

SHOULD THE COLLEGE OF WOOSTER GO TEST OPTIONAL?

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OVERVIEW

- ❖ RESEARCH QUESTIONS
- ❖ DATA
- ❖ METHODS
- ❖ RESULTS
 - APPLICATION
 - SUMMARY
- ❖ LIMITATIONS
- ❖ RECOMMENDATIONS



RESEARCH QUESTIONS



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Should the
College of
Wooster go
test optional?

Does SAT/ACT predict
student success at the
College of Wooster?

What factors predict retention?



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DATA

❖ SIMPLIFIED DATA

- (5 YEARS, 2,800 OBSERVATIONS)
- ADMISSIONS
- CoW ACADEMIC
- CIRP SURVEY
- APEX

❖ VARIABLES THAT DETERMINE SUCCESS

- FIRST YEAR GPA
- RETENTION
- GRADUATION





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METHODS

❖ IDENTIFYING IMPORTANT FACTORS

- RANDOM FOREST
- LINEAR AND LOGISTIC REGRESSION

❖ GENERATING PREDICTIVE MODELS

- MULTIPLE LOGISTIC REGRESSION MODEL (BINARY VARIABLE)
- MULTIPLE LINEAR REGRESSION MODEL (NUMERIC VARIABLE)



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Test
Optional

Retention



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RESULTS

- ❖ TEST OPTIONAL
 - RECAP OF MIDTERM
 - MULTIVARIABLE PREDICTIVE MODELS
 - READER RATING
- ❖ RETENTION



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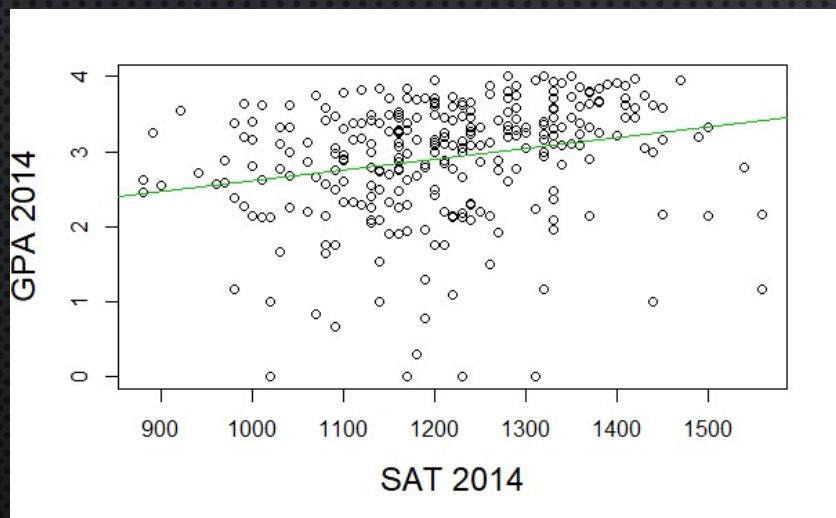


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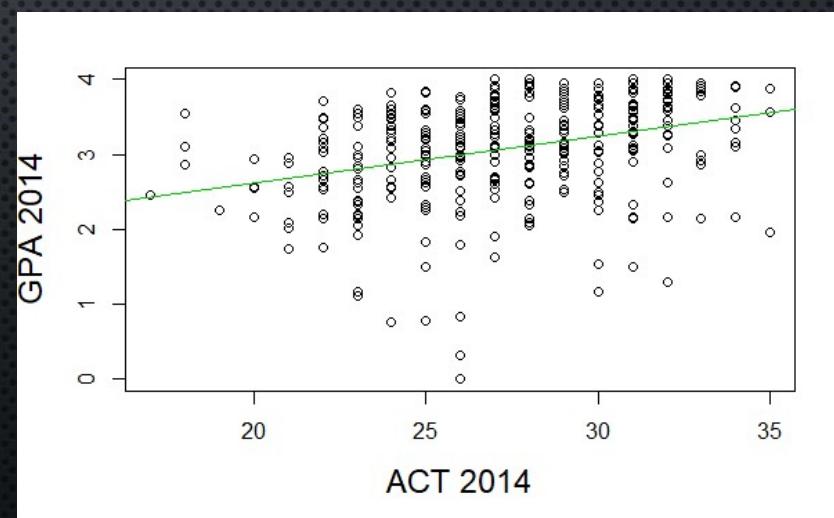
DOES ACT/SAT PREDICT FIRST-YEAR GPA?

