i>	<i>sd</i>	<i>n</i>	<i>Correlation with AP Score</i>
AP Score	3.09	1.26	9,128	1.000
High School Grades*	2.70	1.43	8,991	-0.299
Economics Courses	0.71	0.40	7,958	0.069
Total Social Science Courses**	3.71	0.48	8,941	0.250
Total Math Courses	4.80	1.77	8,994	0.110
<i>Microeconomics</i>	<i>Mean</i>	<i>sd</i>	<i>n</i>	<i>Correlation with AP Score</i>
AP Score	3.05	1.26	7,176	1.000
High School Grades*	2.70	1.44	7,064	-0.303
Economics Courses	0.75	0.42	6,262	0.048
Total Social Science Courses**	3.72	0.48	7,020	0.211
Total Math Courses	4.83	1.80	7,069	0.082
<i>Music Theory</i>	<i>Mean</i>	<i>sd</i>	<i>n</i>	<i>Correlation with AP Score</i>
AP Score	3.29	1.16	1,343	1.000
High School Grades*	3.10	1.66	1,309	-0.269
Art Courses	3.54	0.93	1,268	0.085
Art Grades**	3.97	0.17	1,287	0.064
Total Art Courses	4.62	1.74	1,328	0.132

\* Grades are negatively coded (A + = 1, A = 2, A - = 3...D = 11, E/F = 12).

\*\* A = 4, B = 3, C = 2, D = 1, E/F = 0.

<i>Physics B</i>	<i>Mean</i>	<i>sd</i>	<i>n</i>	<i>Correlation with AP Score</i>
AP Score	2.83	1.29	12,420	1.000
High School Grades*	2.49	1.30	12,256	-0.221
Total Math	5.07	1.98	12,255	0.098
Physics Courses	1.27	0.56	11,587	0.114
Total Natural Science Courses	4.26	1.36	12,267	0.117
Natural Sciences Grade	3.77	0.45	12,211	0.233
<i>Physics C: Mechanics</i>	<i>Mean</i>	<i>sd</i>	<i>n</i>	<i>Correlation with AP Score</i>
AP Score	3.31	1.34	7,916	1.000
High School Grades*	2.39	1.27	7,795	-0.266
Total Math Courses	5.28	2.00	7,799	0.096
Physics Courses	1.53	0.62	7,459	0.168
Total Natural Science Courses	4.49	1.50	7,805	0.150
Natural Science Grades**	3.82	0.41	7,771	0.260
<i>Physics C: Electricity &amp; Magnetism</i>	<i>Mean</i>	<i>sd</i>	<i>n</i>	<i>Correlation with AP Score</i>
AP Score	3.25	1.47	4,020	1.000
High School Grades*	2.37	1.26	3,945	-0.235
Total Math Courses	5.41	2.13	3,960	0.049
Physics Courses	1.65	0.63	3,820	0.119
Total Natural Science Courses	4.67	1.63	3,966	0.102
Natural Science Grades**	3.83	0.39	3,936	0.250
<i>Psychology</i>	<i>Mean</i>	<i>sd</i>	<i>n</i>	<i>Correlation with AP Score</i>
AP Score	3.42	1.22	6,991	1.000
High School Grades*	3.10	1.54	6,867	-0.392
Psychology Courses	0.90	0.47	6,066	-0.008
Total Social Science Courses	4.41	1.58	6,918	0.003
Social Science Grades**	3.64	0.52	6,848	0.284
<i>Spanish Language</i>	<i>Mean</i>	<i>sd</i>	<i>n</i>	<i>Correlation with AP Score</i>
AP Score	3.34	1.23	19,824	1.000
High School Grades*	2.88	1.52	19,494	0.012
Spanish Courses	3.66	0.74	18,445	-0.240
Language Grades**	3.78	0.44	19,441	0.107
<i>Spanish Literature</i>	<i>Mean</i>	<i>sd</i>	<i>n</i>	<i>Correlation with AP Score</i>
AP Score	3.41	1.08	2,512	1.000
High School Grades*	3.15	1.60	2,440	-0.240
Spanish Courses	3.60	0.77	2,283	-0.063
Language Grades**	3.77	0.44	2,426	0.203
<i>Studio Art: Design</i>	<i>Mean</i>	<i>sd</i>	<i>n</i>	<i>Correlation with AP Score</i>
AP Score	3.26	1.09	2,791	1.000
High School Grades*	3.82	1.76	2,711	-0.148
Art Courses	3.46	0.83	2,568	0.106
Art Grades**	3.94	0.25	2,729	0.066
<i>Studio Art: Drawing</i>	<i>Mean</i>	<i>sd</i>	<i>n</i>	<i>Correlation with AP Score</i>
AP Score	3.29	1.16	1,232	1.000
High School Grades*	3.80	1.76	1,204	-0.147
Art Courses	3.41	0.89	1,127	0.204
Art Grades**	3.93	0.26	1,206	0.058
<i>U.S. Government and Politics</i>	<i>Mean</i>	<i>sd</i>	<i>n</i>	<i>Correlation with AP Score</i>
AP Score	3.07	1.09	27,120	1.000
High School Grades*	2.72	1.43	26,804	-0.297
U.S. Government Courses	0.77	0.38	24,336	0.036
Total Social Science Courses	3.88	1.42	26,832	0.057
Social Science Grades**	3.74	0.46	26,631	0.281

\* Grades are negatively coded (A + = 1, A = 2, A - = 3...D = 11, E/F = 12).

