

USA: PERSPECTIVES ON

Admissions & Admissions Testing¹



ACT[®]

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Landscape of Colleges and College Enrollment in the U.S.

In 2014 approximately 2.9 million students graduated from U.S. high schools and over two-thirds of them enrolled immediately in post-secondary institutions. Four-year college matriculation rates have remained fairly stable since 1985 with about 4 out of every 10 graduates enrolling in college, while two-year college enrollment has increased by about 35 percent over the same period. However, females comprise over 54 percent of entering full-time freshmen and 57 percent of enrolled undergraduates, having overtaken males in 1980. The immediate college enrollment rate of high school completers from low-income families was 58 percent, 26 percentage points lower than the rate of high school completers from high-income families (84 percent). Enrollment gaps between Black and White graduates have closed (70 percent vs. 68 percent, respectively), while Asian Americans (91 percent) are more likely to enroll immediately in college and Hispanic students (65 percent) continue to have the lowest immediate enrollment rates (Snyder, de Brey, & Dillow, 2016).²

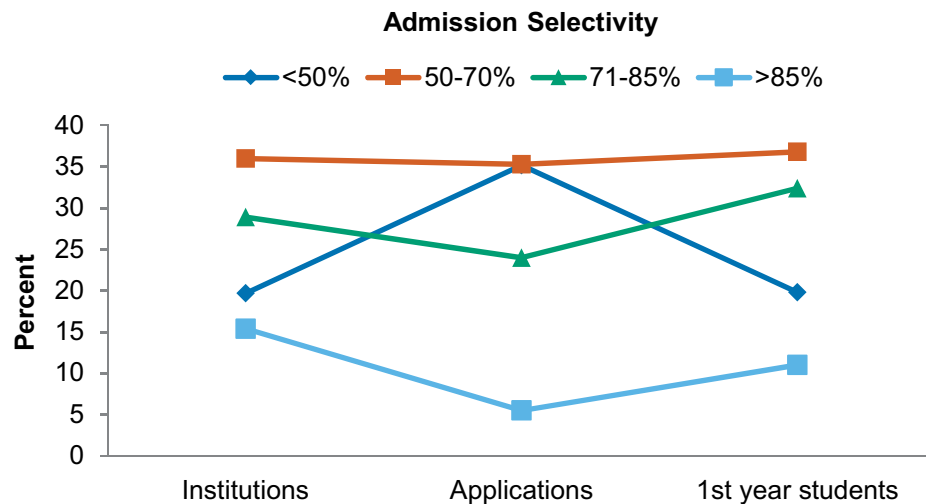
College admission in the United States has always been the subject of much controversy (Bowen and Bok, 1998, Fisher & Resnick, 1990; Shelton, 1997; Soares, 2011; Zwick, 2002, 2017). Though some may be concerned about reports that recent college graduates have trouble finding work and paying off their student loan debt (Stone, Horn, & Zukin, 2012; The Economist, 2014), the value of a degree, from both a financial and individual standpoint, has been well established. With higher levels of educational attainment, unemployment rates decrease and earnings and wealth accumulation increase (Boshara, Emmons, & Noeth, 2015; United States Department of Labor, 2017). Baum and Ma (2007) demonstrated that a full time employee without a college degree would earn on average approximately \$20,000 less per year than those with a college degree. College degree recipients also engage in more pro-social behaviors, such as volunteering, voting, and participating in political activities (Bowen and Bok, 1998; Goldberg and Smith, 2008).

The numbers are even more dramatic when recipients of advanced degrees are investigated. Lacey and Crosby (2004) estimated that obtaining a master's degree increased earnings for employees by approximately 21 percent compared to employees who completed similar work who had obtained only a bachelor's degree. Another recent report estimated that the average annual earnings for full-time employees with a bachelor's degree was approximately \$57,000 compared to full-time professional degree holders (e.g., MD, JD, DDS), who had an average annual salary of \$103,400 (Julian & Kominski, 2011). Another report estimated full-time employees with a bachelor's degree who worked full time throughout their adult lives would earn approximately \$2.4 million (in 1999 dollars). In contrast, employees holding a master's degree were estimated to earn \$2.8 million, while those with a doctorate (\$3.5 million) and professional degrees (\$4.2 million) were estimated to earn even more (Julian, 2012).

Given these benefits, it is not surprising that more students choose to enter into higher education institutions after high school and many aspire to earn graduate and professional degrees. Among ACT-tested students, 42% aspire to earn a bachelor's degree and 35% reported that they intended to earn a graduate or professional degree (ACT, 2016a). Colleges and universities have observed an increase in applications, due in part to the ease of submitting applications online. Whereas four-year institutions received only 49% of their applications online in 2005, they received 94% of their applications online in 2013 (Clinedinst,

Koranteng, & Nicola, 2016). For 14 consecutive years, over 60 percent of four-year institutions have seen an increase in applications according to the National Association for College Admission Counseling (NACAC) (Clinedinst, Hurley, and Hawkins, 2014). Students are also applying to an increasing number of colleges with about 36 percent of students applying to 7 or more colleges in 2015 compared to 9 percent in 1990 (Clinedinst, et al., 2016).