- DOES ACT/SAT TREND WITH GPA?
 - WHEN SAT INCREASES BY 150, GPA INCREASES BY 0.212
 - WHEN ACT INCREASES BY 5, GPA INCREASES BY 0.3

GPA vs SAT



GPA vs ACT





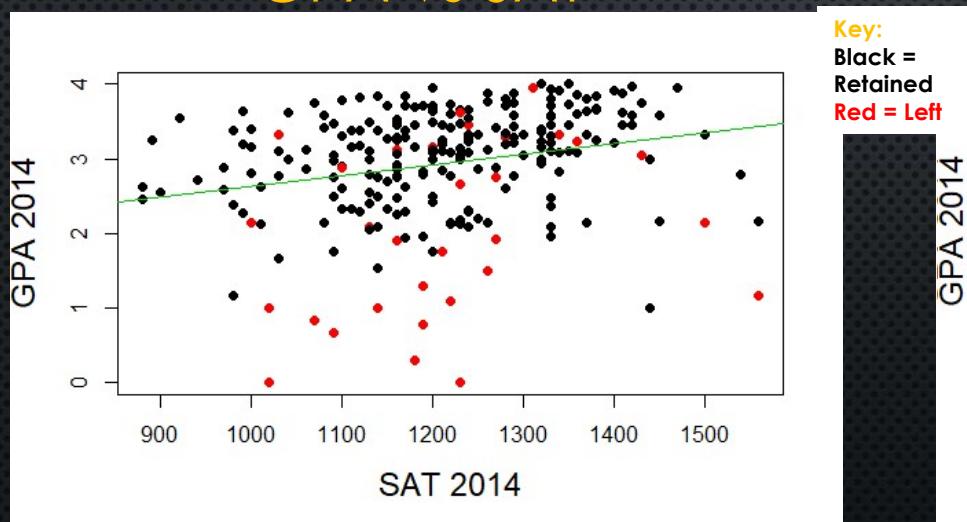
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DOES ACT/SAT PREDICT FIRST-YEAR GPA?

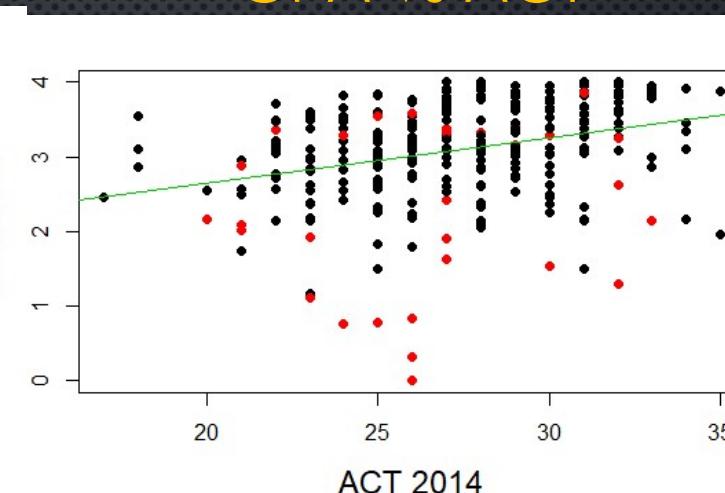
YES!

- DOES ACT/SAT TREND WITH GPA?
 - WHEN SAT INCREASES BY 150, GPA INCREASES BY 0.212
 - WHEN ACT INCREASES BY 5, GPA INCREASES BY 0.3

GPA vs SAT



GPA vs ACT





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DOES ACT/SAT PREDICT FIRST-YEAR RETENTION?

