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No. 2009-7

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The College Board, New York, 2009

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Abstract

There have been numerous studies validating the SAT® as a predictor of first-year grade point average (FYGPA), and the evidence overwhelmingly substantiates its use for college admission (e.g., Bridgeman, McCamley-Jenkins, & Ervin, 2000; Burton & Ramist, 2001; Hezlett et al., 2001; Kobrin, Patterson, Shaw, Mattern, & Barbuti, 2008; Morgan, 1989). However, less attention and research has focused on the relationship between the SAT and other indicators of college success such as retention. Research on college retention is particularly relevant for admission officers and educators given the prevalence of attrition in higher education and its grave consequences. This study attempts to bridge this research gap by examining the relationship between scores on the SAT and retention to second year of college using student level data from the freshman class of 2006 at 106 four-year institutions. Results indicate the SAT predicts second-year retention, with 95.5 percent of high performers returning but only 63.8 percent of low performers. While retention rates do vary by subgroups (i.e., gender, ethnicity, parental income, and highest parental education) and institutional characteristics (i.e., control, selectivity, size), these differences are moderated when SAT performance and other indicators of academic preparation are considered. Implications are discussed.

Is Performance on the SAT® Related to College Retention?

There have been hundreds of studies examining the relationship between performance on the SAT and first-year grade point average, and the results consistently find support for its use in college admission (e.g., Bridgeman et al., 2000, Burton & Ramist, 2001; Hezlett et al., 2001; Kobrin et al., 2008; Morgan, 1989). For example, a meta-analysis by Hezlett et al. (2001) found a strong relationship between SAT scores and FYGPA with multiple correlations ranging from 0.44 to 0.62. An earlier study conducted on the SAT found that the corrected correlation between the SAT and FYGPA was 0.53 (uncorrected correlation = 0.35, Kobrin et al., 2008). Additionally, research has shown that the SAT is also strongly related to more distal measures of course grades, such as cumulative GPA (i.e., Bridgeman, Pollack, & Burton, 2008; Hezlett et al., 2001). However, less attention and research has focused on the relationship between the SAT and other, non-grade-related indicators of college success, such as retention.

Research on college retention is one critical component of the College Board's research on the validity of the SAT. In addition to performance indicators like first-year college GPA, it is important that the research on the predictive validity of the SAT looks at numerous criterion variables. One of the key criterion variables is retention to second year of college. It is important to study college retention for a variety of reasons. First, research on college retention is particularly relevant for admission officers and educators given the prevalence of attrition in higher education and its grave consequences. As an early indicator of persistence, retention is often operationalized as the percentage of first-time, full-time students returning to the same institution for their second year of college. Note that this definition excludes students who transfer to another higher education institution. Based on this definition, 77.4 percent of full-time students attending a four-year institution returned to that institution for their second year of college in 2005 as reported by The National Center for Higher Education Management Systems (NCES, IPEDS, 2005). The percentage of successful students drops substantially when the outcome is more distal such as degree attainment. Additionally, research has found that the percentage of students leaving the first four-year institution they enrolled in without graduating is over 50 percent, and of those students, almost half never earned a college degree (Tinto, 1993). The financial consequences of not earning a college degree for students in terms of lower salaries have been well documented. A report by the College Board found that individuals with a college degree earned 62 percent, on average, more than individuals with only a high school diploma in 2005 (Baum & Ma, 2007).

Low retention rates can result in substantial financial consequences for institutions in terms of lost tuition and increased recruitment costs, which is another reason why retention research is so important. Research examining what factors are related to retention can help inform admission practices so that institutions select students who are more likely to stay and succeed at their institution. For example, are students who score higher on the SAT more likely to return for their second year than students who score lower on the SAT? Does it depend on the type of the institution?

Two studies (Kobrin et al., 2008; Mattern, Patterson, Shaw, Kobrin, & Barbuti, 2008) were conducted examining the relationship between SAT and first-year GPA. Kobrin et al. found that performance on the SAT was highly predictive of FYGPA with a corrected correlation of 0.53. Mattern et al. examined the differential validity and prediction of the SAT in terms of FYGPA by gender, race/ethnicity, and best language subgroups. This study is an extension of this earlier work with the overarching goal of accumulating

additional sources of validity evidence for the use of the SAT in college admission.

College Retention

Studies of college retention have found that students leave college for a variety of reasons; therefore, no single variable is likely to explain a majority of the variation in college retention (Ramist, 1981; Robbins, Lauver, Le, Davis, & Langley, 2004). Ramist (1981) listed numerous factors that could influence whether one remained enrolled in college, including academics, finances, motivation, personal considerations (e.g., adjustment), dissatisfaction, military service, and work. More recently, Astin (1997) found that the majority of variance in retention could be explained by high school grade point average (HSGPA), standardized test scores, gender, and ethnicity. Even after controlling for student characteristics such as academic performance and gender, Bowen and Bok (1998) found that institutional characteristics were related to whether or not students persisted. Given the complex nature of college retention, current research on the topic almost always examines a variety of student characteristics, such as prior academic achievement, gender, ethnicity, and socioeconomic status, and/or institutional characteristics such as selectivity and control (i.e., public or private) within a study.

Student Characteristics

Academic Achievement

Research examining the relationship between academic achievement, such as HSGPA and high school (HS) rank, standardized test scores, and FYGPA, consistently reveals a positive relationship with retention (e.g., Allen, 1999; Astin, 1997; Murtaugh, Burns, & Schuster, 1999; Robbins et al., 2004). For example, Allen (1999) found that FYGPA had the strongest relationship with retention to second year (r = 0.59 for non-minorities and 0.76 for minorities) followed by HS rank (r = 0.33 for non-minorities and 0.39 for minorities) as compared to other variables examined.

Murtaugh, Burns, and Schuster (1999) found similar results, with HSGPA and first-quarter GPA as the strongest predictors of withdrawal over four years. Using first-quarter GPA, the likelihood of being retained for one year jumped from 57 percent for students with the lowest first-quarter GPAs (0.0–2.0) to 91 percent for students with the highest first-quarter GPAs (3.3–4.0). Based on the pre-2005 SAT (containing math and verbal sections), with a score scale ranging from 400 to 1600, SAT scores were also positively related to retention, with students whose SAT scores were less than 1000 having a 78 percent probability of returning for their second year as compared to 87 percent probability for students with SAT scores 1200 or greater. Similarly, examining the percentage of students graduating in four years, Astin, Tsui, and Avalos (1996) found that among students who earned an A for their HSGPA, 80 percent graduated who had an SAT score of 1300 or greater, whereas only 28 percent graduated who had an SAT score of less than 700.

Gender

Previous research on the relationship between gender and retention has not been as definitive. Some studies have found that females are more likely to persist than males (e.g., Astin, 1975; Peltier, Laden, & Matranga, 1999), whereas others have found no relation (e.g., Murtaugh, Burns, & Schuster, 1999) or that the relationship disappears when controlling for other variables such as college setting (St. John, Hu, Simmons, & Musoba, 2001). Furthermore, other research has found interaction effects between gender and other characteristics, such as ethnicity and whether or not one has children, on retention rates (Leppel, 2002).

Race/Ethnicity

Research has found that Asian and white students are more likely to persist in college as compared to other racial/ethnicity subgroups (Astin, 1975; Murtaugh, Burns, & Schuster, 1999; Leppel, 2002). However, the difference between groups disappears, or is greatly diminished, when other factors are controlled for, such as academic achievement (Murtaugh, et al., 1999). Other research has found that racial/ethnic status moderates the relationships between retention and academic-related variables. Allen (1999) found that HS rank was more predictive of retention for nonminority students. Furthermore, parental education was only significantly related to retention for nonminority students, whereas desire to finish college was only predictive of retention for minority students.