Although it is relatively easy to enter college in the United States, competition to enter selective four-year colleges and professional programs can be extremely high (Zwick, 2017). Media attention given to selective college admissions has focused on the most prestigious institutions, yet only 13% of four-year colleges are considered *most selective*, meaning they accept fewer than 50 percent of applicants (Zwick, 2017). In a recent NACAC survey, these institutions accounted for 35 percent of all applications but only 20 percent of freshmen (Clinedinst et al., 2016), as illustrated in Figure 1. Less selective institutions (admit >70 percent of applicants) comprise 44 percent of four-year colleges, 30 percent of applications, and 43 percent of enrolled freshmen.



Source: Clinedinst, Koranteng, & Nicola (2016)

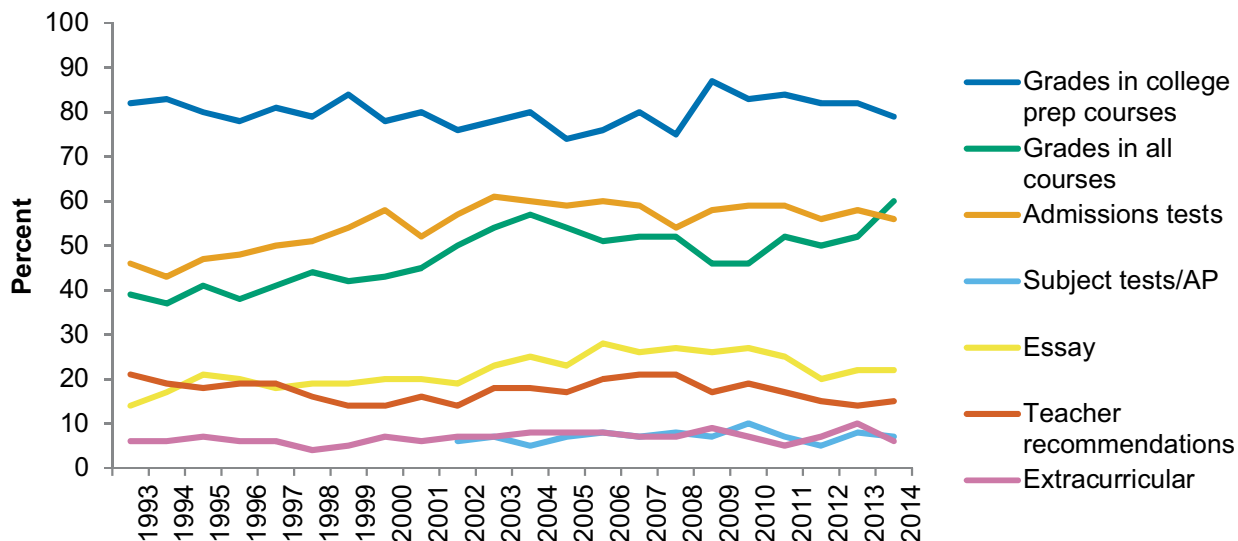
Figure 1. National share of institutions, applications received, and enrolled freshman, by admission selectivity (four-year institutions)

Today there are 701 four-year public and 1,584 four-year private not-for-profit institutions, with a total enrollment of about 12 million students,³ of which about 3.9 million attend private not-for-profit colleges (Snyder et al., 2016). In 2014-2015, there were only 342 public and private not-for-profit four-year institutions with open admissions in the U.S.,⁴ which indicates that the majority of four-year colleges have some competitive admission process which considers students' prior achievement and experience.

Undergraduate College Admission in the U.S.

Many different factors are considered in admission to U.S. colleges and universities. Since the vast majority of students applying to four-year colleges are transitioning directly from high school, prior grades in college preparatory courses and grades in all courses are considered of considerable importance or moderate importance by more than 90 percent of all such

institutions, followed by about 90 percent for admission test scores and the rigor of the curriculum (Clinedinst, et al., 2016). Figure 2 shows the percentage of four-year colleges and universities indicating the importance of various admission requirements over time. Other factors such as essays, recommendations, and extracurricular activities are of importance to far fewer institutions (Clinedinst et al., 2016).



Sources: Clinedinst, Hurley, & Hawkins (2015); Clinedinst, Koranteng, & Nicola (2016)

Figure 2. Trends in admission factors considered of considerable importance by four-year institutions

Over 95 percent of institutions place some importance on admission test scores, with public institutions more likely to consider admission test scores of considerable importance than private colleges (Clinedinst et al., 2014; Clinedinst et al., 2016). In addition, a significantly lower percentage of New England colleges indicated admission tests were of considerable importance when compared to the rest of the nation (Hawkins & Clinedinst, 2006). Zwick (2017) notes that colleges have consistently attributed considerable importance to grades and course rigor, but the percent of institutions reporting considerable importance to admission tests has increased in the past quarter-century (see Figure 2). However, FairTest lists more than 950 schools that have adopted some form of test optional policy for admission (FairTest, 2017). The exact definition of test optional varies by school, and can include schools that have decided to not use admission test scores at all when making admission decisions as well as schools that do not require admission test scores for students with high GPAs or students applying to certain programs. Milewski and Camara (2002) inspected the then current list of 391 schools available from FairTest and found that a large majority of them were either less competitive or non-competitive schools. They also found that a significant majority of the schools listed still required an admission test for most of their students, but exempted a percentage of them, such as students who ranked in the top 10 percent of their graduating class. Nonetheless, there are some well-known and competitive schools on the list, many of which are small liberal arts colleges or technical schools (FairTest, 2017).