➤ NO CONSISTENT PREDICTIVE INDICATION

	2014	2015	2016	2017
ACT Math	Predictive	Not Predictive	Predictive	Not Predictive
SAT Critical Reading	Predictive	Predictive	Not Predictive	Not Predictive
ACT Science	Not Predictive	Not Predictive	Predictive	Not Predictive
ACT Reading	Not Predictive	Predictive	Not Predictive	Not Predictive



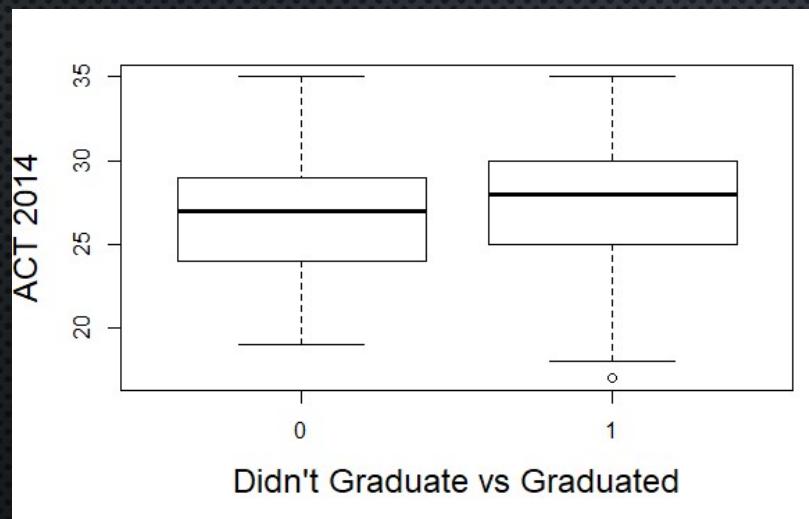
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DOES ACT/SAT PREDICT GRADUATION?

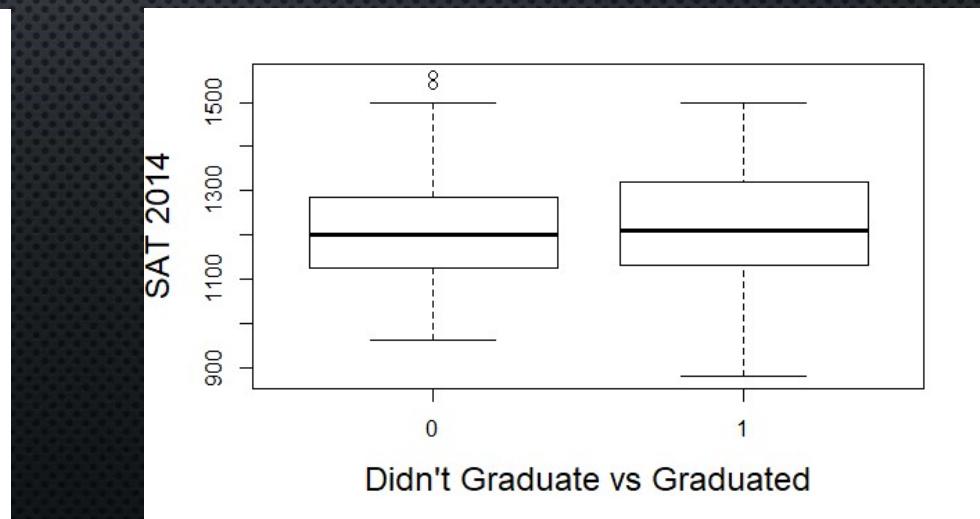
- ❖ DOES THE AVERAGE TEST SCORES OF GRADUATED STUDENTS SIGNIFICANTLY DIFFER FROM STUDENTS WHO DID NOT GRADUATE?

➤ NO, NOT WITH OUR DATA (2014, 2015)

ACT vs Graduated



SAT vs Graduated





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RESULTS

- ❖ TEST OPTIONAL
 - RECAP OF MIDTERM
 - MULTIVARIABLE PREDICTIVE MODELS
 - READER RATING
- ❖ RETENTION



MULTIVARIABLE PREDICTIVE MODEL FOR FIRST-YEAR RETENTION

- ❖ TRAIN MODELS ON 2014, 2015, AND 2016 DATA
- ❖ TEST MODELS ON 2017 DATA
- ❖ COMBINED DATA INCLUDES:
 - APEX
 - CIRP
 - ADMISSION
 - COW ACADEMIC





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VARIABLES

❖ APEX (17)

- CAREER PLANNING VISITS
- OCS
- APEX APPOINTMENTS
- ⋮

❖ CIRP (131)

- CHANCES OF TRANSFER
- COMMUNITY ENGAGEMENT
- ⋮

❖ ADMISSION (46)

- READER RATING
- NO TEST RR
- SAT/ACT SCORES
- ⋮

❖ COW ACADEMIC (23)

