

Academic Achievers Program Evaluation Using Matching Procedures

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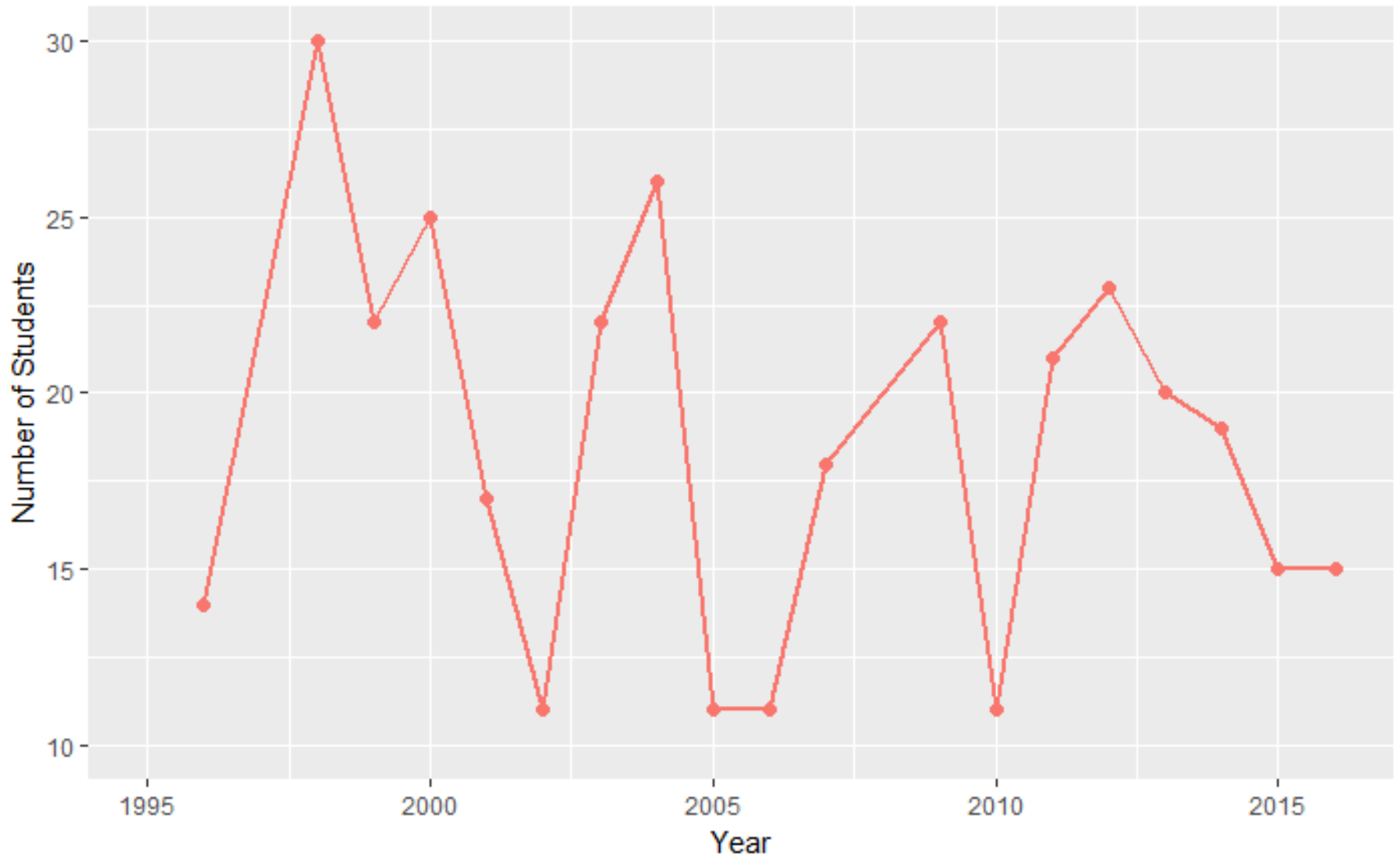
Introduction

- Established under CMAS to recruit underrepresented Hispanic students
- Benefits
 - Mandatory tutoring and study hall hours
 - Attend skills workshops and leadership training
 - Receive academic counseling
 - Attend monthly meetings
 - Up to \$3,000 in scholarship/financial aid

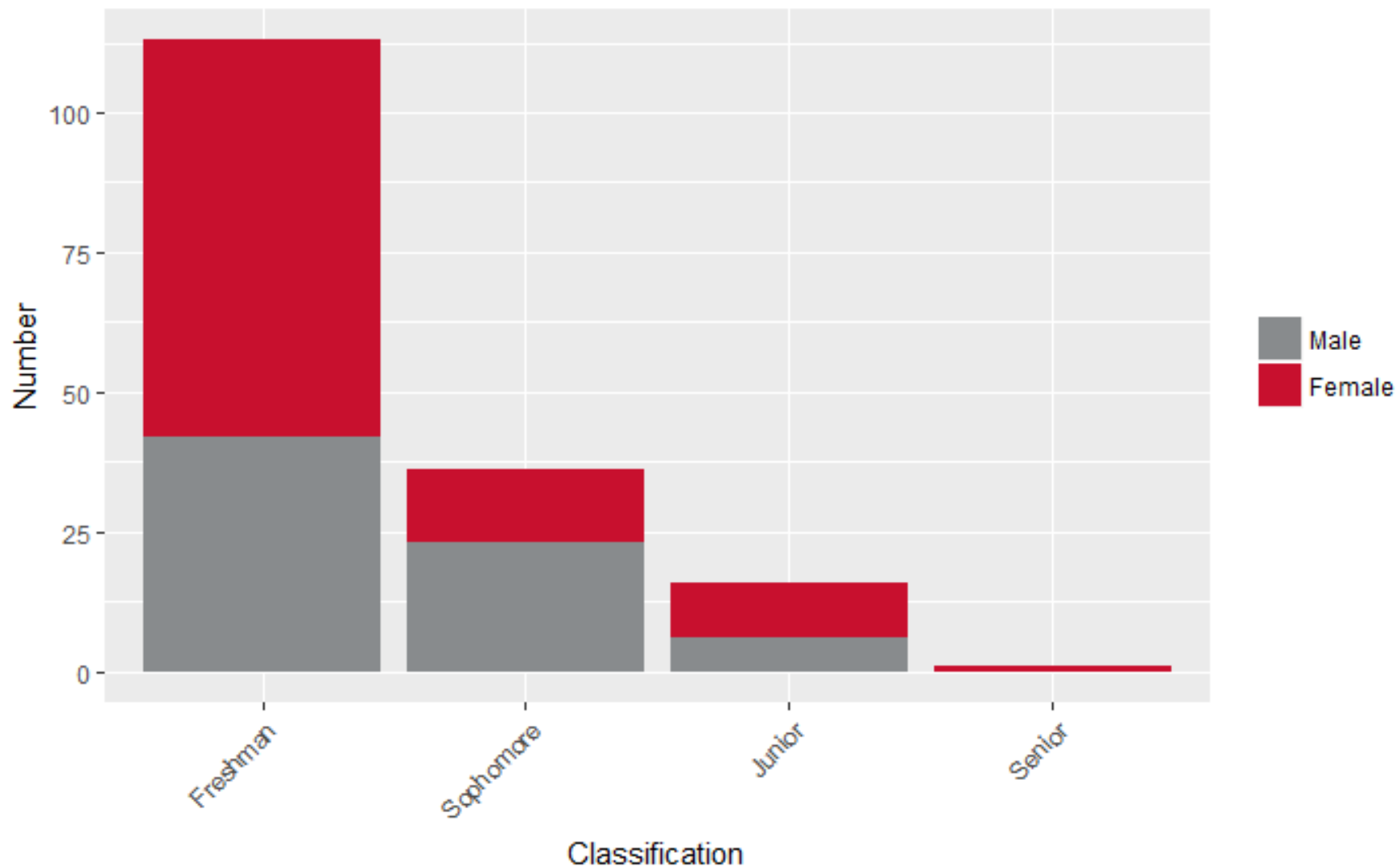
Introduction

- Participation requirements
 - Minimum 2.7 GPA
 - Demonstrate financial need
 - First in family to attend college
 - Completed less than 66 credit hours
 - Maintain full-time enrollment (12 hour minimum)