Postsecondary institutions and researchers cite many reasons for choosing and recommending a test optional policy. The reason given most often is to increase the diversity of

the applicant pool to admit greater numbers of racial and ethnic minorities, females, and rural, low-SES, and first-generation college students (Rooney & Schaeffer, 1998; Zwick, 2017). In addition, not requiring test scores encourages students with a discrepancy between their test scores and high school GPA to apply.

Despite the increase in the number of test optional institutions, colleges use scores when they are submitted by applicants for admission, and “the vast majority of applicants submit scores” (NACAC, Report of the Commission on Admissions Testing, 2008). Private institutions which do not require admission test scores have been labeled “test optional” colleges and will generally consider other qualifications of students in place of admission test scores. Many reasons have been attributed to the increase in test optional admission policies among selective private colleges in the U.S., including the desire to: (a) increase diversity among groups who traditionally score lower on tests; (b) increase the attractiveness to all low scoring students in order to have a larger applicant pool generally; (c) send a signal to particular groups of students about an institution; and (d) indicate admission tests have limited value beyond other factors (Belasco, Rosinger, & Hearn, 2015; FairTest, 2012; Rooney & Schaeffer, 1998; Zwick, 2017).

Belasco et al., (2015) state that, “test-optional admissions policies, as a whole, have done little to meet their manifest goals of expanding educational opportunity for low-income and minority students” (p.12), but have had a latent effect of increasing the perceived selectivity and rankings of institutions. Their study demonstrated that as results on admissions tests are de-emphasized, selective colleges rely more on participation in AP course, IB, and extracurricular activities which are distributed inequitably among low-income and minority students.

Although performance on Advanced Placement (AP) exams and SAT Subject Tests are of considerable importance to only 5 percent of institutions, they appear to be increasingly important for admission to top tier institutions which often require two or more Subject Tests and have few applications from students who have not completed AP or International Bachelorette (IB) programs (Clinedinst et al., 2014). Between one-third and one-half of the four-year colleges in a national survey indicated that race, school attended, first-generation status, state or country of residence, or alumni relations were of some importance in admissions considerations (Clinedinst et al., 2016). Private institutions and more-selective institutions attributed greater weight to these factors than did public institutions (Clinedinst et al., 2014). Bowen and Bok (1998) reported that the overall admission rate for legacies was almost twice that for all other candidates at elite private institutions in their study.⁵

In 2003, the U.S. Supreme Court reached decisions in two important cases (Gratz et al. v. Bollinger, 2003; Grutter v. Bollinger et al., 2003) that provided continued encouragement for the use of holistic or comprehensive review in admissions. Thirty or more years ago, some universities set minimum test scores or high school grade requirements to increase the efficiency of admission processes and also to provide students with some indication of their probability for admission. Many institutions implemented affirmative action programs with defined weights for certain underrepresented groups (e.g., minorities, low income, females) or processes which strongly implied advantages to such groups in a competitive admission environment. Today, the vast majority of four-year selective universities use a fully holistic review of applications for undergraduate admissions. Admission officers and related staff evaluate all relevant educational and life experiences of applicants (e.g., admissions tests, grades, school record, essay, life experiences, and personal characteristics) before arriving

at a recommendation or decision. Mechanistic processes which assigned weights to specific factors began decreasing in the late 1980s and have nearly become extinct after *Grutter v. Bollinger* (2003).

Undergraduate Admission Tests

Many researchers have noted the similarities between the two national admission testing programs, the ACT and the SAT (Greenwood & Linn, 2001). Despite their similarities, they were designed with somewhat different purposes and retain some important differences in content and structure. The SAT was originally developed for competitive admission decisions and originally measured general verbal and mathematical reasoning in order to provide “a standard way of measuring a student’s ability to do college-level work” (quoted in Wightman & Jaeger, 1998:5–6). In contrast, the ACT was designed to assist Midwestern institutions that generally admitted all qualified applicants. The ACT was intended not only to assist colleges in admission and recruitment, but also with course placement and academic planning. It had the additional purpose of helping students to “identify and develop realistic plans for accomplishing their educational and career goals” (quoted in Wightman & Jaeger [1998:3] from ACT materials). As noted by Greenwood and Linn (2001, p. 5), “Although the distinction between the coastal and midwestern institutions that accounted for these differences has faded, the SAT and the ACT have retained their distinct goals despite the fact that in many institutions the two tests are used almost interchangeably.”

The ACT⁶

The ACT[®] test, created and maintained by ACT, Inc., is a test of high school educational achievement and college readiness taken by college-bound high school students. The first ACT administration was in the fall of 1959. Like the SAT, it is a paper-based test administered multiple times each year in schools on Saturdays and on weekdays in states with statewide testing. The administration of the ACT is timed to be 2 hours and 55 minutes without an optional essay, which adds 30 minutes of testing time. In the high school class of 2016, 2,090,342 graduating seniors took the ACT sometime during their high school careers compared to 1,171,460 in 2004 (ACT, 2004, 2016a). There are four required tests on the ACT in English, mathematics, reading, and science and one optional writing test. Each of the required tests is comprised of four-option multiple choice questions, and the writing test is a single essay.