- YEAR END GPA
- FYS GRADE
- ⋮



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PREDICTIVE FACTORS FOR RETENTION

Key:

- = Less likely to Leave
- + = More likely to Leave

❖ APEX

- CAREER PLANNING VISITS (-)
- APEX APPOINTMENTS (+)

❖ CIRP

- CHANCES OF TRANSFER (+)

❖ ADMISSION

- NO TEST RR (-)



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SIMPLE MODEL FOR RETENTION

❖ EVERYONE STAYS

- YOU COULD BE RIGHT 88.1% OF THE TIME
- HOWEVER, 0% OF STUDENTS WHO LEFT IDENTIFIED





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APPLICATION

❖ EXAMPLE: PRATYUSH

- CHANCES OF TRANSFERRING: VERY LITTLE CHANCE
- NO TEST RR: 14
- CAREER PLANNING VISITS: 2
- APEX APPOINTMENTS: 6
- PROBABILITY OF LEAVING: 0.13 (NOT INCLUDED IN THE INTERVENTION GROUP)





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PREDICTION RESULTS (+ SAT/ACT)

❖ Predicting Federal
Cohort 2017: 519
students

Cutoff	Red Flagged but Stayed	Red Flagged and Left	Total Red Flagged
> 0.50	114 (82.0%)	25 (18.0%)	139
> 0.60	74 (85.1%)	13(14.9%)	87
> 0.70	28 (80.0%)	7 (20.0%)	35
> 0.80	1 (100%)	0 (0%)	1



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COMPARE PREDICTION RESULTS (+/- SAT/ACT)

❖ Predicting Federal Cohort 2017: 519 students

➤ SAT/ACT slightly improves the model

Cutoff	Red Flagged but Stayed	Red Flagged and Left	Total Red Flagged
> 0.60 (- SAT/ACT)	79 (85.9%)	13 (14.1%)	92
> 0.60 (+ SAT)	74 (85.1%)	13(14.9%)	87



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READER RATING

- ❖ SCORE 0-20
 - TRANSCRIPT: 0-5
 - CURRICULUM: 0-4
 - WHOLE PERSON: 0-4
 - TEST: 0-3
 - HIGH SCHOOL: 0-3
 - Woo Fit: 0-1





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IMPORTANT VARIABLES OF READER RATING

- ❖ INCONSISTENCY WITH SIGNIFICANT VARIABLES YEAR TO YEAR
- ❖ EXAMINING EVERY YEAR TOGETHER:
 - FIRST YEAR RETENTION:
 - TRANSCRIPT RR, HIGH SCHOOL RR, TEST RR
 - FIRST YEAR GPA:
 - TRANSCRIPT RR, TEST RR, HIGH SCHOOL RR, WHOLE PERSON RR



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REDISTRIBUTION OF TEST READER RATING