Socioeconomic Status (SES)

In educational research, socioeconomic status (SES) has been found to be positively related to persistence in college (e.g., Allen, 1999; Bowen & Bok, 1998; Cabrera, Nora, & Castañeda, 1992). In a meta-analysis by Robbins et al. (2004), SES was positively correlated with retention with an uncorrected correlation of 0.21, which was based on six independent studies and 7,704 students. Bowen and Bok (1998) found similar results in that students from high SES backgrounds were more likely to graduate than students from low SES backgrounds even after controlling for academic achievement (i.e., SAT scores and HSGPA).

Institutional Characteristics

Selectivity

Astin (1975) found a positive relationship between institutional selectivity, which was based on average SAT scores, and persistence rates. However, after controlling for a student's dropout proneness,[1] which included the student's academic performance, financial aid awarded, work status, and residence, the relationship disappeared. On the other hand, Bowen and Bok (1998) found that regardless of the student's academic preparedness, students who attended a highly selective institution were more likely to persist than students who attended less selective institutions. To examine the effects of selectivity, they created three levels of selectivity based on average SAT scores at each institution. Controlling for student and institutional characteristics, the six-year graduation rate for the most selective institutions was 10 percent higher than those of the least selective institutions. Therefore, students of the same ability but attending a more selective institution were more likely to graduate.

Control

Research has also found higher retention rates for private institutions as compared to public institutions. Astin (1975) found higher dropout rates for public institutions as compared to private institutions; however, the differences were smaller for colleges than universities. This was true even after controlling for a student's dropout proneness. Similarly, a report by ACT in 2002 found that 75 percent of students who attend a private institution return for their second year as compared to 72 percent for public institutions; however, in 2008, ACT reported no differences in overall retention rates by control for four-year institutions (ACT, 2002; 2008). Both of these studies did not control for academic performance; therefore, results should be interpreted with caution since private institutions are more likely to accept students with higher academic performance as measured, for example, by average standardized test scores (Kobrin et al., 2008).

Purpose of the Current Study

The purpose of the current study is to examine the relationship between performance on the SAT and retention to the second year. Given the complex nature of college retention, additional analyses were conducted examining the influence of student and institutional characteristics on retention controlling for the SAT. The student characteristics investigated were gender, ethnicity, parental income, and highest parental education. The institutional characteristics examined were the institution control, selectivity, and size.

Method

Sample

Data collected for the national SAT admission validity study were used in the current study (see Kobrin et al., 2008 for a complete description of the sample). Data from each institution include students' course work and grades, FYGPA, and whether or not they returned for the second year. These data were matched to College Board databases that included SAT scores, self-reported high school grade point average (HSGPA), and demographic information. The original sample consisted of individual level data on 196,364[2] students from the 2006 cohort from 110 colleges and universities from across the United States. Students in the sample who did not have retention information, scores on the SAT, or a valid HSGPA from the SAT Questionnaire were excluded from the analyses. Four institutions were dropped because they failed to provide any retention data. The final sample included 147,999 students from 106 institutions.

The distribution of participating institutions by region, selectivity, size, and control are provided in Table 1. The sample is diverse in regard to these characteristics and is largely representative of the target population, which was composed of the 726 four-year institutions that received at least 200 SAT score reports in 2005.[3] Note

1. Dropout proneness was based on a student's academic performance, family background, educational aspirations, expectations about college, study habits, age, marital status, whether or not one smoked, and participation in extracurricular activities in high school.
2. During the completion of this study, it came to the authors' attention that of the original 196,364 students included in the national SAT validity database, a small percentage (0.5 percent) of cases was matched incorrectly. Additional analyses indicated that removal of these cases had little to no impact on the final results and conclusions. The results reported in this study do not include the duplicate records.
3. These 726 institutions served as the sample population, and available information on these schools from the College Board's *Annual Survey of Colleges* on various characteristics, including control (public/private), region of the country, selectivity, and full-time undergraduate enrollment, were used to form stratified target proportions on those characteristics for the target institutions to be recruited.

that the target population does not include institutions such as two-year and for-profit institutions, which have missions and admission processes that are different than the traditional four-year college or university. As a result of refining the sample, the findings of this study are more generalizable to the issue of retention at four-year academic institutions.

Table 1
Distribution of Participating Institutions by Key Characteristics as Compared to the Population

Variable		Population	Sample
Region of U.S.	Midwest	16%	15%
	Mid-Atlantic	18%	23%
	New England	13%	22%
	South	25%	11%
	Southwest	10%	11%
	West	18%	18%
Selectivity	Admits under 50%	20%	22%
	Admits 50 to 75%	44%	55%
	Admits over 75%	36%	24%
Size	Small	18%	20%
	Medium to Large	43%	40%
	Large	20%	22%
	Very Large	19%	19%
Control	Public	57%	42%
	Private	43%	58%

Note: Percentages may not sum to one hundred due to rounding. With regard to institution size, small = 750 to 1,999 undergraduates; medium to large = 2,000 to 7,499 undergraduates; large = 7,500 to 14,999 undergraduates; and very large = 15,000 or more undergraduates.

Measures

SAT Scores

Official SAT scores obtained from the 2006 College-Bound Seniors cohort database were used in the analyses. This database is composed of students who participated in the SAT Program and reported an intention to graduate from high school in 2006. Students' most recent scores were used in the analyses. The SAT is composed of three sections: critical reading, mathematics, and writing, and the score scale range for each section is 200 to 800.

For decisions about individual students, the College Board recommends that the three scores be considered separately. Our goal was to characterize overall performance of groups of students across the three skill areas; therefore, we summed the three scores, creating a 600 to 2400 point scale.

SAT Questionnaire Responses

Self-reported gender, race/ethnicity, parental income, and highest parental education, as well as HSGPA, were obtained from the SAT Questionnaire that students completed during registration for the SAT. For highest parental education, it should be noted that students are asked to indicate their mother's and father's highest education level, and this variable represents the higher of the two responses.

Retention

Participating institutions supplied retention data with a value of "1" indicating that a student did return for a second year of college and a value of "0" indicating that a student did not return for a second year. This measure does not differentiate between students who transferred to another college from students who dropped out. That is, students who transferred and those who dropped out were grouped together and classified as non-returners. The two decisions, transferring and dropping out, are quite different and have drastically different consequences, especially for the student. Available data was insufficient for the comparison of the two types of students; however, it may be fruitful for future research to distinguish between the two. It should be noted that from an institutional perspective, colleges are concerned with all students who leave their institution. Therefore, the results in this report should be informative.

Analyses and Results

Description of Total Sample: Returning and Non-Returning Students

The first analysis compared students who returned for their second year to those who did not return. Of the 147,999 students, 127,290 (86.0 percent) were classified as enrolled in their second year. Despite the larger percentage of returners, over 20,000 students in this sample still failed to return for their second year at the first institution at which they enrolled. The retention rate is slightly higher than what has been reported in previous national studies (e.g., NCES, IPEDS, 2007). Based on data collected by NCES, IPEDS, the 2007 national second-year retention rate was 77.1 percent for first-time, full-time students, which was based on 1,441,286 students.