AAP New Student Counts by Year



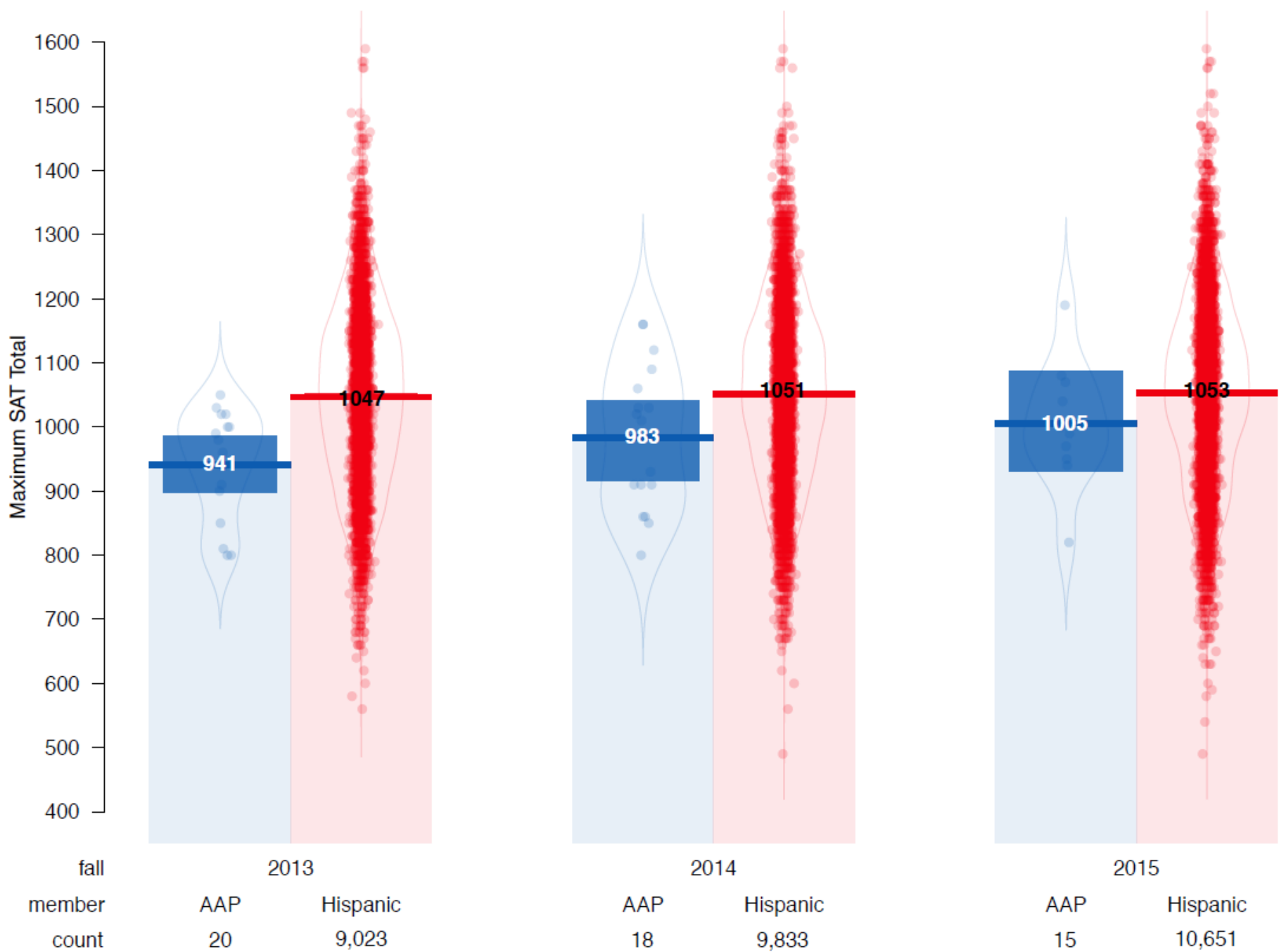
AAP Students by Gender and Classification, 2007-2016



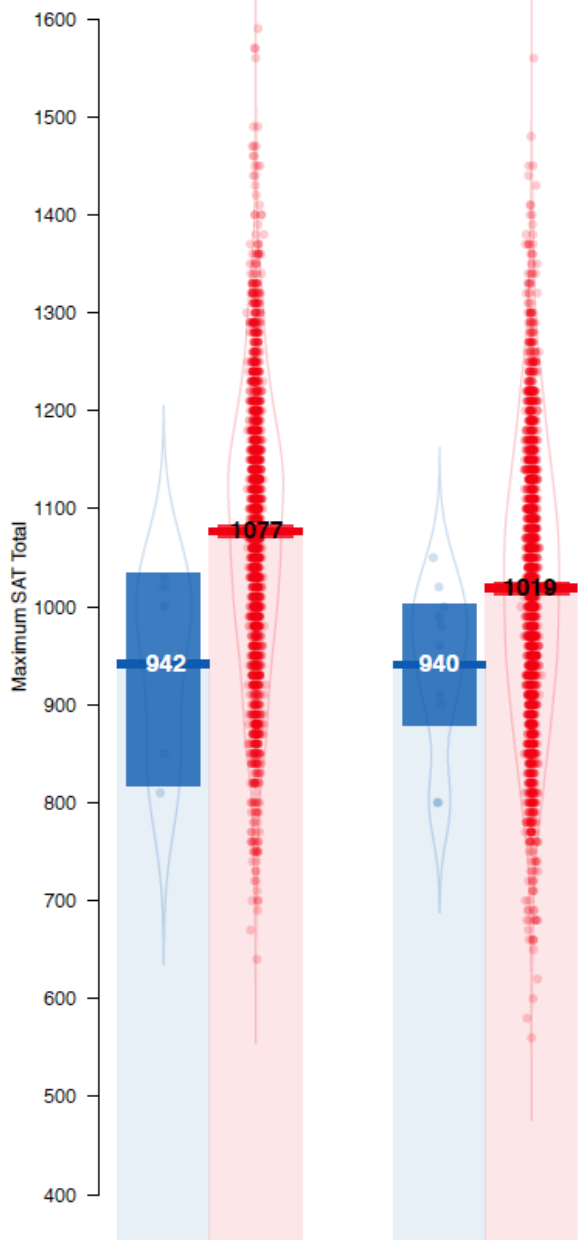
Previous Research

- Compared to non-AAP Hispanic students:
 - AAP students have higher SAT scores
 - AAP students have higher GPAs
 - Successfully complete more SCH
 - AAP students have greater graduation and retention rates
 - Sources: Martinez, 2016; Hayatghaibi & Moreno, 2010

