

ACT Research Insights Part II: Improving Student Success and Completion

Justine Radunzel and Krista Mattern, ACT

July 20, 2018

The ACT logo is displayed in white text on a dark blue background.

2018 Higher Education **RESEARCH DIGEST**



- 2 Explore ACT Data to Help Inform Recruitment, Enrollment, and Success Strategies. Three New Publicly Available ACT Databases
- 6 Building a Diverse and College-Ready Class: The Power of Social and Emotional Learning Skills
- 11 New Understanding of High School Rigor and College Success Predictions: An Empirically-Derived Index of High School Academic Rigor
- 14 Sticking to the Plan: Who Is Likely to Declare a Major That Is Consistent with Their Intentions?
- 18 College and Career Ready: How Much Academic Preparation Is Needed for Middle-Skills Jobs?
- 22 They May Be *First* but Will They *Last*? Retention and Transfer Behavior of First-Generation Students
- 27 Academic Readiness and Discipline: Two Factors Related to Degree Completion
- 32 Fair to Compare: A Guide to the 2018 ACT/SAT Concordance

Research included in the 2018 HERD can help inform discussions around:

- Building a Diverse and College Ready Class
- Quantifying the rigor of students' high school experience
- Identifying students who are likely to declare a major that is consistent with their intentions
- **Academic preparation level needed for Career Readiness versus College Readiness**
- **Identifying first-generation students who are likely to leave your institution**
- **Improving college completion rates through the consideration of both academic and social and emotional learning skills**

Roadmap

During this session, you will learn more about:

- 1. College and career ready: How much academic preparation is needed for middle skills jobs?**
- 2. Retention and transfer behavior of first-generation students**
- 3. Academic readiness and discipline: Two factors related to degree completion**
- 4. A publicly available college completion database**

COLLEGE AND
CAREER READY:
**HOW MUCH
ACADEMIC
PREPARATION
IS NEEDED FOR
MIDDLE-SKILLS JOBS?**

Jeffrey Steedle, Justine Radunzel, and Krista Mattern



Background

Middle-Skills Jobs

- **Jobs offering middle-class salaries and opportunities for advancement**
 - Requires some postsecondary training
 - New jobs emerging in fields such as information technology, health science, and human services
 - Two-year institutions are essential component of the pipeline into these jobs
 - Supply of workers does not meet demand

Background

College and Career Readiness

- **Historically considered distinct**
 - Vocational education separate from college-preparatory curricula
- **Recently often defined as a unified construct**
 - Increasing focus on academic skills in CTE programs
 - Policy goals to set high standards for all students – “choice” ready
 - Ignoring readiness requirements could have negative consequences
- **Need to evaluate empirically if they are equivalent**

ACT College Readiness Benchmarks

ACT Readiness Benchmarks

- **The minimum ACT score associated with at least a 50% chance of earning a B or higher in first year college course(s)**

ACT test	College course	Benchmark score
English	English Comp I	18
Mathematics	College Algebra	22
Reading	Social science	22
Science	Biology	23

Social science courses include American History, Other History, Psychology, Sociology, Political Science, and Economics.

- **The minimum ACT Composite score associated with at least a 50% chance of earning a FYGPA of 3.00 or higher is 23**

Study objective – examine comparability of college readiness and career readiness as measured by the ACT

Research Questions:

- **Do readiness benchmarks at two-year institutions differ**
 - **Between middle-skills (career readiness) and high-skills majors (college readiness)?**
 - **From the established ACT College Readiness Benchmarks?**
 - **Across major families?**
 - **For CTE courses from those for core academic courses?**

Current study
data

Sample

- **~108,000 ACT-tested first-time entering college students from 2005 to 2014 freshman cohorts**
 - 59 two-year institutions from three state systems
 - First-year CIP major codes, course transcripts and grades
- **Determination of major groupings associated with middle- and high-skills occupations**
 - Based on relationships between CIP codes, SOC codes, and O*NET job zones
 - Middle-skills – Job Zone 3 – 37.9% of sample
 - High-skills – Job Zones 4 and 5 – 62.1% of sample

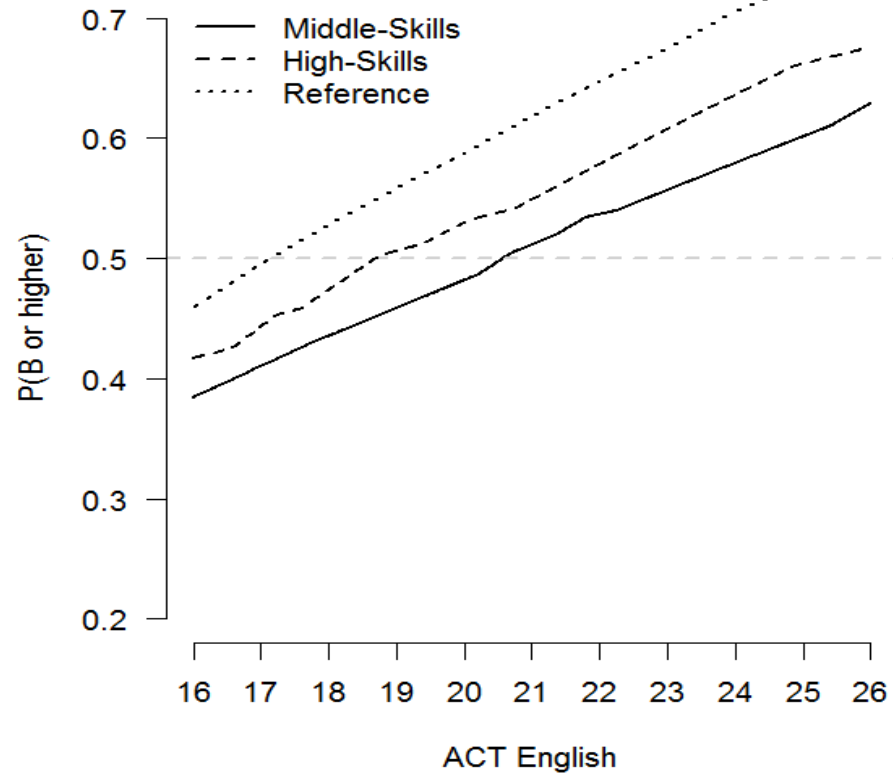
Percentages of Students in Skills Level by Major (CIP) Family

CIP Family	% of Total Sample	Middle-Skills	High-Skills
Agriculture, Agriculture Operations, and Related Sciences	1.1	99.9	0.1
Computer and Information Sciences and Support Services	1.8	81.7	18.3
Engineering Technologies/Technicians	4.0	99.0	1.0
Family and Consumer Sciences/Human Sciences	1.2	73.3	26.7
Parks, Recreation, Leisure, and Fitness Studies	0.5	73.7	26.3
Security and Protective Services	2.8	99.4	0.6
Mechanic and Repair Technologies/Technicians	0.9	100.0	0.0
Health Professions and Related Clinical Sciences	15.2	96.9	3.1
Business, Management, Marketing, and Support Services	8.4	80.6	19.4
Communication, Journalism, and Related Programs	0.6	10.1	89.9
Education	5.9	9.5	90.5
Engineering	1.4	0.0	100.0
Liberal Arts and Sci., General Studies and Humanities	39.0	0.0	100.0
Biological and Biomedical Sciences	1.2	0.0	100.0
Multi/Interdisciplinary Studies	0.8	0.0	100.0
Physical Sciences	1.1	0.0	100.0
Psychology	1.0	0.0	100.0
Social Sciences	1.4	0.0	100.0
Visual and Performing Arts	1.8	24.4	75.6

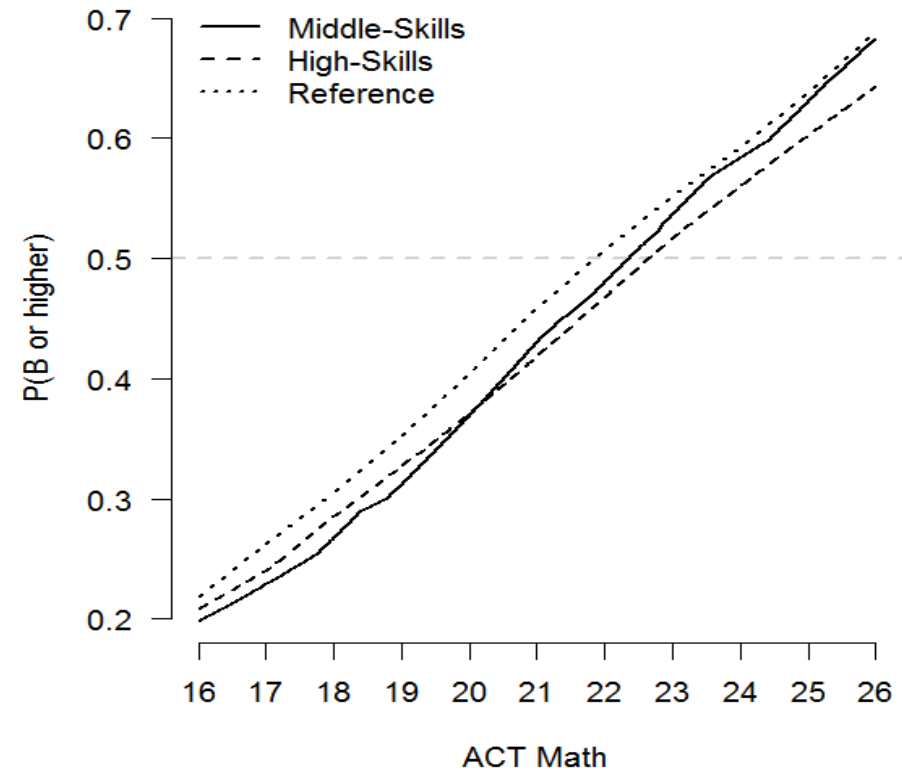
Shown for major families accounting for at least 0.5% of the sample.