EVEN DISTRIBUTION

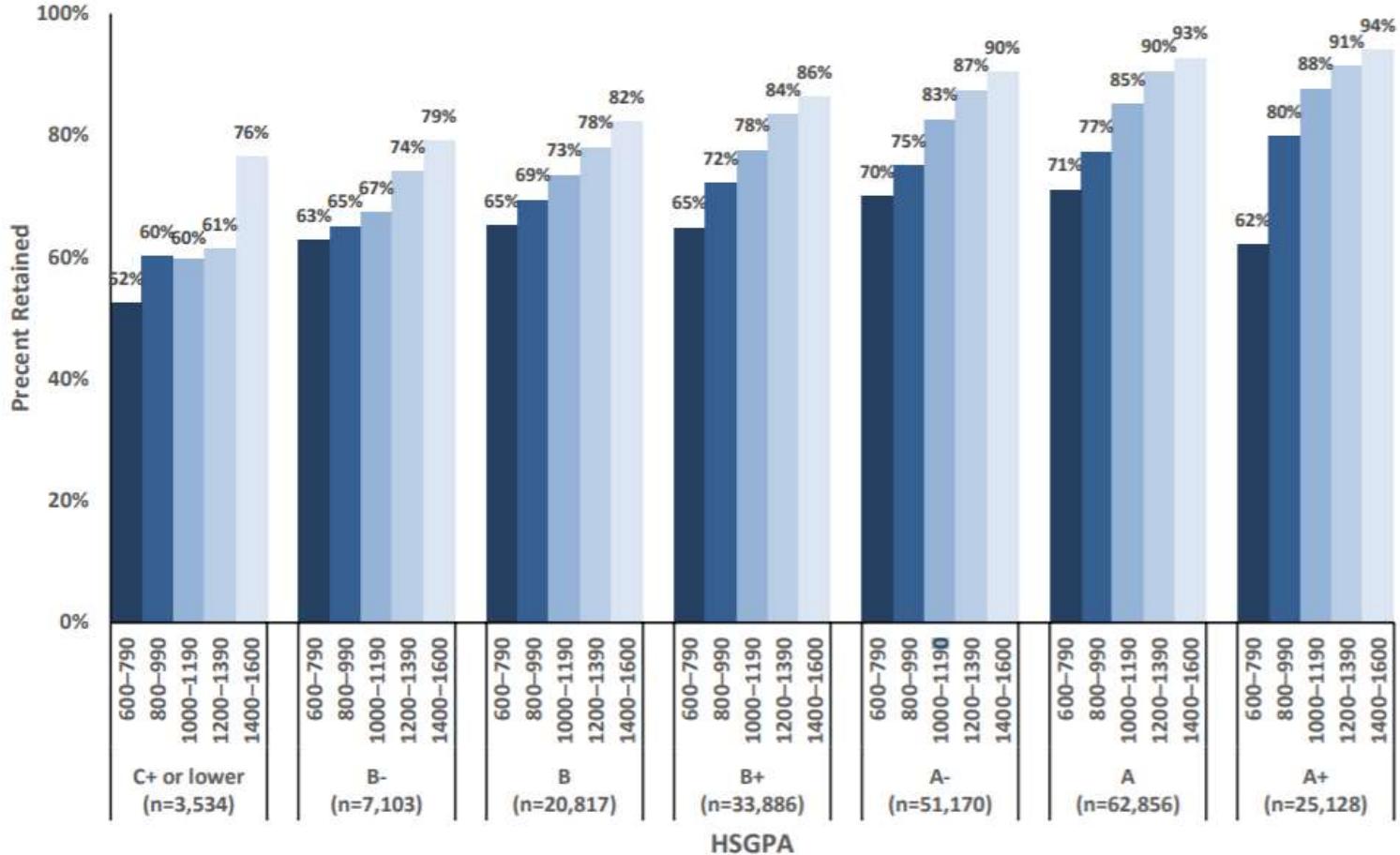
- ❖ CORRECTLY PREDICT: 793
- ❖ OFF BY 1: 1146
- ❖ OFF BY 2: 214