To ensure the accuracy of the retention data, retention rates reported on the NCES website (http://nces.ed.gov/

collegenavigator/) for each of the 106 institutions included in the current analyses were compared to the observed retention rates for this sample. Results of this comparison are provided in Table 2 (page 11). Furthermore, data were compared to additional data sources including *The College Board College Handbook* (The College Board, 2007), and National Student Clearinghouse enrollment verification data and were found to be in line with expectations. Comparing the sample retention rates with NCES reported rates, the two data sources reported exactly the same retention rates for 54 of the 106 institutions. Moreover, retention rates differed by 2 percent or less for 91 of the institutions. Therefore, it appears that discrepancy in the overall retention rate for this sample as compared to national data is not due to problematic data received from participating institutions.

One explanation for the higher retention rate reported in this study may be attributed to differences in our sample with the national population of four-year institutions in the United States. For example, the national NCES retention rate reported above included private, for-profit institutions, which on average have substantially lower retention rates (51.2 percent); however, given that only a small percentage of students (5 percent) attend this type of institution, it cannot fully explain the discrepancy. If these students were excluded from the national rate, the percentage of returners would increase to 78.5 percent, which is still lower than the observed rate for this sample. As mentioned previously, the target population for this research did not include all four-year institutions; and therefore, this is likely to be one of the reasons for the difference in overall retention rates. Furthermore, since NCES does not disaggregate their data by selectivity, differences in the sample in terms of institutional selectivity cannot be ascertained. If differences do exist, this could also potentially influence the overall retention rate.

Table 3 (page 12) presents the distribution of the sample by gender, race/ethnicity, parental income, and education for the total group as well as for returning and non-returning students. For the total group, the distribution of students by demographic variables is largely representative of the national cohort of SAT takers. Females comprised 54.0 percent of the sample, and 69.3 percent of the sample consisted of white students. The sample was diverse in terms of parental income and highest parental education. As for institutional characteristics, the majority of students attended an institution that admits 50 to 75 percent of applicants (57.3 percent) and was public (69.1 percent). Finally, almost half (47.0 percent) of the students attended a very large institution.

The last two columns of Table 3 provide the distribution of returners and non-returners across the student and institutional characteristics described above. For example, the percentage of non-returners that are American Indian, African American, and Hispanic were slightly higher than for the total group. Furthermore, students with reported family income less than $70,000 made up a greater percentage of the non-returners as compared to the total group while students from high-income families (more than $100,000) made up a greater percentage of the returners as compared to the total group. A similar pattern emerged for parental education; students whose parents do not have at least a four-year college degree (i.e., associate degree or less) made up a larger percentage of the non-return group as compared to the total group while those students who have at least one parent with a college degree (bachelor's or higher) are more likely to return to college for their second year. That is, students from higher SES families are more likely to return for their second year.

As for institutional characteristics, 15.4 percent of the sample attended a selective institution (i.e., an institution that admits fewer than 50 percent of applicants); however, this percentage varied markedly for returners (16.8 percent) and non-returners (7.2 percent). As for the size of the institution, there was not very much variation in terms of the two groups. For the control of the institution, 30.9 percent of the total group attended a private school; however, that percentage dropped to 24.4 percent for non-returners. These data confirm that selective and private institutions retain more students.

Finally, students who returned for their second year tended to be more academically able than non-returners, with mean SAT scores roughly 40 points higher per section (120 points total) and HSGPAs 0.2 higher. These results underscore the fact that academically able students are more likely to return for their second year. In sum, the results clearly indicate that returners and non-returners do vary systematically based on student characteristics as well as the characteristics of the institution they attended.

Because numerous student and institution characteristics are related to retention and because these characteristics are probably related to each other, it was important to examine the relationship between retention and SAT in light of these other important variables. Table 4 (page 13) provides the mean SAT total score and standard deviation for students who return for their second year, compared to the score and standard deviation of students who did not return for their second year, by student and institutional characteristics.

It is quite evident that SAT performance is related to retention even after controlling for student and institutional characteristics. The mean SAT score is consistently higher for students who return, versus the mean score for students who do not return, within each subgroup comparison. For example, females who return have a mean SAT score of 1680.7 (SD = 253.3) compared

to females who do not return who have a mean SAT score of 1562.0 (SD = 231.9). Low-income students (i.e., parental income < $30,000) who return, score, on average, nearly 100 points higher on the SAT as compared to students with the same parental income who don't return. This pattern of results holds for all ethnic, parental income, and education subgroups; for each HSGPA category; and for each institutional selectivity, size, and control category. That is to say, the mean SAT score is always higher for students who return, versus the mean score of students who do not return, by subgroup. The results provide strong support for the relationship between student retention and SAT performance.

Retention Rates by Student Academic Characteristics

Next, retention rates were computed by the academic ability of students. SAT scores were categorized into 290-point score bands, and HSGPA was categorized by letter grade in order to examine the percentage of students returning by each category. In Table 5 (page 14), the number of students falling within each SAT score band and HSGPA grade, along with the mean retention rate and standard deviation, are provided. For the SAT, students in the lowest score band (600 to 890) have the lowest retention rate, 63.8 percent, whereas students in the highest score band (2100 to 2400) have the highest retention rate, 95.5 percent. A similar pattern emerges for HSGPA. Of the students who had a HSGPA of C- or lower, only 65.0 percent returned for their second year of college, whereas 93.4 percent of students with an A+ HSGPA returned. In addition to the strong relationship between these admission measures with FYGPA (e.g., Hezlett et al., 2001; Kobrin et al., 2008), these results provide support for the use of both SAT scores and HSGPA in the admission process to select students who are more likely to return after their first year.

Additionally, the mean retention rate within HSGPA category by SAT band was computed and is presented graphically in Figure 1 (see Appendix A for mean retention rates and sample sizes for each HSGPA category by SAT score band comparison). This graph reveals that mean retention rates vary substantially within specific HSGPA categories and that a proportion of this variance can be explained by SAT performance. This represents strong evidence that the SAT provides meaningful incremental predictive validity over and above HSGPA alone. For example, students who have an A HSGPA (A+, A, A-) but scored between 900 and 1190 on the SAT have a mean retention rate of 76.8 percent, whereas students with the same HSGPA but scored 2100 or higher on the SAT have a mean retention rate of 96.0 percent. Similar patterns were found for other HSGPA categories. For students who earned a HSGPA of C+ or lower, the relationship between SAT performance and retention rates was not as strong as for the other HSGPA categories, yet there was still a positive monotonic relationship between SAT performance and retention. Students with a HSGPA of C+ or lower constitute a very small percentage of students (2.6 percent) and results should be interpreted with caution. Refer to Appendix A for more detailed information, specifically mean retention rates and sample sizes[4] for finer HSGPA categories.

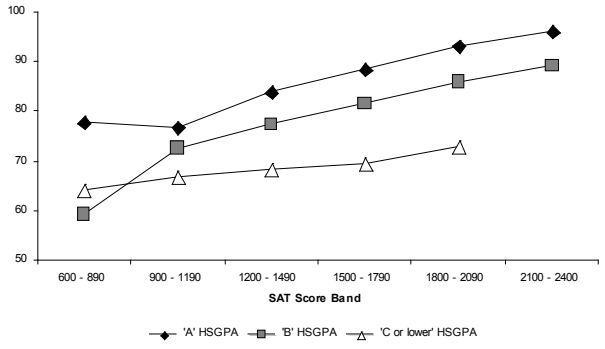

Figure 1
Retention rates by SAT performance within HSGPA categories.

