2017 HIGHER EDUCATION RESEARCH DIGEST

ACT®

2017

ENROLLMENT MANAGEMENT DATABASE

The **Enrollment Management Database** is an interactive tool—that is updated on an annual basis with data from more recent cohorts—allowing one to follow an ACT-tested high school graduating class from high school through the first two years of college. The database allows for the examination of student characteristics, preferences, college search behaviors, and enrollment patterns to assist enrollment managers, admissions personnel, and other college administrators with student recruitment, enrollment, and persistence. The database is structured into five topical areas, allowing users to answer questions of interest to them. The five topical areas along with potential questions that can be explored are provided below:

1 ACT-Tested Population

- How is the overall number of ACT-tested students changing?
- How is the number of ACT-tested students changing for specific student subgroups (e.g., African Americans, low-income students)?

2 College Preferences

- What are students' college preferences: college type (e.g., four-year public, four-year private, two-year), location (in-state, out-of-state), and distance from home?
- How do students' college preferences differ by their background characteristics (e.g., race/ethnicity, gender) and academic achievement (e.g., test scores, benchmarks)? For example, are low-income students less likely than their peers to prefer to attend an out-of-state college?

3 Score-Sending Patterns

- What is the median/average size of the students' consideration set (i.e., the number of colleges to which they send their ACT scores)?
- How does the size of the students' college consideration set differ by their background characteristics (e.g., race/ethnicity, family income, gender, etc.) and academic achievement (e.g., test scores, benchmarks)? For example, do lower-achieving students typically send their ACT scores to fewer colleges than their peers?

4 College Enrollment

- How many (and what percentage of) ACT-tested students enroll directly into college after high school?
- How do students' direct enrollment rates differ by their background characteristics (e.g., race/ethnicity, family income) and academic achievement (e.g., test scores, benchmarks)? For example, do females enroll at higher rates than males?
- How many (and what percentage of) direct-enrolled ACT-tested students enroll in specific college types or certain college locations relative to their homes (i.e., in-state/out-of-state, distance)?

5 Second-Year Retention, Transfer, and Dropout Rates

- How do students' dropout rates, transfer rates, and retention rates differ by their background characteristics (e.g., race/ethnicity, family income, gender, etc.) and academic achievement (e.g., test scores, benchmarks)? For example, do males transfer at higher rates than females?
- What are some of the common paths that ACT-tested, college-enrolled students take between their first and second year of college? Paths refer to changes in college type, in-state/out-of-state location, and distance to college attended.

The **Enrollment Management Database** along with the Enrollment Management Database User Guide is available for access at: ***www.act.org/researchdigest***. Within the database, you can examine data that is most relevant to you and your institution by filtering by state and relevant student characteristics.

TESTING, TESTING: WHAT IS THE FAIREST SCORE WHEN APPLICANTS RETAKE ADMISSIONS TESTS?

College applicants have the choice of whether to retake an admissions test. Along these lines, research suggests that the percentage of students retaking college admissions tests is rising. This increases the complexity of the college admission process for colleges and universities. Specifically, colleges and universities must make decisions on how to summarize these applicants' multiple scores. Unfortunately, guidance for appropriate scoring across retakes remains dated or limited in scope.

To address this gap, a joint study with Harvard and ACT evaluated the validity and fairness of different scoring approaches (average, last, highest, superscoring).

Which Scoring Method Best Reflects How Your Applicants Will Perform in the First Year?

Colleges use ACT scores to evaluate students' readiness for college-level work and their likelihood of success if admitted. Existing research has illustrated the relationship between ACT scores and important college outcomes. However, this evidence is based on students' most recent ACT scores, whereas institutions use a variety of different scoring methods to compute a composite score for applicants with multiple test records.

The current study evaluates whether different scoring methods systematically over- or under-predict how well students will perform in the first year of college, and if this prediction error varies by number of testing occasions.

Figure 1.
Magnitude of differential prediction by four composite scoring methods for students who tested once as compared to students who tested four or more times. Regression models were run for each scoring method. Prediction error is calculated by subtracting one's expected freshman GPA based on the overall model as compared to one's expected FYGPA based on the model that includes number of testing occasions as a predictor at a composite score of 23.

IS SUPERSCORING THE WAY TO GO?

In a dataset of 280,000 first-time college students attending a four-year, postsecondary institution, 29.1% took the ACT® test once, 35.3% took it twice, 20.2% took it three times, and 15.4% took it four or more times. Among scoring methods, superscores have the largest correlation with freshman GPA, accounting for 16.8% of the variation in FGPA, compared to 14.9% for average scores.

In terms of overprediction and underprediction, the superscoring method resulted in the least amount of prediction error by number of testing occasions as compared to the three other scoring methods. For example, all scoring methods overpredicted FYGPA for students who tested once; however, the overprediction was smallest for the superscoring method (-0.15) as compared to average (-0.23), last (-0.20), and highest (-0.18) methods (see **Figure 1**). On the other hand, FYGPA was underpredicted for students who tested three times and four or more times. That is, these students earned higher FYGPAs than what was predicted. Predicted FYGPAs for students who tested twice were similar to the overall model that didn't take into account the number of testing occasions (i.e., near-zero residuals). As shown in **Figure 1**, even though all scoring methods underpredicted FYGPA for students who tested four or more times, the superscoring method resulted in the least amount of underprediction (0.19) as compared to the other three methods (range = 0.23 to 0.32). These results hold for student subgroups.

What Does This Mean for a Student?

Take Ty for example, a freshman at State University. He took the ACT four times. Below are his ACT scores based on the four scoring methods, his earned FYGPA, and predicted FYGPA based on the four methods. The results illustrate in the table below that the superscoring method most closely predicts how well Ty will perform in the first year of college.

