Predictive Modeling Data

in the ACT Electronic Student Record

ACT®

overview

Predictive Modeling Data Added to the ACT Electronic Student Record

With the release of student records in September 2012, predictive modeling data from four behavioral indexes were added to the ACT Electronic Student Record. A fifth index, the Interest–Major Fit score, was also added to the student record.

The predictive modeling data elements do not predict whether a student will enroll at a *specific* institution; rather, they predict four enrollment behaviors:

- The **Mobility Index** predicts the likelihood of a student enrolling out of state. Mobility Index scores range from a low of 01 to a high of 99. The higher the score, the more likely the student will enroll out of state.
- The **Institution Type Index** predicts the likelihood of a student enrolling at a private college or university. Institution Type Index scores range from a low of 01 to a high of 99. The higher the score, the more likely the student will enroll at a private institution.
- The **Selectivity Index** predicts the selectivity of the institution at which a student is most likely to enroll. Selectivity Index scores range from 0.0 to 5.0, in increments of 0.1. A higher Selectivity Index corresponds to a greater likelihood of attending a more selective institution.
- The **Institution Size Index** predicts the size of the institution at which the student is most likely to enroll. Institution Size Index scores range from 0.0 to 4.0, in increments of 0.1. A higher Institution Size Index score corresponds to a greater likelihood of attending a larger institution.

Percentile ranks for each index are not reported on the student score report; crosswalk tables showing percentile ranks for all index values will be available on the ACT website at **www.act.org/aap/infosys/recordinfo.html**.

index locations

Position Locations of the Indexes in the ACT Electronic Student Record

In Table 1 below are the positions of the five new indexes in the ACT Electronic Student Record:

Table 1. Five new indexes in the ACT Electronic Student Record

Field	Position	Range
Mobility Index	391–392	01–99
Institution Type Index	393–394	01–99
Selectivity Index	395–396	00–50 with an implied decimal
Institution Size Index	397–398	00–40 with an implied decimal
Interest–Major Fit Score	399–400	00–99

All data are numeric. If no predictions are made, the fields are set to blank. The full record layout is available online at **www.act.org/aap/infosys/recordinfo.html**.

accuracy

Accuracy of the Predictive Modeling Fields

The four Predictive Modeling Indexes are built using actual data on enrolled students and are, therefore, very accurate. Every year, ACT sends a file of all ACT-tested students in that year's high school graduating class to the National Student Clearinghouse, which matches the ACT file with its institutional enrollment records. More than 3,300 colleges and universities, enrolling more than 96% of all students in public and private U.S. institutions, participate in the Clearinghouse. As a result, ACT has information on first-time college enrollments for most of the ACT-tested students who go to college. Because ACT has data on which students go out of state, which students attend private institutions, and the selectivity and size of the institutions that students attend, it is possible to develop predictive models that accurately predict those four behaviors.

The accuracy of the Predictive Modeling Indexes relates directly to the self-reported information provided by students about their enrollment preferences (type and size of institution and preferred distance from home to campus), as well as the types of institutions they are considering. When students take the ACT, they can choose to send their scores to up to six institutions in preference order. ACT calls this mix of campuses (instate/out of state, public/private, selective/non-selective, large/small) the "Choice Set." Through extensive research, ACT has determined that this Choice Set carries a predictive power that far outweighs other variables. Because the indexes reflect a student's Choice Set in measurable and objective ways, they provide quite a bit of information not only on student enrollment intentions but also on your competition—the other institutions besides yours to which a student sends scores.

mobility index

Predicting Out-of-State Enrollment

The Mobility Index predicts the likelihood that a student will enroll at an out-of-state institution, using (1) the student Choice Set or campus mix (campuses to which students send scores); (2) ACT Composite score; (3) preferred distance from home to campus; and (4) selected other variables.

The campus mix comprises more than four-fifths of the Mobility Index model; this suggests that the student score sender choices are intentional, and thus serve as the basis for accurate predictions. If students send scores to out-of-state institutions, they are much more likely to enroll out of state. If students do not send scores to out-of-state institutions, they are very unlikely to enroll out of state.

The score range of the Mobility Index is 01 to 99. The higher the score, the more likely the student is to enroll out of state. The lower the score, the more likely the student is to enroll instate.