Probability of Earning a B or higher

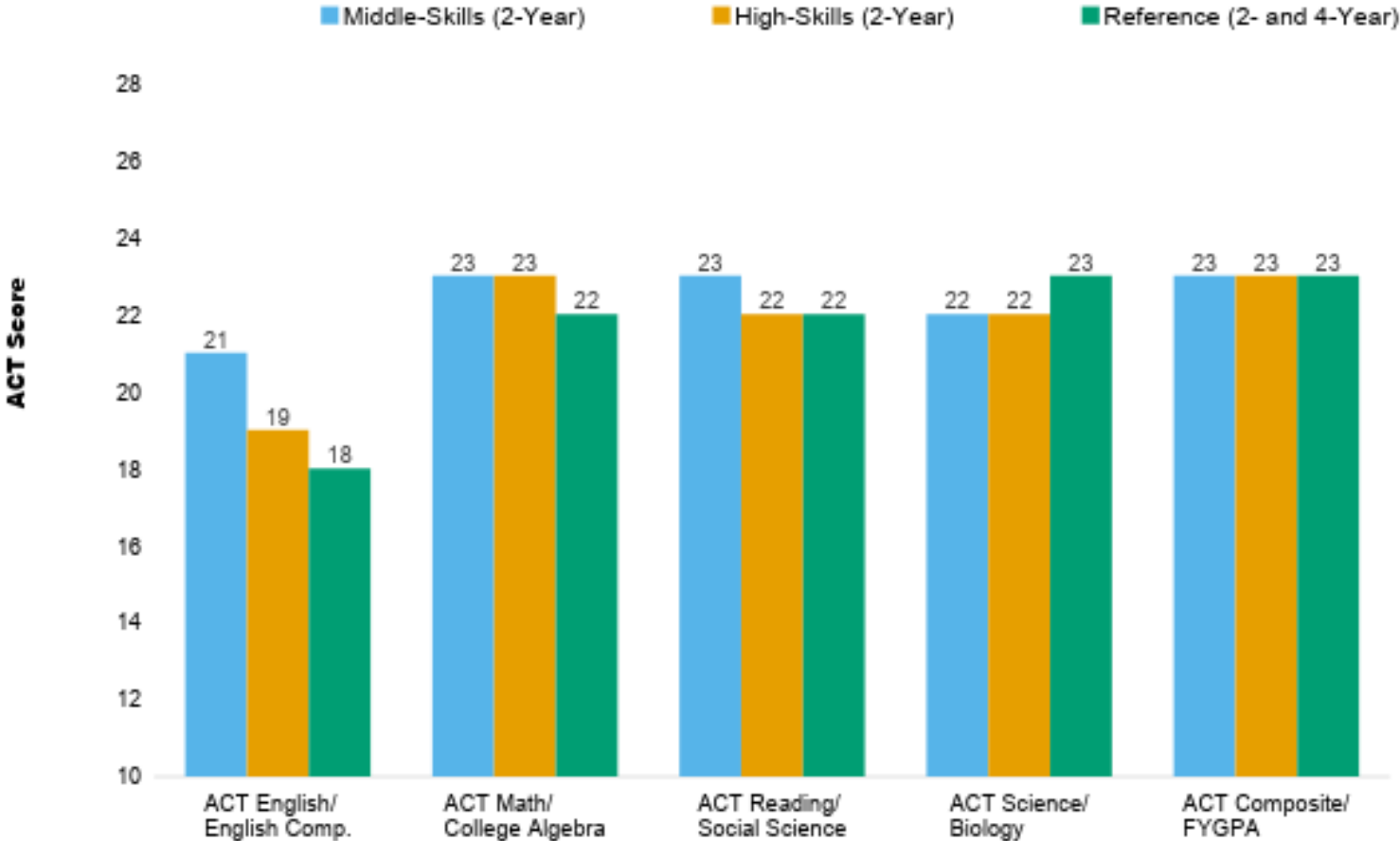
English Composition



College Algebra



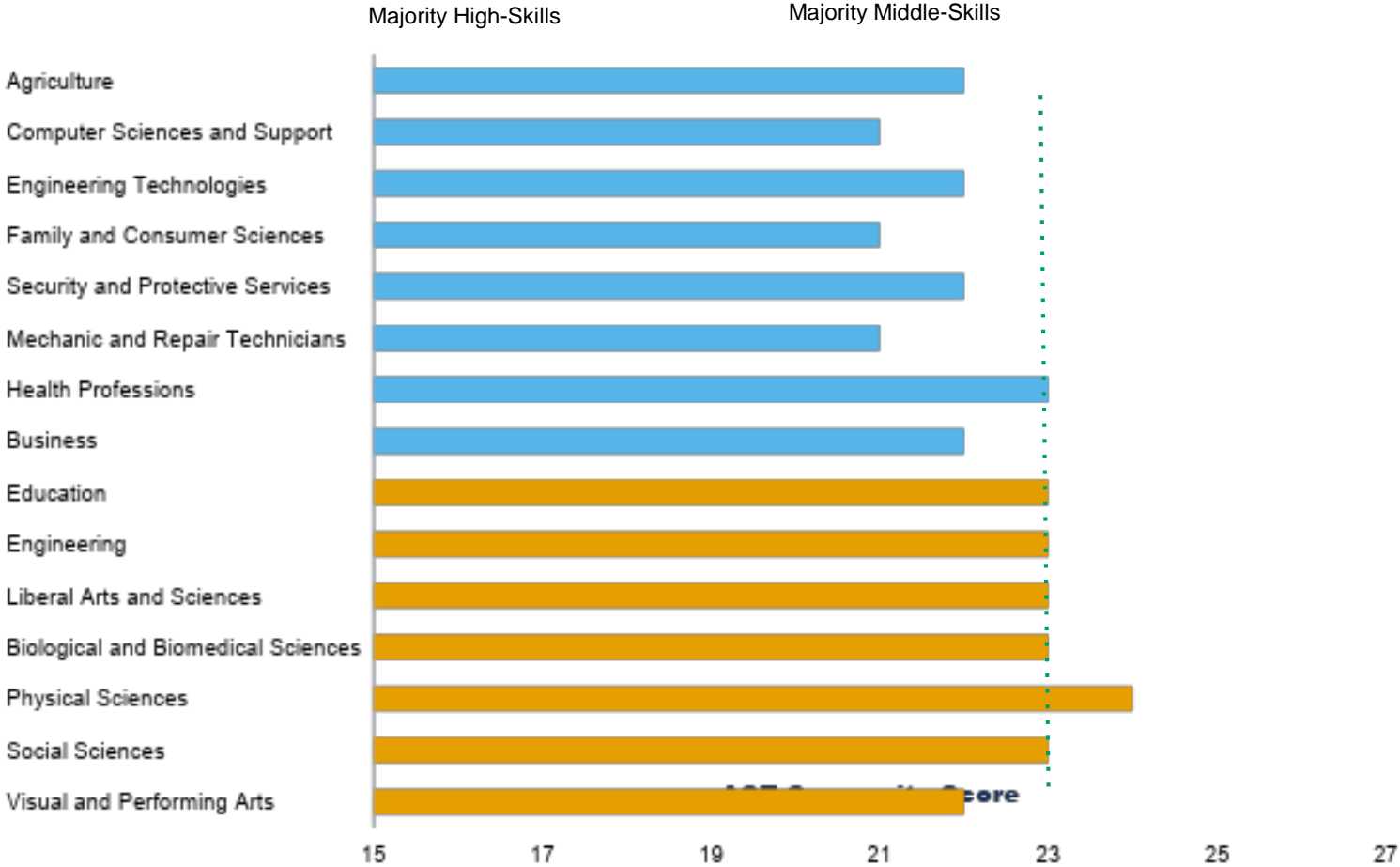
Readiness Benchmark Scores



Social science courses include American History, Other History, Psychology, Sociology, Political Science, and Economics.



