



***Developing a Concordance Between the
ACT Assessment and the SAT I:
Reasoning Test for The University of
Texas at Austin***

THE UNIVERSITY OF TEXAS AT AUSTIN

Office of Admissions Research

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***Developing a Concordance Between the ACT Assessment and the SAT I:
Reasoning Test for The University of Texas at Austin***

by

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Introduction

The Office of Admissions of the University of Texas at Austin (UT-Austin) is responsible for the admission and readmission of undergraduate students to the University. As with all Texas public colleges and universities, and in accordance with Texas Education Code §51.803, students are automatically admissible as first-time freshmen if they (1) graduate in the top ten percent of their high school class (provided they are from an accredited Texas high school) and (2) submit all required credentials comprising a completed application by a deadline established by the university. At UT-Austin, applicants not eligible for automatic admission must have completed a specified group of high school courses, and like those automatically admitted, must present credentials before established deadlines.¹

One of the credentials required of all UT-Austin applicants is the submission of a standardized college admissions test score. The ACT Assessment and the SAT I: Reasoning Tests are the only nationally-validated standardized tests used in the college admissions process, not only in Texas, but throughout the United States.²

The ACT Assessment was developed in the late 1950s by college faculty, chief among them E.F. Linquist, associated with the University of Iowa. Linquist was also the primary founder of the American College Testing Program, Inc., later changed to ACT, Inc.

ACT's current literature characterizes the ACT Assessment as "tests of educational development" measuring readiness for postsecondary education. It is more popularly known as an achievement test since it is organized by subject matter area and its scaled scores are reported that way. There are four tests in the curricular areas of English, Mathematics, Reading and Science Reasoning. The contents of the ACT tests are based on the judgments of high school and college instructors about the academic knowledge and skills that students need to succeed in typical first-year courses and that are taught in typical college-preparatory programs in high school. Since 1988, during the development phase of what was then called the "Enhanced ACT Assessment," ACT conducted a National Curriculum Study and has since continually analyzed (every three years) state curriculum guides, scopes and sequences, and state-approved textbooks to determine the content of the ACT Assessment and its related assessments.³ This is consistent with Linquist's vision of college-admissions testing: that what should be measured is what the student can do with what they have actually been taught.

The SAT I: Reasoning Tests consist of two tests that measure verbal and mathematical reasoning abilities of college-bound students. The College Board, primarily Carl Campbell Brigham, first developed it in 1926.⁴ Historically, the SAT I has been considered an "aptitude" test emphasizing critical thinking and problem solving skills that are deemed essential for college-level work. Indeed, "SAT" was once an acronym for "Scholastic Aptitude Test," suggesting no tie to a particular curriculum. In fact, the Board argues, this approach compensates for non-standard, and by implication, sub-standard, grading practices and differences in secondary school quality and curriculums. The Board further argues that while the SAT is not intended to be curricular, the test nonetheless reflects acceptable educational content, standards and practices. (Content and technical specification differences of the ACT and the SAT are described in greater detail below in a separate section.) The Preliminary SAT/National Merit Scholarship Qualifying Test (PSAT/NMSQT) is the only other standardized exam directly related to the SAT. It was developed and normed for college-bound high school juniors and is made up of retired SAT questions.

The University of Texas at Austin requires the submission of a complete set (either ACT Assessment or SAT I) of college admissions test scores of all its applicants.

Substantial numbers of students send at least one set of both. While the university does not “prefer” either in an admission decision, there are instances in which there is a need for a common and standard measure for all UT-Austin applicants, admits, and enrollees. Since some students send only an SAT, and some others send only an ACT, it becomes necessary to have some basis for comparison of the scores on the two tests. Historically, for research and other reporting purposes, since UT-Austin receives far more SAT than ACT score reports, ACT scores have been concorded to the SAT scale.