The English Test includes five prose passages accompanied by 75 selected response items. Of these items, 40 assess conventions of the English language (Usage/Mechanics) and 35 assess rhetorical skills. Usage/Mechanics is comprised of punctuation, grammar and usage, and sentence structure. Rhetorical Skills is comprised of strategy, organization, and style. The mathematics test consists of 60 selected response items with 24 items on Pre-Algebra/Elementary Algebra, 18 items on Intermediate Algebra/Coordinate Geometry, and 18 items on Plane Geometry/Trigonometry. Content is integrated with skill to assess the ability to use knowledge, facts, and formulas to solve problems in mathematical and real-world situations as well as knowledge of and the ability to integrate major concepts. Certain calculators are permitted on both the ACT and SAT Math sections. The reading test has 40 items and is comprised of four passages in social studies, natural sciences, fiction, and humanities. The items assess reading comprehension through the skills of referring to explicit

content and reasoning to determine implicit content. The science test includes seven sets of scientific information in three formats—data representation, research summaries, and conflicting viewpoints—and is comprised of 40 selected response items. Content in biology, chemistry, physics, and the Earth/space sciences are assessed through interpretation, analysis, evaluation, reasoning, and problem-solving. Test takers are assumed to have completed one year of biology and one year of a physical or Earth science course. The optional writing test is a 40-minute essay test whereby one prompt that describes a complex issue and presents three points of view on an issue is provided and the test takers write an essay in which they develop their own perspective on the issue (ACT, 2016b). About 75 percent of the 2016 graduating seniors took the ACT without the optional essay (ACT, 2016a).

The ACT test is scored with rights only scoring, which means that one point is awarded for each correct answer and there is no penalty for incorrect responses. One Composite score and four subscores on each test are reported on a scale from 1 to 36. Students also receive an ACT STEM score. The STEM score is the average of the mathematics and science scale scores rounded to the nearest integer (fractions of 0.5 or greater round up). Students who take the optional ACT writing test receive an ACT ELA score. The ELA score is the average of the 1–36 scale scores for English, reading, and writing. Only students who receive scores for all three tests receive an ELA score. The STEM and ELA scores both range from 1 to 36. Students who take the optional writing test receive a total of five scores: a single subject-level writing score reported on a scale of 2 to 12 and four domain scores, also 2 to 12, that are based on an analytic scoring rubric. The subject-level score is the rounded average of the four domain scores. Two trained readers score each essay on a 1 to 6 scale on each of the four domains. If the readers disagree by more than one point, a third reader resolves the discrepancy. Finally, students preparing for the ACT often took ACT Plan in 10th grade and ACT Explore in 8th grade, though many are now taking the ACT Aspire assessments.

In 2015-16, nearly 20 states administered the ACT to an entire cohort of high school students. Several states are using the ACT for federal accountability (e.g., Nebraska, Wisconsin), while other states use it as a measure of college readiness to aid schools and students in gaining greater understanding of students' preparedness for postsecondary education. In 2005, ACT released a report which established cut scores that predict college readiness. The cut scores were set at the point where students have a 50 percent probability of attaining a B or higher and a 75 percent probability of attaining a C or higher on freshman courses in each subject (Allen & Sconing, 2005). Updated in 2013 (Allen, 2013), this report, and each year's annual release, identifies the number and percentage of college-bound seniors who are considered to be college ready. In 2016, 26 percent of students were considered college ready across all Benchmarks (ACT, 2016). In spring 2014 and 2015, ACT administered the ACT on computer in a field trial, and comparability was established, allowing scores to be reportable for admissions and scholarship purposes. ACT has assisted several states in establishing cut scores for multiple performance levels (e.g., basic, proficient, advanced) when used for accountability.

A few years ago, the ACT released a linear computer-based version of the paper test for exclusive use by states and districts conducting school-day testing. Schools and districts participating in the digital ACT administration have three multi-day windows to administer the ACT, and scores across paper and digital modes are equated to control for any small mode effects (Li, Yi and Harris, 2016). In 2016, ACT delivered a full-length practice test ("Pre-ACT"), which is similar to the discontinued ACT PLAN test, and recently announced plans to release a computer-based version of the ACT for international administrations.

The SAT⁷

The SAT, which launched in 1926, is owned and managed by the College Board. The SAT is a standardized college admissions test that determines college readiness and is also used for awarding scholarships and financial aid based on academic potential. In March 2016, the College Board released a new version of the SAT. The new paper-based SAT consists of two tests, Evidence-Based reading and writing and math, each scored on a 200 to 800 scale, with a Composite score on a scale from 400 to 1,600. The Evidence-Based reading and writing test consists of two timed sections: a 65-minute reading test with 52 multiple-choice questions, and a 35-minute writing and language test with 44 multiple choice questions. The math test also consists of two timed sections: a 55-minute section with 38 questions during which students may use a calculator, and a 25-minute section with 20 questions during which calculators are prohibited. Of the 58 math questions, 45 are multiple choice and 13 are student-produced response questions that require students to grid-in their responses. For both the Evidence-Based reading and writing and math tests, the formula scoring has been changed to rights only scoring (no penalty for guessing). The Essay exam is now optional and is scored on a 1 to 4 scale by two raters on three dimensions: Reading, Analysis, and Writing. The combined scores of the two raters are reported on a 2 to 8 scale. The total testing time for the new SAT is 3 hours plus 50 minutes if the writing test is administered.