FYGPA Readiness Benchmark Scores for Major Families



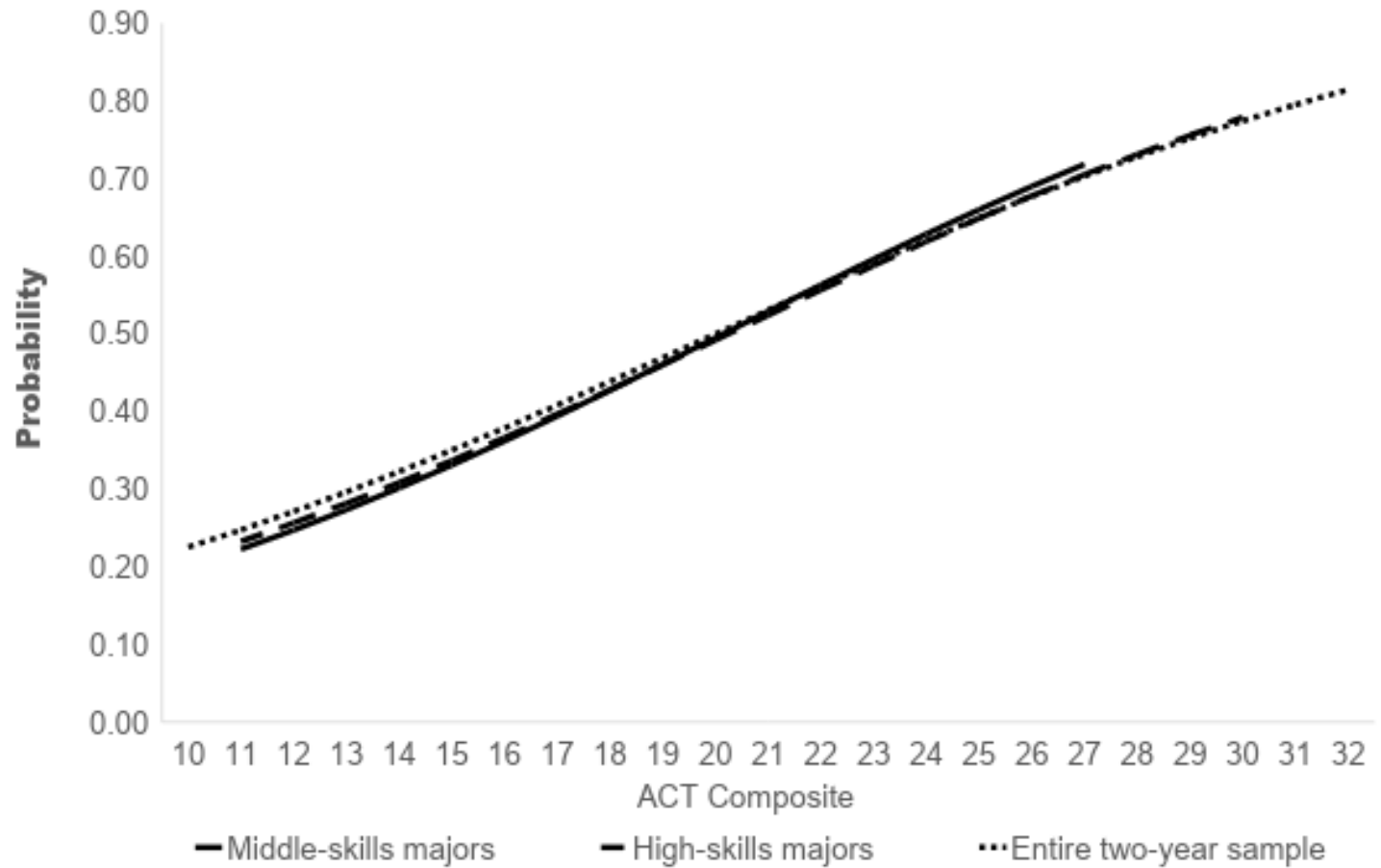
Select CTE Course Benchmark Scores

CTE Subject	Predictor	Sample Size		Cut Score		
		Stud.	Inst.	Median (Benchmark)	25 th %ile	75 th %ile
Business	ACT Reading	5,067	52	22	20	24
Computer	ACT Math	14,426	41	22	18	26
Nursing/Dental	ACT Science	11,148	51	19	18	21
Criminal Justice	ACT Reading	1,019	22	19	17	21
Teacher Education	ACT Reading	2,368	36	20	16	22

Supplemental validation analyses

for ~60,000 ACT-tested students from 260 two-year institutions with major info from 2010 ACT/NSC matched data source

Probability of Completing a Degree within Six Years by ACT Composite Score



Includes any degree – certificate, associate's, or bachelor's degree.

Six-Year Initial Degree Completion by FYGPA Benchmark Attainment



FYGPA Benchmark attainment of achieving a 23 or higher ACT Composite score.

Supplemental
validation
analyses

for ~60,000 ACT-tested
students from 260
two-year institutions
with major info from
2010 ACT/NSC matched
data source

Study implications

Findings suggest:

- **College readiness and career readiness are similar for students at two-year institutions**
 - The commonly-accepted notion that students enrolling in CTE programs or pursuing middle-skills occupations need less academic preparation was not supported
 - Provides a useful signal to students
- **All students should take rigorous courses in high school to be well prepared for postsecondary pursuits**
 - To ensure students are “choice” ready

THEY MAY BE *FIRST* BUT
WILL THEY *LAST*?

RETENTION AND TRANSFER BEHAVIOR OF FIRST-GENERATION STUDENTS

By Justine Radunzel



Background

First-
Generation
(FG) students

FG less likely than peers to:

- **Persist and complete a degree**
- **Be academically prepared for college**
- **Have exposure to and knowledge about college**
- **Have guidance and support at home**
- **Engage in college-attending behaviors that can foster academic and social integration into college**

FG more likely than peers to:

- **Have financial concerns**
- **Experience a cultural shift at college**

Current study objectives

Retention and transfer at year 2

- **After statistically controlling for other incoming student information**
 - Do rates differ by parental education?
 - Do predictors differ by parental education?
 - Does transfer type differ by parental education?

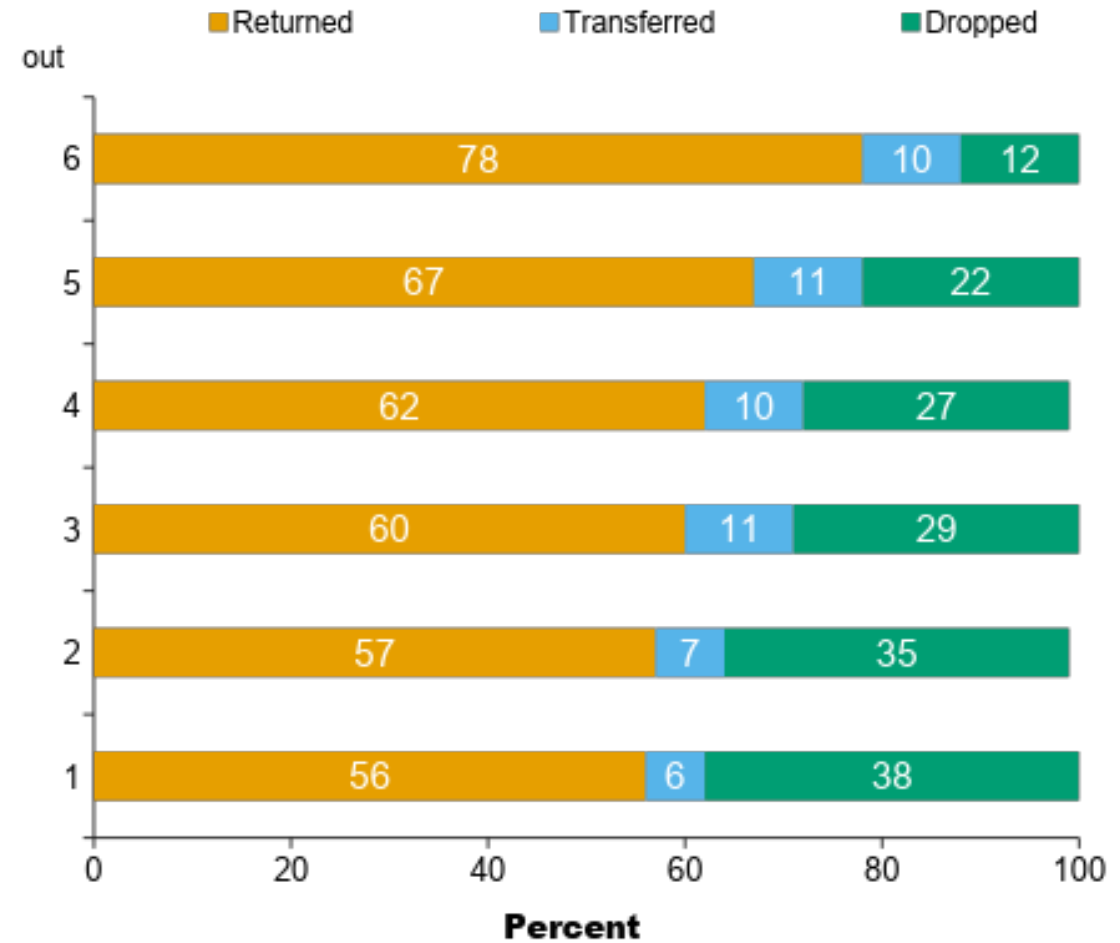
Current study
data

Study sample

- **~150,000 ACT-tested first-time entering college students from 2012 to 2014 freshman cohorts**
 - ~70 institutions from two state systems
 - Supplemented with NSC data
- **FG students – parents had no college experience**
 - 15% four-year sample
 - 27% two-year sample

FG students more likely than peers to drop out at year two

Retention and Attrition Rates



Statistically controlling for institution attended only.