TY'S PERFORMANCE DATA	LAST	AVERAGE	HIGHEST	SUPERSCORE
ACT Composite Score	22	21	23	24
$FYGPA_{Predicted}$	2.73	2.67	2.79	2.84
$FYGPA_{Earned}$	3.00	3.00	3.00	3.00
Prediction Error ($FYGPA_{Earned} - FYGPA_{Predicted}$)	0.27	0.33	0.21	0.16

But Why...

One may have expected that the superscoring method would result in the least valid scores as that has the potential to capitalize on measurement error by cherry picking the highest scores across administrations.

Moreover, if superscores represent an inflated estimate of one's academic preparation, then you would expect that predicted freshmen GPAs based on superscores would be overpredicted, particularly for students who retest more often; however, the results suggest exactly the opposite.

An alternative explanation is that superscores and number of retesting occasions reflect not only academic preparation but also a motivational component. Specifically, the student who is willing to forgo multiple Saturdays to sit for a multiple-hour test with the hope of maybe increasing his score is also the student who is likely to ask questions in his college courses, visit his professor during office hours, and take advantage of any extra credit opportunities to ensure the best possible grade.

Why Is Prediction Error Smallest for Two Times?

Prediction error is based on comparing a model that includes only a composite score (e.g., average ACT composite score; overall

model) as compared to one that includes an indicator for the number of times tested (e.g., average ACT composite score and indicator for number of testing occasions). Since the statistical method is designed to minimize prediction error for the total sample, the group of students who make up the larger percentage of the total group will have a larger influence on the overall model, which happens to be students who tested twice in this study. The point is not that students who tested twice have the least prediction error. **The point is that within the number of testing occasions, the superscoring method results in the least prediction error.**

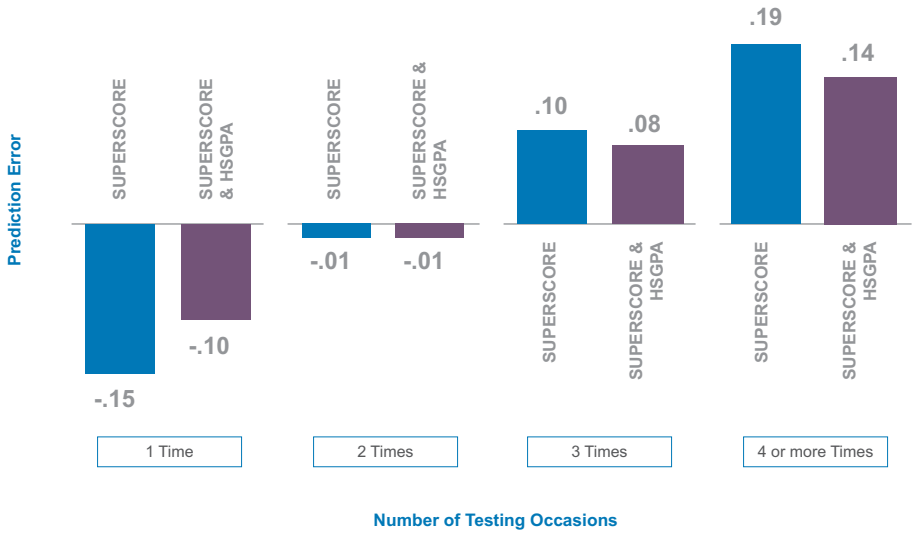


Figure 2. *Magnitude of differential prediction by number of testing occasions for the Superscore composite model versus the Superscore composite and HSGPA model*

CAN DO VS. WILL DO

If retesting and superscoring methods result in the least amount of differential prediction because they capture both cognitive ("can do") and noncognitive ("will do") components, then the inclusion of a noncognitive measure in the model that assesses traits such as motivation and persistence should reduce the amount of prediction error seen for each scoring method by number of testing occasions.

To test this hypothesis, prediction models that included HSGPA were run; it has been argued that HSGPA does not represent simply one's level of academic mastery but also reflects noncognitive components such as motivation and persistence. As shown in **Figure 2**, the results clearly indicate that prediction error is reduced when HSGPA is added to the model.

The intent of this study was to provide evidence to admissions officers on the most valid way to combine test scores for multiple administrations. To that end, the current study adds to the literature on the validity of various scoring methods as it pertains to college admissions. The results suggest that superscoring may be the most valid method for treating multiple scores. It is also important to note that the intent of the study was not to inform students whether they should retest or not. That should be a decision they make for themselves. Finally, understanding what factors (such as academic motivation) are related to retesting seems like a fruitful research endeavor, potentially shedding light on the development of new noncognitive admission measures.

A natural concern among admission professionals may be the diversity implications of adopting a superscoring policy as underserved students are less likely to retest. Follow up analyses indicated that the superscoring method did not result in a less diverse admitted class as compared to the other three methods. For more information, the full report is available at **www.act.org/research/R1638-fairest-retest-admission-score**.

WHO WILL DECLARE A STEM MAJOR?

New initiatives and programs are being increasingly implemented to promote STEM (Science, Technology, Engineering, and Mathematics) interest and participation among U.S. students. Similarly, ACT has added a STEM score to the ACT report as well as developed a STEM benchmark, which signals the level of academic preparation needed to succeed in typical mathematics and science courses taken by STEM majors in the first year of college. Despite these efforts, the percentage of students who declare a STEM-related major in college continues to lag behind what would be expected based on students' intentions. Such findings underscore the value of understanding why students who are interested in STEM do not pursue a STEM degree.

In order to answer that question, ACT conducted a study to better understand the relationship between academic and non-academic student characteristics and STEM major choice. The results can help inform initiatives to identify students most likely to enter the STEM pipeline and provide resources and support for this career pathway.

Multidimensional Model of STEM Enrollment

Building upon previous research, the major objective of the study was to identify student characteristics that are useful for identifying those who are likely to declare a STEM major during their first year. Student characteristics evaluated included achievement levels, other measures of mathematics and science academic preparation (high school courses taken and grades earned), intended major, level of certainty of major intention, vocational interests (measured interests via the ACT Interest Inventory), educational goals, and demographic characteristics.