As Dorans has pointed out, there are two ways in which the degree of exchangeability of two different tests can be evaluated: there should be an investigation into the processes that produced the scores; and statistical measures such as correlations should be produced to establish empirical relationships among the scores.⁵

The purposes of this study are to describe the skill and content similarities of the ACT Assessment and the SAT I: Reasoning Test, investigate the skill and content relationships between the two, establish the appropriateness of developing a table that will permit a comparison of the scores, and finally, to construct a table for use in determining comparable SAT scores for given ACT scores for use in admissions and research routines at the University of Texas at Austin. The comparison will be limited to use at The UT-Austin and will be developed via a method known as concordance.

Comparing Content and Skill Specifications

ACT English

ACT English is a 75-question, 45-minute test that measures the understanding of the conventions of standard written English. This, in turn, is separated into two categories: usage/mechanics and rhetorical skills.⁶ Usage and mechanics focuses on editing skills such as punctuation, grammar and usage, and sentence structure, or judgments about what is “right” or “wrong” in writing. For example, in a given sentence, the subject and verb agrees or they do not. Rhetorical Skills tends to require more sophisticated judgments from students. In these questions students are required to make decisions about written material. ACT describes these decisions as those of

strategy, organization and style. These questions do not necessarily focus on the “correctness” of writing, but effectiveness, or whether a given sentence, phrase, or paragraph can be made better.

Three scores are reported for the ACT English test: a total test score based on all 75 questions and placed on a scale of 1-36; a usage/mechanics subscore based on 40 questions (53%) and placed on a scale of 1-18; and a rhetorical skills subscore based on 35 questions (47%) and placed on a scale of 1-18.⁷

ACT Mathematics

The ACT Math test is a 60-question, 60-minute test to assess skills students are expected to have learned in courses taken up to the beginning of the senior year of high school. It requires computational and reasoning skills necessary to solve practical problems. Knowledge of basic formulas and certain computational skills are assumed—not tested as such. Certain types of calculators are permitted.

The math test is comprised of three parts that define its major content areas. *Pre-Algebra/Elementary Algebra (40%)* is the most elementary, often involving content normally taught in middle school. *Intermediate Algebra/Coordinate Geometry (30%)* and *Plane Geometry/Trigonometry (30%)* make up the more advanced content. Like the ACT English test, each content cluster yields a subscore on a scale of 1-18. A math score based on all 60 questions is reported on a scale of 1-36.

ACT Reading

ACT Reading is a 40-question, 35-minute test that measures reading comprehension. In describing the reading test to students, ACT focuses on skills by characterizing the questions as “referring” or “reasoning.” Referring questions have answers that are explicitly stated in the text of the reading passage. Reasoning answers, on the other hand, require students to derive meaning implicitly from the passage. Two reading subscores, however, are reported for content, not skill, areas. *Social Studies/Sciences* and *Arts/Literature* each make up half of the test and are

reported on a scale of 1-18. A reading score based on all 40 questions is reported on a scale of 1-36.

ACT Science Reasoning

ACT Science Reasoning is a 40-question, 35-minute test that measures the interpretation, analysis, evaluation, reasoning, and problem-solving skills required in the natural sciences. Seven sets of scientific information are presented and are followed by multiple-choice questions. The information is conveyed in one of three formats: *Data Representation (38%)* involves graphs, tables and other methods of presenting data; *Research Summaries (45%)* is more text-oriented and usually involve a report of one or more related experiments; *Conflicting Viewpoints (17%)* involves the expressions of opposing ideas and require students to evaluate the merits of arguments. In a departure from its achievement testing slant, ACT literature has indicated that scientific knowledge is not as important as an ability to navigate the scientific process and evaluate arguments and data. There are no subscores associated with the science reasoning test; one score based on all 40 questions is reported on a 1-36 scale.

Computing the ACT Composite and Other ACT Scores

The ACT Composite is not directly derived by all 215 questions of the four tests. The Composite is merely the sum of the four test scores divided by four and rounded to the nearest whole number. Thus, the Composite is based on a 1-36 scale and each of the four tests carry equal “weight” in determining the overall score.

It is worthy to note, however, that since each of the four test scores are placed on a 36-point scale, that the ACT scale is really a 144-point scale.