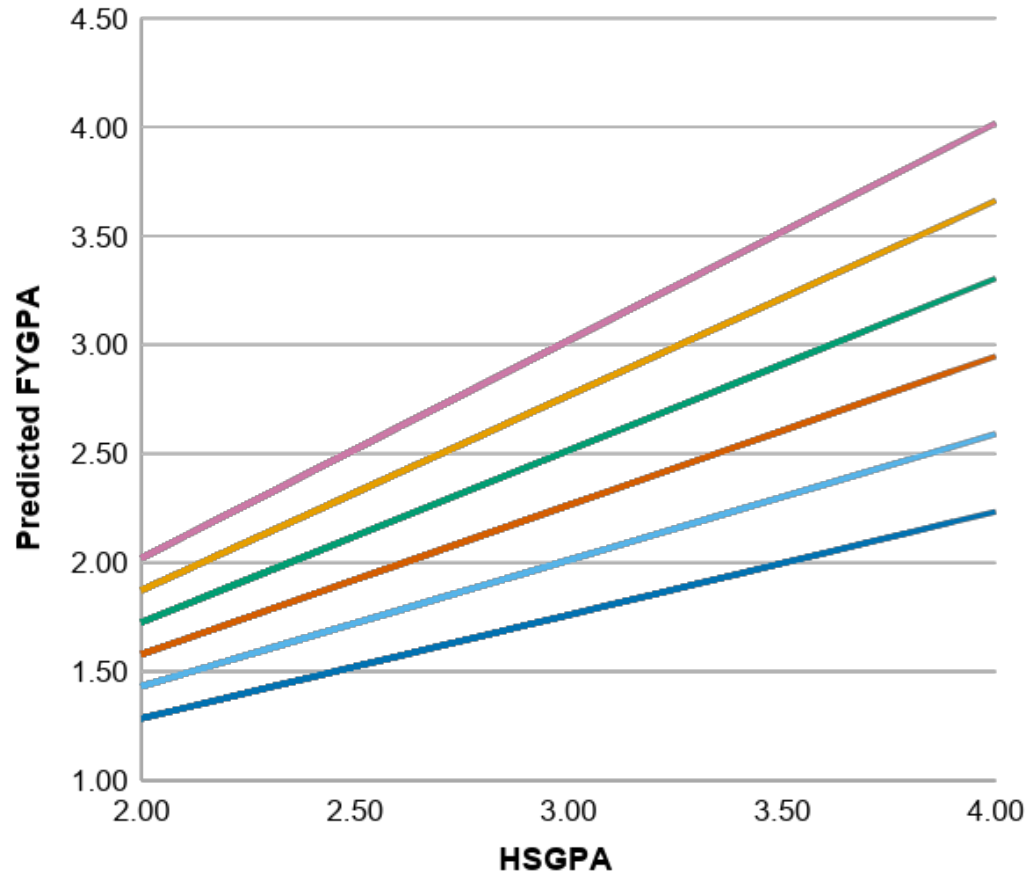
Incoming
student
information

Predictors

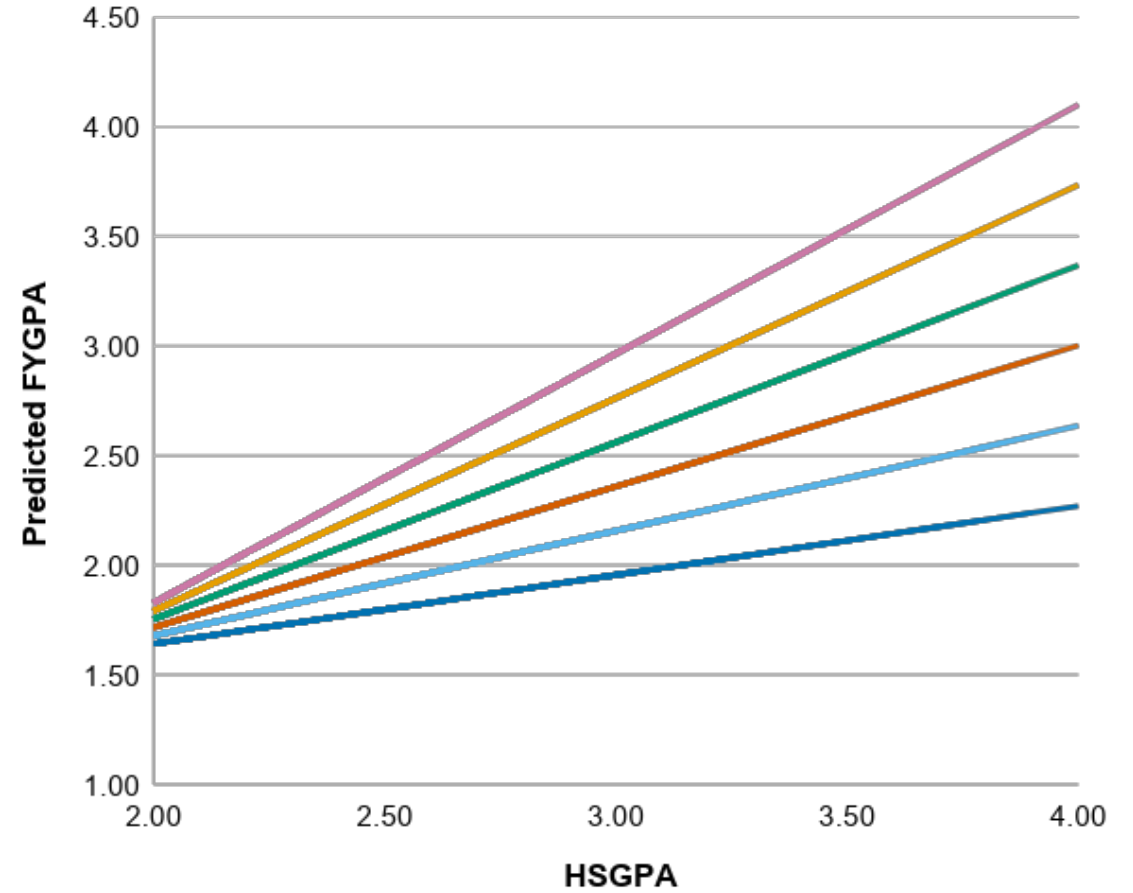
- **Academic readiness**
 - Institution-specific predicted FYGPA based on ACT Composite score and HSGPA
- **College intentions**
 - Intend to live on campus, Number of hours plan to work, Educational goals
- **College enrollment characteristics**
 - Enrollment status, Distance from home
- **Demographic characteristics**
 - Gender, Race/ethnicity, Annual family income, Neighborhood median household income

Predicted FYGPA based on ACT Composite Score and HSGPA

Four-year sample



Two-year sample



ACT Composite score:

— 10 — 15 — 20 — 25 — 30 — 35

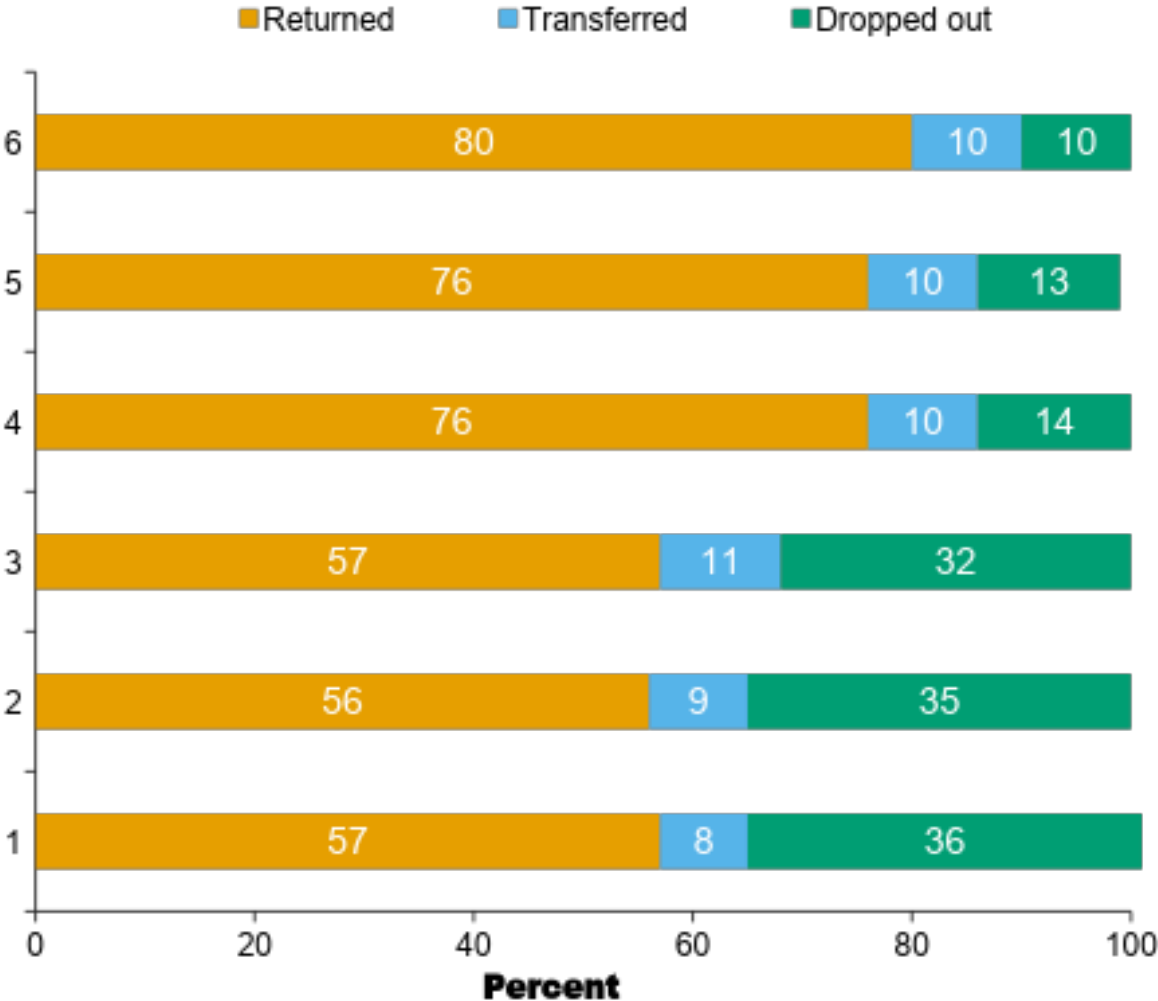


ACT Composite score:

— 10 — 15 — 20 — 25 — 30 — 35

Modeled Retention and Attrition Rates from Multiple-Predictor Models

Reduction in gaps when account for other student characteristics



Holding all other predictors constant at the respective sample means.

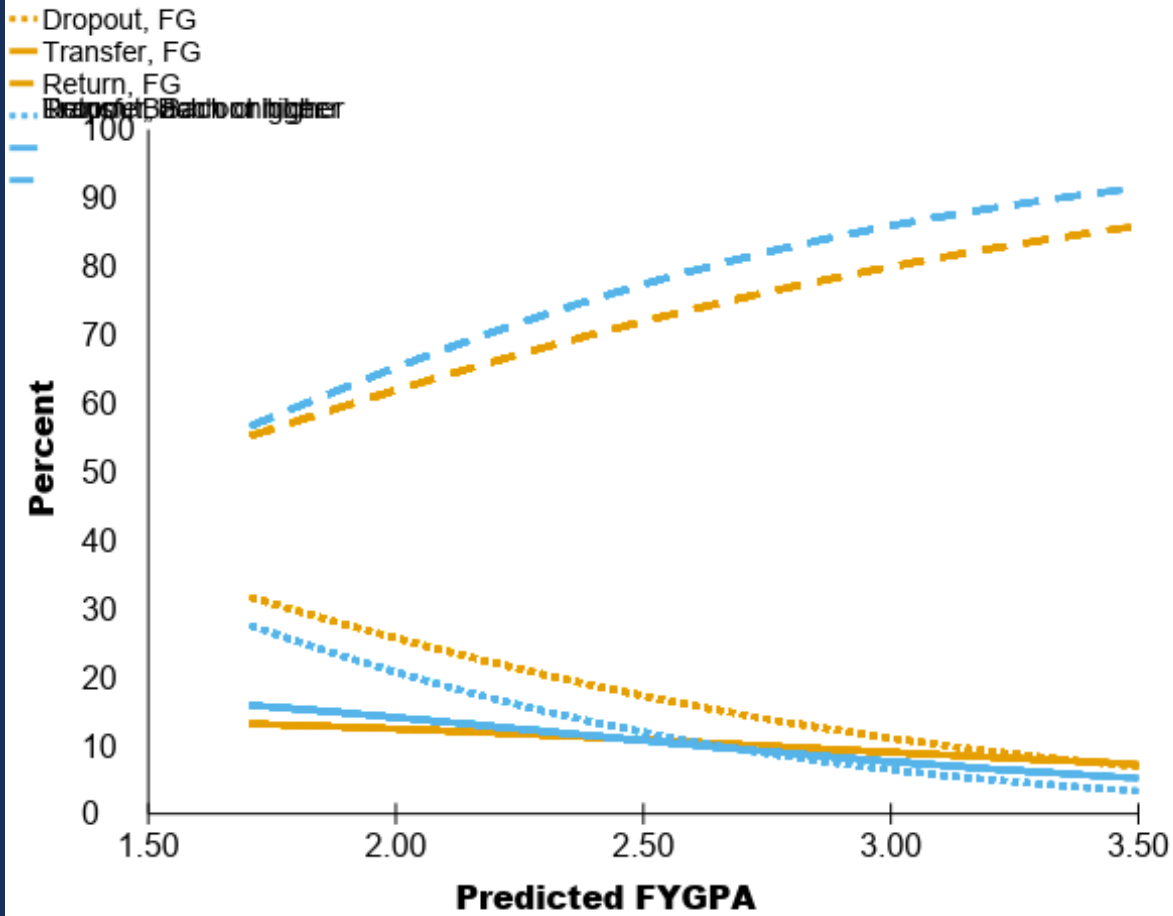
Effects on
student
retention and
attrition

Predictor Effects that Differ by Parental Education

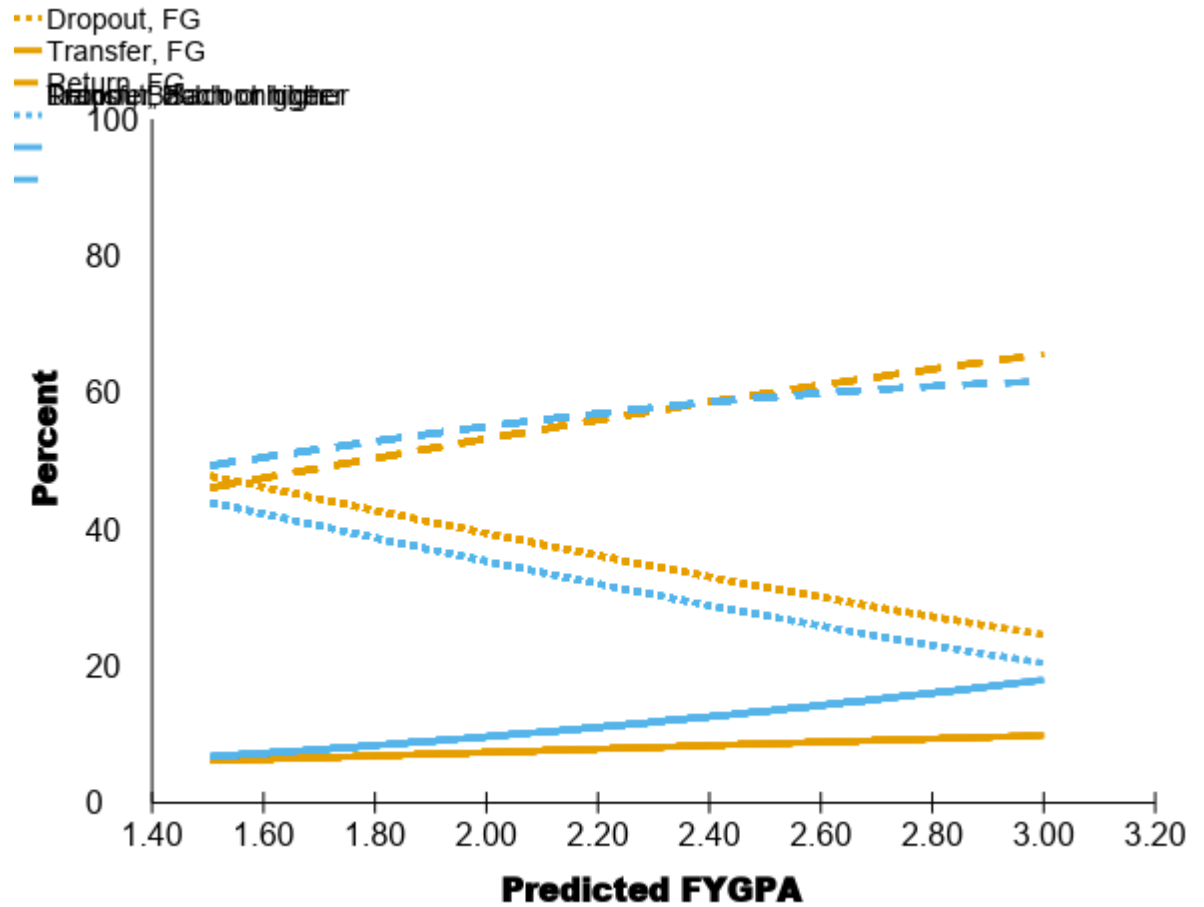
- **Predicted FYGPA**
- **Gender**
- **Race/ethnicity**
- **Enrollment status**
- **Plans to live on campus (four-year sample only)**