In addition to the structure of the exam, the content of the redesigned SAT has also changed. The reading test focuses on reading comprehension and consists of 52 passage-based multiple choice questions. The reading test includes one passage on U.S. and world literature, two passages or one passage and a pair of passages on history or social studies, and two passages or one passage and a pair of passages on science. The writing and language test calls on students to edit and revise a variety of texts. It consists of 44 multiple choice questions based on four reading passages (11 questions each). The math tests covers four content areas: Heart of Algebra (linear equations and systems), Problem Solving and Data Analysis (quantitative literacy), Passport to Advanced Math (manipulation of complex equations), and Additional Topics in Math (including geometry and trigonometry). The optional writing test consists of one prompt based on a reading passage. Passages are taken from published sources, and though the content of the passages vary, each passage is considered an argument on a general topic and written for a broad audience.

Scores on the revised SAT cannot be directly compared to scores from tests taken prior to March of 2016. A concordance table is available to link scores across the two versions. Scores on the new SAT are generally 30 or more points higher than the same percentile for the previous SAT. Of the college-bound seniors of 2016, 1,637,589 took the old SAT (College Board, 2016) at some point in their high school career, and nearly 1.4 million students have taken the new SAT between March and June of 2016 (College Board, 2017a). As part of their preparation, students can take the PSAT/NMSQT during 10th and/or 11th grade to prepare for and predict their scores on the SAT. Approximately 1.6 million students in 11th grade and 1.8 million 10th graders took the PSAT/NMSQT in 2014 (College Board, 2017b).

Wiley, Wyatt and Camara (2010) developed a college readiness index designed to estimate the percent of SAT students considered to be college ready. Student SAT scores, high school GPA, and an index of academic rigor derived from the SAT Questionnaire were combined to develop a single estimate of student college readiness. Wiley, Wyatt and Camara estimated that in 2009, 32 percent of SAT test takers should be considered college ready. Additional

research has been conducted to estimate student progress toward reaching college readiness benchmarks in earlier grades, link SAT benchmarks to state and national assessments (e.g., NAEP, STARR), base college readings on course grades, and assess the impact of using external data in setting cut scores on state tests.

The SAT Subject Tests™

The SAT Subject Tests are a set of college admission tests produced by the College Board. The purpose of these tests is for college-bound students to demonstrate acquisition of subject-specific knowledge and skills. There are 20 Subject Tests that cover English Literature, United States History, World History, mathematics Level 1 and Level 2, Biology, Chemistry, Physics, Chinese with Listening, French, French with Listening, German, German with Listening, Modern Hebrew, Italian, Japanese with Listening, Korean with Listening, Latin, Spanish, and Spanish with Listening. Scores on the Subject Tests are particularly useful for students seeking admission into a particular program of study or school within a college or university who want to distinguish their ability from other applicants. Scores are currently required by about a dozen colleges and recommended by many additional colleges. The Subject Tests are paper-based and contain only selected response items. Each test is administered in one-hour.

Benefits of Admission Tests

The admission tests mentioned above have been, and continue to be, discussed based on their use in admission decisions. Because of these persistent questions, a committee of the National Research Council was charged with examining the evidence centered on the use of these tests. The committee identified a number of key benefits accrued with the use of the tests, such as:

- *Standardization*—curricula, grading standards, and course content vary enormously across schools, and admission tests offer an efficient source of comparative information for which there is no substitute.
- *Efficiency*—admission tests are provided at relatively low cost to students and are efficient for institutions comparing hundreds or thousands of applicants in a very short period of time.
- *Opportunity*—standardized tests provide an opportunity to demonstrate talent for students whose academic records are not particularly strong, who have not attended the most prestigious prior institutions, or taken the most rigorous courses (Beatty, Greenwood, & Linn, 1999).

Research Topics—Validity

As would be expected with tests whose primary focus is on admission, the majority of validity evidence for these tests is dedicated to demonstrating their efficacy in the context of admission decisions (Sireci & Sukin, 2013). The earliest conception of validity focused on prediction, and for several decades validity centered on the basis of predictive accuracy (Brennan, 2006). In fact, the first validity study on admission tests was actually conducted as students completed the first SAT in 1926 and earned college grades (Mattern, Kobrin, Patterson, Shaw, & Camara, 2009). For the ACT, validity evidence was first reported in 1962 using ACT scores from the 1959-1960 cohort of examinees and their 1960-1961 college grades (ACT, 2009). This section identifies key themes or patterns observed across various validity studies conducted on the major admission testing programs.

Accuracy of Prediction

A meta-analysis of SAT validity was conducted in relation to college grades after one semester and after each year of college, including cumulative grades (Hezlett, Kuncel, Vey, Ahart, Ones, Campbell, & Camara, 2001). Results for first-year college grades were based on over 1,734 studies, with aggregate sample sizes ranging from 146,000 to over one million. The average, sample-weighted, observed validity coefficients for first-year college GPA (FYGPA) ranged from .30 to .36. The operational validities of the SAT-Verbal (SAT-V), SAT-Math (SAT-M), and SAT-Total (SAT-T, V + M) in predicting GPA for first-semester and first-year of college ranged from .44 to .62. None of the 90 percent credibility intervals (90% CrI) around the operational validities included zero, and the standard deviations of the operational validities (SD_p) ranged from .06 to .20. These small to moderate values suggest that either predictive validity values were not affected by moderator variables or that the effects of any moderators were relatively small. Collectively, these results demonstrated that SAT scores are valid predictors of performance early in college. The operational validities of the SAT-V and SAT-M for predicting non-cumulative GPA in the second, third, and fourth years of college also ranged from the mid-thirties to the mid-forties. Results for two-year and four-year cumulative college grades were similarly robust, with aggregated sample sizes of at least 10,000, with observed validities ranging from .29 to .37 and operational validities from .40 to .50. Burton and Ramist (2001) conducted an extensive review of studies evaluating the ability of SAT scores and high school GPA to predict successful performance in college. They found that both SAT scores and high school GPA (HSGPA) made significant contributions to the prediction of FYGPA, cumulative GPA, and eventual college graduation. In all cases, the combination of the two variables provided notably more accurate predictions than using either one alone. Both predictors also seemed to show strong evidence for their ability to predict other academic behaviors, such as awards of academic distinction and departmental honors.