Retention Rates by Student Demographic Characteristics

In addition to the academic achievement of students, retention rates by student demographic characteristics of gender, race/ethnicity, parental income, and highest parental education were examined. Results are provided in Table 6 (page 15). Retention rate by gender was fairly similar for males and females, with females having a slightly higher rate of 86.3 percent compared to 85.7 percent for males. As for race/ethnicity, Asian American and white students had the highest retention rates of 89.3 percent and 86.2 percent, respectively. Asian American and white students also tend to score higher on the SAT and HSGPA compared to other underrepresented groups (Mattern et al., 2008). American Indian students had the lowest retention rate, with a value of 78.6 percent.

For parental income, the percentage of students being retained increased as the income band increased from 81.8 percent for students who indicated an annual parental income of less than $30,000 to 88.0 percent for students who indicated an annual parental income of more than $100,000. Similarly, for parental education, 81.6 percent of students whose parents do not have a high school diploma returned for their second year, whereas 89.2 percent of students who have at least one parent with a graduate

4. Categories that included fewer than 15 cases are not reported.

degree returned for their second year. Prior research has found that higher levels of SES are associated with higher SAT scores (Camara & Schmidt, 1999). In sum, retention rates do vary systematically by student demographics; however, this is partly attributable to differences in the academic achievement level (i.e., HSGPA and SAT scores) of these groups. Refer to Appendix A for retention rates within student and institutional characteristics by SAT score band. Note that differences in retention rates by student characteristics are minimized and in some instances eliminated when controlling for SAT scores.

Retention Rates by Institutional Characteristics

Prior research has also found that retention rates vary systematically for different types of institutions. Even though the overall percentage of students returning was quite high (86.0 percent), this percentage varied markedly across institutions. For example, of the 106 institutions included in this study, 28 institutions had retention rates of less than 80 percent whereas 34 had retention rates between 90 percent and 99 percent. Figure 2 provides the distribution of retention rates across institutions.

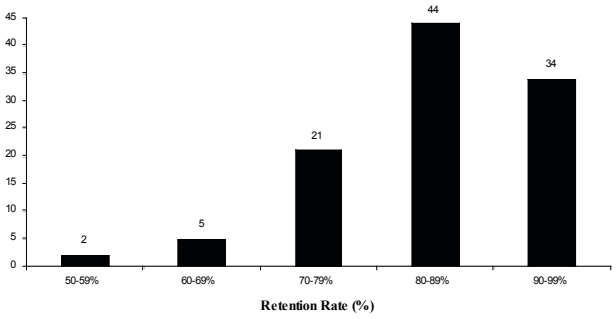

Figure 2
Distribution of Institutional Retention Rates

As they were in Table 3, institutions were compared based on their retention rate. Institutions were classified as having either a low retention rate (< 75.0 percent), medium retention rate (≥ 75.0 percent and ≤ 85.0 percent), or high retention rate (> 85.0 percent). The distribution of student and institutional characteristics for the three groups were computed and are presented in Table 7 (page 16). First, it should be pointed out that only 11.6 percent of the students in the sample attended an institution that was considered to have a low retention rate, whereas 61.3 percent of the students attended an institution with a high retention rate. High retention institutions had slightly fewer females, more Asian students, more students from families with high SES in terms of both parental income and education, when compared with low retention institutions. These institutions tended to be more selective, very large, and private. Finally, students at high retention rate colleges outperformed students at medium and low retention colleges on both the SAT and HSGPA.

Next, retention rates by institutional characteristics of control, size, and selectivity were computed and are presented in Table 8 (page 17). For control, students at private institutions were more likely to return for their second year (88.9 percent versus 84.7 percent at public institutions). An earlier report also found higher SAT scores and HSGPAs for private institutions (Kobrin et al., 2008). As for institution size, no clear pattern emerged in terms of the relationship among institutional size and retention. For example, retention was the highest for students at very large institutions. However, large institutions had a lower retention rate (84.9 percent) than that of medium institutions (86.1 percent), and small institutions had the lowest retention rate (82.1 percent). Finally, the most selective institutions (those that admit fewer than 50 percent of applicants) had the highest retention rate 93.5 percent, whereas the less selective institutions (those that admit over 75 percent of applicants) had the lowest retention rate (82.5 percent). Again, prior research has shown that more selective institutions admit students that have higher average SAT scores and HSGPAs (Kobrin et al., 2008). Refer to Appendix B for retention rates by two institutional characteristics (e.g., small, private institutions).

In addition, the mean retention rate within institutional selectivity category by SAT band was computed and is presented graphically in Figure 3 (see Appendix A for mean retention rates and sample sizes for each selectivity category by SAT score band comparison as well as other institutional characteristics by SAT score band comparisons). This graph reveals that mean retention rates vary within institutional selectivity categories and demonstrates that SAT performance influences retention rates within each of these categories. In other words, these data show that retention is not

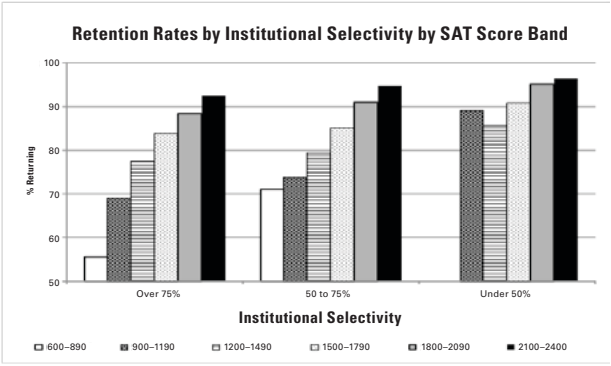

Figure 3
Retention Rates by Institutional Selectivity by SAT Score Band

solely a function of the quality of the institution to which one is admitted but is dependent on individual student's academic preparation as well. For example, students attending an institution that is not selective (admits over 75 percent of applicants) and who scored between 600 and 890 on the SAT have a mean retention rate of 55.6 percent, whereas students attending an institution of the same selectivity level but who scored 2100 or higher on the SAT have a mean retention rate of 92.6 percent. A similar positive relationship between SAT performance and retention rate was found for moderately and highly selective institutions, albeit the differences are smaller for highly selective institutions.

These results underscore that attending a selective college does not ensure success but is dependent on the student's academic preparation. Furthermore, the differences in retention rates for colleges of varying selectivity nearly disappear when controlling for SAT performance. Refer to Appendix C for retention rates by institutional characteristics by student characteristics.

Discussion

This study examined the relationship between SAT scores and second-year retention rates. Retention rates by SAT score bands revealed widely varying rates across the distribution of SAT scores. Whereas 95.5 percent of students with the highest SAT total scores (scores ranging from 2100 to 2400) returned for their second year of college, only 63.8 percent of students with the lowest SAT total scores (scores ranging from 600 to 890) returned. A similar pattern emerged for HSGPA. These findings provide support for the use of both SAT scores and HSGPA to predict another dimension of college success, retention to second year. When holding HSGPA constant, higher SAT scores were again associated with a greater likelihood of returning for the second year of college. In other words, SAT performance provides incremental power beyond HSGPA in predicting student retention. Additionally, this study examined whether or not retention rates varied as a function of student and institutional characteristics. The results found that retention rates did vary systematically by both student and institutional characteristics; however, evaluating a student's academic preparation (as measured by both SAT performance and HSGPA) can virtually eliminate these differences.