Retention and Attrition Rates by Predicted FYGPA and Parental Education

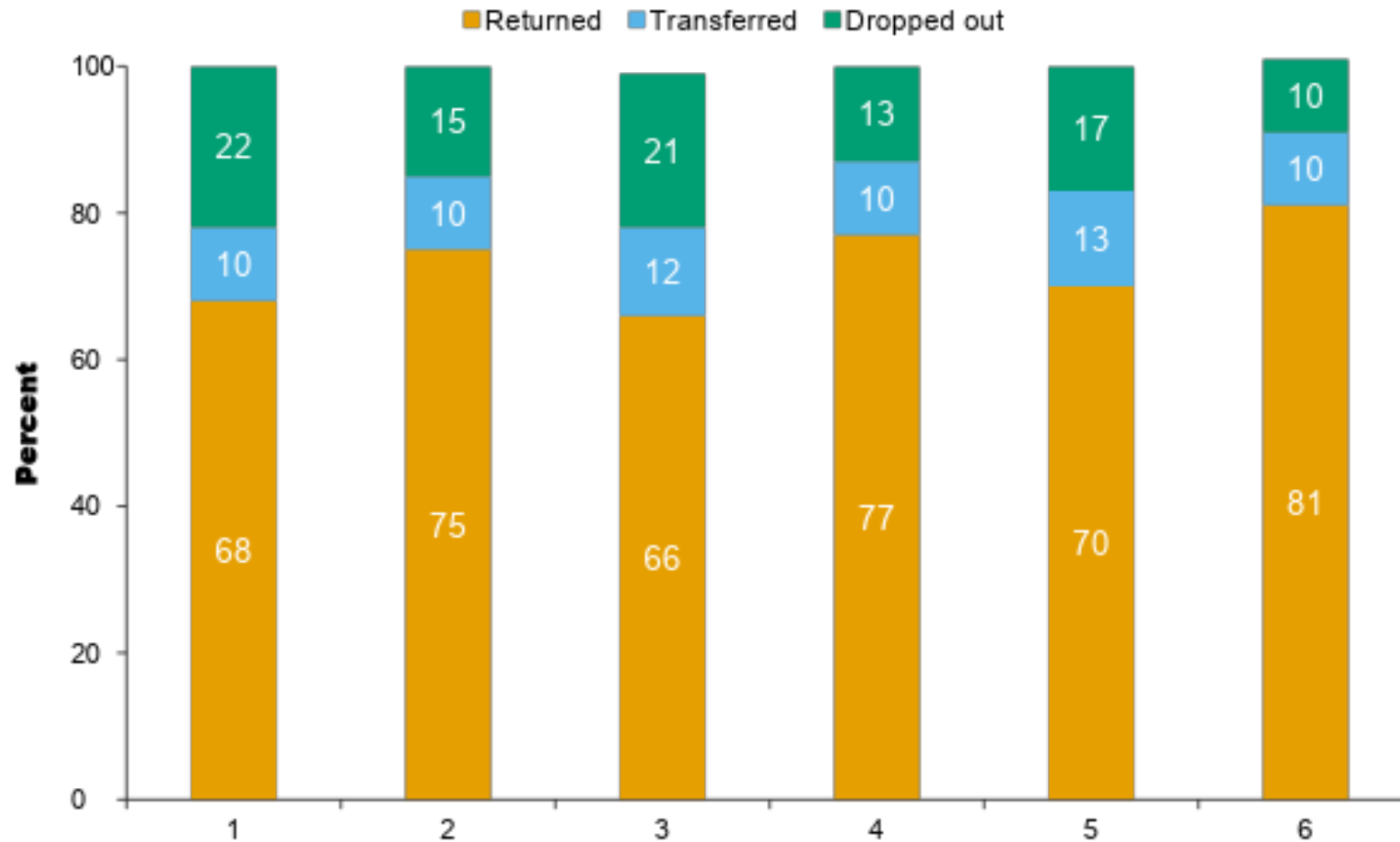
Four-year sample



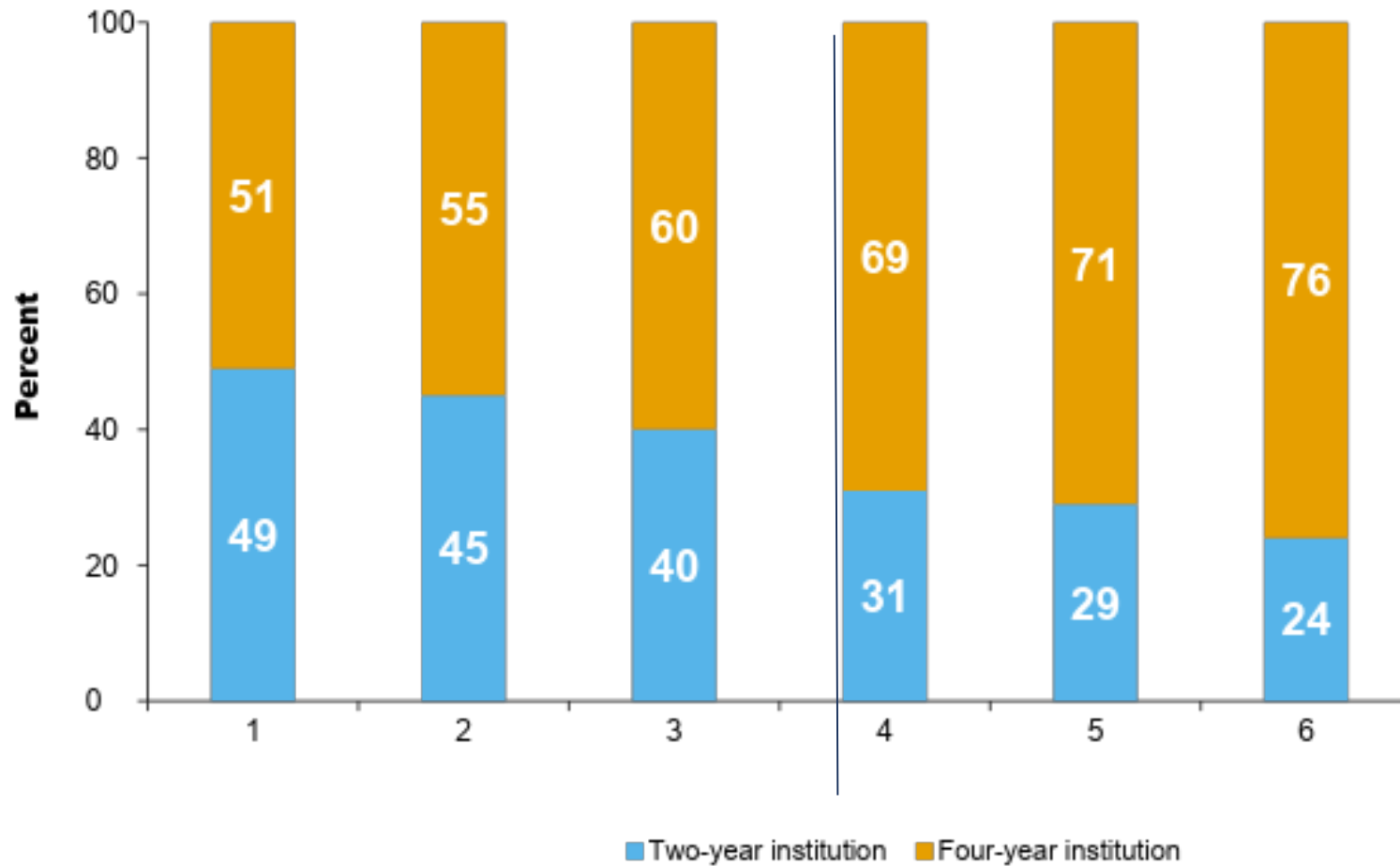
Two-year sample



Modeled Retention and Attrition Rates by Enrollment Status and Parental Education



Where are Transfer Students Going?