Research on the validity of ACT Composite scores of first- and second-year cumulative GPA has produced comparable results. A recent meta-analysis with data from 50 four-year institutions and 189,612 students found that after corrections for range restriction, the validity coefficients for ACT Composite scores were .51 (90% CrI, .43 to .60) and .55 (90% CrI, .51 to .59) for first- and second-year cumulative GPA, respectively (Westrick, Le, Robbins, Radunzel, & Schmidt, 2015). ACT Composite scores also had positive relationships with second- and third-year retention, with point-biserial correlations of .19 (90% CrI = .12, .25) and .18 (90% CrI = .13, .23), respectively.

A common concern cited with validity studies is that different grades have different meaning at different colleges, making it difficult to compare FYGPA across institutions and professors. Berry and Sackett (2009) proposed a solution by examining the validity of admission tests at the individual course level within an institution. Overall, they found a correlation of .58 between SAT scores and course grade composites compared to a correlation of .47 using FYGPA as the criterion. The correlation of HSGPA and course grade composite was .58 compared to .51 for FYGPA. They concluded that the predictive validity of the SAT was reduced by 19 percent due to the “noise” that is added as a result of taking different courses across different institutions. In fact, several studies have demonstrated that the validity of admission test scores often increases when the criterion is course grades rather than FYGPA—this is particularly true in science and math courses (Camara, 2009). Kuncel and Hezlett (2007) recently released a synthesis of meta-analyses that investigated the ability of admission test

scores to predict performance in graduate and professional programs. They identified four key results or findings (p. 1080):

1. Standardized admission tests are effective predictors of performance in graduate school.
2. Both admission tests and undergraduate grades predict important academic outcomes beyond just grades earned in graduate school.
3. Standardized admission tests predict most measures of successful performance better than college grades.
4. The combination of college grades and an admission test score provides the most accurate prediction.

The results identified by Kuncel and Hezlett (2007), as well as by Burton and Ramist (2001), have been consistently confirmed across a wide variety of studies covering a wide range of admission tests. Research consistently demonstrates similar findings and the ability to predict successful performance in subsequent educational environments (Julian, 2005; Kobrin, Patterson, Shaw, Mattern & Barbuti, 2008; Kuncel, Credé & Thomas, 2007; Kuncel & Hezlett, 2007; Kuncel, Hezlett & Ones, 2001; Noble & Sawyer, 2002; Stilwell, Dalessandro & Reese, 2007). More importantly, research has consistently demonstrated that while both test scores and grades predict college performance, the combination of the two always consistently outperforms either one variable alone. This relationship is observed with the SAT, where a recent report (Kobrin et al., 2008) demonstrated an incremental increase in predictive validity of .08 when SAT scores were added to the prediction equation using HSGPA alone, as well as the ACT (Noble, 2003). Recent work at ACT has demonstrated that the ACT also adds incremental validity beyond what can be predicted by HSGPA alone (Pauls, Mattern, & Allen, 2017). Perhaps the most significant finding in their work is that the incremental validity of ACT scores beyond HSGPA is greater for underrepresented and other disadvantaged groups than it is for students overall. Table 1 highlights the increases in validity by adding ACT scores to HSGPA.

Table 1. Incremental Validity of ACT Composite Scores when Used in Conjunction with High School GPA to Predict First-Year Undergraduate GPA

Student Group	N Students	N Colleges and Universities	Weighted Mean R		Increase in Predictive Strength by Using ACT Composite
			HSGPA	HSGPA + ACT Composite	
Overall	816,547	461	.452	.487	7.7%
Females	454,045	461	.451	.501	11.0%
African American	77,785	384	.311	.355	14.1%
Asian	20,399	272	.414	.480	16.1%
Hispanic	33,704	355	.416	.450	11.8%
Other/Multiple Races	21,612	334	.396	.455	14.7%
Low-Income	159,078	453	.398	.433	8.9%
Parents no college	29,722	193	.402	.440	9.4%
Student with disability	24,979	375	.373	.405	8.7%
Non-English speaking home	20,300	298	.381	.439	15.1%
Urban high school	192,762	428	.436	.486	11.3%
Public, high-poverty high school	20,120	250	.351	.405	15.4%

Note. Correlations were not corrected for range restriction or measurement error.

Empirical evidence has consistently shown that test scores do not systematically demonstrate evidence of bias against underrepresented minority students. Both Linn (1973) and Young and Kobrin (2001) conducted extensive reviews of the available studies and found similar results. Both reviews found that admission test scores slightly over-predict the performance of underrepresented minority students. At the undergraduate level, whereas the amount or degree of over-prediction did vary across studies, the amount of over-prediction was, on average, approximately 0.20 on a 4.0 GPA scale.