Table 2 shows the percent of students in the 2011 ACT-tested graduating class whose Mobility Index score falls within specific ranges. ACT research shows that only about 20% of ACT-tested students enroll out of state, so most Mobility Index scores are quite low; 53% of all ACT-tested students have Mobility Index scores of 20 or lower. Students with Mobility Index scores of 20 or higher are more likely than average to enroll out of state.

Students with very low scores on the Mobility Index are looking only instate. Students with very high scores are probably looking only out of state. Students in the middle ranges are probably looking both instate and out of state.

Table 2. Percent of 2011 ACT-tested graduates in each Mobility Index score range

Mobility Index Score Ranges	Percent in Each Range (National)
01–05	24
06–20	29
21–35	27
36–55	11
56–65	4
66–80	5
81–99	1

Table 3 below shows the percent of students in the 2011 ACT-tested graduating class by ACT Composite score and for a given range of Mobility Index scores. Students with a Composite score below 24 tend to have lower Mobility Index scores. Students with a Composite score of 24 and above tend to have higher Mobility Index scores. Students with ACT Composite scores of 24 and higher are more likely than average to go out of state.

Table 3. Percent of 2011 ACT-tested graduates at combinations of ACT Composite score range and Mobility Index score range

Mobility Index Score Ranges	ACT Composite Score Ranges					
	1–15	16–19	20–23	24–27	28–32	33–36
01–05	11	30	35	19	5	0
06–20	8	22	31	25	13	1
21–35	5	17	30	28	17	2
36–55	3	11	22	29	28	6
56–65	6	18	28	26	19	3
66–80	2	8	21	31	31	7
81–99	0	2	10	25	44	19

institution type index

Predicting Enrollment at a Private College or University

The Institution Type Index predicts the likelihood that a student will enroll at a private college or university by using (1) the student Choice Set or campus mix (campuses to which a student sends scores); (2) ACT Composite score; (3) preferred institution type; and (4) selected other variables. The campus mix comprises almost two-thirds of the Institution Type Index model. Preferred institution type accounts for another quarter of the model. Together, the campus mix and preferred institution type account for almost 90% of the model; this suggests that the student score sender choices are intentional, and thus serve as the basis for accurate predictions.

The score range of the Institution Type Index is 01 to 99. The higher the score, the more likely the student is to enroll at a private college or university. The lower the score, the more likely the student is to enroll at a public college or university.

Table 4 shows the percent of students in the 2011 ACT-tested graduating class whose Institution Type Index scores fall within specific ranges. ACT research shows that only about 20% of ACT-tested students enroll at private institutions, so most Institution Type Index scores are quite low; 61% of all ACT-tested students have Institution Type Index scores of 20 or lower. Students with Institution Type Index scores of 20 or higher are more likely than average to enroll at private institutions.

Students with very low scores on the Institution Type Index are probably looking only at public institutions. Students with very high scores are probably looking only at private institutions. Students in the middle ranges are probably looking at both public and private institutions.

Table 4. Percent of 2011 ACT-tested graduates in each Institution Type Index score range

Institution Type Index Score Ranges	Percent in Each Range (National)
01–05	13
06–20	48
21–35	18
36–55	11
56–65	4
66–80	4
81–99	3

Table 5 below shows the percent of students in the 2011 ACT-tested graduating class by ACT Composite score and for a given range of Institution Type Index scores. Students with a Composite score below 24 tend to have lower Institution Type scores. Students with a Composite score of 24 and above tend to have higher Institution Type Index scores.

Table 5. Percent of 2011 ACT-tested graduates in combinations of ACT Composite score range and Institution Type Index score range

Institution Type Index Score Ranges	ACT Composite Score Ranges					
	1–15	16–19	20–23	24–27	28–32	33–36
01–05	18	42	32	8	1	0
06–20	7	23	35	25	9	1
21–35	3	10	22	33	28	4
36–55	4	12	25	31	25	4
56–65	2	13	26	24	25	10
66–80	2	11	24	31	26	6
81–99	0	3	14	31	41	11

selectivity index

Predicting Enrollment by Selectivity of Institution

ACT classifies colleges and universities into five categories of admission selectivity: highly selective, selective, traditional, liberal, and open. The Selectivity Index predicts the selectivity of the institution at which the student is likely to enroll, using (1) the student Choice Set or campus mix (campuses to which a student sends scores); (2) ACT Composite score; (3) high school GPA; and (4) selected other variables.