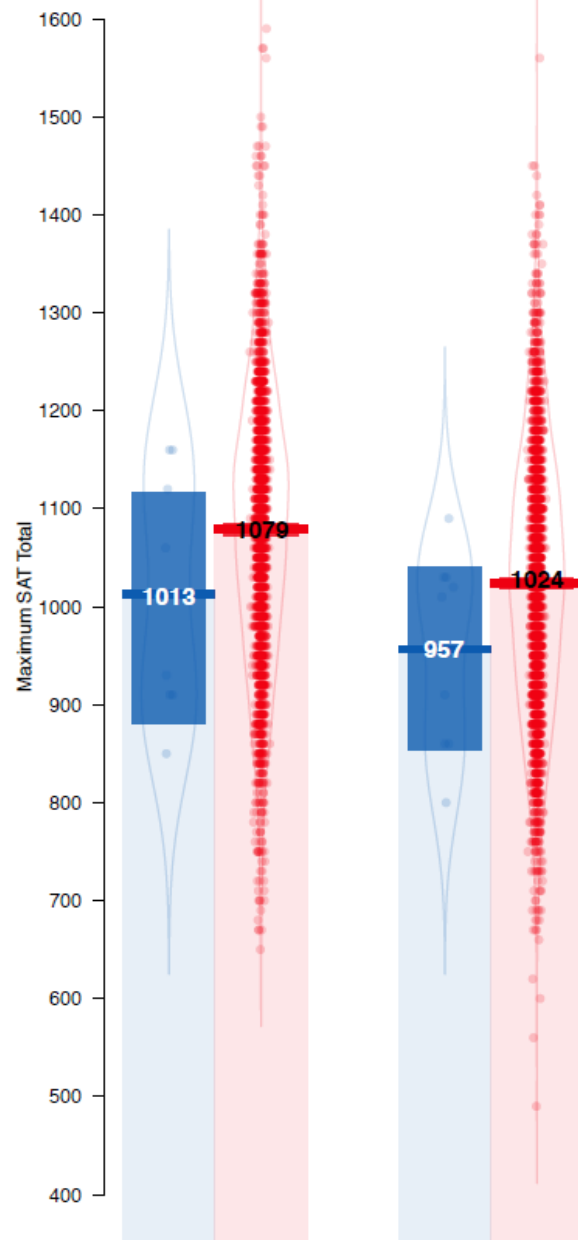
Maximum SAT Total Scores for AAP and Hispanic Students, Fall 2013–15