REGRESSION DISTRIBUTION

- ❖ CORRECTLY PREDICT: 824
- ❖ OFF BY 1: 1151
- ❖ OFF BY 2: 175

➤ Unable to reproduce test RR

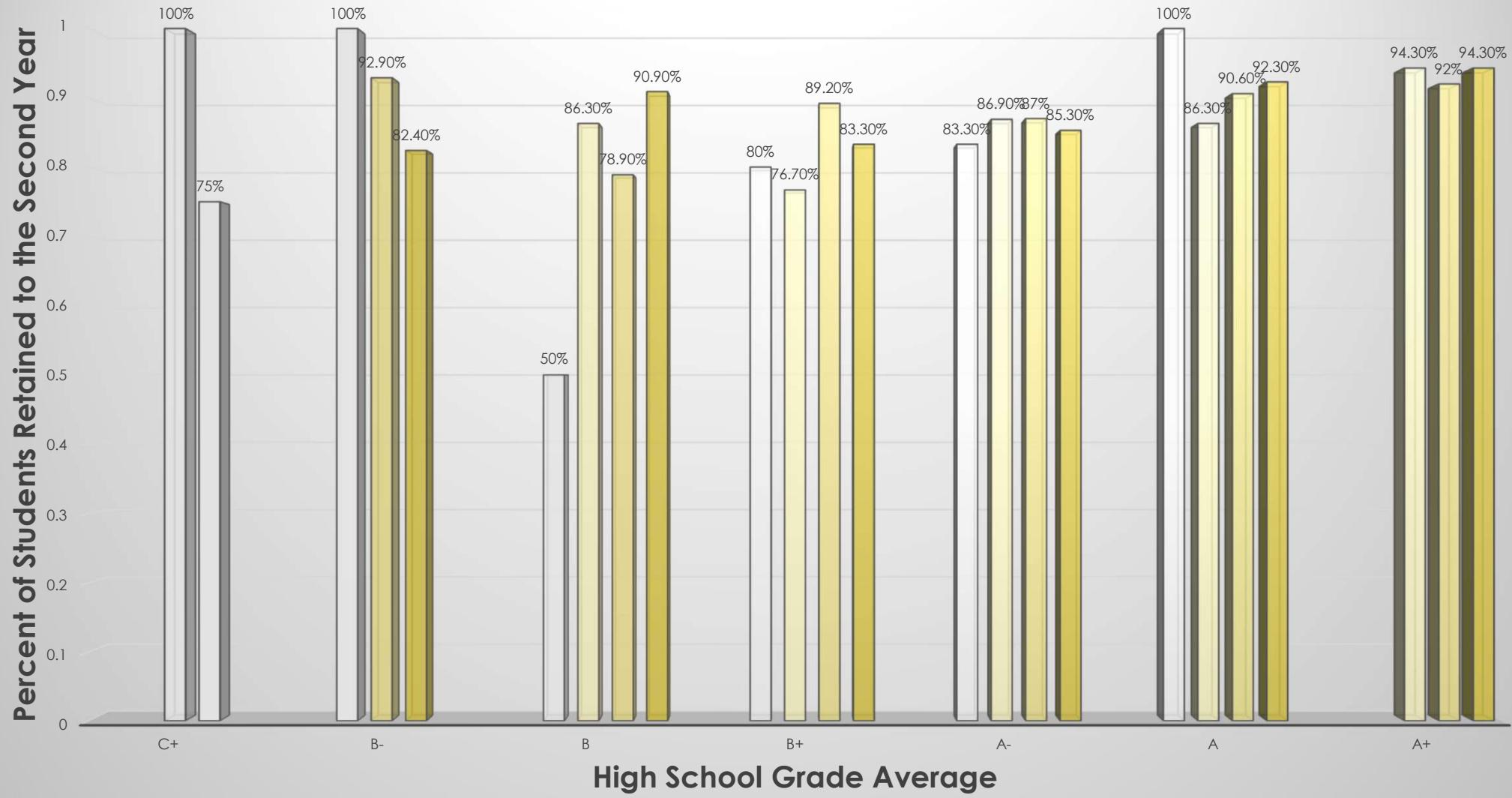
Figure 5: Mean Second-Year Retention Rate by HSGPA and SAT Total Score Bands