All ACT scale scores are computed through the conversion of a raw score, or the number of correct answers on a given test form, to a scale score. Since only the number of correct answers is considered, there is no “penalty” for guessing wrong on the ACT.

SAT I Verbal

The SAT Verbal test consists of two 30-minute and one 15-minute section, for a total of 75 minutes of testing time. (Unlike the ACT, which administers the whole of each of its four tests in a specified order, the SAT administration alternates between the verbal and math.) Verbal questions test the student's ability to understand and analyze prose, recognize sentences that make logical sense, and see relationships between pairs of words. A good vocabulary is prerequisite to doing well on this section, but it is not always specifically tested.⁸ That is why the rote memorization of lists of words is not likely to significantly increase verbal scores. (Unless, of course, an individual happens to memorize the definitions of specific words on a given form of the SAT—which is very unlikely.)

In order to measure the abilities stated above, the SAT Verbal test uses three types of questions: analogies (19), sentence completions (19), and critical reading (40). Analogies are designed to measure a student's knowledge of the meanings of words, the relationship in a pair of words, or the recognition of a similar or parallel relationship. In its literature, the College Board encourages students to look closely at the pairs of words and create a sentence or phrase that states the relationship. (e.g., "A *crumb* is a piece of *bread*.) In that respect, memorized definitions of words are unlikely to be of much help to students. Moreover, only occasionally do the analogies contain esoteric, polysyllabic words; they are far more likely to contain common words students readily know the definitions of. Words such as "ERASER : PAGE" and "DRAMA : ACTS" are typical of SAT analogies because measuring relationships between words is more important than measuring definitions. (Saying SAT "measures analogies" is overly simplistic and specious. It is more accurate to say that SAT *uses* analogies to measure a student's grasp of the relationships between pairs of words.)

Sentence completions, like analogies, measure knowledge of the meanings of words. They also measure the ability to understand how the different parts of a sentence fit logically together. Students are presented with a sentence with one or two blanks. Students must then fill in the blank(s) with a word(s) that fits the logic of the sentence. (e.g., "Medieval kingdoms did not become constitutional republics overnight;

on the contrary, the change was -----.” From five choices the correct answer is “gradual.”)

Slightly more than half of the verbal section of the SAT I is critical reading. It measures the ability to read and think carefully about several different reading passages. There can be more than one passage for a given set of questions, but generally it is one of about 400 to 850 words in length. There are many different types of questions ranging from demonstrating knowledge of how a single word is used to the meaning of the passage as a whole. Critical reading on SAT verbal is very similar to ACT’s Reading test.

The SAT Verbal test produces a scale score between 200 and 800 reported in intervals of ten—or a 61-point scale.

SAT I Math

There are three types of questions on the mathematics sections of the SAT I: standard five-choice multiple-choice questions (35); four-choice quantitative comparison questions that emphasize the concepts of equalities, inequalities and estimation (15); and student-produced responses, sometimes called the “grid-in” questions (10).

In its review for the SAT I math test, the College Board listed mathematics concepts that students should know in the following areas: arithmetic, algebra, geometry and other concepts like logical reasoning. There is no mention of advanced mathematics like college algebra, trigonometry or calculus.⁹ True to its non-curricular focus, the emphasis is on skills identified as data interpretation and applied math, i.e., reasoning. According to collegeboard.com, the following constitutes the makeup of the SAT I math test: arithmetic reasoning (18-19); algebraic reasoning (17); geometric reasoning (16-17); and miscellaneous reasoning (7-9).

The SAT I Math test does distinguish itself from the ACT Assessment and most other standardized tests in that ten of the questions are not multiple choice, but student-produced. The “grid-in” questions require the production of an answer, which on its face eliminates any vestige of corruption by good guessing. The student then must grid in the response. (There is no penalty for guessing in this section.) This answer collection

method, however, may have problems of its own; *Taking the SAT I: Reasoning Test*, the free student preparation guide that accompanies an SAT registration packet, has two full pages of directions and hints for filling in the answer grids.¹⁰

The SAT Math test produces a scale score between 200 and 800 reported in intervals of ten—or a 61-point scale.