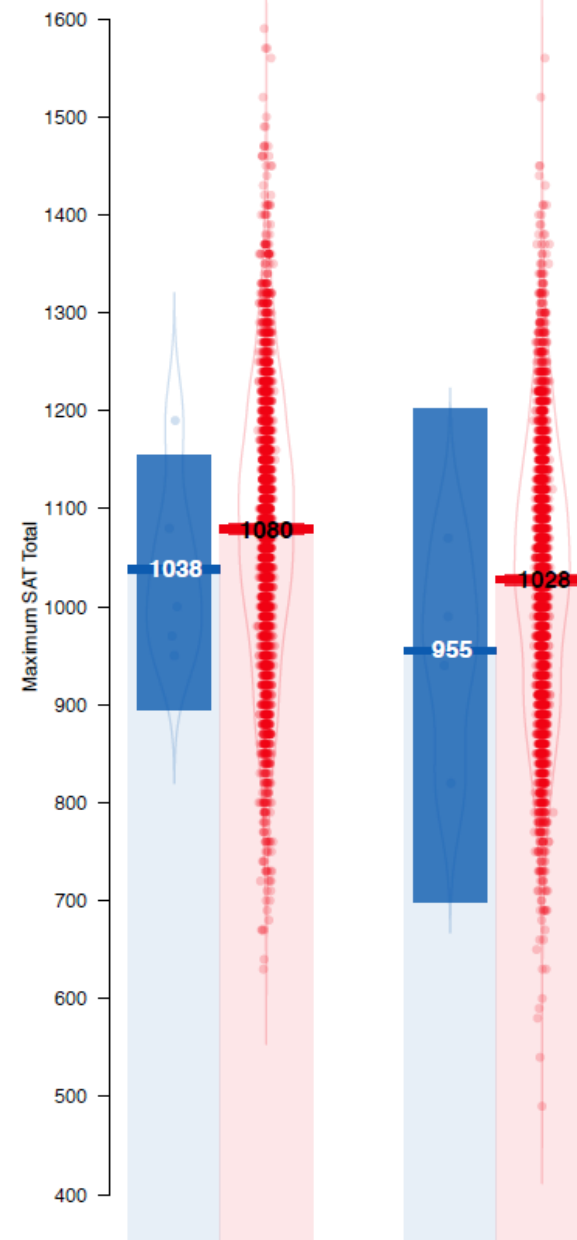
Max SAT Total Scores
fall = 2013



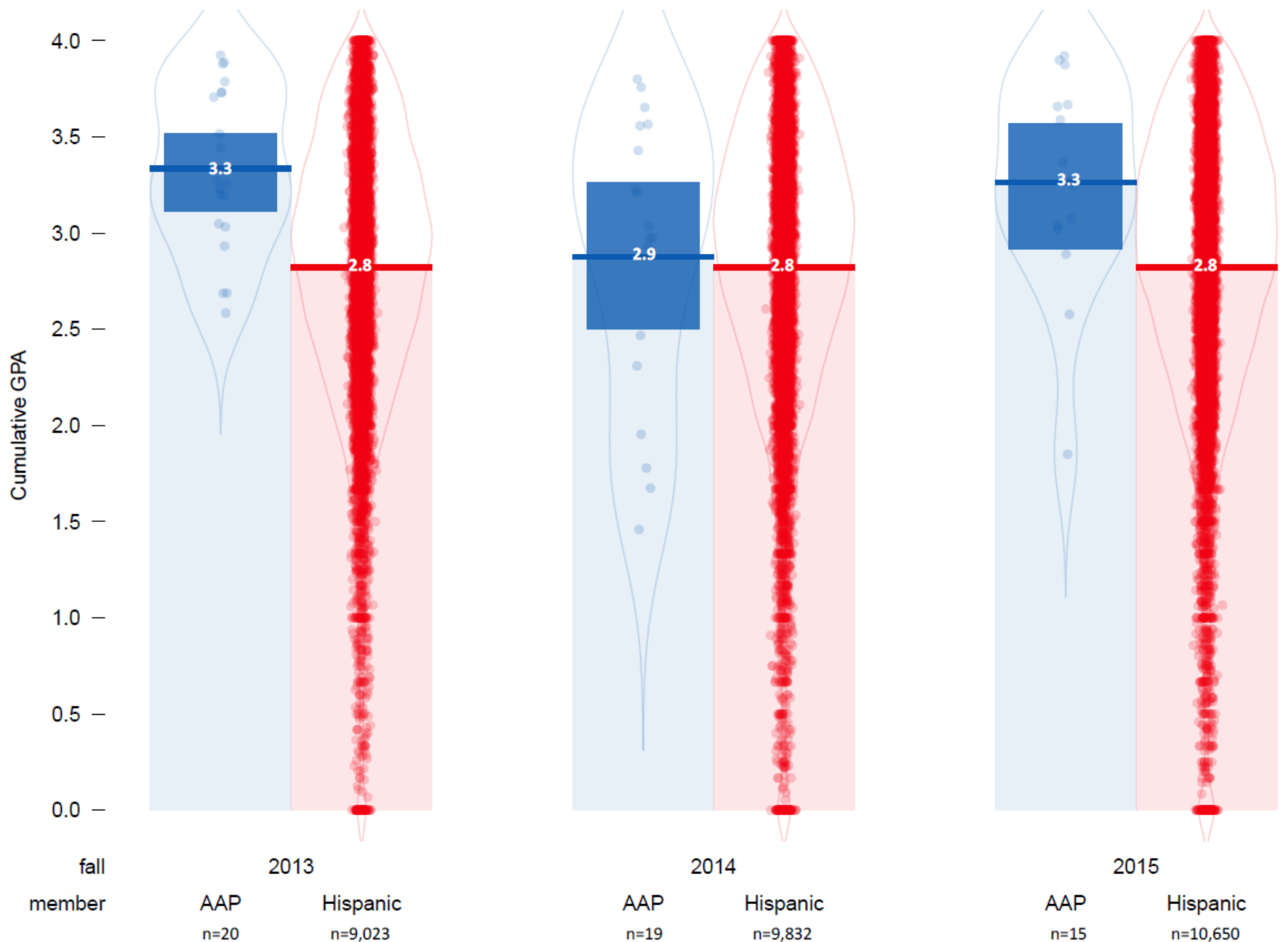
Max SAT Total Scores
fall = 2014



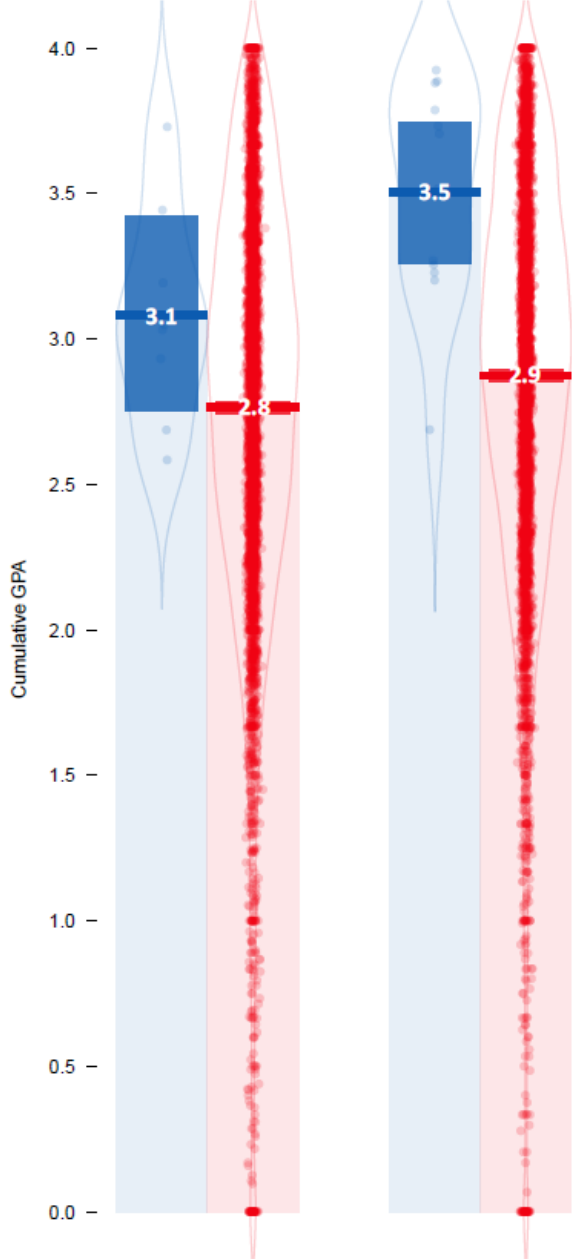
Max SAT Total Scores
fall = 2015



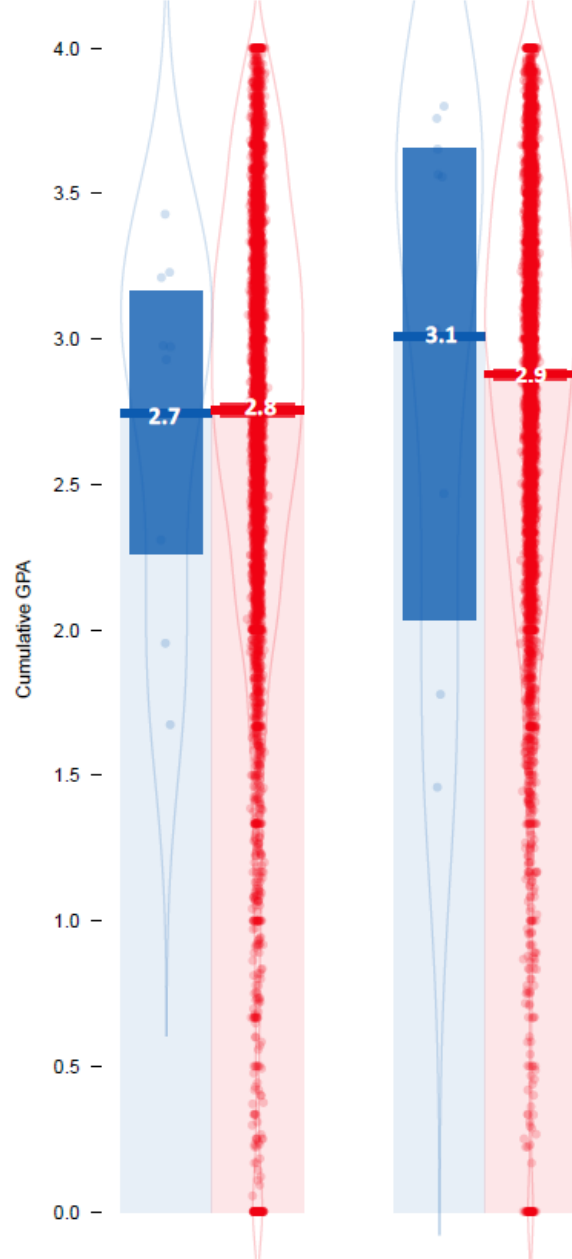
Cumulative UH GPA for AAP and Hispanic Students, Fall 2013–15