One potential limitation of this study was how retention to second year was operationally defined. Retention to second year, as provided by each participating institution, did not distinguish between students who dropped out and those who transferred to another institution. Dropping out of college is undoubtedly different than transferring to another institution. Students who dropped out have decided to terminate their higher education experience, whereas students who have transferred have simply chosen a different institution for their higher education experience. That being said, from an admission officer's perspective, the outcome for the two types of students is the same — leaving that institution — which is currently a critical problem for enrollment management. Therefore, these findings are useful for admission personnel to inform admission practices and policies. However, more basic research interested in modeling college persistence, in general, should distinguish between these different types of students when analyzing data and reporting findings.

Another limitation of the study was that the institutions included in this study had a higher retention rate than the national average, which limited the variability in the overall retention rate. That is, a very high percentage, 86.0 percent, of students in this sample returned for their second year compared to a national average of 77.4 percent. Since there were large differences in retention rates across institutions (refer to Figure 3), more research should focus specifically on institutions with lower retention rates and how they vary from institutions with higher retention rates. This paper began to address this question, but much more research is needed. Research should examine what institutions that currently have low retention rates can do to remedy the problem. Would implementing or restructuring their first-year experience course help increase retention rates? What about the financial aid packages available? Since all institutions cannot become highly selective overnight, other solutions to the retention problem need to be researched.

In a similar vein, future research should examine more distal persistence outcomes, such as retention to third year, retention to fourth year, and ultimately graduation. Given that Astin et al. (1996) found that 40 percent of students enrolled in four-year institutions never earn a degree, which is a significantly higher number than the percentage that don't return for their second year, it will be important to determine what factors are related to more long-term retention outcomes. Institutions participating in this research have been asked to provide longitudinal data in order to test these research questions.

Conclusion

By analyzing a national dataset including individual level data on nearly 150,000 students from 106 colleges and universities, this study demonstrates the strength of the relationship between SAT performance and retention to second year, an outcome that has received much less attention than FYGPA. Results of this study add to our understanding of the retention process and its relationship to admission criteria such as SAT scores and HSGPA. Furthermore, the study demonstrates that although retention rates vary substantially by student and institutional characteristics, evaluating a student's academic preparation (as measured by both SAT performance and HSGPA) can substantially reduce these differences.

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Table 2

Comparison of the Sample's Institutional Retention Rates (%) to NCES Reported Retention Rates (%)

Institution	Sample	NCES	Diff	Institution	Sample	NCES	Diff	Institution	Sample	NCES	Diff
School 1	60	**65**	-5	School 37	83	83	0	School 73	75	75	0
School 2	74	**78**	-4	School 38	91	91	0	School 74	69	69	0
School 3	66	70	-4	School 39	92	92	0	School 75	86	86	0
School 4	83	86	-3	School 40	70	70	0	School 76	80	79	1
School 5	60	63	-3	School 41	81	81	0	School 77	75	74	1
School 6	84	86	-2	School 42	72	72	0	School 78	93	92	1
School 7	80	81	-1	School 43	74	74	0	School 79	70	69	1
School 8	57	**58**	-1	School 44	73	73	0	School 80	96	95	1
School 9	83	84	-1	School 45	87	87	0	School 81	61	60	1
School 10	70	71	-1	School 46	97	97	0	School 82	93	92	1
School 11	87	88	-1	School 47	81	81	0	School 83	65	64	1
School 12	96	97	-1	School 48	87	87	0	School 84	97	96	1
School 13	93	94	-1	School 49	83	83	0	School 85	87	86	1
School 14	95	96	-1	School 50	85	85	0	School 86	98	97	1
School 15	82	83	-1	School 51	96	96	0	School 87	79	78	1
School 16	58	59	-1	School 52	87	87	0	School 88	99	**98**	1
School 17	82	83	-1	School 53	96	96	0	School 89	85	84	1
School 18	77	78	-1	School 54	95	95	0	School 90	83	82	1
School 19	90	91	-1	School 55	82	82	0	School 91	87	86	1
School 20	87	88	-1	School 56	89	89	0	School 92	91	90	1
School 21	89	90	-1	School 57	91	91	0	School 93	73	72	1
School 22	76	76	0	School 58	82	82	0	School 94	79	77	2
School 23	77	77	0	School 59	83	83	0	School 95	89	87	2
School 24	85	85	0	School 60	94	94	0	School 96	81	79	2
School 25	74	74	0	School 61	96	96	0	School 97	85	82	3
School 26	87	87	0	School 62	83	83	0	School 98	95	92	3
School 27	71	71	0	School 63	84	84	0	School 99	87	84	3
School 28	95	95	0	School 64	90	90	0	School 100	93	90	3
School 29	93	93	0	School 65	85	85	0	School 101	91	87	4
School 30	86	86	0	School 66	92	92	0	School 102	92	88	4
School 31	90	90	0	School 67	83	83	0	School 103	82	78	4
School 32	71	71	0	School 68	84	84	0	School 104	81	77	4
School 33	96	96	0	School 69	79	79	0	School 105	84	79	5
School 34	84	84	0	School 70	72	72	0	School 106	79	72	7
School 35	94	94	0	School 71	74	74	0				
School 36	93	93	0	School 72	79	79	0				

Note: NCES data source: nces.ed.gov/collegenavigator. The bolded values (k = 4) indicate that data were obtained from alternative sources (e.g., institution's Web page) because NCES did not provide information for those institutions.

Table 3
Comparison of Returning and Non-Returning Students by Student and Institutional Characteristics

Number of Students	Total 147,999	Return 127,290	Non-Return 20,709
	Percentage of Students		
Female	54.0	54.2	53.0
Race/Ethnicity			
American Indian	0.5	0.5	0.8
Asian	9.0	9.3	6.8
Black/African American	6.7	6.5	7.9
Hispanic	7.1	6.8	9.1
Other	2.9	2.9	3.0
White	69.3	69.5	68.3
No Response	4.4	4.5	4.1
Parental Income			
Less than $30,000	7.6	7.2	9.8
$30,000–$50,000	9.7	9.3	11.7
$50,000–$70,000	11.0	10.7	12.5
$70,000–$100,000	17.2	17.2	17.2
More than $100,000	23.0	23.5	19.7
No Response	31.7	32.1	29.1
Highest Parental Education			
No High School Diploma	1.8	1.7	2.3
High School Diploma	20.7	19.4	28.4
Associate Degree	6.6	6.3	8.1
Bachelor's Degree	33.1	33.4	31.3
Graduate Degree	33.0	34.2	25.4
No Response	4.9	5.0	4.5
Selectivity			
Under 50%	15.4	16.8	7.2
50% to 75%	57.3	57.1	58.7
Over 75%	27.3	26.2	34.1
Size			
Small	4.3	4.1	5.6
Medium	20.3	20.4	20.2
Large	28.3	27.9	30.5
Very Large	47.0	47.6	43.7
Control			
Private	30.9	32.0	24.4
Public	69.1	68.0	75.6
	Mean Values by Performance Variables		
SAT – CR	557.4	562.5	526.3
SAT – M	574.9	580.8	538.7
SAT – W	550.7	556.2	516.8
HSGPA	3.6	3.6	3.4

Note: Column percentages may not sum to 100, due to rounding. With regard to institution size, small = 750 to 1,999 undergraduates; medium to large = 2,000 to 7,499 undergraduates; large = 7,500 to 14,999 undergraduates; and very large = 15,000 or more undergraduates.