The campus mix comprises more than three-fourths of the Selectivity Index model. ACT Composite score accounts for another 14% of the model. Together, the campus mix and ACT Composite score account for 93% of the model; this suggests that the student score sender choices are intentional, and thus serve as the basis for accurate predictions. Students are very likely to send scores to institutions that are similar in selectivity to the institution at which they will eventually enroll.

The score range of the Selectivity Index is 0.0 to 5.0. The higher the score, the more likely the student is to attend a more selective college or university. The lower the score, the more likely the student is to attend a less selective college or university.

Table 6 shows the percent of students in the 2011 ACT-tested graduating class whose Selectivity Index scores fall within specific ranges. Three-fourths of all of these students enroll at institutions in the Traditional and Selective categories.

Table 6. Percent of 2011 ACT-tested graduates in each Selectivity Index score range

Selectivity Index Score Ranges	Percent in Each Range (National)	Selectivity Category
0–1.1	2	Open
1.2–2.0	16	Liberal
2.1–2.8	35	Traditional
2.9–3.8	40	Selective
3.9–5.0	7	Highly Selective

Institutions which are highly selective or which are open admission will see most enrolled students distributed at the top or bottom of the Selectivity Index scale. Institutions of medium or traditional selectivity often find that they enroll significant numbers of students from several selectivity bands. This, again, may reflect a population looking at several types and sizes of institutions close to home.

Table 7 below shows the percent of students in the 2011 ACT-tested graduating class by ACT Composite score and for a given range of Selectivity Index scores. Students with a Composite score below 24 tend to have lower Selectivity Index scores. Students with a Composite score of 24 and above have much higher Selectivity Index scores.

Table 7. Percent of 2011 ACT-tested graduates at combinations of ACT Composite score range and Selectivity Index score range

Selectivity Index Score Ranges	Selectivity Category	ACT Composite Score Ranges					
		1–15	16–19	20–23	24–27	28–32	33–36
0–1.1	Open	60	36	4	0	0	0
1.2–2.0	Liberal	27	49	20	3	0	0
2.1–2.8	Traditional	4	31	48	15	1	0
2.9–3.8	Selective	0	4	25	45	25	1
3.9–5.0	Highly Selective	0	0	1	12	63	24

institution size index

Predicting Enrollment by Size of Institution

For purposes of the Institution Size Index, ACT classifies colleges and universities into four size categories of full-time undergraduate populations: fewer than 5,000, 5,000–9,999, 10,000–19,999, and more than 20,000. The Institution Size Index predicts the size of the institution at which the student is likely to enroll, using (1) the student Choice Set or campus mix (campuses to which a student sends scores); (2) ACT Composite score; (3) preferred college size; and (4) selected other variables.

The campus mix comprises more than four-fifths of the Institution Size Index model. ACT Composite score accounts for another 7% of the model. Together, the campus mix and ACT Composite score account for more than 95% of the model; this suggests that the student score sender choices are intentional, and thus serve as the basis for accurate predictions. Students are very likely to send scores to institutions that are similar in size to the institution at which they will eventually enroll.

The score range of the Institution Size Index is .01 to 4.0. The higher the score, the more likely the student is to attend a larger institution. The lower the score, the more likely the student is to attend a smaller institution.

Table 8 shows the percent of students in the 2011 ACT-tested graduating class whose Institution Size Index scores fall within specific ranges; 64% of students enroll at institutions in the medium and large categories.

Table 8. Percent of 2011 ACT-tested graduates in each Institution Size Index score range

Institution Size Index Score Ranges	Percent in Each Range (National)	Institution Size Categories	Institution Size Type
0–1.6	20	<5,000	Small
1.7–2.2	36	5,000–9,999	Medium
2.3–2.7	28	10,000–19,999	Large
2.8–4.0	16	>20,000	Very Large

If your institution is very large or very small, you will see most enrolled students distributed at the top or bottom of the Institution Size Index score ranges. If your institution is medium size, you may find that you enroll significant numbers of students from several size bands. This, again, may reflect a population looking at several types and sizes of institutions close to home.

Table 9 below shows the percent of students in the 2011 ACT-tested graduating class by ACT Composite score and for a given range of Institution Size Index scores. Students with a Composite score below 20 tend to have lower Institution Size Index scores. Students with a Composite Score of 24 and above have much higher Size Index scores. Students with a Composite score of 20–23 are evenly distributed across all size categories.