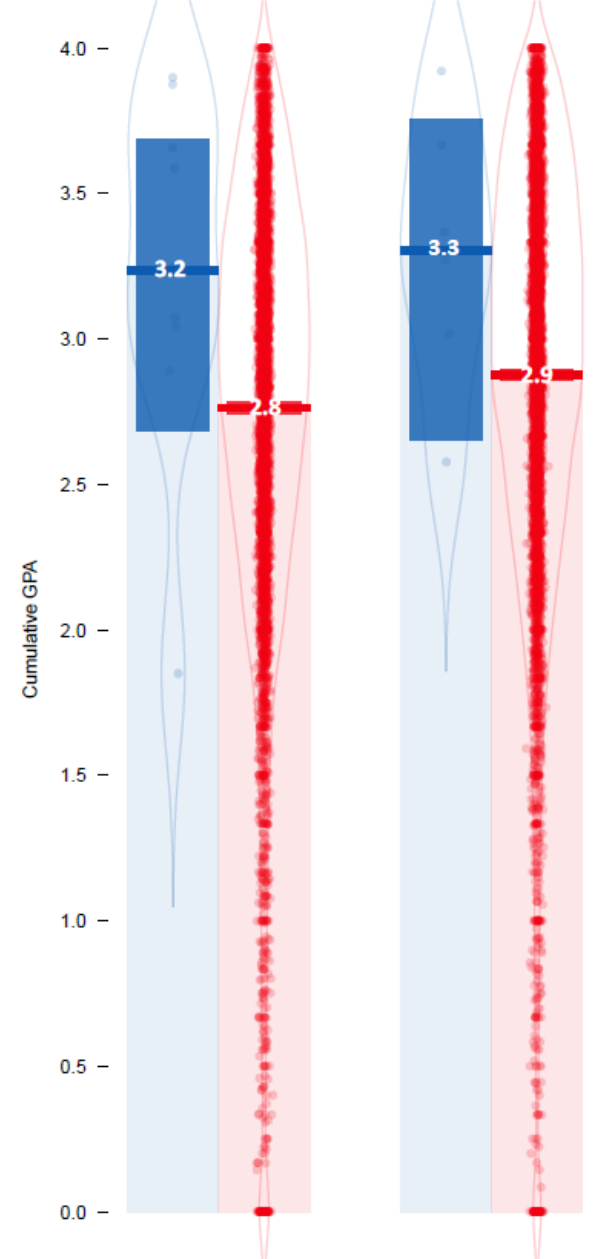
Cumulative UH GPA
fall = 2013



Cumulative UH GPA
fall = 2014



Cumulative UH GPA
fall = 2015



gender member
Male
AAP n=8
Hispanic n=4,372

gender member
Female
AAP n=12
Hispanic n=4,561

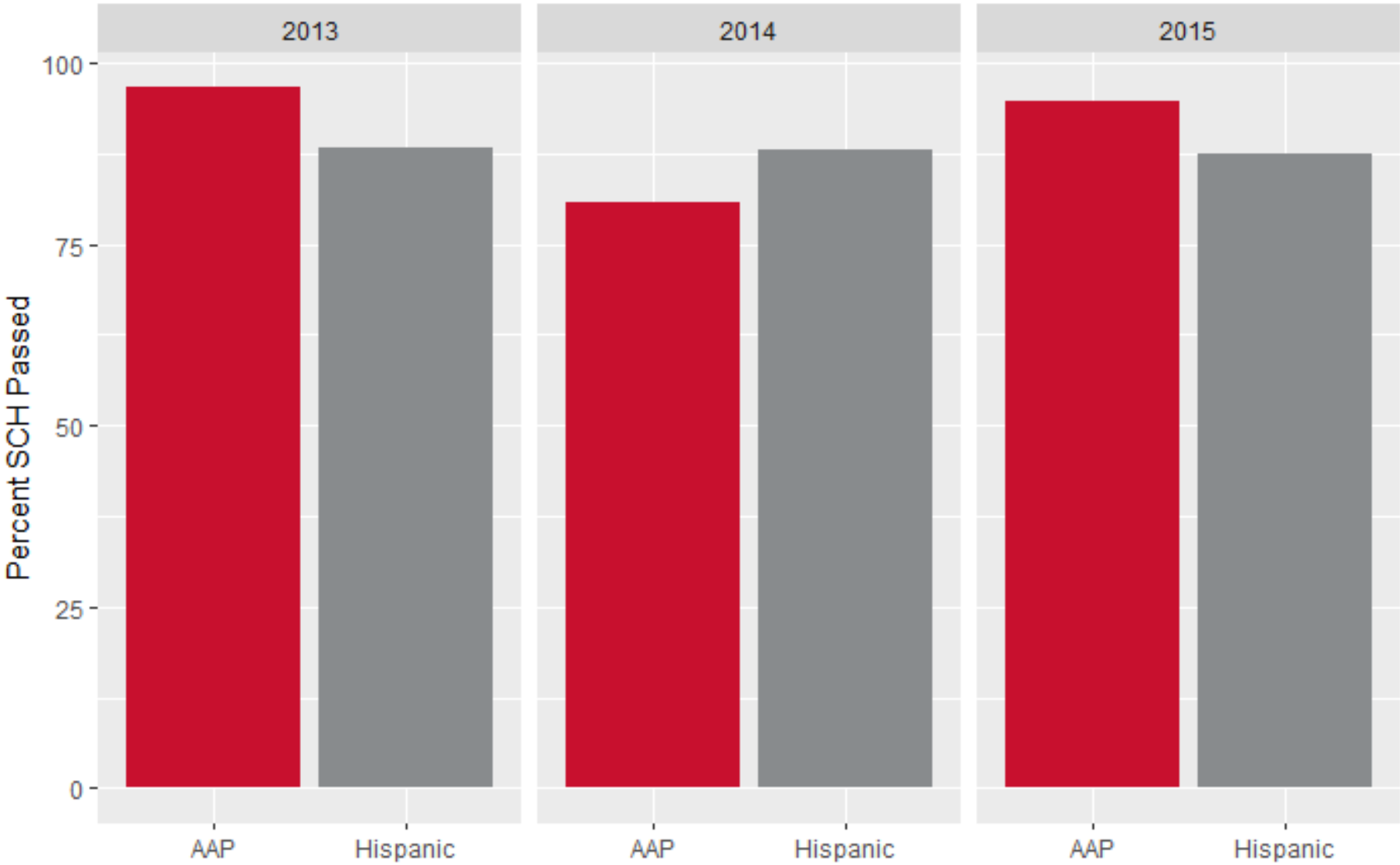
gender member
Male
AAP n=9
Hispanic n=4,772

gender member
Female
AAP n=10
Hispanic n=5,060

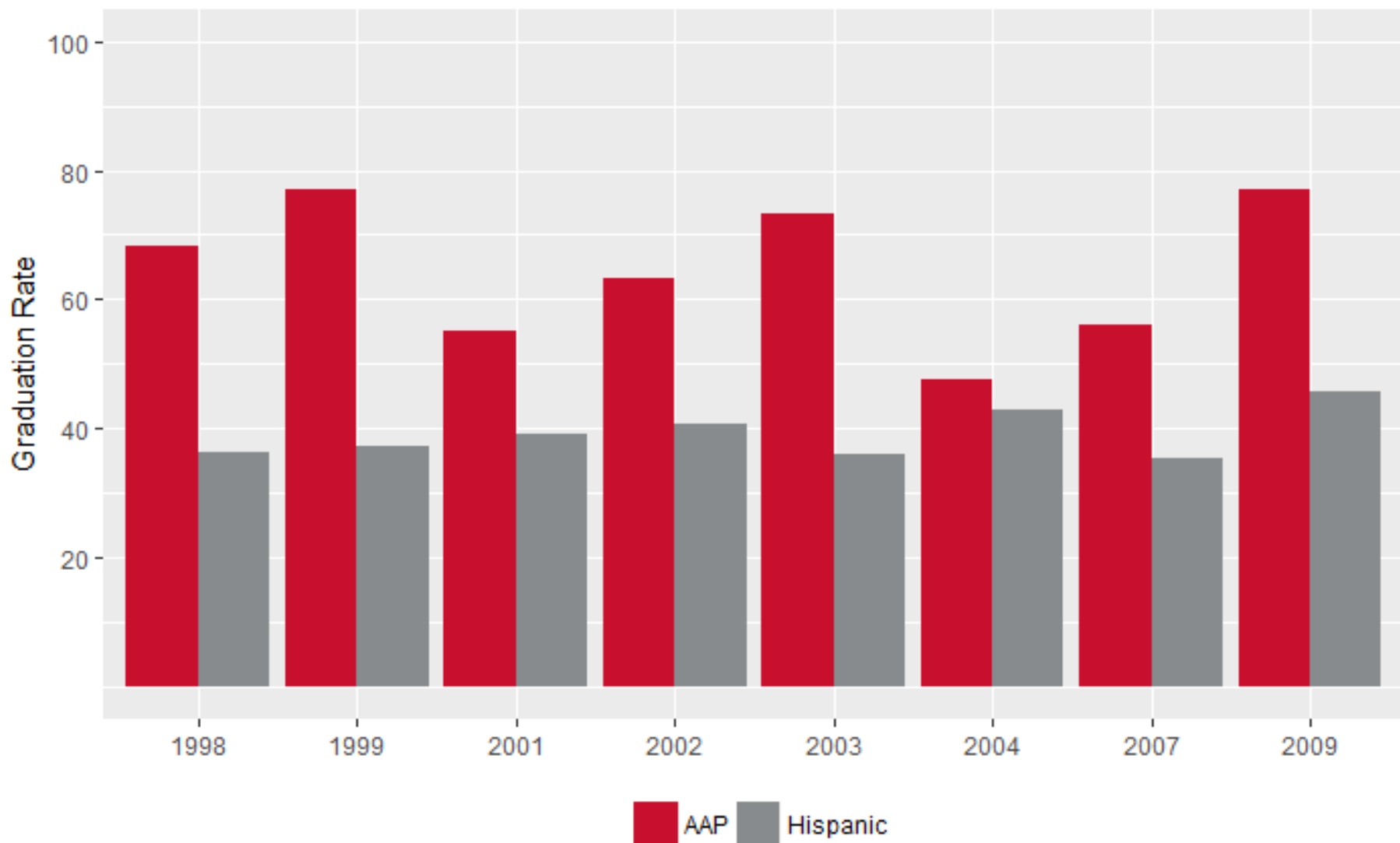
gender member
Male
AAP n=9
Hispanic n=5,221

gender member
Female
AAP n=6
Hispanic n=5,429

Percent Term SCH Passed for AAP and Hispanic Students, Fall 2013-2015



Six Year Graduation Rates for AAP and Hispanic Students, 1998-2009



Focus Groups

- Economic capital

“I was looking for opportunities when I got here, to the University of Houston, and uh, I was looking for scholarships specifically because I am a DACA recipient. and um, I was looking for scholarships where I could be sort of in a familia, and uh belong, have a place to be and study.” Alejandro

Focus Group 3, lines 51-54 (McNamara, 2017).