Table 4

SAT Performance for Returners and Non-Returners by Student and Institutional Characteristics

Variables		Return			Non-Return		
		n	Mean	SD	*n*	Mean	SD
Gender	Female	69,006	1680.7	253.3	10,985	1562.0	231.9
	Male	58,284	1721.7	252.4	9,724	1604.3	239.4
Race/Ethnicity	American Indian	638	1641.1	235.6	174	1557.9	213.2
	Asian	11,878	1748.0	270.7	1,417	1623.0	242.5
	Black/African American	8,288	1515.2	232.4	1,629	1425.5	222.8
	Hispanic	8,633	1594.0	245.5	1,876	1482.9	230.2
	Other	3,740	1689.8	264.1	612	1570.8	239.8
	White	88,414	1717.4	242.2	14,154	1606.1	226.5
	No Response	5,699	1761.2	269.6	847	1639.8	248.8
Parental Income	Less than $30,000	9,155	1566.2	255.7	2,033	1477.3	239.1
	$30,000–$50,000	11,881	1628.1	243.0	2,425	1527.1	221.7
	$50,000–$70,000	13,638	1659.7	236.7	2,589	1560.9	222.8
	$70,000–$100,000	21,850	1688.6	240.6	3,557	1591.2	225.4
	More than $100,000	29,923	1761.9	243.2	4,073	1650.6	231.0
	No Response	40,843	1723.5	257.4	6,032	1596.1	238.8
Highest Parental Education	No High School Diploma	2,157	1501.0	249.0	486	1429.0	218.2
	High School Diploma	24,691	1582.4	230.7	5,876	1505.0	216.7
	Associate Degree	8,056	1605.8	226.4	1,684	1526.9	208.9
	Bachelor Degree	42,501	1701.9	235.5	6,490	1600.3	222.8
	Graduate Degree	43,565	1790.6	246.5	5,251	1676.1	241.5
	No Response	6,320	1699.2	273.1	922	1586.1	246.8
HSGPA	≤C-	152	1423.8	279.9	82	1388.2	235.3
	C	736	1417.7	220.5	357	1404.1	222.2
	C+	1,798	1449.6	219.8	784	1430.3	209.7
	B-	4,985	1502.2	213.0	1,753	1475.5	212.0
	B	15,880	1557.3	217.4	4,206	1517.3	214.3
	B+	22,415	1621.5	225.4	4,522	1564.9	220.2
	A-	30,897	1706.1	232.1	4,368	1624.7	224.5
	A	35,297	1780.9	236.7	3,575	1682.8	229.5
	A+	15,130	1871.8	227.4	1,062	1755.9	224.7
Selectivity	Under 50%	21,359	1881.2	258.2	1,489	1740.7	275.6
	50% to 75%	72,620	1683.1	235.6	12,164	1589.8	225.3
	Over 75%	33,311	1618.5	232.1	7,056	1534.7	229.8
Size	Small	5,280	1687.1	261.7	1,150	1533.2	247.1
	Medium	25,918	1722.1	281.7	4,192	1578.5	245.4
	Large	35,536	1672.8	260.2	6,315	1552.9	236.4
	Very Large	60,556	1706.5	234.4	9,052	1609.8	227.1
Control	Private	40,702	1795.7	265.8	5,059	1638.9	264.0
	Public	86,588	1654.2	234.5	15,650	1563.4	223.6
Total		**127,290**	**1699.5**	**253.7**	**20,709**	**1581.8**	**236.4**

Note: With regard to institution size, small = 750 to 1,999 undergraduates; medium to large = 2,000 to 7,499 undergraduates; large = 7,500 to 14,999 undergraduates; and very large = 15,000 or more undergraduates.

Table 5
Retention Rates by Student Academic Characteristics

Subgroup			Retention	
		n	Mean	SD
Overall		147,999	86.0	34.7
SAT Score Band	600–890	105	63.8	48.3
	900–1190	3,172	72.6	44.6
	1200–1490	32,393	79.2	40.6
	1500–1790	63,319	85.4	35.4
	1800–2090	40,276	91.5	27.8
	2100–2400	8,734	95.5	20.8
HSGPA	≤C-	234	65.0	47.8
	C	1,093	67.3	46.9
	C+	2,582	69.6	46.0
	B-	6,738	74.0	43.9
	B	20,086	79.1	40.7
	B+	26,937	83.2	37.4
	A-	35,265	87.6	32.9
	A	38,872	90.8	28.9
	A+	16,192	93.4	24.8

Table 6
Retention Rates by Student Demographic Characteristics

Subgroup			Retention	
		n	Mean	SD
Overall		147,999	86.0	34.7
Gender	Female	79,991	86.3	34.4
	Male	68,008	85.7	35.0
Race/Ethnicity	American Indian	812	78.6	41.1
	Asian	13,295	89.3	30.9
	Black/African American	9,917	83.6	37.1
	Hispanic	10,509	82.1	38.3
	Other	4,352	85.9	34.8
	White	102,568	86.2	34.5
	No Response	6,546	87.1	33.6
Parental Income	Less than $30,000	11,188	81.8	38.6
	$30,000–$50,000	14,306	83.0	37.5
	$50,000–$70,000	16,227	84.0	36.6
	$70,000–$100,000	25,407	86.0	34.7
	More than $100,000	33,996	88.0	32.5
	No Response	46,875	87.1	33.5
Highest Parental Education	No High School Diploma	2,643	81.6	38.7
	High School Diploma	30,567	80.8	39.4
	Associate Degree	9,740	82.7	37.8
	Bachelor's Degree	48,991	86.8	33.9
	Graduate Degree	48,816	89.2	31.0
	No Response	7,242	87.3	33.3

Table 7
Comparison of Institutions with Low, Medium, and High Retention Rates by Student and Institutional Characteristics

	Low	Medium	High
Number of Students	17,243	39,918	90,838
	Percentage of Students		
Female	57.7	55.6	52.7
Race/Ethnicity			
American Indian	0.7	0.6	0.5
Asian	4.5	7.0	10.7
Black/African American	10.4	7.8	5.5
Hispanic	12.6	6.3	6.4
Other	2.8	3.0	2.9
White	65.3	71.2	69.2
No Response	3.6	4.1	4.7
Parental Income			
Less than $30,000	10.4	8.5	6.6
$30,000–$50,000	12.9	11.0	8.5
$50,000–$70,000	13.3	12.9	9.7
$70,000–$100,000	18.6	18.8	16.2
More than $100,000	16.6	18.2	26.3
No Response	28.2	30.5	32.8
Highest Parental Education			
No High School Diploma	2.3	2.0	1.6
High School Diploma	30.9	26.9	16.0
Associate Degree	9.0	8.8	5.2
Bachelor's Degree	32.0	33.0	33.4
Graduate Degree	21.5	24.3	39.0
No Response	4.3	5.0	5.0
Selectivity			
Under 50%	0.8	2.9	23.7
50% to 75%	54.9	68.6	52.8
Over 75%	44.3	28.6	23.5
Size			
Small	11.5	4.0	3.1
Medium	22.0	23.9	18.5
Large	28.0	37.0	24.5
Very Large	38.5	35.1	53.9
Control			
Private	21.2	20.4	37.4
Public	78.8	79.6	62.6
	Mean Values by Performance Variables		
SAT – CR	500.9	521.4	584.0
SAT – M	509.4	535.2	604.8
SAT – W	493.8	514.1	577.6
HSGPA	3.3	3.4	3.7

Note: Column percentages may not sum to 100, due to rounding. Small = 750 to 1,999 undergraduates; medium = 2,000 to 7,499 undergraduates; large= 7,500 to 14,999 undergraduates; and very large= 15,000 or more undergraduates.