\*\* A = 4. B = 3. C = 2. D = 1. E/F = 0.

<i>U.S. History</i>	<i>Mean</i>	<i>sd</i>	<i>n</i>	<i>Correlation with AP Score</i>
AP Score	3.09	1.12	68,804	1.000
High School Grades*	2.57	1.32	67,882	-0.275
U.S. History	1.14	0.42	65,066	0.045
Total Social Science Courses	3.90	1.47	68,089	0.050
Social Science Grades	3.75	0.46	67,600	0.298

\* Grades are negatively coded (A + = 1, A = 2, A - = 3...D = 11, E/F = 12).

\*\* A = 4, B = 3, C = 2, D = 1, E/F = 0.

Tables 5 through 7 illustrate the relationship between PSAT/NMSQT scores and AP Examination grades of greater than or equal to 3 and greater than or equal to 4. As noted earlier, AP grades are reported on a 1 to 5 scale with values of 3 or 4 most often used by colleges and universities for awarding credit or advanced placement. For most AP courses, students with moderate scores on the PSAT/NMSQT have a high probability of success on the examinations. For example, a majority of students with PSAT/NMSQT verbal scores of 46–50 received grades of 3 or above on nearly all of the 25 AP Examinations studied, while over one-third of students with scores of 41–45 achieved grades of 3 or above on five AP Examinations.

An additional constraint in correlating high school grades and AP Examination grade is the restriction in range found in estimated high school grade-point average (i.e., total grades), and grades in specific high school subject areas (e.g., mathematics, science) for students in this sample, but also for college-bound students generally. Over 37 percent of college-bound students reported an average high school GPA of A in 1997, compared to only 28 percent in 1987 (College Entrance Examination Board, 1997). Students completing AP Examinations are among the most highly motivated and highest ability students nationally. Table 4 illustrates that the mean high school grades were between A and A- for AP students completing 23 of the 29 AP Examinations.

There are substantial variations across AP subjects that must be considered. For example, a smaller proportion of students with PSAT/NMSQT mathematics scores below 56 attained scores of 3 or above on AP Physics and Chemistry Examinations than for most other AP Exams, while a larger proportion of students with PSAT/NMSQT verbal scores of 41 and above reached grades of 3 or higher on AP Art History, Psychology, and English Literature Examinations.

## *Effects of Time Interval Between Testings*

The next set of analyses examined the effects of the time interval between completion of the PSAT/NMSQT and

AP Examination (7 or 19 months). That is, are there statistical, and more important, practical differences between correlations of assessments completed in the same school year (seven-month interval) versus the preceding school years (19-month interval)? AP Examinations in U.S. History, English Literature, and Calculus AB were selected because the largest number of students complete these examinations each year, providing adequate samples for subgroup analyses. In addition, these examinations represent slightly different curriculum areas in high schools.

Table 8 illustrates the correlations between PSAT/NMSQT scores and AP Examination grades in these three subjects. The 19-month interval includes cohorts 1b, 2b, and 3 from Table 1, while the 7-month interval includes cohorts 1a, 2a, and 2c. Correlations for males, females, and total test takers in each group were tested for significance. For total test takers, there was a significant effect for AP U.S. History but in the opposite direction than expected. Correlations between PSAT/NMSQT and AP U.S. History grades were actually higher when there was a greater interval between testing,  $r = .490$  (19-month interval) versus  $r = .446$  (7-month interval) (significant at  $p > .001$ ). This effect was found separately for both males and females. However, there was no significant difference for time interval between assessments for AP English Literature or AP Calculus AB. There was a significant effect for females on the math examination ( $p > .05$ ), but when examining the magnitude of correlations for practical significance it is evident that there is no practical difference attributed to time interval.

The primary reason for conducting these analyses was to determine whether separate analyses would be required for students completing the PSAT/NMSQT a year prior to the AP Examination. If correlations were consistently stronger for students completing both assessments in the same year, then results based on the total test takers would overestimate the strength of the relationship for students completing the PSAT/NMSQT one year prior to the AP Examination. Because we are most interested in determining the utility of using PSAT/NMSQT test scores in assisting with placement decisions in AP courses, the cohort with a 19-month time interval is of most interest.

TABLE 5

**AP Examinations Using PSAT/NMSQT Verbal Scores:  
Percentage of Students with a Particular Verbal Score  
Receiving an AP Grade at or Above 3 or 4**

PSAT/NMSQT V Score	AP Grade		n
	3	4	
80-76	100.0	90.4	52
75-71	97.9	81.7	235
70-66	93.8	72.6	391
65-61	92.4	61.7	781
60-56	88.6	49.5	893
55-51	82.8	42.4	1,115
50-46	77.6	29.1	1,043
45-41	67.5	20.9	831
40-36	53.4	12.4	412
35-31	39.5	5.4	185
30-26	37.1	3.2	62
25-20	30.7	5.1	39
Total	—	—	6,039

**AP Comparative Government and Politics**

PSAT/NMSQT V Score	AP Grade		n
	3	4	
80-76	94.7	67.9	56
75-71	92.9	66.2	266
70-66	88.2	57.1	469
65-61	82.0	46.3	922
60-56	74.5	34.4	916
55-51	67.6	23.7	1,321
50-46	53.9	16.4	1,057
45-41	42.4	9.8	662
40-36	28.5	5.4	333
35-31	21.2	2.9	104
30-26	18.2	—	33
25-20	—	—	18
Total	—	—	6,157