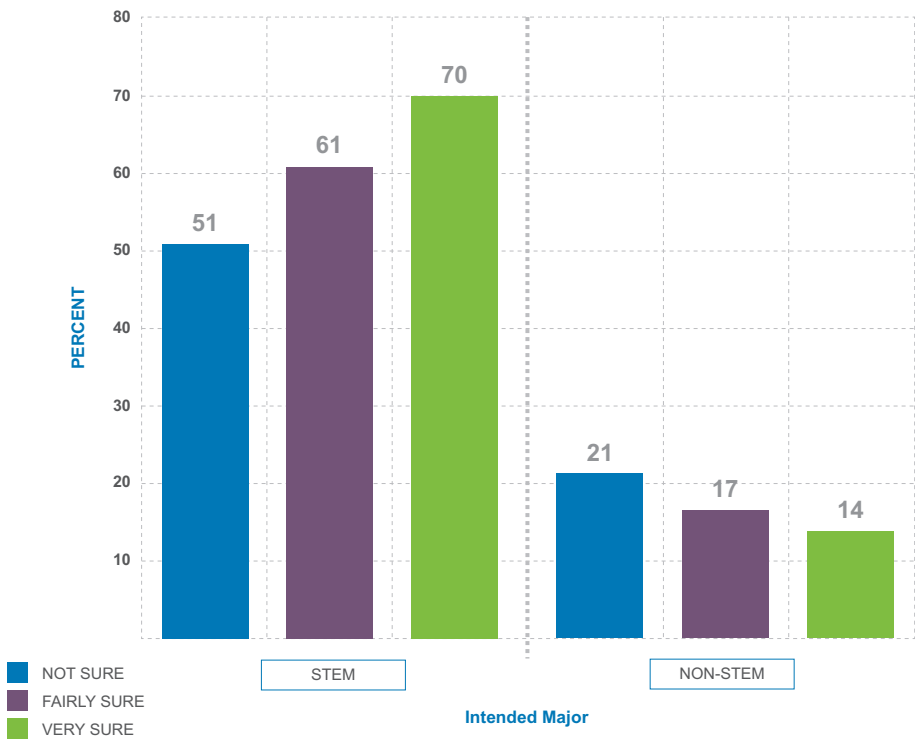


Figure 3.
STEM major choice by intended major and major sureness

The Role of Intentions

Overall, 39% of the sample declared a STEM major; however, this rate varied by student characteristics. For example, major intentions and level of sureness of those intentions also played a significant role in identifying which students are more likely to declare a STEM major.

Among students who intended to major in STEM, the odds of declaring a STEM major for those who were very sure and fairly sure about their major intentions were 2.25 and 1.51 times that of those who were not sure, respectively. **Figure 3** provides an illustration of the joint contribution of major intentions and the certainty of those intentions on STEM major choice, holding all other variables constant at their sample means. For the example shown, students' chances of declaring a STEM major increased from 51% to 70% as the level of sureness of one's STEM major intentions increased from not sure to very sure.

The corresponding rates among students with non-STEM intentions decreased from 21% for those not sure to 14% for those very sure about their major intentions.

Results also showed that measured interest in STEM (as assessed with the ACT Interest Inventory) was positively related to STEM enrollment.

Academic Preparation Matters Too!

We found that the relationship between STEM major choice and achievement levels in mathematics and science depended on students' major intentions. Specifically, the relationship between ACT STEM score and declaring a STEM major was strongest (steeper slope) among students with STEM major intentions, and weakest for students with non-STEM major intentions.

As illustrated in **Figure 4**, students with STEM major intentions and higher STEM scores were very likely to declare a STEM major during their first term in college. In comparison, regardless of their mathematics and science ability, students with non-STEM intentions were unlikely to declare a STEM major.

For undecided students, higher ACT STEM scores were related to an increased likelihood of STEM enrollment.

The Power of Three

STEM Readiness
+
STEM Intentions
+
Sureness of STEM Intentions

STEM Major

Students who are STEM Ready (ACT STEM ≥ 26), intend to major in STEM, and are very sure about their STEM major intentions have a very high likelihood of enrolling in a STEM major. Probabilities range from .78 for an ACT STEM of 26 to .92 for an ACT STEM score of 36.