Focus Groups

- Economic capital

“Just scholarships. It's hard to find scholarships (Thomas: for DACA) for DACA recipients, 'cause a lot of them require you to be a citizen” Alejandro

Focus Group 3, lines 550-552 (McNamara, 2017)..

Focus Groups

- Social & cultural capital

“that's actually happened before, when [Ms. Becky] went above and beyond, and went to actually find one of those uh, kind of, behavioral exams, it figures out what you're good at. Yeah, I don't know what they're called. But yeah, we went ahead and did that with that student and now he's doing better, he kind of knows where, what track he should follow, and then what kind of steps he should do be successful.

Focus Group 2, lines 240-244 (McNamara, 2017)

Focus Groups

- Social & cultural capital

Ramon: well, the advisers um, they tell you how to choose the classes to take to graduate, but they won't tell you which professors to take. (background: laughter, and comments)

Miguel: they tell you what you need, and not what you necessarily want.

Gloria: (overlapping) yeah, not what you should get.

Jafet: well, and they don't sit down in the class and see if the professor's good or not. To them, it's just a class.

Gloria: yeah, they just care about number on the class, not the professor. (McNamara, 2017).

Research Question

- Do AAP students have a greater probability of graduation compared to non-AAP Hispanic students?

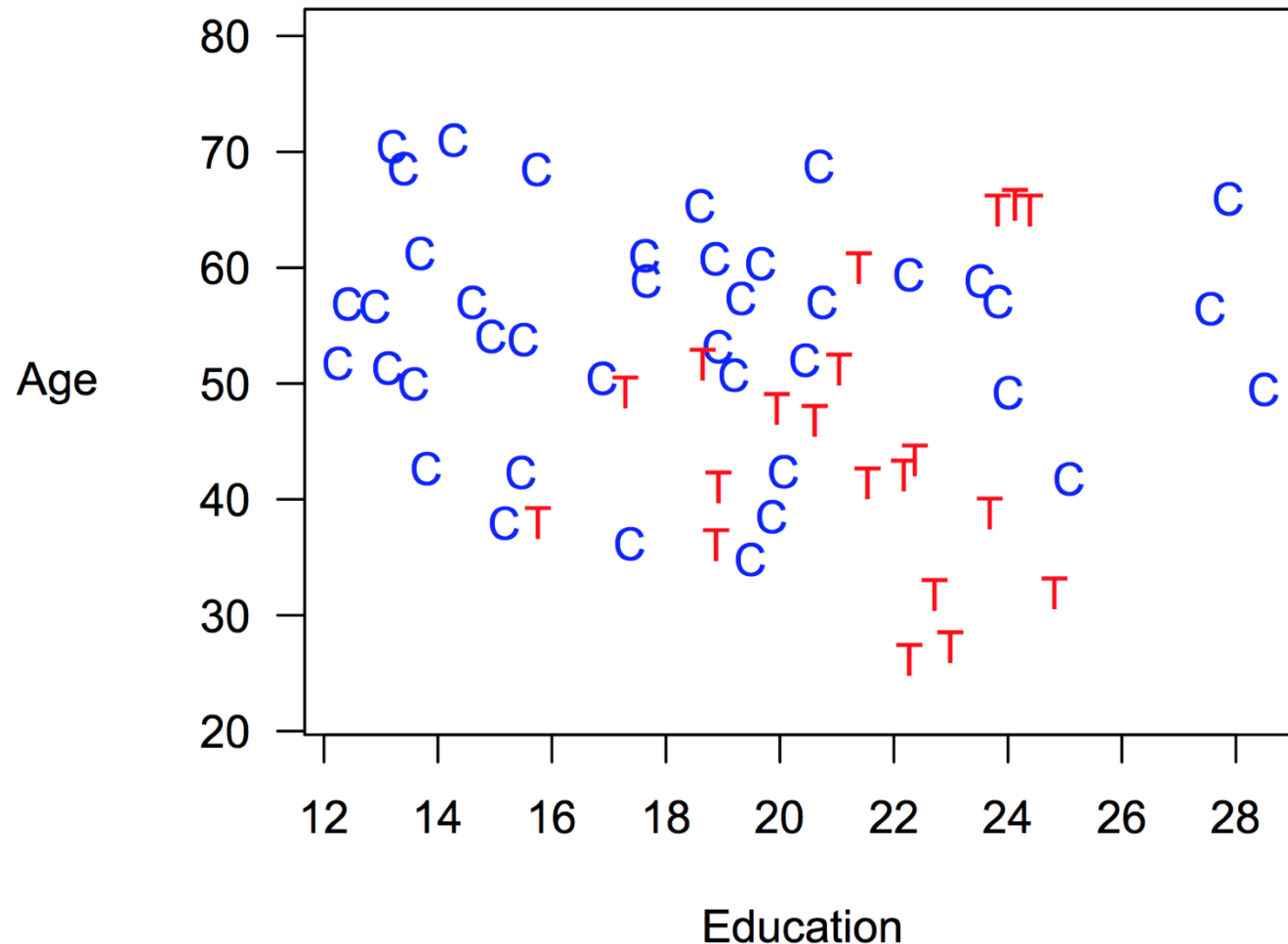
Statistical Matching

- Quasi-experimental treatment and control group matching for evaluating causal effects
- Pruning observations with no close matches on pre-treatment covariates
- Result is typically less model-dependent, less biased, and more efficient (King and Zeng 2006; Ho, Imai, King, and Stuart 2007; Iacus et al. 2008)

Coarsened Matching

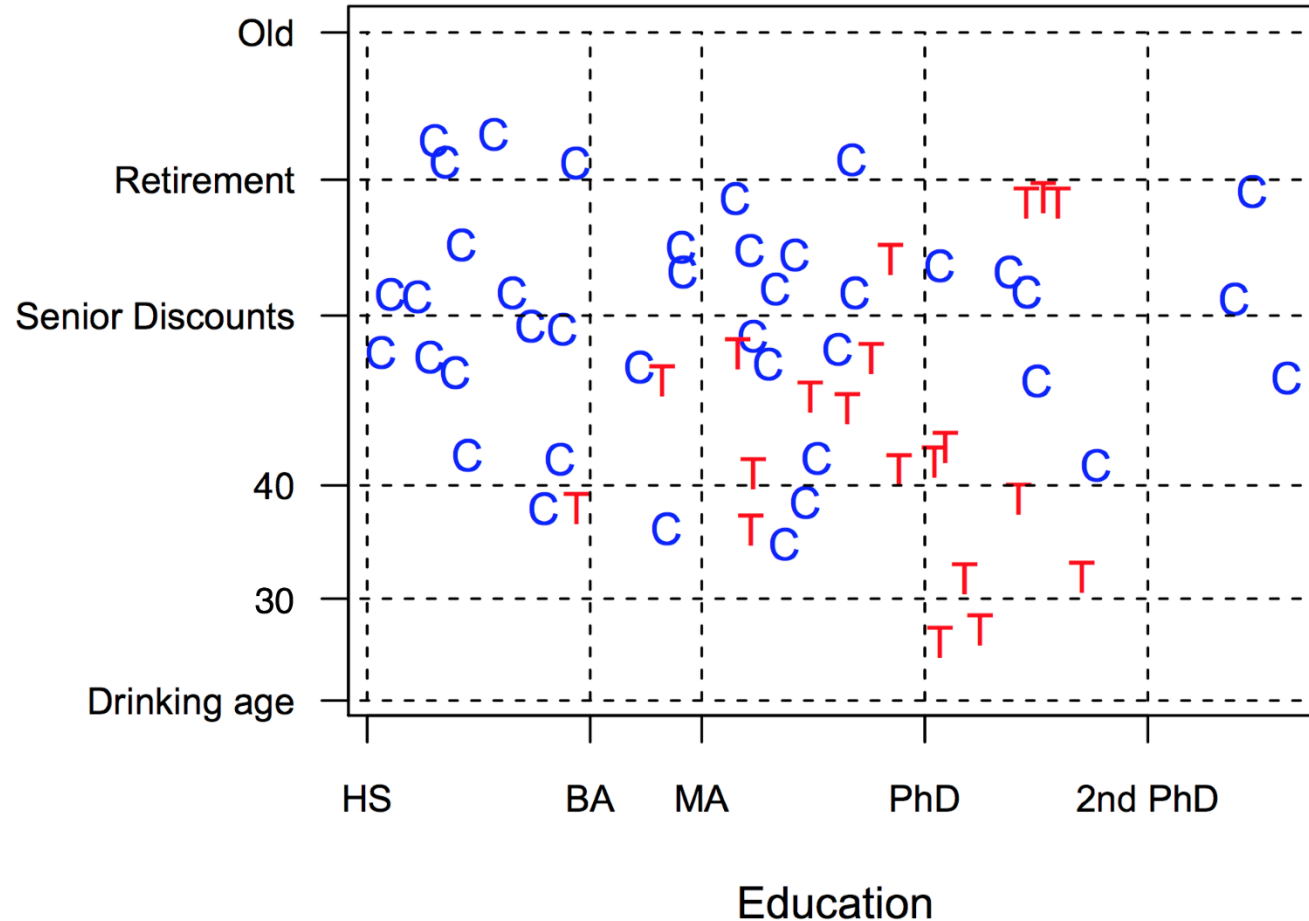
- Step 1: Temporarily coarsen each control variable for matching
- Step 2: Sort all units into strata
- Step 3: Prune any units in the data set that do not include at least one treated and one controlled unit