**AP English Language**

PSAT/NMSQT V Score	AP Grade		n
	3	4	
80-76	99.3	91.7	446
75-71	97.9	85.4	1,826
70-66	95.9	73.0	3,763
65-61	90.3	58.8	7,784
60-56	77.7	39.1	9,031
55-51	66.5	23.9	12,922
50-46	48.0	10.9	12,363
45-41	28.2	3.6	8,206
40-36	12.6	1.0	4,501
35-31	4.8	0.6	1,797
30-26	2.8	1.0	512
25-20	2.4	1.2	257
Total	—	—	63,408

**AP English Literature**

PSAT/NMSQT V Score	AP Grade		n
	3	4	
80-76	99.6	95.5	485
75-71	99.2	91.3	3,652
70-66	97.9	82.5	7,275
65-61	95.8	69.9	16,211
60-56	90.6	52.9	17,774
55-51	80.4	35.3	26,880
50-46	62.2	17.7	25,267
45-41	39.4	7.0	16,063
40-36	20.2	2.1	8,117
35-31	6.8	0.8	3,060
30-26	3.8	0.6	888
25-20	2.6	0.3	400
Total	—	—	126,072

**AP European History**

PSAT/NMSQT V Score	AP Grade		n
	3	4	
80-76	98.7	83.9	799
75-71	97.8	78.0	2,533
70-66	95.7	64.1	5,030
65-61	90.8	51.6	8,965
60-56	83.2	38.1	9,688
55-51	75.4	28.3	11,742
50-46	65.0	19.5	9,740
45-41	51.7	11.2	5,854
40-36	37.2	6.5	2,758
35-31	25.3	3.0	971
30-26	23.0	4.1	270
25-20	17.0	7.8	141
Total	—	—	58,491

**AP French Language**

PSAT/NMSQT V Score	AP Grade		n
	3	4	
80-76	96.3	74.1	212
75-71	91.9	68.2	864
70-66	84.8	53.4	1,404
65-61	79.2	44.9	2,256
60-56	67.7	33.0	2,075
55-51	61.0	26.9	2,574
50-46	53.1	22.3	2,084
45-41	45.5	20.4	1,243
40-36	43.6	21.8	661
35-31	44.6	28.8	278
30-26	—	—	105
25-20	—	—	78
Total	—	—	13,834

**AP French Literature**

PSAT/NMSQT V Score	AP Grade		n
	3	4	
80-76	97.6	85.7	42
75-71	96.6	78.2	175
70-66	92.0	66.5	201
65-61	81.0	54.3	305
60-56	70.3	39.6	225

<i>AP French Literature (cont.)</i>			
<i>PSAT/NMSQT V Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
55-51	66.4	31.2	271
50-46	53.6	21.2	177
45-41	47.4	13.4	97
40-36	31.6	7.7	60
35-31	—	—	19
30-26	—	—	9
25-20	—	—	7
Total	—	—	1,588

<i>AP Latin Literature</i>			
<i>PSAT/NMSQT V Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
80-76	90.7	68.8	32
75-71	88.1	60.5	185
70-66	86.5	56.5	230
65-61	75.0	40.1	384
60-56	62.4	26.4	314
55-51	51.3	18.5	355
50-46	50.4	14.5	302
45-41	38.8	8.6	139
40-36	27.7	1.5	65
35-31	18.5	—	27
30-26	—	—	5
25-20	—	—	3
Total	—	—	2,041

<i>AP Latin Vergil</i>			
<i>PSAT/NMSQT V Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
80-76	93.8	80.0	65
75-71	89.8	67.6	306
70-66	86.2	57.5	442
65-61	77.7	43.6	660
60-56	68.0	31.8	616
55-51	57.2	23.5	697
50-46	50.6	17.7	554
45-41	36.0	6.7	345
40-36	27.6	8.2	134
35-31	17.1	4.3	47
30-26	—	—	5
25-20	—	—	7
Total	—	—	3,878

<i>AP Psychology</i>			
<i>PSAT/NMSQT V Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
80-76	98.0	94.1	51
75-71	98.1	92.5	266
70-66	97.6	86.8	554
65-61	95.1	79.0	1,326
60-56	91.0	67.9	1,479
55-51	84.9	55.2	2,306
50-46	73.6	42.3	2,272
45-41	59.3	27.7	1,742
40-36	42.1	16.5	1,009

<i>AP Psychology (cont.)</i>			
<i>PSAT/NMSQT V Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
35-31	28.1	9.2	380
30-26	15.0	4.5	133
25-20	20.7	4.8	63
Total	—	—	11,581

<i>AP U.S. History</i>			
<i>PSAT/NMSQT V Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
80-76	95.1	83.0	1,480
75-71	93.6	78.2	5,448
70-66	87.7	66.5	11,863
65-61	80.3	54.3	23,977
60-56	68.1	39.6	28,211
55-51	59.9	31.2	38,472
50-46	47.4	21.2	36,164
45-41	35.0	13.4	24,278
40-36	23.8	7.7	13,165
35-31	14.7	4.8	5,167
30-26	9.6	2.9	1,543
25-20	7.8	2.4	744
Total	—	—	190,51

<i>AP U.S. Government and Politics</i>			
<i>PSAT/NMSQT V Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
80-76	98.2	84.6	162
75-71	97.4	81.8	1,083
70-66	94.7	69.0	2,084
65-61	90.1	55.8	4,523
60-56	82.7	43.4	4,699
55-51	74.0	32.7	7,160
50-46	59.9	19.5	6,752
45-41	42.8	11.0	4,540
40-36	27.1	5.3	2,325
35-31	15.8	2.6	912
30-26	12.0	2.6	308
25-20	6.9	2.3	131
Total	—	—	34,679