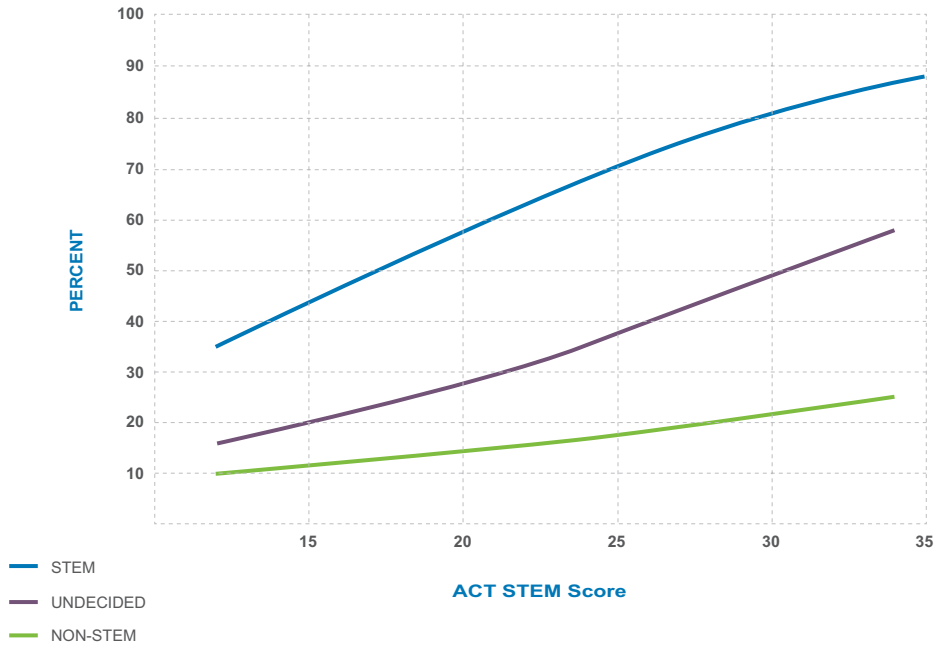


Figure 4.
STEM major choice by ACT STEM score and intended major

Using This Information to Recruit and Admit STEM Majors

The findings from the current study align with previous research on STEM success. Specifically, data from these earlier studies indicate that STEM majors better prepared in math and science are more likely than those less prepared to persist in a STEM major through year four, earn a cumulative GPA of 3.0 or higher over time, and complete a degree in a STEM field. Moreover, students' interests in STEM (i.e., having measured and expressed interest) contribute incrementally to STEM success beyond academic readiness.

The findings from the current study may be useful to postsecondary institutions in their recruitment efforts, particularly if they are actively targeting potential STEM majors or have enrollment goals to increase the number of STEM majors on their campus. The variables identified in this study that are most related to STEM enrollment could be used by institutions in their search criteria in such services as ACT EOS (Educational Opportunity Service) to target specific subpopulations of prospective students. Undecided students with high STEM scores appear to be a particularly fruitful pool of applicants to recruit into STEM. Note that research has confirmed the accuracy of self-reported information collected during registration for the ACT.

Institutions can also use this information for enrollment planning to project resource needs such as lab space and course offerings based on the number of students anticipated to declare a STEM major in the first year.

In sum, the current study highlights the fact that the decision to declare a STEM major is related to multiple factors including academic preparation, major intentions and the certainty of those intentions, vocational interests, educational goals, and demographic characteristics. Understanding the multidimensional and complex nature of choosing a STEM major can help inform interventions aimed at increasing participation and student success in STEM.

For more information, the full report is available at **http://www.act.org/research/who-will-declare-a-stem-major.**

RETENTION, TRANSFER, AND DROP OUT: OH MY!

Over the past decade, postsecondary institutions have been under considerable pressure to increase their retention and degree completion rates while maintaining equal opportunity and diversity in student enrollments. Recent statistics on a national sample of students from the 2008 college freshman cohort suggest that only 60% of students who initially enroll in four-year institutions complete a degree within 150% of normal time from their initial institution attended. The rates are slightly higher at private institutions as compared to public institutions (65% vs. 58%), while the corresponding percentage for students initially enrolling in two-year institutions is considerably lower at 28%. Other research suggests that the largest share of students leave their initial institution during their first two years.

To help postsecondary institutions identify students who are most likely to persist on their campus, ACT conducted a study focused on identifying incoming student information that might be useful for determining early on, students who are at risk of leaving their initial institution in year two while also differentiating between two types of student attrition that may occur from the institution's perspective: drop out and transfer. Student characteristics evaluated included:

- academic preparation and achievement measures
- college intentions about living on campus, enrolling full-time, and working while in college
- educational goals
- the number of college preferences met by the initial institution
- distance between home and initial institution attended
- demographic characteristics

What Factors Are Related to Leaving?

In line with previous research, the findings indicate that multiple academic and non-academic factors are useful for predicting student attrition. This is in alignment with many long-standing beliefs about student retention. Specifically, at both two- and four-year institutions, students who were less academically prepared for college were more likely to drop out of college than those who were better prepared.

Academic readiness was also negatively related to transfer at four-year institutions but was somewhat positively related to transfer at two-year institutions. We show the results by ACT scores in **Figure 5**; a similar pattern emerges for HSGPA and for highest math course completed.

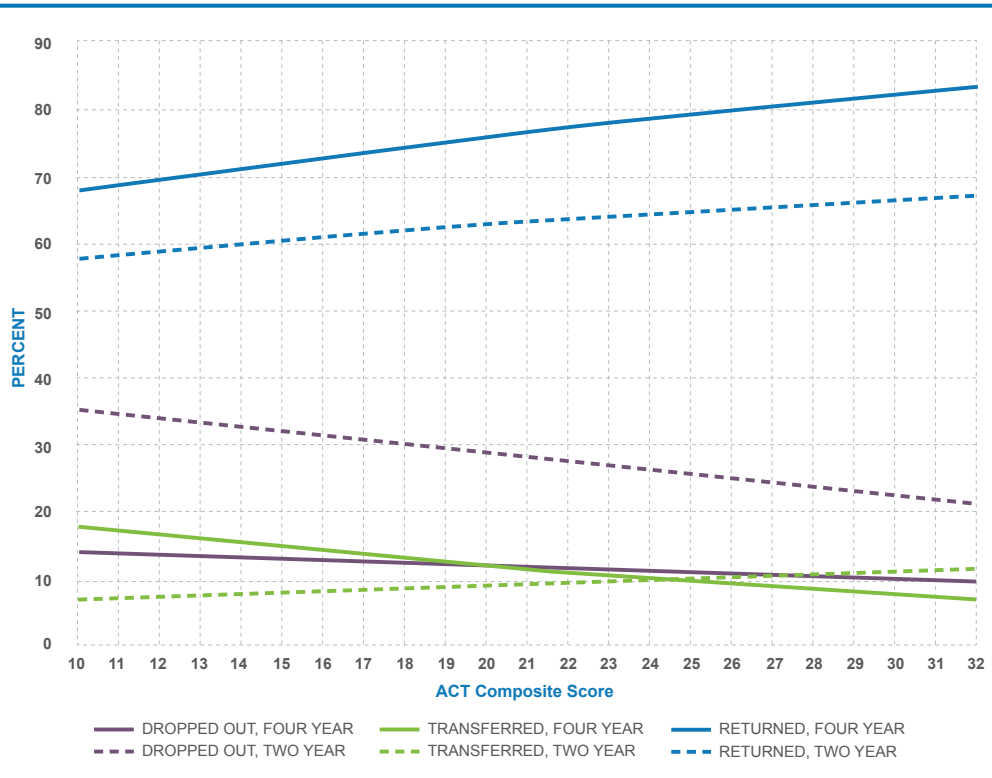


Figure 5.
Modeled retention and attrition rates by ACT score for two- and four year institutions.