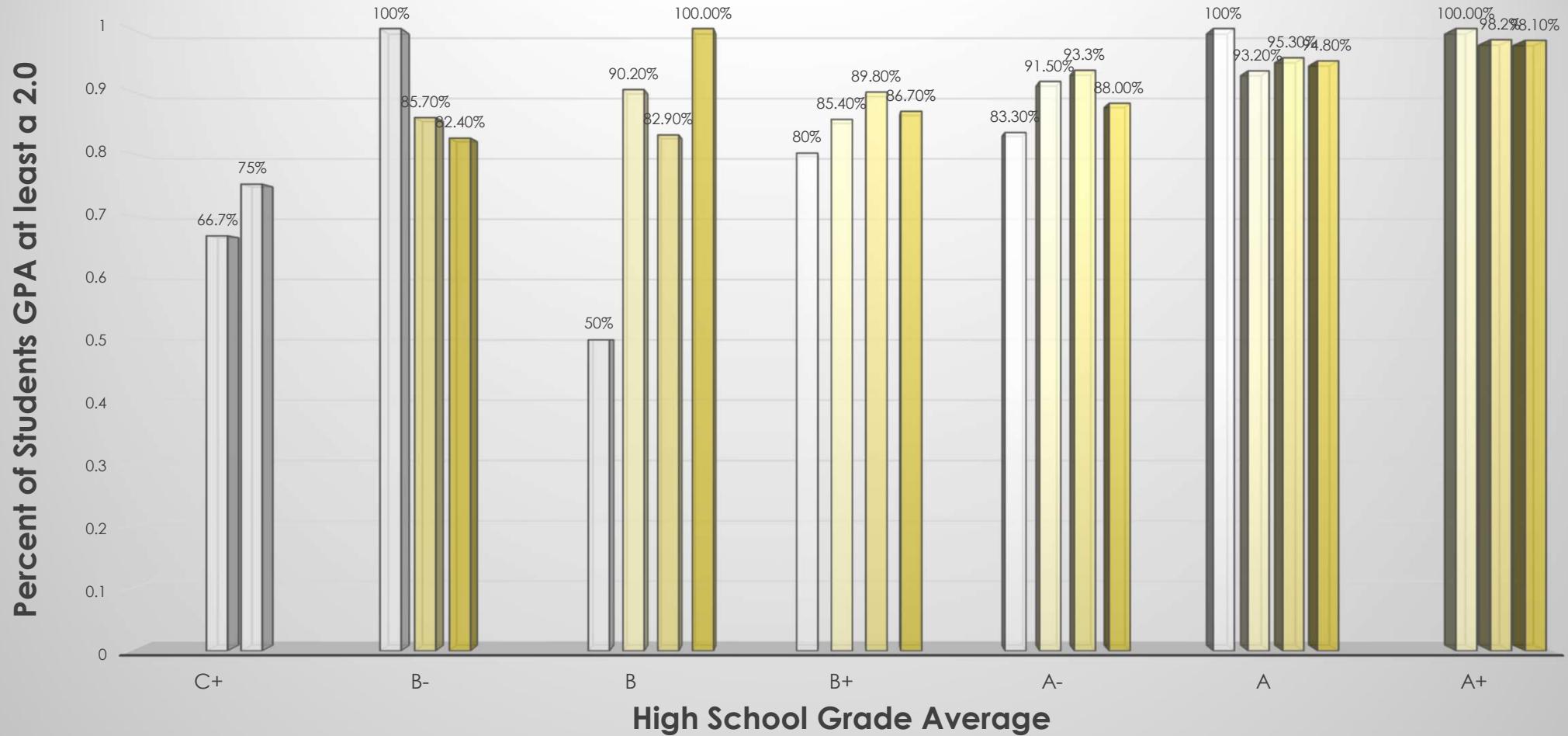
Note. Results are not reported for categories with less than 15 students (e.g., 400-590).

Westrick, Paul A, et al. "Validity of the SAT for Predicting First-Year Grades and Retention of the Second Year." CollegeBoard, May 2019, collegereadiness.collegeboard.org/pdf/national-sat-validity-study.pdf.

1st Year Retention Comparing High School GPA and SAT Scores



Accademic Probation Comparing High School GPA and SAT Scores





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SHOULD THE COLLEGE OF WOOSTER GO TEST OPTIONAL?

	No	Inconclusive	Yes
SAT/ACT with GPA	X		
SAT/ACT with Retention		X	
SAT/ACT with Graduation		X	
Retention Model		X	
Graduation Model		X	
GPA Model		X	
Test RR	X		
Graphs		X	
Simple Means	X		



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RATE YOUR WRITING ABILITY

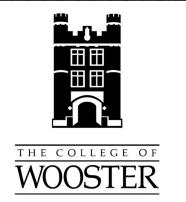
	Below Avg.	Avg.	Above Avg.
Left	11%	12.4%	11%
Number of Observations	154	677	1086

DO YOU HAVE A PSYCHOLOGICAL DISORDER

	No	Yes
Left	10.9%	18.5%
Number of Observations	835	135



COMPREHENSIVE LIST



- ❖ POLITICAL VIEW: CONSERVATIVE
- ❖ SEEK PERSONAL COUNSELING: NO CHANCE
- ❖ IMPACT OF COLLEGE'S REPUTATION FOR SOCIAL ACTIVITIES: SOMEWHAT IMPORTANT
- ❖ ENGAGE IN VOLUNTEER WORK: PROBABLY NOT
- ❖ CHANGE OF TRANSFERRING: POSSIBLE
- ❖ INFLUENCE THE POLITICAL STRUCTURE: IMPORTANT
- ❖ CONFIDENCE IN INTELLECTUAL ABILITY: BELOW AVERAGE
- ❖ JOIN GREEK LIFE: PROBABLY
- ❖ LIVE NEAR HOME: VERY IMPORTANT
- ❖ GOAL OF RAISING A FAMILY: IMPORTANT
- ❖ PSYCHOLOGICAL DISORDER: YES