Computing the SAT I Score

Like the ACT Assessment, the computation of the individual test scores are done separately and raw scores are converted to scaled scores. However, there is a major difference in the SAT computation in that students providing wrong answers are “penalized” (or “adjusted”). In short, if a student answers a question correctly, s/he earns one point towards a final raw score. If a student provides no answer, no credit is given. If a student answers a question and gets it wrong, there is an “adjustment” for guessing. This adjustment equals a $-1/4$ point if the question was a five-option multiple choice; or a $-1/3$ point if the question was a four-option multiple choice. (Again, there is no adjustment for the student-produced responses in the math test.) The justification for this procedure is that, in theory, random guessing in a multiple choice format should yield 20-25% correct answers, resulting in a raw score that is 20-25% of the total, suggesting that students knew 20-25% of the content of the test. Adjustments of this sort mean that random guessing (the equivalent of “knowing nothing”) should result in a raw score closer to zero.

Curiously, while the SAT I Total score (scale=400 to 1600) is one of the most recognized scaled scores in the world today, the College Board seldom, if ever, reports its scores in that way. Student score reports do not, and have never, reported SAT Verbal and Math (V+M) as a single score. The Educational Testing Service (ETS) does not report combined (V+M) in its data transfer to colleges and universities. They also do not routinely report percentiles for those scores. The adding of the verbal and math scores into an SAT Total score is done at homes, high schools, by the media, and by colleges and universities wishing to secure a single measure of performance for a student.

Content and Skill Similarities Justifying the Construction of a Concordance

It is the primary purpose of both the ACT Assessment and the SAT I: Reasoning Test to provide measures for college admissions officials to construct a process (most often a regression equation) through which a freshman GPA can be predicted within a reasonable error band. If both instruments serve that purpose, it is logical that there should be a strong correlation between scores of students having taken both—and there is such a strong relationship.

The difference in philosophy and emphasis between ACT, Inc. and College Board/ETS complicates a comparison between the ACT Assessment and the SAT I. The difficulty lies, however, mostly in how each firm chooses to describe its content. ACT defines its content in curricular terms; SAT defines itself in terms of skills—“English” versus “Verbal Reasoning” and “Mathematics” versus “Quantitative Reasoning.” Those distinctions aside, both assessments use commonly taught material from America’s middle and high schools to construct objective questions measuring higher-order thinking skills. For example, after a facial review, it is likely that only intensively-coached students in both the ACT and the SAT are likely to detect any meaningful difference between the ACT Reading passages/questions and the critical reading section of the SAT I Verbal test. At UT-Austin, lower (but still strong) correlations between Verbal/English ($r=.76$) and Verbal/Reading ($r=.77$) scores are likely due to ACT’s separating content which overlaps with the single SAT Verbal into two tests. When ACT English and Reading scores are combined, forming a test with a greater skill and content overlap with the SAT Verbal, the relationship increases ($r=.82$). Table 4 below illustrates the same trends nationally in a study conducted jointly by ACT, Inc. and ETS.

In short, the skill levels of the ACT and the SAT are very similar in that they both require problem solving and higher order thinking skills such as analysis, synthesis, evaluation, and the application of logical thinking and reasoning. In math, they use mostly arithmetic, algebra and geometry; on the language arts side the emphasis is on critical reading.

The skill level, content, and statistical relationships between the ACT Assessment and the SAT I: Reasoning Test more than justify the construction of a concordance table, based on data provided by UT-Austin applicants, for use at the University of Texas at Austin.