Table 8

Retention Rates by Institutional Characteristics

Variable		Retention		
		n	Mean	SD
Overall		147,999	86.0	34.7
Control	Private	45,761	88.9	31.4
	Public	102,238	84.7	36.0
Size	Small	6,430	82.1	38.3
	Medium	30,110	86.1	34.6
	Large	41,851	84.9	35.8
	Very Large	69,608	87.0	33.6
Selectivity	Under 50%	22,848	93.5	24.7
	50% to 75%	84,784	85.7	35.1
	Over 75%	40,367	82.5	38.0

Note: Small = 750 to 1,999 undergraduates; medium = 2,000 to 7,499 undergraduates; large= 7,500 to 14,999 undergraduates; and very large = 15,000 or more undergraduates.

Appendix A: Retention Rates Within Student and Institutional Characteristics by SAT Score Band

Table A1
Retention Rates (and Sample Sizes) by HSGPA Category by SAT Score Band

	SAT Score Band					
HSGPA	**600–890**	**900–1190**	**1200–1490**	**1500–1790**	**1800–2090**	**2100–2400**
≤ C-		66.7	59.2	69.1	76.5	
		45	98	68	17	
C		65.2	67.9	67.6	64.9	
		164	555	309	57	
C+	62.5	67.5	69.2	70.0	75.9	
	16	286	1,284	844	145	
B-	64.7	68.4	72.7	75.5	78.1	77.3
	17	456	2,979	2,721	543	22
B	66.7	71.6	77.0	80.0	83.9	87.7
	30	846	7,524	9,032	2,499	155
B+		76.5	79.4	83.9	87.7	90.2
		699	7,767	12,737	5,221	501
A-		74.1	82.8	86.8	91.6	94.1
		386	6,669	16,408	10,065	1,723
A		79.8	85.1	89.2	93.4	95.7
		263	4,589	16,061	14,350	3,605
A+		85.2	85.9	90.8	94.7	97.6
		27	928	5,139	7,379	2,719

Note: Shaded cells included less than 15 cases and are not reported.

Table A2
Retention Rates (and Sample Sizes) by Gender by SAT Score Board

	SAT Score Band					
Gender	**600–890**	**900–1190**	**1200–1490**	**1500–1790**	**1800–2090**	**2100–2400**
Female	69.0	73.7	79.9	85.9	92.3	95.5
	58	1,911	19,305	34,468	20,072	4,177
Male	57.4	70.9	78.2	84.7	90.8	95.4
	47	1,261	13,088	28,851	20,204	4,557

Table A3

Retention Rates (and Sample Sizes) by Race/Ethnicity by SAT Score Band

	SAT Score Band					
Race/Ethnicity	**600–890**	**900–1190**	**1200–1490**	**1500–1790**	**1800–2090**	**2100–2400**
American Indian or Alaska Native		68.2	74.3	78.1	84.8	90.0
		22	226	366	178	20
Asian, Asian American, or Pacific Islander		79.8	83.5	87.8	92.7	96.9
		233	2,411	5,106	4,216	1,317
Black or African American	52.6	73.7	80.2	87.4	91.9	90.6
	38	820	4,212	3,764	1,019	64
Hispanic, Latino, or Latin American	64.7	68.0	76.3	84.4	91.3	93.5
	17	537	3,593	4,331	1,817	214
Other		74.3	80.5	84.8	91.6	96.1
		140	989	1,779	1,182	255
White	61.5	72.2	79.0	85.1	91.5	95.3
	26	1,298	19,844	45,573	29,635	6,192
No Response		74.6	79.8	85.5	90.4	95.5
		122	1,118	2,400	2,229	672

Note: Shaded cells included less than 15 cases and are not reported.

Table A4

Retention Rates (and Sample Sizes) by Parental Income by SAT Score Band

	SAT Score Band					
Parental Income	**600–890**	**900–1190**	**1200–1490**	**1500–1790**	**1800–2090**	**2100–2400**
Less than $30,000	64.5	71.1	78.6	83.2	89.6	94.3
	31	805	4,023	4,413	1,669	247
$30,000–$50,000	70.0	69.2	78.1	83.4	90.4	96.1
	20	468	4,278	6,313	2,817	410
$50,000–$70,000		73.3	77.4	84.2	90.7	94.5
		333	4,170	7,497	3,656	566
$70,000–$100,000		72.5	80.0	85.5	91.4	94.1
		396	5,657	11,594	6,521	1,235
More than $100,000		77.5	80.3	86.4	91.8	95.7
		275	5,067	14,159	11,585	2,902
No Response	64.9	74.0	79.9	86.1	92.1	96.0
	37	895	9,198	19,343	14,028	3,374

Note: Shaded cells included less than 15 cases and are not reported.

Table A5

Retention Rates (and Sample Sizes) by Parental Education by SAT Score Band

	SAT Score Band					
Parental Education	**600–890**	**900–1190**	**1200–1490**	**1500–1790**	**1800–2090**	**2100–2400**
No High School Diploma		76.4	77.7	85.1	90.4	91.9
		271	1,139	944	239	37
High School Diploma	59.6	68.4	77.1	81.8	88.6	94.4
	47	1,309	10,595	13,546	4,624	446
Associate Degree		71.4	78.5	83.1	90.4	94.7
		276	3,109	4,557	1,620	171
Bachelor's Degree		74.4	80.3	86.1	91.8	95.1
		731	9,684	22,612	13,647	2,304
Graduate Degree		76.3	81.5	87.4	92.2	95.7
		367	6,260	18,779	18,149	5,247
No Response		81.7	80.6	87.1	91.2	95.8
		218	1,606	2,881	1,997	529

Note: Shaded cells included less than 15 cases and are not reported.

Table A6

Retention Rates (and Sample Sizes) by Institutional Selectivity by SAT Score Band

	SAT Score Band					
Selectivity	**600–890**	**900–1190**	**1200–1490**	**1500–1790**	**1800–2090**	**2100–2400**
Under 50%		89.2	85.8	90.9	95.2	96.4
		166	2,068	5,810	9,926	4,872
50 to 75%	71.1	73.9	79.5	85.2	91.0	94.8
	45	1,619	18,448	38,950	22,602	3,120
Over 75%	55.6	69.1	77.6	83.9	88.4	92.6
	54	1,387	11,877	18,559	7,748	742

Note: Shaded cells included less than 15 cases and are not reported.

Table A7

Retention Rates (and Sample Sizes) by Institutional Size by SAT Score Band

	SAT Score Band					
Size	**600–890**	**900–1190**	**1200–1490**	**1500–1790**	**1800–2090**	**2100–2400**
Small: 750 to 1,999 undergraduates		65.7	71.4	83.0	91.2	92.8
		210	1,627	2,562	1,680	345
Medium: 2,000 to 7,499 undergraduates	90.5	73.8	78.6	84.7	91.8	96.0
	21	707	6,986	11,172	8,313	2,911
Large: 7,500 to 14,999 undergraduates	52.3	71.7	79.3	84.2	91.4	96.2
	44	1,243	10,663	17,535	10,119	2,247
Very Large: 15,000 or more undergraduates	67.6	74.2	80.5	86.4	91.5	94.8
	34	1,012	13,117	32,050	20,164	3,231

Note: Shaded cells included less than 15 cases and are not reported.