<i>AP Spanish Literature</i>			
<i>PSAT/NMSQT V Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
80-76	100.0	82.6	23
75-71	97.0	80.1	136
70-66	95.7	68.1	210
65-61	91.1	61.2	415
60-56	90.7	53.6	407
55-51	84.3	47.8	550
50-46	77.9	43.0	581
45-41	76.1	39.6	523
40-36	77.2	37.1	461
35-31	73.9	31.3	326
30-26	70.4	30.1	216
25-20	55.9	17.6	193
Total	—	—	4,041



TABLE 6

**AP Examinations Using PSAT/NMSQT Math Scores:  
Percentage of Students with a Particular Math Score  
Receiving an AP Grade at or Above 3 or 4**

*AP Calculus AB*

<i>PSAT/NMSQT M Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
80–76	97.1	87.0	2,539
75–71	92.1	71.7	9,846
70–66	82.1	52.2	17,984
65–61	68.3	33.8	23,844
60–56	52.9	19.9	17,286
55–51	38.2	11.0	11,011
50–46	24.5	5.3	6,873
45–41	15.6	2.8	3,051
40–36	9.1	2.0	1,175
35–31	6.0	1.3	383
30–26	9.2	4.6	109
25–20	—	—	13
Total	—	—	94,114

*AP Calculus BC*

<i>PSAT/NMSQT M Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
80–76	97.1	86.9	3,087
75–71	92.1	70.4	5,716
70–66	82.4	51.1	5,315
65–61	69.6	33.2	3,621
60–56	58.2	23.1	1,460
55–51	42.7	12.3	612
50–46	35.0	12.8	257
45–41	30.0	10.0	90
40–36	17.6	0.0	34
35–31	—	—	7
30–26	—	—	4
25–20	—	—	1
Total	—	—	20,204

*AP Chemistry*

<i>PSAT/NMSQT M Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
80–76	95.4	81.2	2,812
75–71	89.9	63.9	6,313
70–66	79.8	45.5	8,457
65–61	64.4	27.8	9,502
60–56	49.9	16.8	7,107
55–51	36.6	9.5	4,937
50–46	21.7	4.6	2,952
45–41	13.5	1.7	1,540
40–36	8.9	1.0	619
35–31	5.9	1.6	257
30–26	6.8	2.7	73
25–20	—	—	12
Total	—	—	44,581

*AP Music*

<i>PSAT/NMSQT M Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
80–76	96.3	82.7	110
75–71	93.1	64.9	259
70–66	90.3	62.7	359
65–61	84.8	53.3	428
60–56	76.5	41.3	395
55–51	71.5	33.5	316
50–46	64.9	28.0	268
45–41	47.4	20.6	194
40–36	28.4	8.4	95
35–31	36.4	15.9	44
30–26	—	—	16
25–20	—	—	3
Total	—	—	2,487

*AP Computer Science A*

<i>PSAT/NMSQT M Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
80–76	90.4	73.0	403
75–71	81.4	56.4	1,028
70–66	71.3	44.1	1,500
65–61	56.0	28.5	1,836
60–56	38.1	15.6	1,412
55–51	25.9	7.2	951
50–46	16.9	4.2	600
45–41	9.6	2.5	353
40–36	7.5	5.0	161
35–31	—	—	50
30–26	—	—	10
25–20	—	—	4
Total	—	—	8,308

*AP Computer Science AB*

<i>PSAT/NMSQT M Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
80–76	93.7	79.1	918
75–71	88.2	68.6	1,352
70–66	78.4	49.9	1,341
65–61	73.7	35.0	1,065
60–56	54.0	23.5	584
55–51	35.9	16.6	301
50–46	28.7	11.1	153
45–41	25.4	9.5	63
40–36	—	—	21
35–31	—	—	7
30–26	—	—	2
25–20	—	—	2
Total	—	—	5,809

*AP Macroeconomics*

<i>PSAT/NMSQT M Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
80–76	93.6	83.7	583
75–71	88.4	73.4	1,476
70–66	79.7	60.9	2,064
65–61	72.8	48.0	2,545

<i>AP Macroeconomics(cont.)</i>			
<i>PSAT/NMSQT M Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
60–56	60.8	36.5	1,955
55–51	48.0	25.8	1,511
50–46	35.4	15.3	1,122
45–41	19.2	11.7	691
40–36	14.9	7.1	309
35–31	9.0	2.7	112
30–26	2.1	—	48
25–20	—	—	8
Total	—	—	12,424

<i>AP Microeconomics</i>			
<i>PSAT/NMSQT M Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
80–76	85.4	78.1	503
75–71	87.8	69.7	1,141
70–66	79.9	54.6	1,733
65–61	74.1	43.7	2,052
60–56	61.5	30.4	1,583
55–51	51.9	21.6	1,200
50–46	37.8	11.5	882
45–41	29.3	8.0	503
40–36	16.9	3.7	219
35–31	10.4	2.6	77
30–26	3.2	—	31
25–20	—	—	2
Total	—	—	9,926

<i>AP Physics B</i>			
<i>PSAT/NMSQT M Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
80–76	95.4	76.6	1,120
75–71	88.5	58.4	2,929
70–66	77.2	42.0	4,265
65–61	64.1	27.1	4,603
60–56	51.2	16.6	3,043
55–51	40.0	9.8	1,961
50–46	28.8	4.6	1,076
45–41	19.0	3.6	551
40–36	13.7	1.0	204
35–31	1.4	1.4	69
30–26	9.0	4.5	22
25–20	—	—	3
Total	—	—	19,846