Does Working Get in the Way?

College intentions also played a role in identifying who was likely to leave their initial institution. For example, students who indicated that they planned to work more hours while in college were more likely to drop out of college than those intending to work fewer hours. Additionally, the fewer the number of college preferences met by the initial institution attended the more likely a student was to drop out or transfer to another institution. Attending an institution farther away from home was also associated with higher transfer rates.

Table 1. *Understanding What Influences Transfer Decision*

PREDICTORS	FOUR-YEAR "TRANSFER DOWN"	TWO-YEAR "TRANSFER UP"
Academic readiness		
Higher ACT Composite scores	–	+
Higher HSGPAs	–	+
College intentions		
Live on Campus	–	+
Work more hours	+	–
Educational plans		
Bachelor's or beyond vs. associate's	ns	+
Initial college distance		
Farther away from home	–	–

\+ indicates more likely – indicates less likely ns indicates nonsignificant

Where Are Transfer Students Going? Transfer Up versus Transfer Down

Given the positive relationship between ACT scores and transferring for students beginning at a two-year institution, but the negative relationship for those beginning at a four-year institution, follow-up analyses were conducted to see where these students went. In particular, we were interested in identifying student characteristics related to:

- transferring up to a four-year institution from a two-year institution
- transferring down to a two-year institution from a four-year institution

As summarized in **Table 1**, higher ACT scores, higher HSGPAs, intentions of living on campus, and attending a college farther away from home were associated with a lower likelihood of transferring down from four-year institutions, whereas planning to work more hours in college was associated with a higher likelihood of transferring down. On the other hand, students at a two-year institution were more likely to transfer up if they had higher test scores, higher HSGPAs, intentions of living on campus, and had education plans of a bachelor's degree or higher. Planning to work more hours and attending a college farther away from home was associated with a lower likelihood of transferring up.

How ACT Information Can Inform Retention Strategies

The study findings illustrate how institutions can use incoming student information from the ACT record to help identify students who are at-risk of leaving their institution, allowing for the opportunity to intervene early with these students. Specifically, we focused on data elements thought to serve as possible proxies for barriers to social integration at the initial institution attended, such as: students' college intentions of living on campus, enrolling full-time, and number of hours planned to work; number of college preferences met based on type, size, and state location; and distance from home. The ACT student record contains many data elements including ones that were not examined in the current study (such as the ACT Interest Inventory scores and college extracurricular plans) that can help institutions

build and/or augment their multidimensional models of student success in order to better identify students who might benefit from additional academic and student support services upon entering college. Additionally, information from the ACT record could be incorporated into student-level dashboards to help faculty advisors learn more about their incoming students and equip them to better serve their advisees. Additional research has examined the accuracy of self-reported information collected during registration for the ACT, and the findings indicated that students reliably and validly report this information.

For more information, the full report is available at **www.act.org/research/students-at-risk**.

DOES OPTING INTO A SEARCH SERVICE PROVIDE BENEFITS TO STUDENTS?

Each year, roughly 3 million first-time, first-year, degree-seeking undergraduates begin their college education at one of over 4,000 degree-granting postsecondary institutions within the United States. From a strategic enrollment management perspective, one of the goals each year for a college is to matriculate an optimal number of these students while getting the desired mix of student characteristics to ensure an academically engaging and diverse learning community.

One of the primary ways in which colleges identify prospective students is through student search services such as ACT's Educational Opportunity Service (EOS). Although there is some evidence to suggest that the use of student search services is an effective part of a college's marketing and recruitment strategy, what is not clear is whether participating in a search service is an effective part of a student's college search strategy.

Whether or not students receive some benefit from participating in a search service is an important policy question; although student participation in a search service is optional, it requires students to consent to the release of their personal information to interested colleges and scholarship agencies. In an era of heightened scrutiny over how individuals' personal information is shared among and used by those entities that collect it, having empirical evidence that speaks to the personal benefits of participating in a search service could help to better inform students and those who guide students through the admissions process about the decision to opt into such a service.

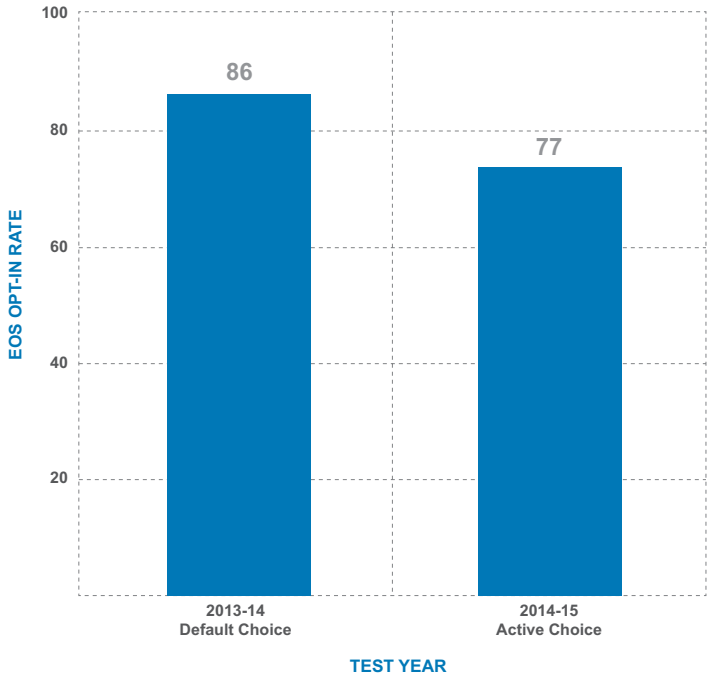
For this study, we hypothesized that participating in a search service would benefit students by increasing their awareness of specific college opportunities that may not have been previously under their consideration. Under this hypothesis, we would expect that the students who participate in a search service would have a larger college consideration set (i.e., the number of colleges to which they send their ACT scores) than they would have had in absence of their participation in the service. We addressed this hypothesis using data from students who have taken the ACT on a national test date and who have elected either to opt into or out of EOS.