Coarsened Matching



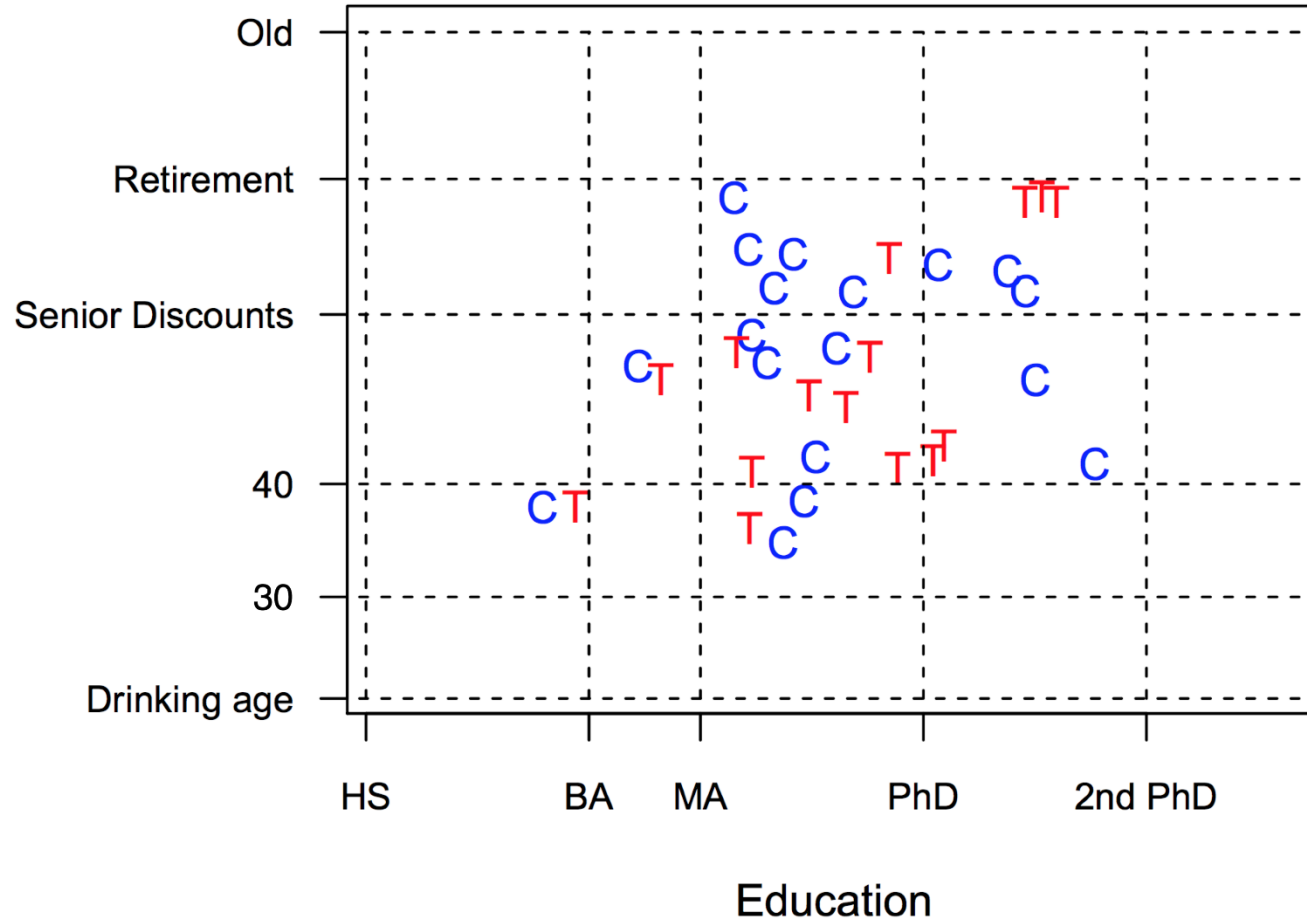
Adapted from King *Detecting and Reducing Model Dependence* (King 2017)

Coarsened Matching



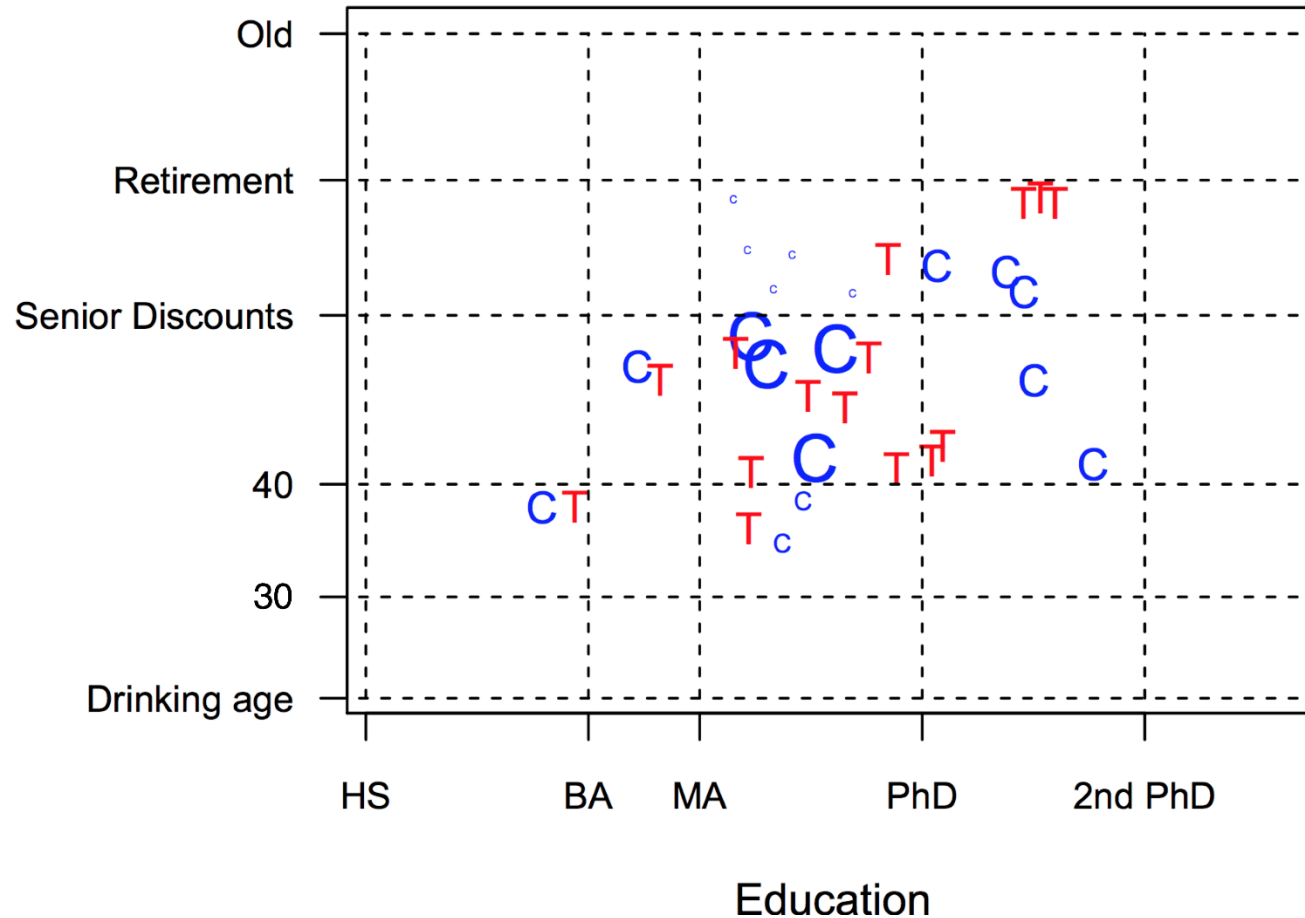
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Coarsened Matching