COOPERATIVE INSTITUTIONAL RESEARCH PROGRAM
at the HIGHER EDUCATION RESEARCH INSTITUTE AT UCLA



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IMPACT VARIABLES

- ❖ SEEK PERSONAL COUNSELING: NO CHANCE
- ❖ CHANCE OF TRANSFERRING: POSSIBLE
- ❖ LIVE NEAR HOME: VERY IMPORTANT
- ❖ PSYCHOLOGICAL DISORDER: YES



APEX DATA

ID	Reason	Date
814856	CP - Pre-Health	11/6/2014
814856	CP - Pre-Health	3/26/2015
120708	CP - Pre-Health	9/25/2014
120708	CP - Pre-Health	11/6/2014
120708	OCS	9/26/2014
120708	CP	3/30/2015
120708	CP	3/30/2015
120708	CP	3/30/2015
728790	CP	10/27/2014
728790	LC	11/3/2014
728790	LC	1/16/2015
728790	LC	9/24/2014
728790	LC	9/24/2014
728790	LC	11/11/2014
350128	EL	1/29/2015
350128	EL	1/29/2015
737781	Advising	10/20/2014
737781	Advising	5/5/2015
737781	Advising	10/20/2014
737781	Advising	4/30/2015
737781	Advising	5/5/2015



A	B	C	D	E	F	G	H	I	J	K
ID	Federal_Cohort	Advising	APEX	CP	EL	Entre	LC	OCS	Registrar	Frequency_resources_Apps
111858	2017	0	0	0	0	0	2	0	0	2
112121	2016	0	0	0	0	0	11	0	0	11
112555	2016	0	0	1	0	0	4	1	0	6
114209	2017	0	0	0	0	0	3	0	0	3
114708	2015	0	1	0	0	0	0	0	0	1
115290	2018	0	0	1	0	0	0	0	0	1
116358	2014	0	1	0	0	0	0	0	0	1
116871	2017	0	0	0	0	0	1	0	0	1
117114	2015	0	0	0	1	0	0	0	0	1
117459	2017	0	0	4	0	0	1	0	0	5
117484	2015	1	0	0	0	0	0	0	0	1
117604	2016	0	0	1	1	0	0	0	0	2
117742	2014	0	0	12	2	0	0	2	8	24
119217	2016	0	0	1	0	0	8	1	0	10
119440	2015	0	1	2	0	0	0	0	0	3
119596	2015	1	0	0	0	0	0	0	0	1
119981	2018	0	0	2	0	0	0	0	0	2
120708	2014	0	0	5	0	0	0	1	0	6
120923	2015	0	1	0	0	0	0	0	0	1
121165	2018	0	0	4	0	0	0	0	0	4
121819	2017	0	0	1	0	0	1	0	0	2
122066	2015	0	1	0	0	0	1	0	0	5



STUDENT ENGAGEMENT WITH APEX

PERCENTAGE OF STUDENTS WHO GO TO APEX:

- ❖ APPOINTMENTS: 66.5%
- ❖ EVENTS: 50%
- ❖ EITHER: 80%

PERCENTAGE OF STUDENTS WHO LEFT THAT WENT TO APEX:

- ❖ APPOINTMENTS: 66.8%
- ❖ EVENTS: 45.4%
- ❖ EITHER: 79.9%



PERCENT OF STUDENTS WHO LEAVE AFTER VISITING APEX OFFICES

LOWEST PERCENTAGE

- ❖ CAREER PLANNING EVENT: 3.4%
- ❖ EXPERIENTIAL LEARNING APPOINTMENT: 4.9%
- ❖ CAREER PLANNING APPOINTMENT: 6.3%

HIGHEST PERCENTAGE

- ❖ ENTREPRENEURSHIP APPOINTMENT: 18.5%
- ❖ LEARNING CENTER APPOINTMENT: 16.3%
- ❖ ELL OR LEARNING CENTER EVENT: 13%



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LIMITATIONS

- ❖ DIFFICULT TO FULLY PREDICT SUCCESS
- ❖ STATISTICAL UNCERTAINTY
- ❖ LIMITED DATA
- ❖ MISSING DATA



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RECOMMENDATIONS

- ❖ INDICATION OF SAT/ACT BEING VALUABLE
- ❖ STATISTICALLY APPROACH RETENTION
 - DIVE DEEPER INTO APEX DATA
 - APPROACH RETENTION HOLISTICALLY



THANK YOU!