<i>AP Physics C: Electricity and Magnetism</i>			
<i>PSAT/NMSQT M Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
80–76	88.4	79.8	815
75–71	76.9	64.5	1,360
70–66	65.2	48.9	1,158
65–61	49.0	31.2	844
60–56	33.9	23.0	387
55–51	32.5	18.3	169
50–46	23.1	8.5	82
45–41	11.7	4.7	43
40–36	—	—	21

<i>AP Physics C: Electricity and Magnetism (cont.)</i>			
<i>PSAT/NMSQT M Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
35–31	—	—	6
30–26	—	—	2
25–20	—	—	—
Total	—	—	4,887

<i>AP Physics C: Mechanics</i>			
<i>PSAT/NMSQT M Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
80–76	95.9	88.3	1,219
75–71	89.9	70.0	2,341
70–66	79.6	50.7	2,244
65–61	63.3	32.3	1,877
60–56	45.8	17.6	1,066
55–51	34.3	12.1	531
50–46	19.7	3.9	284
45–41	13.5	3.4	149
40–36	8.0	4.0	50
35–31	—	—	15
30–26	—	—	6
25–20	—	—	2
Total	—	—	9,784

TABLE 7

**AP Examinations Using PSAT/NMSQT Verbal and Math Scores: Percentage of Students with a Particular Sum of Verbal and Math Scores Receiving an AP Grade at or Above 3 or 4**

<i>AP Biology</i>			
<i>PSAT/NMSQT V + M Score</i>	<i>AP Grade</i>		<i>n</i>
	<i>3</i>	<i>4</i>	
156–160	100.0	98.9	92
151–155	99.6	98.4	365
146–150	99.4	95.4	783
141–145	98.5	91.9	1,548
136–140	97.8	88.9	2,700
131–135	96.3	82.2	3,567
126–130	93.1	74.6	5,168
121–125	89.8	66.3	6,378
116–120	85.4	57.1	7,427
111–115	77.4	47.9	7,705
106–110	70.5	38.6	7,783
101–105	62.8	29.5	7,168
96–100	51.6	22.1	5,963
91–95	44.6	16.1	4,968
86–90	34.7	11.2	3,709
81–85	26.6	7.5	2,680
76–80	20.4	5.1	1,773
71–75	13.1	3.6	1,086
66–70	10.3	1.8	658
61–65	10.0	3.0	334
56–60	6.6	2.9	244
51–55	6.8	2.3	88
46–50	—	—	42
40–45	—	—	12

TABLE 8

**PSAT/NMSQT Correlations with AP Examination Grades by Time Interval Between Testings**

<i>interval</i>	AP U.S. History			AP Calculus AB			AP English Literature		
	<i>males</i>	<i>females</i>	<i>total</i>	<i>males</i>	<i>females</i>	<i>total</i>	<i>males</i>	<i>females</i>	<i>total</i>
19-month r	.475	.502	.490	.473	.483	.473	.601	.604	.603
n	31,511	38,804	70,315	39,113	37,875	76,988	39,503	69,638	109,141
7-month r	.425*	.465*	.446*	.481	.520**	.496	.589	.597	.594
n	47,193	53,912	101,105	5,395	3,444	8,839	1,700	2,861	4,561

\* Significant difference for 19- and 7-month interval,  $p > .001$

\*\* Significant difference for 19- and 7-month interval,  $p > .05$

Because the correlations between assessments for 19-month intervals are as strong or stronger than the correlations for two of the three tests, and all correlations are within .05 of each other, using results on total test takers will not overestimate the effects of using PSAT/NMSQT in making placement decisions for the next academic year. Therefore, examining total test takers without controlling for time between testing was appropriate for analyses conducted across all AP Examinations. Educators can use the results confidently with students who have taken the tests in different years or the same year.

### Multiple Regressions

PSAT/NMSQT score, estimated high school grade-point average, grades in related subjects (e.g., English, mathematics), and course grades (e.g., algebra, calculus, English literature) provide the best model for predicting AP Examination grades in the three examinations (AP U.S. History, AP Calculus AB, AP English Literature) investigated. Total years (number of courses) in the subject or related courses did not account for substantial additional variation. This was expected from the generally low correlations with AP Examination grades reported in Table 4 above.

Total grades, total years and grades in subject area courses, and specific courses were entered into separate linear multiple regressions for AP Examination grades in English Literature, U.S. History, and Calculus AB. Predictors were entered into the regressions in order of the amount of variance they accounted for. PSAT/NMSQT scores were entered in the first step of all regressions. Results are presented in Tables A1-A3 in the Appendix.

In AP Calculus AB, in addition to PSAT/NMSQT math score, eight additional predictors were included in the regression: total grades; grades in all math courses; number of years of math, geometry, algebra, calculus, precalculus, and trigonometry. These nine predictors

had a Multiple R of .5248 ( $F = 1,461.202$ ,  $F \text{ sig.} > .0001$ ) and accounted for 28 percent of the variance in AP Calculus AB grades. PSAT/NMSQT math score, total grades in high school, and grades in all math courses had the largest beta values and when entered as a block in a second linear regression accounted for 27 percent of the variance alone (Multiple R = .5229,  $F = 4,339.604$ ), with PSAT/NMSQT math scores accounting for 24 percent of the variance. AP Examination grades were generally not correlated with years of math courses (correlations ranged from .097 to -.001), but had moderate correlations with math grades.