Transferred to:

Study implications

Institutions and state systems can use this info to:

- **Augment their early alert/warning systems**
- **Learn more about incoming FG students**
 - Incorporate into student-level dashboards
 - Use other ACT data available on student record
 - ACT Interest Inventory scores, Intended major and major certainty, College extracurricular plans, etc.
- **Evaluate and inform for FG students**
 - Retention strategies
 - Transfer strategies and policies

ACADEMIC READINESS
AND DISCIPLINE:
**TWO FACTORS
RELATED TO DEGREE
COMPLETION**

By Justine Radunzel, Krista Mattem, and Joann Moore



Background – ACT's Holistic Framework



The holistic model of education and work success

<p>CORE ACADEMIC SKILLS English Language Arts Mathematics Science</p>	<p>CROSS-CUTTING CAPABILITIES Information and Communication Technology Collaborative Problem Solving Thinking Skills Learning Skills</p>	<p>BEHAVIORAL SKILLS Acting Honestly Getting Along Well with Others Keeping an Open Mind Maintaining Composure Socializing with Others Sustaining Effort</p>	<p>EDUCATION & CAREER NAVIGATION Self-Knowledge Environmental Factors Integration Managing Career & Education Actions</p>
---	--	---	--

Study
objective and
data

Study Objective:

Examine how students' ACT performance and social emotional learning (SEL) skills can help identify students at-risk of not completing a degree

Data:

Matched ACT records and National Student Clearinghouse enrollment and degree information for the 2010 ACT-tested high school graduating class

College Readiness Translates to a College Degree

Students who meet more ACT College Readiness Benchmarks are more likely to attend college and earn a degree within six years

Out of every 10 high school graduates:

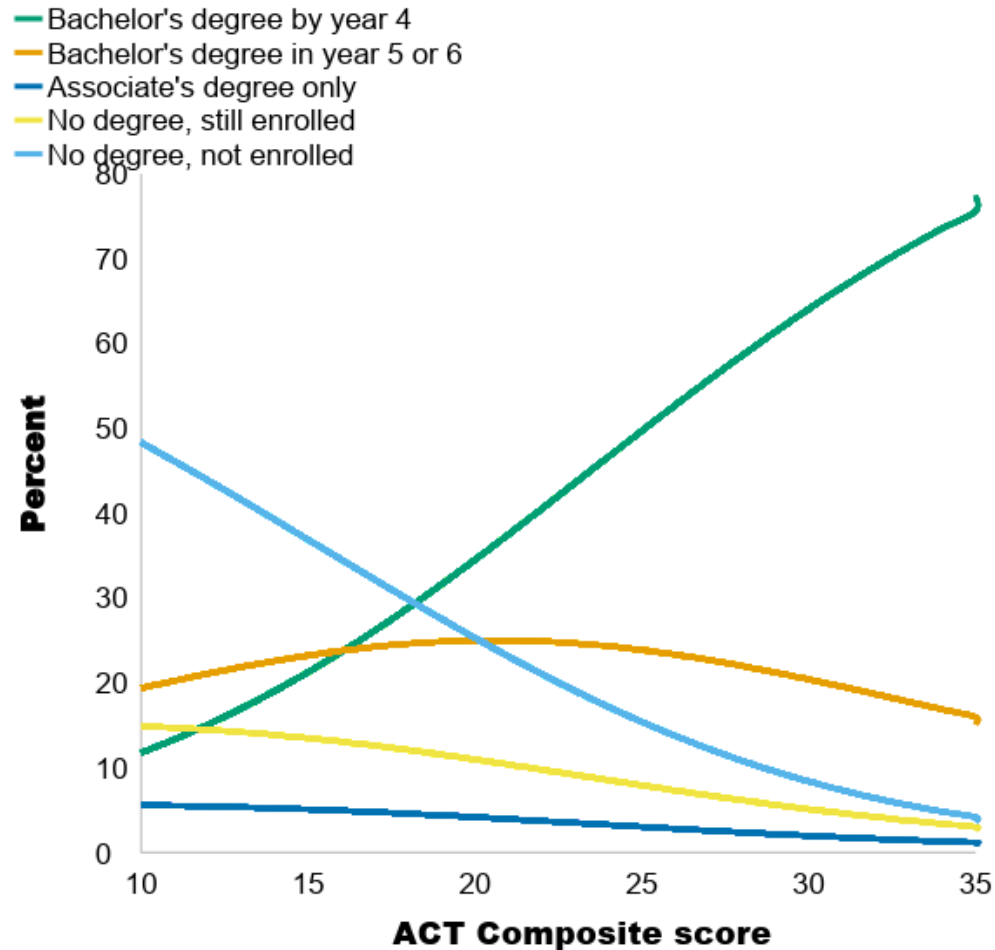
■ # who do not enroll in college ■ # who enroll in college ■ # who enroll in college and earn a degree



Based on 1,568,835 ACT-tested 2010 high school graduates.

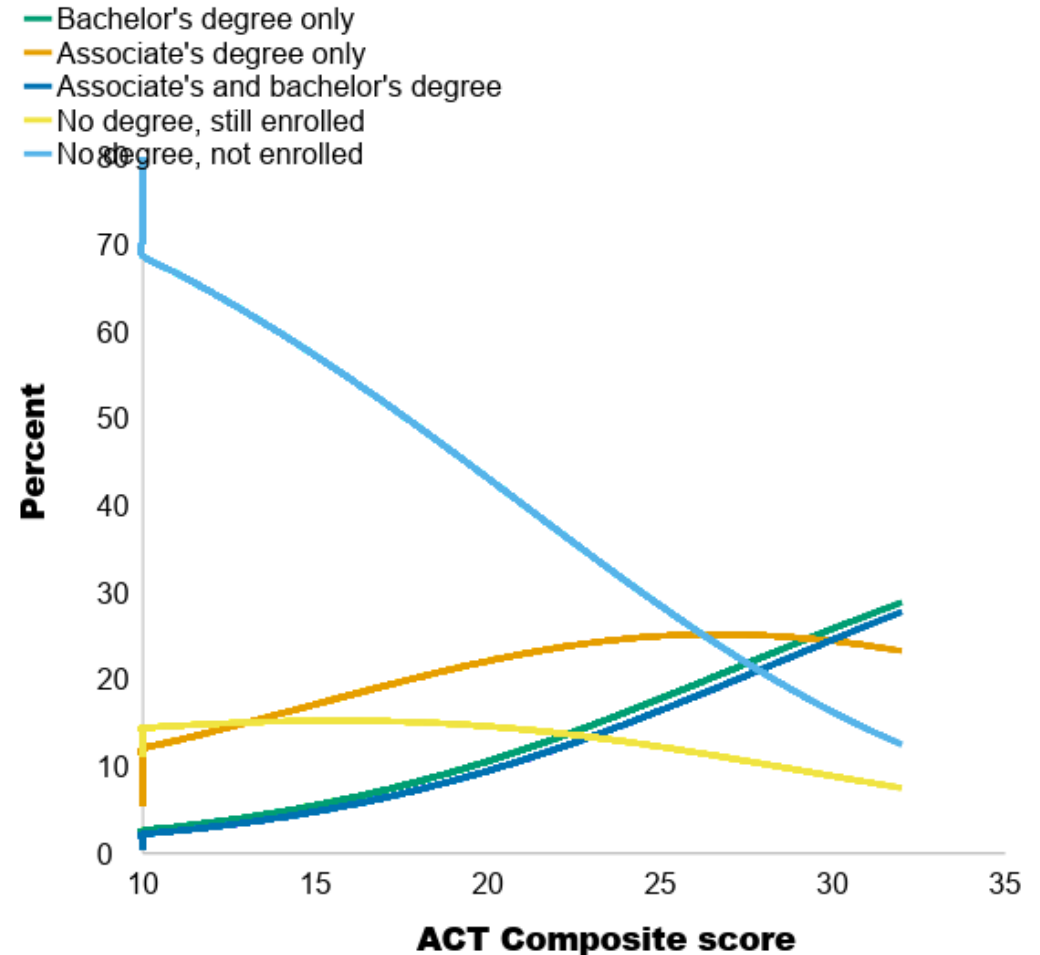
Year 6 Degree Completion Status by ACT Composite Score