Very similar results have been observed by individual studies conducted by independent researchers as well as researchers associated with each testing program. At the undergraduate level, a study conducted by Noble (2003) investigated the predictive validity of the ACT for underrepresented minority students, whereas a recent study by Mattern, Patterson, Shaw, Kobrin and Barbuti (2008) did the same for the SAT. Both studies showed very consistent results, with their respective admission test scores both slightly over-predicting the performance of underrepresented minority students. Interestingly, they both also observed that the degree of over-prediction was even greater for HSGPA than it was for admission test scores. In both cases, underrepresented minorities obtained slightly lower college grades than White students who attained the same scores on admission tests, and by using both HSGPA and the admission test scores, the magnitude of over-prediction was notably reduced.

Test optional colleges and other critics of testing often cite different outcomes on tests as either an indication of bias or simply a reason to exclude tests from prediction models. However, subgroup differences still exist across grades and are especially apparent on criteria related to college success (e.g., college grades, persistence, graduation). Figures 3, 4, and 5 illustrate that underrepresented ethnic minorities and lower income students have similar gaps on high school grades as reported on standardized tests.

In summary, research consistently demonstrates that when admissions tests and high school grades are both used in admissions decisions they result in both the highest level of validity and less overprediction of performance than when either measure is used alone (Camara, 2009; Camara, Kobrin, & Sathy, 2005; Camara & Schmidt, 1999).

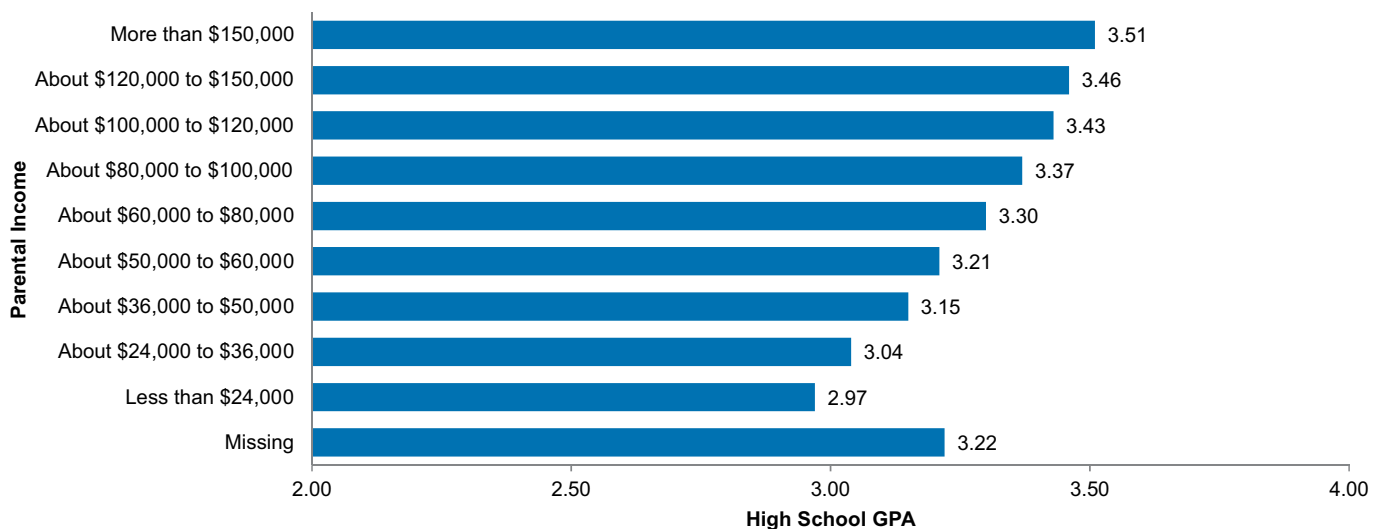


Figure 3. Average high school GPA by parental income (2016 graduating seniors, ACT)