In AP U.S. History a regression of PSAT/NMSQT verbal score, grades in social studies, and total grades provided the best model for predicting AP Examination grade (Multiple R = .5362,  $F = 8724.349$ ,  $F \text{ sig.} > .0001$ ), accounting for 29 percent of the variance. PSAT/NMSQT verbal score alone produced a Multiple R of .5053 with grades in social studies and total grades accounting for an additional 3.2 percent of the variance in AP Examination grades. Entering years of social studies, U.S. history, U.S. government, and English; total grades; and grades in English and social studies had no practical effect on the prediction and had low correlations (each below .09) with AP grade.

PSAT/NMSQT verbal score, grades in English, and total grades also accounted for 40 percent of the variance in predicting AP English Literature grades (Multiple R = .6313,  $F = 20,902.453$ ,  $F \text{ sig.} > .0001$ ), with years of English courses having little practical significance. PSAT/NMSQT accounted for 62 percent of the variance alone.

### Gender Differences

Table 8 illustrates that the correlations between assessments are stronger for females than males in these three AP Examinations, irrespective of time interval. Table 2, while not examining gender by time-interval differ-

ences, does illustrate that correlations between PSAT/NMSQT and all but one AP Examination are slightly higher for females than males. The outlier is AP Spanish Literature, which has a lower correlation with PSAT/NMSQT than other examinations for males and females alike. However, a stronger relationship between these assessments does not mean females are more likely to obtain higher AP grades given the same PSAT/NMSQT score. Gender differences on AP Examinations are discussed elsewhere (Willingham and Cole, 1997), but generally males' mean and median grades exceeded those of females on 18 of 25 AP Examinations in this study. Female performance exceeds male on AP Art History, AP English Language and English Literature, and four of the AP foreign language examinations.

### Ethnic Differences

Small sample sizes prevented us from examining differences among ethnic minority groups for many of the 25 AP Examinations. However, correlations of AP grades with PSAT/NMSQT scores were computed separately by gender for seven ethnic and racial groups on the same three large-volume AP Examinations. Table 9 below illustrates that, with the exception of American Indian and Puerto Rican groups, which have the smallest sample sizes, correlations are generally consistent across racial and ethnic groups.

The relationship between PSAT/NMSQT score and AP Examination grade is in fact stronger for minority groups than whites on 13 of 18 comparisons. The

female-male differences reported in Table 2 are still present in Table 9, and additional gender by ethnic differences exist in some instances. As noted earlier, there is a stronger relationship between measures among females than males for all AP Examinations except one.

## Using Expectancy Tables

Two considerations were involved in selecting the most appropriate PSAT/NMSQT score scale to be used in computing the following expectancy tables: (1) the size or strength of the correlation of various PSAT/NMSQT scores and AP Examinations, and (2) simplicity of use for educators. Because the purpose of the expectancy tables is to aid high school counselors and faculty in placement we felt varying the score scale across AP Examinations would create confusion among users and possibly increase the risk of misuse.

Therefore, either the verbal or mathematics scale from the PSAT/NMSQT was employed in 24 of the 25 expectancy tables for AP Examinations. Table 3 illustrates that V+M would actually provide a stronger predictor for 10 of the 25 AP Examinations, but the difference in correlations was marginal in all but one of these instances. Except in AP Biology, where the reduction was significant, the verbal or mathematics scale was selected for the expectancy tables. In these instances, using the verbal or mathematics scale will provide a slightly less accurate estimate of student success on AP Examinations than using the 2V+M or V+M scale scores.

TABLE 9

### PSAT/NMSQT Correlations by Ethnic/Racial Groups Within Gender

<i>ethnic/racial group</i>	AP U.S. History			AP Calculus AB			AP English Literature		
	<i>males</i>	<i>females</i>	<i>total</i>	<i>males</i>	<i>females</i>	<i>total</i>	<i>males</i>	<i>females</i>	<i>total</i>
Native American	.354 (341)	.418 (463)	.391 (804)	.380 (172)	.534 (142)	.450 (314)	.625 (194)	.672 (354)	.655 (548)
African American	.459 (2,547)	.473 (5,284)	.468 (7,831)	.501 (1,409)	.467 (2,165)	.480 (3,574)	.607 (1,495)	.623 (4,560)	.619 (6,055)
Mexican American	.438 (1,690)	.458 (1,959)	.449 (3,649)	.505 (960)	.473 (850)	.519 (1,810)	.651 (1,056)	.644 (1,776)	.647 (2,832)
Asian/Pacific Islander	.462 (10,718)	.501 (11,843)	.482 (22,561)	.528 (7,605)	.529 (7,013)	.529 (14,618)	.631 (4,847)	.656 (7,189)	.646 (12,036)
Puerto Rican	.462 (401)	.494 (530)	.480 (931)	.454 (186)	.460 (207)	.456 (393)	.542 (236)	.609 (391)	.584 (627)
Latino/Hispanic	.436 (1,893)	.462 (2,335)	.450 (4,228)	.475 (937)	.507 (851)	.490 (1,788)	.615 (928)	.659 (1,628)	.643 (2,556)
White	.418 (61,114)	.458 (70,346)	.440 (131,460)	.479 (33,239)	.493 (30,090)	.486 (63,329)	.588 (32,447)	.605 (56,601)	.599 (89,048)

However, this is offset by the simplicity gained in maintaining consistency among the PSAT/NMSQT scales employed for similar (e.g., science, humanities, languages) AP Examinations. Simplicity is also the principal reason that the 2V+M scale was not employed in any of the tables despite its having the highest correlation with eight of the AP Examinations.