Table 9. Percent of 2011 ACT-tested graduates at combinations of ACT Composite score range and Institution Size Index score range

Institution Size Index Score Ranges	Institution Size Categories	ACT Composite Score Ranges					
		1–15	16–19	20–23	24–27	28–32	33–36
0–1.6	<5,000	19	37	28	12	4	0
1.7–2.2	5,000–9,999	7	24	35	23	10	1
2.3–2.7	10,000–19,999	2	13	29	31	21	4
2.8–4.0	>20,000	1	5	21	35	32	6

relationships

The Relationship of ACT Composite Score, Distance from Home to Campus, and the Indexes

ACT research suggests that academic ability is the primary determiner of enrollment behavior. As ability levels rise, students are more likely to enroll out of state, more likely to enroll at a private college or university, more likely to enroll at a selective institution, and more likely to enroll at a larger institution.

Table 10 below shows the median miles from home to campus for enrolled students in the 2011 ACT-tested graduating class by selectivity. Miles are provided at the 25th percentile, the median, and the 75th percentile.

Table 10. Miles from home to campus for 2011 ACT-tested graduates by admission policy

Admission Policy	Count	25th Percentile	Median	75th Percentile
Highly Selective	111,841	56.2	142.2	412.9
Selective	267,712	29.6	94.9	199.7
Traditional	308,945	20.3	66.7	152.8
Liberal	29,567	14.3	53.4	144.0
Open	310,546	6.2	13.0	31.2
Missing	115,734	15.6	71.9	183.5

Because the indexes are determined so much by the Choice Set, it is important to consider how the Choice Set is influenced by ACT Composite score as well as distance from home to campus.

For many students, the primary enrollment intention is to enroll close to home. In fact, about half of all ACT-tested students enroll within 50 miles of home. When considering colleges close to home, it is not uncommon for a student to consider a wide variety of institutions: 2-year/4-year, public/private, and institutions of varying size and selectivity.

In contrast, students planning to enroll farther from home or out of state tend to send scores to institutions that match their specific enrollment intentions. For example, a student might look at several selective private institutions out of state or several large public institutions out of state. On the other hand, it would be very unusual for a student to send scores out-of-state to a 2-year school and a 4-year school or to a selective public school and a non-selective public school.

data sheets

Predictive Modeling Institution Data Sheets

To use the index data strategically, institutions will want to know how predictive the indexes are for enrolled students at their institution. For most institutions in the country, ACT is able to prepare a Predictive Modeling Institution Data Sheet that shows an institution's 2011 ACT-tested enrolled students in terms of the four indexes.

To request a Predictive Modeling Institution Data Sheet for your institution, contact **EMS@act.org** or your ACT regional representative.

Here are a few general rules for interpreting the data sheets:

If the enrolled percentages at your institution match closely with the national distributions for each index, this likely means that your institution is less selective and that most of your enrollment comes from students who live fairly close to your campus. The takeaway in this case is that many students may be choosing your institution because of where your institution is located rather than because of what your institution is (2-year/4-year, public/private, selective/non-selective, large/small). Students may be choosing your institution because it is close to where they live, and one of their primary enrollment intentions may be to enroll close to home.

In contrast, more selective institutions will usually show enrolled student distributions quite different from the national distributions because they are enrolling more students from a greater distance and those who are looking for a specific size, type, and selectivity of institution.

strategic use

Using the Index Data Strategically

Student score reports sent to colleges and universities contain more than 265 data fields that can be used for two strategic purposes: (1) assessing a student's postsecondary enrollment intentions; and (2) assessing a student's level of interest in your institution.

Information about student enrollment intentions comes from the four indexes, student enrollment preferences for size and type of institution and preferred distance from home to campus, and other variables such as highest degree expected.

Information about a student's level of interest in your institution comes from level of college choice (or where they send their scores) and how closely their interests, needs, and preferences match your institution.

Information in the score report on student interests, plans, and needs can be used to personalize communications. Like other data in the ACT score report, the four Predictive Modeling Indexes provide you with data which can be used to better target, segment, and communicate with students.

The indexes represent point-in-time enrollment intentions, and they should always be viewed as starting points. Any subsequent interactions that an institution has with a student will increase or decrease that student's likelihood of enrolling. However, as a starting point, the information from the indexes can be used to determine how well a student's enrollment intentions match the characteristics of your institution.