Although it is an important policy question, the causal effect of participating in a search service on the size of the students' consideration set is difficult to isolate. Because students decide to participate in (as opposed to being randomly assigned to) the search service, any observed differences that we find in the size of the consideration set between students who opted into or out of the service could be subject to some degree of selection bias.

In order to remove selection bias from our findings, we exploited a recent change in the format of the ACT registration question about opting into EOS. This change in format from a default choice to an active choice resulted in an immediate decrease in opt-in rates, suggesting that some students may have opted into EOS unintentionally under the default choice format (see **"Unintentional Opt-ins?"** for more details).

Unintentional Opt-ins?

Between the 2007 08 and 2013 14 test years, the EOS participation decision was framed as a default choice. In this format, a box affirming the student's decision to opt in was pre checked and students needed to take no further action to opt into the service. Students were required to uncheck the box by the statement to opt out of the service. Beginning in the 2014 15 test year, the EOS participation decision was framed as an active choice with "Yes" and "No" response options. After making this change in the question format, the rate at which students opted into EOS immediately fell by 9 percentage points, suggesting that many students who opted into EOS under the default choice format may have done so unintentionally.



To identify these "unintentional" opt-ins, we first estimated the likelihood of opting into EOS for students who made their decision under the active choice format. We then used those estimates to predict which students under the default choice format would have had a low probability of opting into EOS under the active choice format. This resulted in two groups of students with similarly low intentions of opting into EOS. Whereas one of these groups intentionally opted out of EOS under the default choice format, the other group unintentionally opted into EOS under the default choice format (see **Figure 6**).

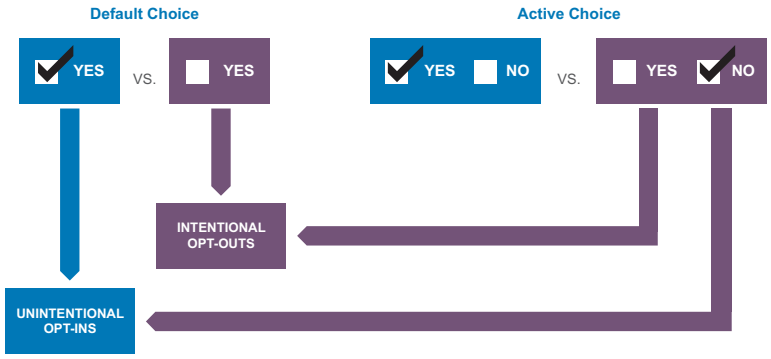


Figure 6.
Using the opt in decisions of students under active choice format to predict the opt in decisions of students under default choice format.

When we compared the size of the college consideration set between our unintentional opt-ins and our intentional opt-outs, the results indicated there was a significant effect of unintentionally opting into EOS on the number of colleges to which students sent their ACT scores. Specifically, we found that unintentionally opting into EOS increased the students' expected consideration set size by 7.5%. **Figure** 7 shows the estimated size of the students' consideration set by ACT Composite score range for unintentional opt-ins and intentional opt-outs after assuming that all other characteristics of these two groups are the same. As seen in the figure, unintentional opt-ins sent their ACT scores to more colleges than their peers who intentionally opted-out. As also seen in the figure, regardless of the students' EOS opt-in status, higher-achieving students sent their test scores to a greater estimated number of colleges.

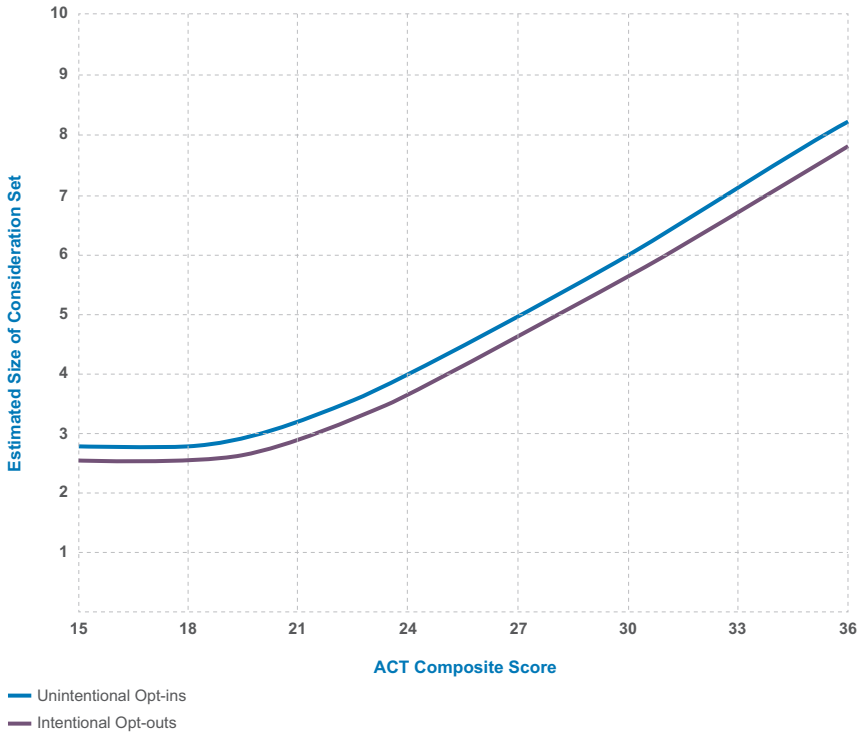


Figure 7.
Estimated number of colleges to which students send their ACT scores

The findings of this study suggest that participating in a student search service such as EOS increases postsecondary opportunity by making students aware of colleges that may not have been previously under their consideration. As such, opting into a search service could be viewed as an effective part of a student's college search strategy. The full report is available here: **www.act.org/research/R1637-opting-into-a-search-service**.