Research scientists from ACT, Inc. and ETS agree: “In particular, users of the ACT Assessment and SAT I scores who have sufficiently large samples of test-takers with both ACT and SAT I scores may wish to investigate the feasibility of developing their own concordance tables.”¹¹

Constructing a Concordance Table

Sample

The Office of Admissions Research, using UT-Austin’s Data Warehouse, constructed the dataset used for this study. The data consisted of records for each student who had scores on both tests who had applied for admission for the summer/fall semesters of 1999 and 2000. UT’s Data Warehouse captures only the ACT Composite of each student. Since this study intends to concord more than just the SAT Total and the ACT Composite, the file was forwarded to the Research Division of ACT, Inc., and matched to the ACT database using student-identifying information. The ACT English, Mathematics, Reading and Science Reasoning scores were appended to the file.

At present, the University of Texas at Austin is the largest university in the United States. Officially, UT-Austin had a total enrollment of 49,996 for the fall of 2000. For the summer/fall 2000 semesters, UT enrolled 7,686 first-time freshmen from 13,256 admitted students from 23,040 applications.¹² Without question, UT has a large enough population to develop its own concordance. Table 1 below illustrates the summer/fall-combined 1999/2000 applicants of UT-Austin’s entering freshmen class. The “dataset” represents those applicants who sent both ACT and SAT scores.

**TABLE I
APPLICATIONS
SUMMERS AND FALLS COMBINED
1999 and 2000**

Ethnicity	1999		2000		1999/2000		Dataset	
	N	%	N	%	N	%	N	%
White	11354	58.53	13690	59.42	25044	59.01	8113	64.01
Native American	91	0.47	114	0.49	205	0.48	68	0.54
African American	1049	5.41	1255	5.45	2304	5.43	696	5.49
Asian American	2738	14.11	3177	13.79	5915	13.94	1501	11.85
Hispanic	2904	14.97	3321	14.41	6225	14.67	2149	16.96
Unknown	1263	6.51	1483	6.45	2746	6.47	142	1.12
All	19399	100.00	23040	100.00	42439	100.00	12669	100.00

It is not surprising that the dataset for this study is representative of the applicant pools for 1999 and 2000, since a standardized test score is required for an application to be considered complete. It is also not surprising that there are fewer “unknowns” in the dataset group, since students sending at least two sets of scores are more likely to identify their racial/ethnic background.

Table 2 below shows mean test scores, standard deviations, and sample sizes for the ACT/SAT test pairs. Skewness and kurtosis measures show comparability in terms of shape. The sample size for the ACT Composite is slightly different because there were some Composite scores that had no corresponding scores on the English and Mathematics tests.

**Table 2
Descriptive Statistics for Concordance Samples
1999 and 2000**

Test	Sample size	Mean	Standard deviation	Skewness	Kurtosis
ACT English	12313	23.8	4.8	-0.0875	-0.2534
SAT Verbal		560	87	0.0141	-0.0616
ACT Mathematics	12313	24.7	4.6	0.0057	-0.6016
SAT Quantitative		575	90	-0.0345	-0.1618
ACT Composite	12669	24.4	4.1	-0.0145	-0.3198
SAT I Total		1135	158	-0.0432	-0.1398

Before concurring any two sets of scores, it is also necessary to establish their statistical relationship. As stated above, computing correlations does this. Table 3 below is a matrix of correlations between ACT Assessment and SAT I scores of the UT-Austin dataset.

Table 3
The University of Texas at Austin
Applicants
Correlations Between ACT Assessment, SAT I Test Scores and Class Rank
1999 and 2000

	ACT E	ACT M	ACT R	ACT SR	ACT C	SAT V	SAT Q	SAT T	Class Rank
ACT E	1	.58	.72	.66	.87	.76	.58	.75	.34
ACT M	.58	1	.5	.67	.80	.56	.86	.80	.37
ACT R	.72	.50	1	.67	.86	.77	.49	.70	.27
ACT SR	.66	.67	.67	1	.86	.66	.65	.73	.28
ACT C	.87	.80	.86	.86	1	.81	.74	.87	.37
SAT V	.76	.56	.77	.66	.81	1	.58	.89	.29
SAT Q	.58	.86	.49	.65	.74	.58	1	.89	.33
SAT T	.75	.80	.70	.73	.87	.89	.89	1	.35

As expected, there are high correlations between comparable ACT and SAT tests. (Composite/Total = .87, English/Verbal = .76, Reading/Verbal = .77, and Math/Quantitative = .86) As stated earlier the English+Reading/Verbal was .82. These correlations are consistent with earlier, national concordance studies. (See Table 4 below.) By contrast, correlations with class rank are lower because of vast differences in the ways the measures are designed and computed. Table 4 presents results from a national concordance study conducted jointly by ACT and ETS in which the population numbered 103,525.