A convenient way to think about segmenting is to assign every score sender to one of four quadrants, as shown in Figure 1 below. The vertical axis represents how desirable a student is to your institution; the horizontal axis represents how well the student's enrollment intentions (as measured by the indexes and level of college choice) match your institution. Your institution will have target populations that are very desirable and a good match (upper left quadrant). On the other hand, your institution may have target populations that are very desirable but not a good match—at least when using the indexes as a starting point to describe student enrollment intentions—and these fall in the lower left quadrant. In that example, you can use the index scores to understand student enrollment intentions and then build strategies to move students toward a better understanding of what your institution offers. Other students may fall in the quadrant of low desirability and poor match, and you may choose to spend less time and fewer resources recruiting those students.

Figure 1. Quadrants of student desirability as matched to academic intentions

More Desirable Good Match	Less Desirable Good Match
More Desirable Poor Match	Less Desirable Poor Match

predictive modeling and EOS

The Predictive Modeling Indexes and Student Search through ACT EOS

For the past three years, data from the four Predictive Modeling Indexes is included with every ACT Educational Opportunity Service (EOS) record that is downloaded. EOS clients cannot use the indexes as search variables in ACT EOS, but each index is closely related to a data variable that can be used when ordering. For example, ACT research shows that students who say that want to enroll within 25 miles of home have very low Mobility Index scores. As a result, ACT recommends that institutions do not select the names of students in ACT EOS who want to enroll within 25 miles of home when selecting the names of out-of-state students who live more than 100 miles from the campus. Other strategies for using the index data strategically in ACT EOS are summarized in "Using EOS Search Criteria Related to Predictive Modeling Indexes.pdf," available online at **www.act.org/eos/order.html**.

Table 11 below shows the positions of the four indexes (and the associated percentile ranks) in the ACT EOS Electronic Student Record:

Table 11. Positions of Predictive Modeling Indexes in the ACT EOS Electronic Student Record

Field	Position/Format	Range
Mobility Index	272–275 (x.xx)	0.01–0.99
Percentile Rank Mobility Index	277–278 (xx)	
Institution Type Index	280–283 (x.xx)	0.01–0.99
Percentile Rank Institution Type Index	285–286 (xx)	
Selectivity Index	288–290 (x.x)	0.0–5.0
Percentile Rank Selectivity Index	292–293 (xx)	
Institution Size Index	295–297 (x.x)	.00–4.0
Percentile Rank Institution Size Index	299–300 (xx)	

fit scores

Interest–Major Fit Score

Effective with the release of student records in September 2012, an Interest–Major Fit score was added to the ACT electronic record. Interest-major fit is derived from two data elements that are collected during ACT registration: (1) the student's ACT Interest Inventory scores; and (2) the student's intended major chosen from a list of 294 college majors.

The Interest–Major Fit score measures the strength of the relationship between the student's ACT Interest Inventory scores and the profile of interests of students in a given major. Interest-Major Fit scores range from a low of 01 to a high of 99. The higher the score, the better the interest–major fit.

Research at ACT and elsewhere suggests that if students' measured interests are similar to the interests of people in their chosen college majors, they will be more likely to:

- persist in college
- remain in their major
- complete their college degree in a timely manner

Interest–major fit clearly benefits both students and the college they attend: students engaged in good-fit majors are more likely to stay in college, stay in their major, and finish sooner.

Interest profiles for majors are based on a national sample of undergraduate students with a declared major and a GPA of at least 2.0. Major was determined in the third year for students in 4-year colleges, and in the second year for students in 2-year colleges.

strategic use

Recruitment Strategies for Using the Interest–Major Fit Score

Many institutions build mail, e-mail, and telephone outreach strategies tied to student intended major. For example, these strategies may include mailing or e-mailing information about academic departments and colleges, or, in some cases, having professors or students contact prospective student majors by phone. All such outreach strategies cost time and money. By combining data from a student's intended major with an Interest–Major Fit score, campuses can identify students who may have a stronger interest in a particular major and who may be more likely to enroll in a particular major. As a result, campuses could do more targeted outreach using both intended academic major and interest–major fit and, perhaps, save time, money, and resources.

Advising and Retention Strategies for Using the Interest–Major Fit Score

College retention interventions often include efforts to identify students more likely to drop out or not make adequate progress toward a degree. Because ACT research suggests that good interest–major fit can lead to positive retention and persistence outcomes, it follows that advisors and retention professionals can use poor Interest-Major Fit scores as a part of efforts to identify at-risk students or students who could benefit from advising and career planning interventions.