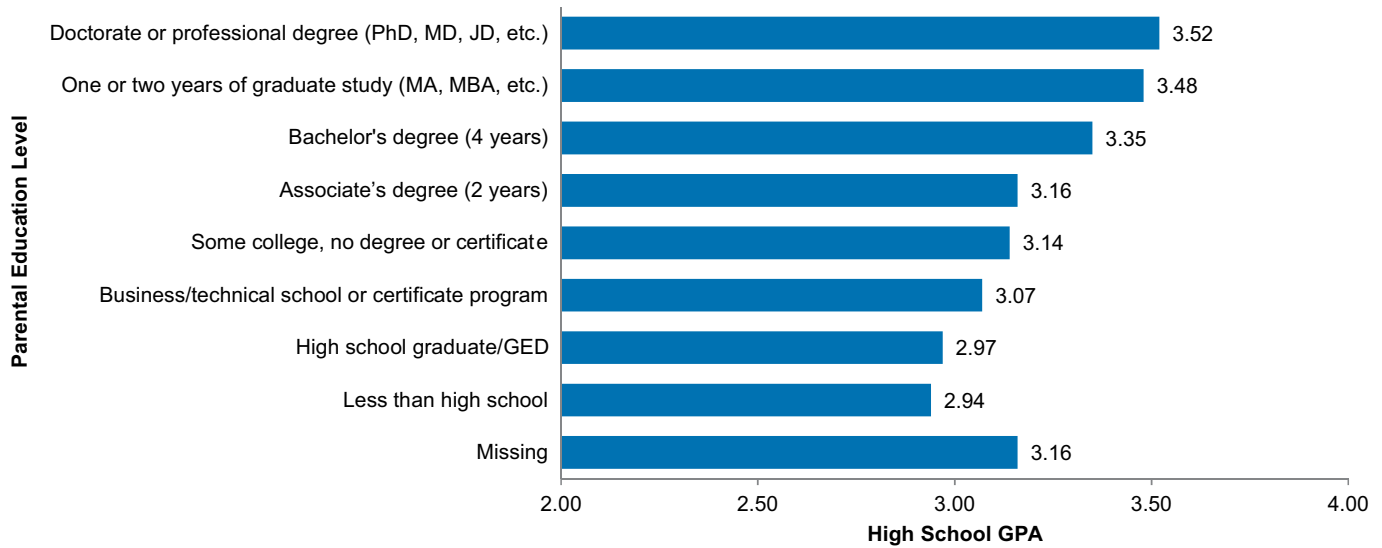


Figure 4. Average high school GPA by highest parental education level (2016 graduating seniors, ACT)

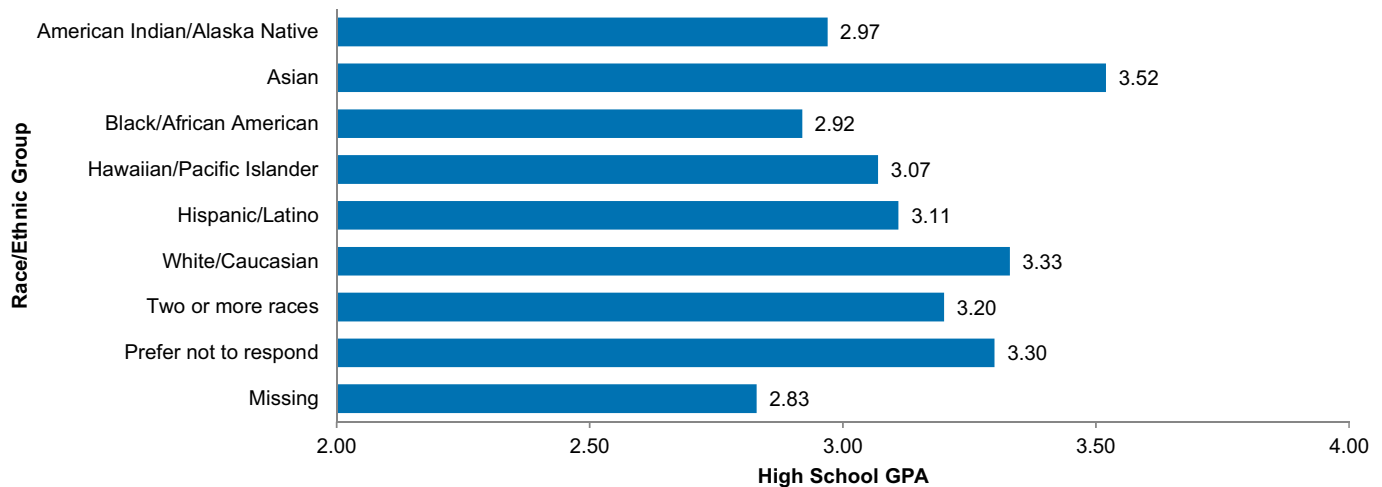


Figure 5. Group differences in average high school GPA (2016 graduating seniors, ACT)

Notes

1. Earlier versions of this paper were delivered at the International Conference on Assessment and Evaluation in Riyadh, Saudi Arabia (Camara, 2012), and at the American Educational Research Association conference in Chicago, Illinois (Camara, 2015).
2. Estimates based on Tables 301.20, 302.10, 301.20, and 301.30 from the National Center for Educational Statistics' *Digest of Education Statistics, 2015* (Snyder, de Brey, & Dillow, 2016).
3. There are an additional 726 four-year for-profit institutions enrolling about 1.3 million students.
4. Open admission is an unselective and non-competitive college admissions process in the U.S. where the only requirement is a high school diploma or a General Educational Development (GED) certificate. The number of open admission institutions was obtained through the NCES IPEDS data center at <https://nces.ed.gov/ipeds/datacenter/reportmain.aspx>. Sorting variables for the 2014-2015 year included Admissions and Test Scores,

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- Open Admission Policy (Yes); and the following Institutional Characteristics: Level of Institution (1 Four or more years); Sector of Institution (1 Public, 4-year or above, and 2 Private, not-for-profit, 4-year or above); Degree-Granting Status (1 Degree granting); and Undergraduate Offering (1 Undergraduate degree or certificate offering). Total enrollment was about 1.4 million at these open admission institutions. Some of the institutions were branch campuses of institutions that had selective admissions at their main campus.
5. More than a decade later, the acceptance rate was approximately 30% for legacies at Harvard (Worland, 2011).
 6. Information presented below was obtained from the ACT Technical Manual (2014), the ACT Technical Manual Supplement (2016), and the ACT website (www.act.org)
 7. Information presented below was obtained from Test Specifications for the Redesigned SAT (College Board, 2016), and the College Board website (<https://collegereadiness.collegeboard.org/sat>).

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