MORE INFORMATION, MORE INFORMED DECISIONS

Over the last few years, an increasing number of colleges have announced that they are going test-optional. These institutions provide several claims for their decision such as: an interest in increasing the diversity of enrolled students on their campus, the belief that test scores are poor predictors of college success, and biased measures of achievement for underserved students. Despite the fact that research has repeatedly contradicted these assertions, these beliefs persist. A recent ACT study summarizes empirical evidence addressing the stated intentions and actual outcomes of test-optional practices. An overview of the main points of the larger research report is provided below.

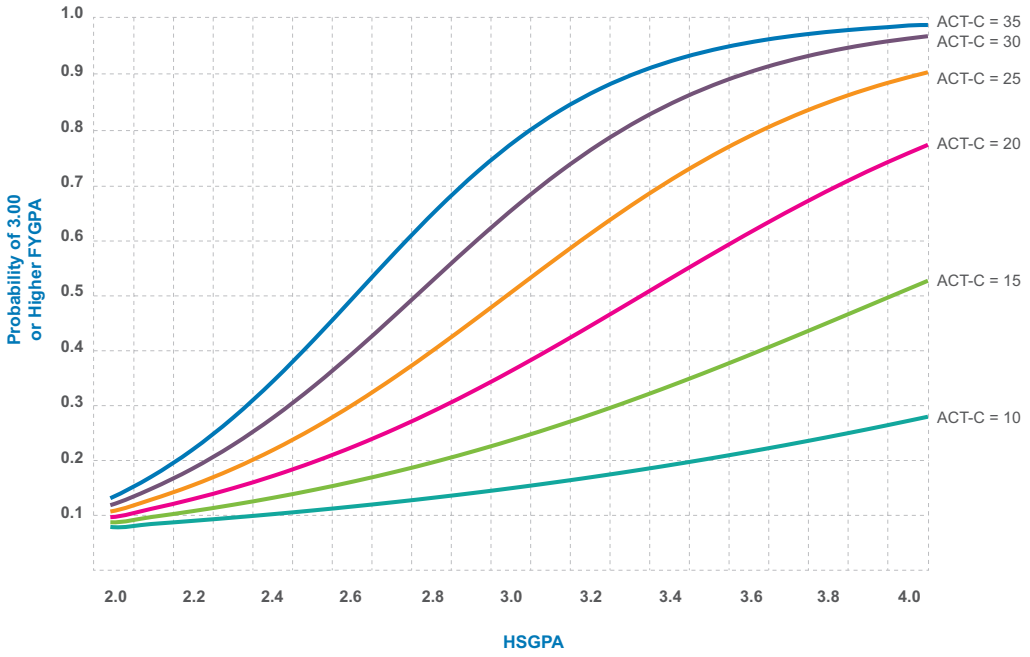
Assertion 1: Test-optional policies increase the diversity of enrolled students.

- The diversity of the student body of a college's enrolled class is unaffected by test-optional policies.
- On the other hand, institutions that adopt test-optional policies receive more applications and report higher average test scores.

Assertion 2: Test-optional policies do not result in admitting less-qualified students.

- Students who do not submit test scores have lower scores than students who submit their scores.
- Non-submitters earn first-year college grade point averages (FYGPAs) commensurate with their test scores. That is, test scores of non-submitters are accurate indicators of their academic preparation level and predictive of their future outcomes.

Figure 8.
Probability of earning a 3.00 or higher FYGPA, given the HSGPA and ACT Composite score



Assertion 3: Test scores do not add any information above and beyond HSGPA.

- Test scores add useful information above and beyond HSGPA in the prediction of FYGPA.
- For example, among students with a 3.0 HSGPA, students with an ACT Composite Score of 20 have a .37 probability of earning a B or higher as compared to .66 probability for students with an ACT Composite score of 30 (**Figure 8**).

Assertion 4: Test scores are not predictive of college success beyond the first year of college.

- Test scores are predictive of long-term college outcomes including retention, cumulative GPA, and graduation. For example, 6 out of 10 students who met all four ACT College Readiness benchmarks are expected to earn a college degree within six years as compared to 2 out of 10 students who met zero benchmarks.

- Moreover, test scores add useful information above and beyond HSGPA in the prediction of long-term outcomes. For example, among students with a 3.0 HSGPA, students with an ACT Composite score of 20 have a .41 probability of earning a cumulative GPA of 3.00 or higher as compared to a .68 probability for students with an ACT Composite score of 30 (**Figure 9**).