Table 4
National Concordance Study
Correlations Between ACT Assessment and SAT I Tests
1997

Score	ACT E	ACT R	ACT ER	SAT V	SAT M	ACT M	ACT SR	ACT Sum	SAT T
ACT E	1	.81	.94	.83	.71	.69	.76	.92	.83
ACT R	.81	1	.96	.83	.63	.62	.76	.91	.79
ACT ER	.94	.96	1	.88	.70	.69	.79	.96	.85
SAT V	.83	.83	.88	1	.71	.66	.76	.87	.92
SAT M	.71	.63	.70	.71	1	.89	.76	.83	.93
ACT M	.69	.62	.69	.66	.89	1	.75	.85	.84
ACT SR	.76	.76	.79	.76	.76	.75	1	.90	.82
ACT Sum	.92	.91	.96	.87	.83	.85	.90	1	.92
SAT T	.83	.79	.85	.92	.93	.84	.82	.92	1

(ACT ER is the sum of the ACT English and Reading. ACT Sum is the sum of the four ACT tests scores.)

Correlations between comparable ACT and SAT measures are slightly higher in the national study. This is most likely the result of differences in the size and scope of the studies. The ACT and SAT were designed to be nationally-validated tests, not Texas exams. Even so, there is not much difference. (For the ACT Composite/SAT Total the correlation is .87 for UT-Austin applicants compared to .92 nationally.)

One feature that might affect the concordance relationship is the dates in which the tests were taken. Logically, if there were a long period of time between testing episodes, the score of the second test would be considerably higher. (The assumption is that a student will learn more during the interim). For this sample, the average difference between test dates was about 5 months (with the ACT usually being taken later). However, over 50% of the students took the tests within 2 months of one another, so it is unlikely that differences in timing had a significant effect on the outcome. (Also, of those with a gap of more than two months, an observably high number spent summer months between tests.)

Method

The equipercentile method was used to determine ACT/SAT concordant values. With this method, a percentile rank, or the percent below that score plus one-half the percent at that score, is defined for each of the two score distributions. It sets as equal those scores on each test having the same percentile ranks. Thus, while the scores are not exchangeable (as in equating), they are comparable if the objective is to sort a population of students and determine a comparable “cut score.”

To minimize the effect of sampling error, ACT researchers used a cubic spline technique to smooth the distributions of concordant values. Score points with frequencies less than one-half of one percent of the total sample size did not contribute to the smoothed results.

Tables 5, 6 and 7 give values that are comparable at UT-Austin. For example, in Table 5, a score of 21 on the ACT English test is concordant (comparable—not exchangeable) to a score of 520 on the SAT I Verbal test. In other words, the percentage of students submitting scores to the University of Texas and scoring at or below 21 on the ACT English test will be approximately the same as the percentage of students who score at or below 520 on the SAT I Verbal test. Table 6 is a concordance between ACT Math and SAT Quantitative, and Table 7 is a concordance between the ACT Composite and the SAT Total.