Tables 5 through 7 report the proportion of students attaining grades of 3 or more and 4 or more on each AP Examination across the range of scores on the PSAT/NMSQT. The data in these analyses:

- Include all students who completed the PSAT/NMSQT in October 1993 or 1994 and subsequently completed an AP Examination in the spring of 1995 or 1996.
- Use recentered PSAT/NMSQT scores.
- Include students who completed the PSAT/NMSQT one year prior to enrolling in an AP course (about 70 percent of the sample) as well as students who completed the PSAT/NMSQT during the same year they completed the AP Examination. In the former case, there was a 19-month interval between tests and in the later, the interval was seven months.
- Demonstrate that the relationships (correlation coefficients) were similar for students who took both examinations during the same year, and for students who completed the PSAT/NMSQT a year prior to enrolling in AP courses.

PSAT/NMSQT scores can supplement existing procedures used by schools to identify additional students who may be successful in specific AP courses. However, PSAT/NMSQT scores should never be used as the sole, or even the primary, indicator. Schools should not establish minimum “cut scores” on the PSAT/NMSQT or any other assessment for placing students into AP courses—such practices are a clear misuse of assessment scores. Faculty and counselors should be cautious in using these tables. First, many students with PSAT/NMSQT scores that place them at the upper ranges of probable success (grades of 3 or higher) for a specific AP Examination may not have fulfilled the appropriate prerequisite courses and would clearly be unprepared for some AP courses.

Second, student performance (grades, teacher recommendations) in previous courses in the content area as well as motivation and interest will be key determinants of their success in AP courses and must be considered. Third, the sample of students used in the analysis was restricted to students who did complete an AP Examination. That is, while the sample of students was quite large, it did not include the even larger number of PSAT/NMSQT test takers who were not enrolled in AP courses, or who chose not to take the examination if en-

rolled. It is impossible to know how students would have performed on AP Examinations. It is quite likely that students who complete AP Examinations differ in meaningful ways from students who do not complete AP Examinations, even when they attain the same PSAT/NMSQT scores and complete the same courses with equal proficiency. Therefore, these tables have not been developed to provide the precise probability for an individual student’s attaining a specific AP Examination grade, but rather to provide the probability of success on AP Examinations for the group of students attaining PSAT/NMSQT scores within a given range.

In general, students with moderate PSAT/NMSQT scores are typically successful when completing many AP Examinations. Students who have completed the prerequisite secondary school courses and have not considered AP courses can be identified for further consideration by faculty and counselors with the use of performance data from the PSAT/NMSQT.

Use of these tables requires finding the appropriate AP Examination and determining which PSAT/NMSQT scale to use, identifying students’ respective scores on the appropriate scale, and finding the proportion who attained grades of 3 or more (or 4 or more if appropriate). Table 3 lists AP courses that use the PSAT/NMSQT verbal scale, mathematics scale, or both scales. There should be no absolute rules for interpreting or using these tables. For example, with U.S. History, you may use score ranges of 41–45, 46–50, or 51–55 to begin to identify potential students, because at these points sizable numbers of students have received grades of 3 or more in the past. Many students identified through this means may have already been considered for AP U.S. History through other procedures already instituted in the school (e.g., teacher recommendations). The use of the PSAT/NMSQT score range can help identify additional students who may be considered for the course. Counselors and teachers would need to determine if these students have had the appropriate prerequisite courses and would also need to consider their performance in these courses, as well as student interest and motivation for completing a rigorous college-level AP course. In essence, these tables cannot provide one-stop shopping in curriculum planning, but can serve as useful aids and supplements to other methods used in the school.

In some schools and for certain subjects, PSAT/NMSQT scores may not be available in time to make decisions about entry into AP courses. This is certainly the case where students complete the PSAT/NMSQT in October of their junior year and a full-year AP course is offered exclusively to juniors. In addition, scores obtained in eleventh grade cannot be

used if the mathematics or foreign language sequence begins in the eighth or ninth grades and students have not taken the required prerequisite courses. Of course, increasing proportions of students are completing the PSAT/NMSQT as sophomores and their scores can be helpful for placement in AP courses that begin after the receipt of student score reports.

## *Determining Whether AP Courses Can Be Offered in a School*

PSAT/NMSQT scores can also be useful for schools considering introducing AP courses as well as offering additional AP courses. Using PSAT/NMSQT score ranges, schools can quickly identify the number of students who may be successful in specific AP courses if these were offered or enrollment was expanded. Schools would first determine the appropriate proportion of students with a probability of achieving an AP grade of 3 or higher to offer or expand an AP course at their school. Some schools may employ a 50 percent success rate, while other schools may prefer a slightly lower or slightly higher proportion. The school would determine the number of students who attain the corresponding PSAT/NMSQT score and who would likely have completed the prerequisite courses and be interested in AP courses. This information can be extremely useful for schools considering offering additional AP courses, as well as those interested in offering additional AP sections of the same course.

## **Conclusion and Summary**

The relationship between AP Examination grades and PSAT/NMSQT scores is substantially stronger for 11 of the 12 subjects previously examined by Haag (1983). In addition, Haag examined a much smaller sample of only a few hundred students in 1982. The current study has shown that student performance on the PSAT/NMSQT can be useful in identifying additional students who may be successful in AP courses. PSAT/NMSQT scores can identify students who may not have been initially considered for an AP course through teacher nomination, self-nomination, or other local procedures.