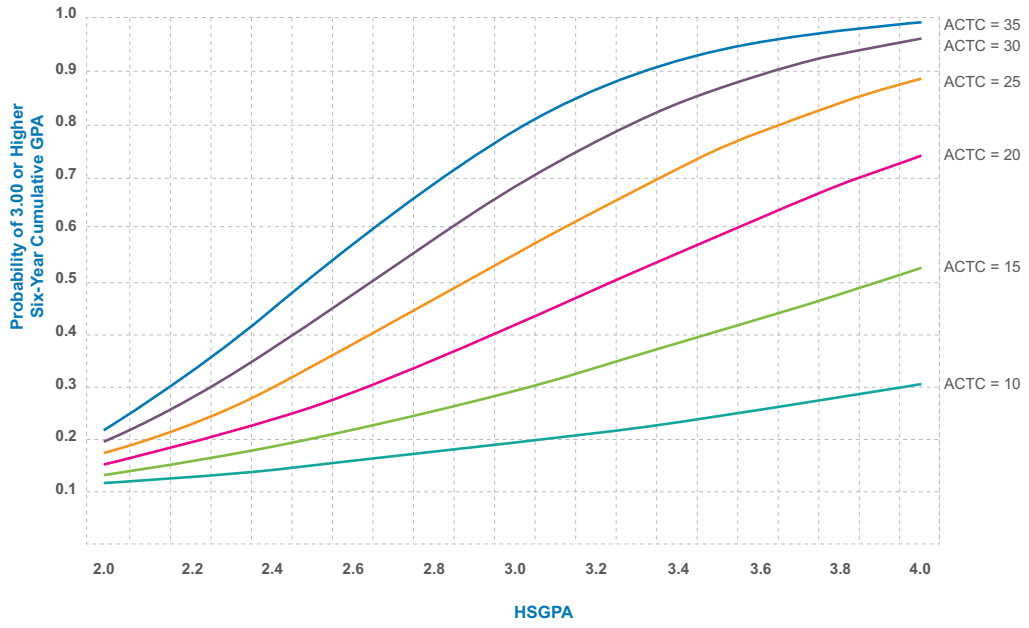


Figure 9.
Probability of earning a 3.00 or higher six year cumulative GPA, given HSGPA and ACT Composite score

Assertion 5: Test scores are biased measures of student readiness for underserved students.

- Though subgroup differences exist on all academic measures (test scores, grades, and enrollment, persistence, and graduation rates), subgroup differences are not the same as test bias.
- Performance gaps can be largely attributable to differences in course-taking patterns, grades, school characteristics, and noncognitive characteristics (**Figure 10**).
- Underserved students perform worse (not better) in college than what would be predicted based on their test scores.

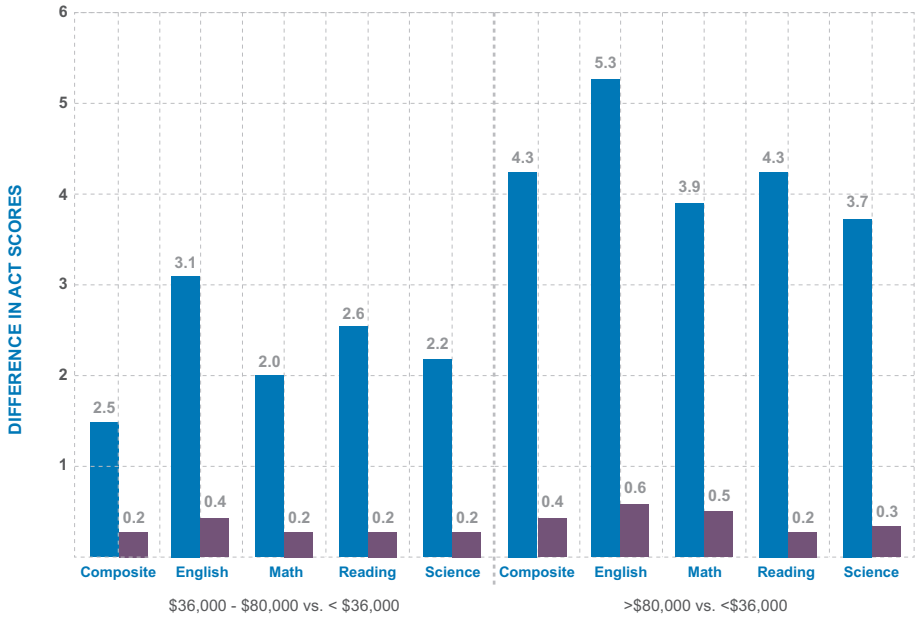


Figure 10.
Unadjusted and adjusted mean differences in ACT scores by family income. ACT scores were adjusted for differences in course taking patterns, grades, school characteristics, and noncognitive characteristics by income group.

For more information, the full report is available at ***www.act.org/research/test optional***

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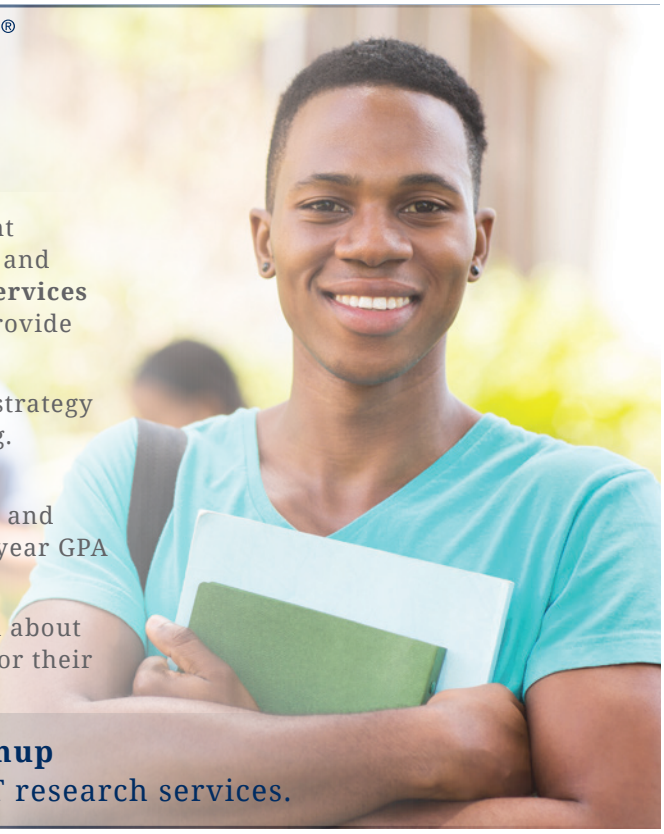

Analyzing trends and patterns can inform your enrollment strategy and predict future performance of your entering and returning classes. ACT offers a variety of **free research services** designed to help you improve enrollment planning and provide information you can put into action.

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A copy of this report can be found at
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