Table 5
Concordance Between ACT English and SAT I Verbal Scores
Based on Students Applying to the University of Texas – Austin
1999 and 2000

ACT English Score	SAT Verbal Score
11	340
12	370
13	380
14	390
15	410
16	430
17	450
18	470
19	490
20	510
21	520
22	540
23	560
24	580
25	600
26	610
27	630
28	650
29	670
30	690
31	710
32	730
33	750
34	780
35	790
36	800

Table 6
Concordance Between ACT Mathematics and SAT Quantitative Scores
Based on Students Applying to the University of Texas – Austin
1999 and 2000

ACT Mathematics Score	SAT Quantitative Score
11	320
12	330
13	340
14	350
15	360
16	390
17	420
18	450
19	470
20	490
21	510
22	520
23	540
24	560
25	580
26	600
27	620
28	640
29	660
30	670
31	700
32	720
33	740
34	770
35	790
36	800

Table 7
Concordance Between The ACT Composite and The SAT Total Scores
Based on Students Applying to the University of Texas – Austin
1999 and 2000

ACT Composite Score	SAT Total Score
11	660
12	690
13	710
14	740
15	760
16	810
17	850
18	890
19	930
20	970
21	1010
22	1050
23	1080
24	1120
25	1160
26	1200
27	1240
28	1270
29	1310
30	1350
31	1390
32	1420
33	1470
34	1520
35	1550
36	1590

Strength of the Relationship

The correlation between two test scores is an index of the strength of their linear statistical relationship. The correlations were .76 for English/Verbal and .86 for Mathematics/Quantitative, and .87 for the ACT Composite and the SAT Total score. As discussed above, the tests are measuring some, but not all, of the same skills. ETS's current project, "Building a Capabilities" is demonstrating that adjusted correlations can be shown to be stronger when factors such as restriction of range are taken into consideration. (This study does not adjust any correlations.) That is to say that it is likely that more science can be applied to demonstrate a relationship that is stronger than has already been shown.

ACT researchers also measured the strength of the relationship between the tests by computing the consistency of admissions decisions that would be made using ACT or SAT alone. (UT-Austin has never, and will never, use test scores alone to make admissions decisions; such a computation is meant only to illustrate the degree of agreement between the two tests.) The Consistency Rate is defined as the percentage of students for whom similar decisions would be made, given a specific cutoff score. The minimum consistency rates for the two tests were .81 for ACT English/SAT I Verbal, and .82 for the ACT Mathematics/SAT I Quantitative. For the ACT Composite/SAT Total combination, the minimum consistency rate was .84. This implies that, if test scores were used alone, at least 84% of admissions decisions would be the same for the ACT as for the SAT I. This compares to a consistency rate of approximately .89 for two equated and exchangeable versions of the ACT Composite score. Table 8 gives consistency rates for some of the values in the score distribution for the English, Mathematics, and Composite scores.

Table 8
Consistency Rates for Concorded Values
ACT English/SAT I Verbal and ACT Mathematics and SAT I Quantitative
1999 and 2000

ACT Score	ACT C/SAT T	ACT E/SAT V	ACT M/SAT Q
16	.98	.93	.95
18	.95	.89	.91
20	.90	.85	.87
22	.85	.82	.84
24	.84	.81	.83
26	.86	.84	.84
28	.90	.87	.87
30	.94	.91	.90
32	.97	.95	.95

Cautions against Misuses of Concordance Tables

The equipercentile method used to develop these concordance tables does not produce “equivalent” scores based upon skill level. For example, in Table 2, an ACT English score of 21 is concordant to a SAT Verbal score of 520. This does not mean that a student who scores a 21 on the ACT English test will score a 520 on the SAT Verbal test. Such a precise prediction is not possible. What is true is that if applicants submitting both ACT and SAT scores from 1999 and 2000 were combined then the percentage below 21 on the ACT English test would be approximately the same as the percentage below 520 on the SAT Verbal test.

The reasons that scores on the tests cannot be considered interchangeable is that the tests have different content specifications, different time limits, and different numbers of questions. These differences mean that some students will do better on one test than on the other, depending on which test measures more of the skills a student has. So, while the percentage of students who score below 21 on the ACT English test, and below 520 on the SAT Verbal is the same, the individuals who comprise these percentages are not exactly the same, but the consistency rates illustrated above show remarkable agreement.