Four-year institutions



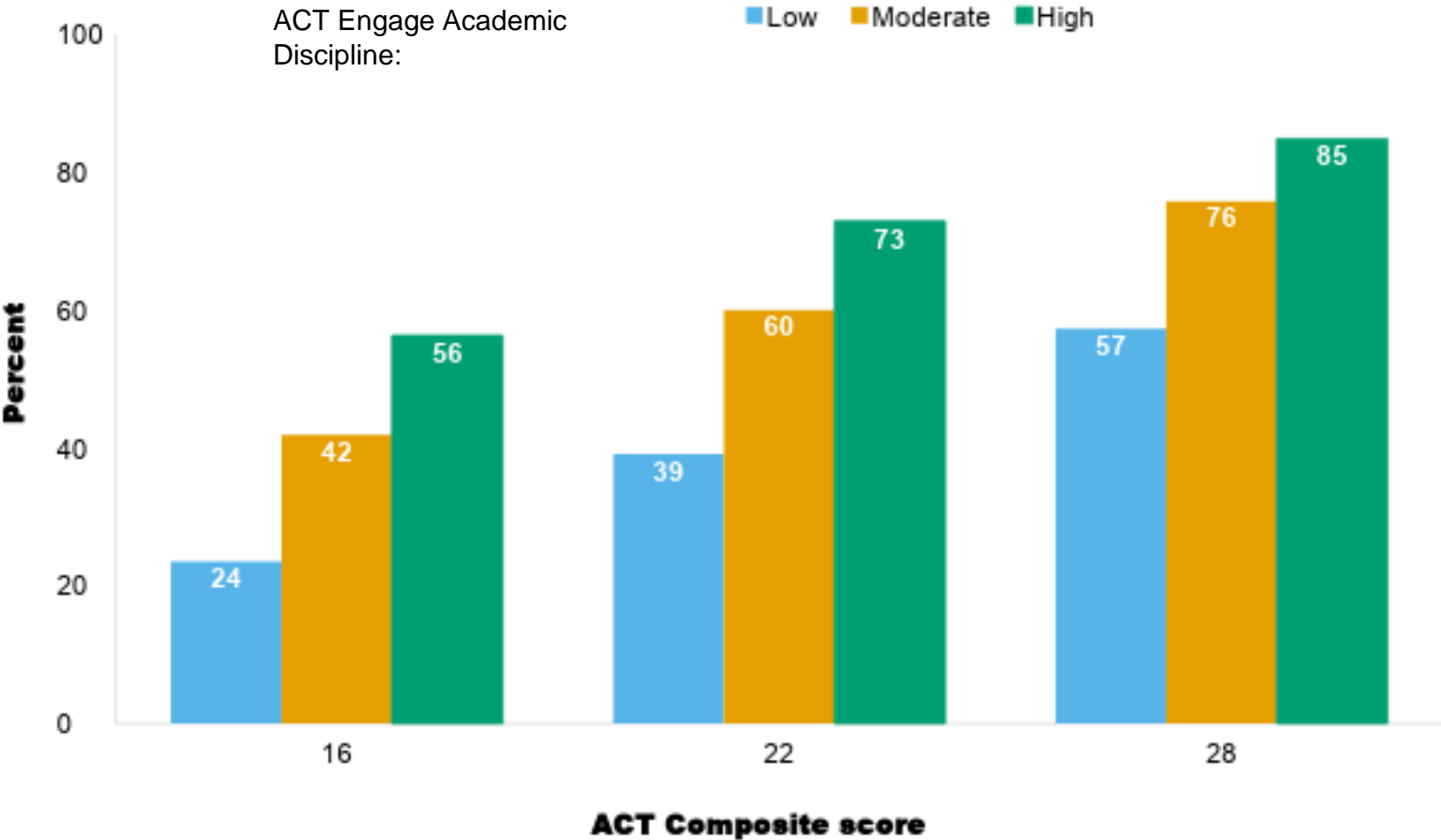
Based on ~831,000 students beginning at a four-year institution.

Two-year institutions



Based on ~246,000 students beginning at a two-year institution.

Six-Year Degree Completion by ACT Composite Score and ACT Engage Academic Discipline



Based on 3,800 ACT-tested 2010 high school graduates from 208 postsecondary institutions who took ACT Engage.

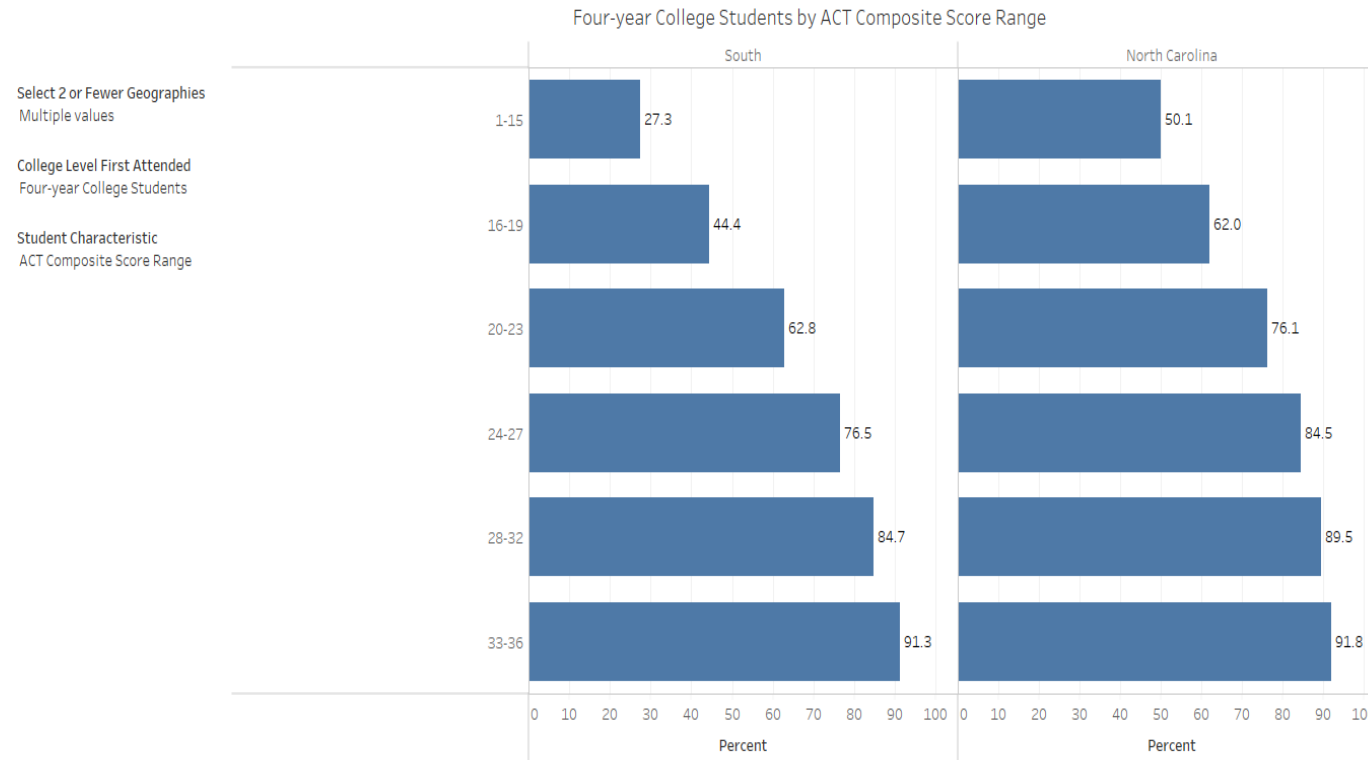
Study
implications

College Degree Completion:

- **Academic readiness matters**
- **SEL skills provide additional insights**
- **Benefits of using multiple measures**

College Completion Database Demonstration

Percent Earning a Degree Within 150% of Normal Time to Degree



Earning a degree within 150% of normal time to degree is defined as receiving a bachelor's degree within 6 years of first enrolling in college or receiving an associates degree within 3 years of first enrolling in college. Students do not have to earn a degree from the institution at which they began their college education in order for that degree to count toward this definition. The geographic entity provided is the state or region in which students graduated from high school; this entity may differ from the state or region in which students first attended college. Data are from the ACT-tested graduating class of 2010 that enrolled in college directly after high school.

Research opportunities



Join **ACT** and other postsecondary institutions in one or more research opportunities:



NATIONAL ACT COLLEGE SUCCESS RESEARCH PARTNERSHIP

Collaborate on a broad research agenda related to student success and the use of ACT data.



ACT ENGLISH LANGUAGE ARTS (ELA) AND WRITING INITIATIVE

Examine relationships between scores and performance in postsecondary reading- and writing-intensive courses.



INTERNATIONAL STUDENT SUCCESS INITIATIVE

Examine relationships between ACT scores and first-year college performance for international students.



WORKKEYS/NCRC 2.0 EFFICACY STUDY

Examine relationships between ACT WorkKeys 2.0 scores and relevant performance outcomes (job performance ratings, productivity, grades, etc.).



TESSERA COLLEGE PILOT STUDY

Examine relationships between social and emotional skills and post-secondary academic achievement.

COLLABORATIVE RESEARCH PARTNERSHIP OPPORTUNITIES

Contact Lakisha Bates at Lakisha.Bates@act.org



Questions?