Performance on the PSAT/NMSQT is not strongly related to AP grades on four examinations: (1) studio art: design, (2) studio art: drawing, (3) German language, and (4) Spanish language. The two studio art courses are graded exclusively with student-produced

portfolios and traditional examinations are not used. In addition, students completing the studio design courses report substantially lower total high school grades than students completing other AP Examinations (nearly one-half of a letter grade lower). As noted earlier, the relationship of PSAT/NMSQT scores with most language examinations also appears weaker than it is for other content areas and could be due to using a proportion of students fluent in the language. The lack of any relationship for Spanish language may be attributed to the very large proportion of students enrolled in this specific course who may have acquired language skills outside of the classroom (native speakers or students for whom Spanish is spoken at home).

The relationship of the PSAT/NMSQT scores with other AP Examination grades is moderately strong and invariant across ethnic groups and time of testing. That is, the relationship is substantially the same for all ethnic and racial groups and is only slightly weaker when time between testing spreads across two academic years. This is an important finding, because faculty and counselors will usually base placement decisions on information available from the previous academic year. Therefore, PSAT/NMSQT tests completed in the junior year can be a useful placement tool for decisions concerning senior year courses, and results from sophomore testing can be useful for course placement in junior and senior years.

The relationship between measures is consistently stronger for females than males on all but one AP Examination (AP Spanish Literature). However, males attain higher grades on 18 of 25 AP Examinations. Some gender by ethnic group differences are also based on the results from three high-volume AP Examinations.

Correlational analyses illustrate that PSAT/NMSQT scores, total high school grades, subject-related grades (e.g., math, social studies), and grades in specific high school courses (e.g., calculus, U.S. History) are related to performance on AP Examinations. Correlations between PSAT/NMSQT and AP grades are greater than .50 for 16 of 25 subjects and greater than .44 for 23 of these 25 subjects. The total number of high school courses in the subject or related subjects has no practical relationship with AP performance. Second, correlations of the number of related high school courses (e.g., math, science, English) completed and AP Examination grades are near zero for most subjects, but similar correlations with grades in those subjects are generally in the range of .35 to .40. Multiple regressions conducted on AP Calculus AB, U.S. History, and English Literature further illustrate that PSAT/NMSQT combined with total high school grades and grades in the subject (i.e., math, social studies, and English,

respectively) account for 27 to 40 percent of the variance in AP grades in these subjects. However, PSAT/NMSQT scores accounted for the greatest share of the variance with grades contributing an additional 1 to 2 percent of the variance.

Findings that total number of years studied in subjects related to AP Examinations had little or no relationship to AP Examination performance may be partially explained by the lack of variation among most students in courses completed. For example, students completing AP English Literature completed an average of 7.81 semesters of literature, composition, grammar, and journalism courses with a standard deviation of .643. In math, AP students completed an average of 7.85 semesters with a standard deviation of .569.

In conclusion, many factors should be considered in making course placement decisions. As explained above, students' previous courses (especially prerequisite courses) and grades (especially in more rigorous courses), student interest and motivation for completing a rigorous college-level AP course, and their interest in the specific subject area are all important factors to consider. Student performance on the PSAT/NMSQT can provide a useful supplement to these data and also permit the school to determine the potential for expanding existing AP offerings or introducing new courses.

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# Appendix

TABLE A1

## Linear Regressions of PSAT/NMSQT Score, Total Grades, and Subject or Course Grades in Predicting AP Examination Grades in Calculus AB

<i>predictor</i>	<i>B</i>	<i>SE B</i>	<i>BETA</i>	<i>T</i>	<i>Sig. T</i>
PSAT/NMSQT M	.2371	.0024	.4722	98.916	.0000
total grades	-.0608	.0037	-.0895	-16.602	.0000
math grades	.1063	.0099	.0581	10.721	.0000
constant	-.3376	.0451	-	-7.491	.0000
Multiple R	.5229				
R square	.2734				
standard error	.7191				
F	4339.604	F sig. > .0001			

TABLE A2

## Linear Regressions of PSAT/NMSQT Score, Total Grades, and Subject or Course Grades in Predicting AP Examination Grades in U.S. History

<i>predictor</i>	<i>B</i>	<i>SE B</i>	<i>BETA</i>	<i>T</i>	<i>Sig. T</i>
PSAT/NMSQT V	.2062	.0016	.4544	131.346	.0000
total grades	-.0415	.0025	-.0642	-16.448	.0000
grades in social studies	.2695	.0072	.1454	37.505	.0000
constant	-.3376	.0319	-	-11.510	.0000
Multiple R	.5362				
R square	.2847				
standard error	.7191				
F	8724.348	F sig. > .0001			

TABLE A3

## Linear Regressions of PSAT/NMSQT Score, Total Grades, and Subject or Course Grades in Predicting AP Examination Grades in English Literature

<i>predictor</i>	<i>B</i>	<i>SE B</i>	<i>BETA</i>	<i>T</i>	<i>Sig. T</i>
PSAT/NMSQT V	.2485	.0011	.5865	222.638	.0000
total grades	-.0379	.0018	-.0639	-20.884	.0000
grades in English	.1248	.0053	.0722	23.868	.0000
years of English	.0080	.0032	.0063	2.490	.0128
constant	-.0601	.0341	-	-1.787	.0740
Multiple R	.6314				
R square	.3986				
standard error	.6253				
F	15679.251	F sig. > .0001			