Table A8

Retention Rates (and Sample Sizes) by Institutional Control by SAT Score Band

	SAT Score Band					
Control	**600–890**	**900–1190**	**1200–1490**	**1500–1790**	**1800–2090**	**2100–2400**
Private	77.3	73.1	79.1	87.1	92.8	95.9
	22	685	6,762	15,610	16,884	5,798
Public	60.2	72.4	79.3	84.8	90.6	94.7
	83	2,487	25,631	47,709	23,392	2,936

Appendix B: Retention Rates by Two Institutional Characteristics

Table B1
Retention Rates (and Sample Sizes) by Institutional Size by Institutional Selectivity

	Institutional Selectivity		
Size	**Under 50%**	**50 to 75%**	**Over 75%**
Small: 750 to 1,999 undergraduates	92.8	79.5	78.0
	1,442	3,365	1,623
Medium: 2,000 to 7,499 undergraduates	93.1	82.6	82.9
	9,760	15,233	5,117
Large: 7,500 to 14,999 undergraduates	93.4	83.8	79.2
	9,458	22,517	9,876
Very Large: 15,000 or more undergraduates	95.9	88.1	84.1
	2,188	43,669	23,751

Table B2: Retention Rates (and Sample Sizes) by Institutional Control by Institutional Selectivity

	Institutional Selectivity		
Control	**Under 50%**	**50 to 75%**	**Over 75%**
Private	94.1	85.1	82.4
	21,154	19,377	5,230
Public	86.1	85.8	82.5
	1,694	65,407	35,137

Table B3
Retention Rates (and Sample Sizes) by Institutional Size by Institutional Control

	Institutional Control	
Size	**Private**	**Public**
Small: 750 to 1,999 undergraduates	82.1	
	6,430	
Medium: 2,000 to 7,499 undergraduates	88.3	77.8
	23,773	6,337
Large: 7,500 to 14,999 undergraduates	92.9	82.4
	9,955	31,896
Very Large: 15,000 or more undergraduates	92.5	86.5
	5,603	64,005

Note: Shaded cells included less than 15 cases and are not reported.

Appendix C: Retention Rates by Student Characteristics by Institutional Characteristics

Table C1
Retention Rates (and Sample Sizes) by Gender by Institutional Characteristics

Institutional Characteristic		Gender	
		Females	Males
Control	Private	89.0	88.9
		25,599	20,162
	Public	85.0	84.4
		54,392	47,846
Size	Small: 750 to 1,999 undergraduates	82.4	81.6
		3,848	2,582
	Medium: 2,000 to 7,499 undergraduates	86.5	85.5
		17,367	12,743
	Large: 7,500 to 14,999 undergraduates	84.7	85.1
		22,433	19,418
	Very Large: 15,000 or more undergraduates	87.5	86.4
		36,343	33,265
Selectivity	Under 50%	93.2	93.9
		12,891	9,957
	50% to 75%	86.0	85.3
		45,828	38,956
	Over 75%	82.8	82.3
		21,272	19,095

Table C2
Retention Rates (and Sample Sizes) by Ethnicity by Institutional Characteristics

Institutional Characteristic		Ethnicity						
		American Indian	Asian	Black/ African American	Hispanic	Other	White	No Response
Control	Private	80.2	92.1	85.9	88.1	89.6	88.9	90.1
		237	4,461	3,684	3,180	1,619	30,006	2,574
	Public	77.9	87.9	82.2	79.5	83.8	85.1	85.1
		575	8,834	6,233	7,329	2,733	72,562	3,972
Size	Small: 750 to 1,999 undergraduates	66.7	88.2	74.8	76.2	80.7	82.6	83.7
		42	296	242	328	197	4,988	337
	Medium: 2,000 to 7,499 undergraduates	81.3	90.9	83.0	86.1	88.0	85.7	88.7
		166	2,288	3,189	1,879	969	19,988	1,631
	Large: 7,500 to 14,999 undergraduates	74.6	88.3	82.8	82.1	84.7	84.9	85.9
		205	3,659	3,081	2,085	1,233	29,762	1,826
	Very Large: 15,000 or more undergraduates	80.7	89.4	85.4	81.3	86.2	87.6	87.3
		399	7,052	3,405	6,217	1,953	47,830	2,752
Selectivity	Under 50%	84.3	95.0	89.0	93.3	93.4	94.0	94.9
		102	2,355	2,606	1,555	753	14,071	1,406
	50% to 75%	79.0	89.9	83.2	82.3	86.1	85.6	85.5
		461	8,771	5,460	5,738	2,606	58,107	3,641
	Over 75%	75.5	81.1	77.1	76.4	80.0	83.7	83.5
		249	2,169	1,851	3,216	993	30,390	1,499

Table C3

Retention Rates (and Sample Sizes) by Parental Income by Institutional Characteristics

Institutional Characteristics		Parental Income					
		Less than $30,000	$30,000–$50,000	$50,000–$70,000	$70,000–$100,000	More than $100,000	No Response
Control	Private	86.1	85.6	86.1	88.1	90.9	89.8
		3,076	3,831	4,179	6,520	12,022	6,133
	Public	80.2	82.1	83.3	85.3	86.4	85.7
		8,112	10,475	12,048	18,887	21,974	30,742
Size	Small: 750 to 1,999 undergraduates	79.6	76.2	79.6	82.1	84.7	83.5
		437	643	742	1,073	1,447	2,088
	Medium: 2,000 to 7,499 undergraduates	82.5	83.3	83.3	84.6	88.6	87.4
		2,232	2,893	3,150	4,605	7,019	10,211
	Large: 7,500 to 14,999 undergraduates	79.8	81.1	83.1	84.9	87.3	86.3
		3,215	4,054	4,634	7,258	9,221	13,469
	Very Large: 15,000 or more undergraduates	83.0	84.8	85.4	87.5	88.5	87.9
		5,304	6,716	7,701	12,471	16,309	21,107
Selectivity	Under 50%	91.9	90.0	91.6	92.4	94.9	94.0
		1,376	1,614	1,714	2,927	6,809	8,408
	50% to 75%	82.1	82.7	83.9	86.0	87.4	86.7
		6,712	8,357	9,519	15,045	18,216	26,935
	Over 75%	76.7	81.1	81.6	83.6	84.1	83.1
		3,100	4,335	4,994	7,435	8,971	11,532

Table C4

Retention Rates (and Sample Sizes) by Parental Education by Institutional Characteristics

Institutional Characteristic		Parental Education					
		No High School Diploma	High School Diploma	Associate Degree	Bachelor's Degree	Graduate Degree	No Response
Control	Private	84.1	83.6	84.8	88.9	91.7	89.3
		715	7,341	2,323	13,605	19,070	2,707
	Public	80.7	79.9	82.0	85.9	87.7	86.0
		1,928	23,226	7,417	35,386	29,746	4,535
Size	Small: 750 to 1,999 undergraduates	76.0	74.0	78.1	83.0	86.8	82.7
		100	1,308	447	1,898	2,377	300
	Medium: 2,000 to 7,499 undergraduates	82.4	81.1	81.1	85.9	89.7	88.3
		471	6,264	1,850	8,941	10,835	1,749
	Large: 7,500 to 14,999 undergraduates	77.9	79.3	81.9	85.8	89.1	84.9
		746	9,264	3,105	13,534	13,015	2,187
	Very Large: 15,000 or more undergraduates	83.9	82.2	84.4	87.9	89.4	88.9
		1,326	13,731	4,338	24,618	22,589	3,006


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