Conclusion

Table 8 below illustrates several concordances developed or once in use at the University of Texas at Austin. In each case ACT Composite scores were concorded to comparable SAT Total scores. The national concordance is, without question, the concordance of choice for institutions not able to produce their own study because of small numbers of students submitting scores from both tests. UT-Austin is not such a school; 12,670 students with ACT and SAT scores is more than enough to develop a local concordance.

UT's Offices of Admissions Research and the Measurements and Evaluation Center (MEC) developed the SAS (Research) Routine and ADM (Admissions) Routine Concordances below during the late 1990s. They are nearly identical and are similar to the results of this current study.

Table 8
The University of Texas at Austin
National and UT-Produced ACT Composite/SAT Total Concordances

ACT Score	National Concordance	SAS Routine Concordance	ADM Routine Concordance	2001 UT/ACT Study
36	1600	1600	1600	1590
35	1580	1600	1600	1550
34	1520	1530	1530	1520
33	1470	1470	1470	1470
32	1420	1410	1400	1420
31	1380	1360	1360	1390
30	1340	1320	1310	1350
29	1300	1280	1280	1310
28	1260	1240	1240	1270
27	1220	1210	1210	1240
26	1180	1180	1180	1200
25	1140	1140	1140	1160
24	1110	1110	1110	1120
23	1070	1070	1060	1080
22	1030	1030	1030	1050
21	990	990	990	1010
20	950	960	950	970
19	910	910	910	930
18	870	860	860	890
17	830	830	820	850
16	780	780	780	810
15	740	720	720	760
14	680	670	670	740
13	620	620	620	710
12	560	560	560	690
11	500	500	500	660
10		460	440	
9		420	420	
8		420	420	
7		420	420	
6		420	420	
5		420	420	
4		420	420	
3		420	420	
2		420	420	
1		420	420	

Since it is the purpose of concordance tables to provide comparable decision points for groups, the table produced by this study will likely permit the same proportions of students to be selected if only test scores were used in the admissions

decisions process. Such was a goal of this study. Factors usually used to determine whether to develop a local concordance are:

1. the size of the testing sample;
2. the quality and comparability of the score distributions;
3. the time lapse between the ACT Assessment and SAT I score distributions;
and
4. the statistical methods used to correct the data and produce the concordance tables.¹³

Each of these issues has been satisfactorily addressed.

¹ See *General Information 2000-2001*, The University of Texas at Austin, pgs. 12-13.

² ACT and SAT are registered trademarks of ACT, Inc. and the College Board, respectively.

³ *College Admissions Assessment: Debunking Myths and Misrepresentations*, ACT Policy Briefs, (ACT, Inc., 2001), pg. 1-2. The related assessments are PLAN, formerly called the P-ACT, for high school sophomores, and EXPLORE for eighth graders.

⁴ See Nicolas Lemann, *The Big Test*, (New York, 1999), pgs. 31-34; *How the SAT Is Made*, (The College Board, 2001), pgs. 5-6.

⁵ Neil J. Dorans, *Correspondences Between ACT and SAT I Scores*, College Board Report No. 99-1, New York, 1999, pg.2.

⁶ See *Preparing for the ACT Assessment, 2000-2001*, pages 5-9, for greater detail on the content specifications of each of the ACT Assessment tests.

⁷ Subscores on the ACT Assessment are computed independent of the test scores or the Composite.

⁸ See *Taking the SAT I: Reasoning Test, 2000-2001*, pgs. 3-33, for more on the content specifications of the SAT I.

⁹ See *Ibid.*, pgs. 19-25.

¹⁰ See *Ibid.*, pgs. 33-34.

¹¹ Neil Dorans, C. Felicia Lyu, and Mary Pommerich and Walter Houston, *Concordance Between ACT Assessment and Recentered SAT I Sum Scores*, White paper in the author's possession.

¹² These figures, and those for Table 1, are taken from UT-Austin's mainframe at *ADHDCT for semesters 996, 999, 006, and 009.

¹³ *Concordance Between SAT I and ACT Scores for Individual Students*, (College Board Research Notes, RN-07, June 1999), pg. 7.