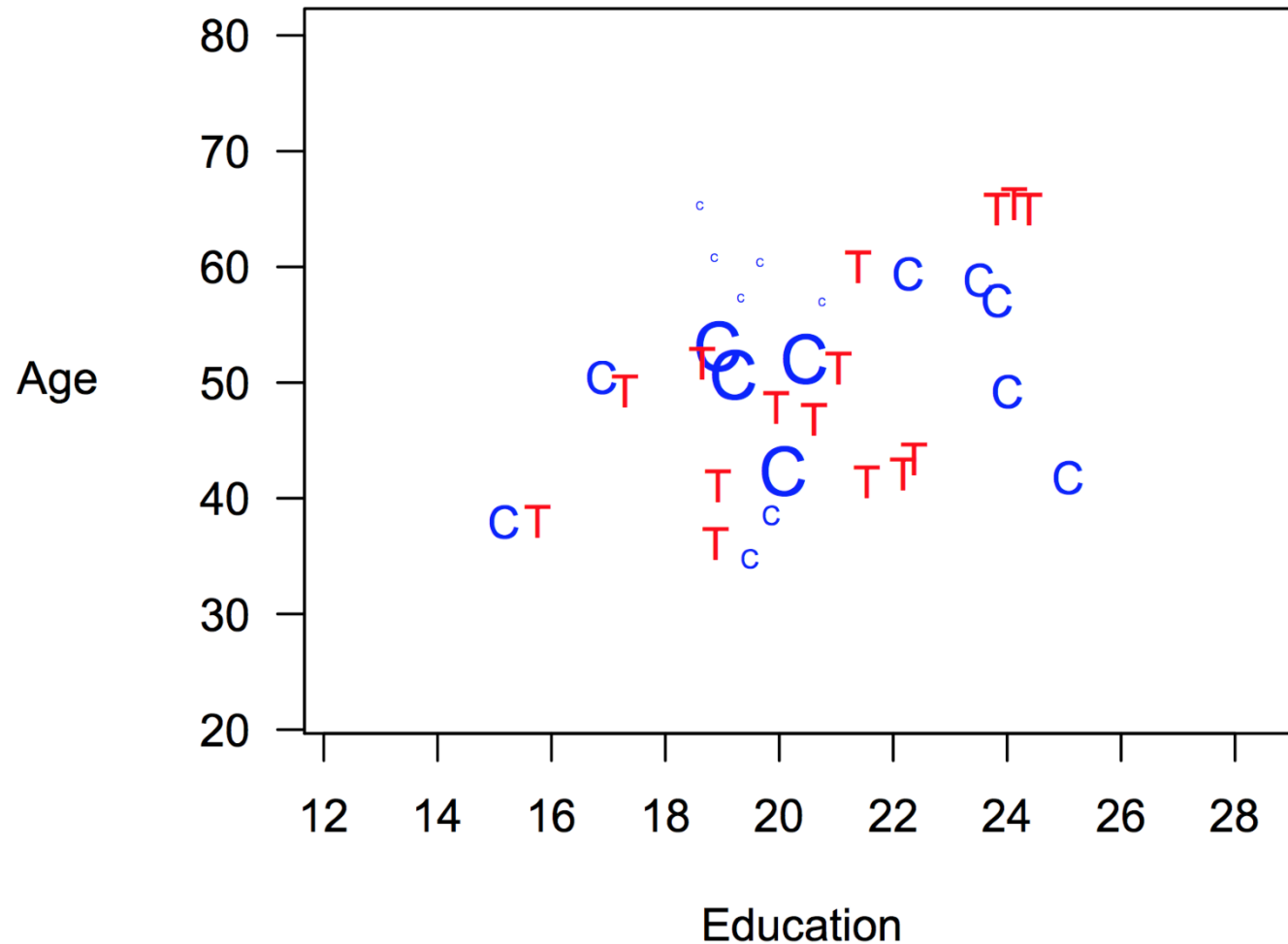


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Coarsened Matching



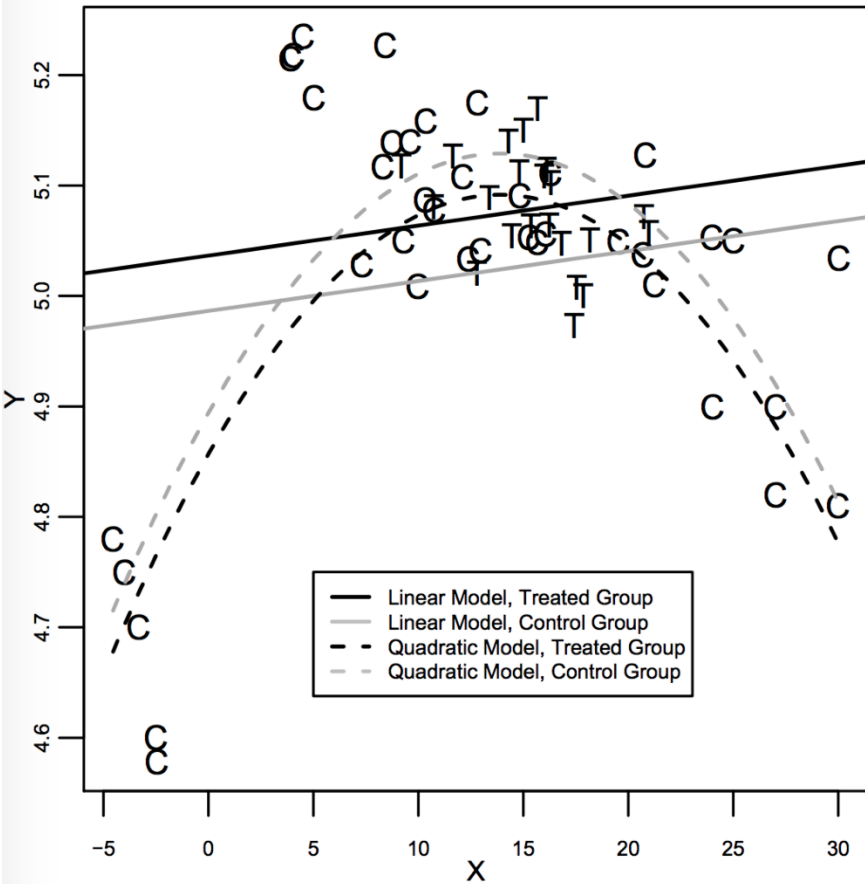
Coarsened Matching



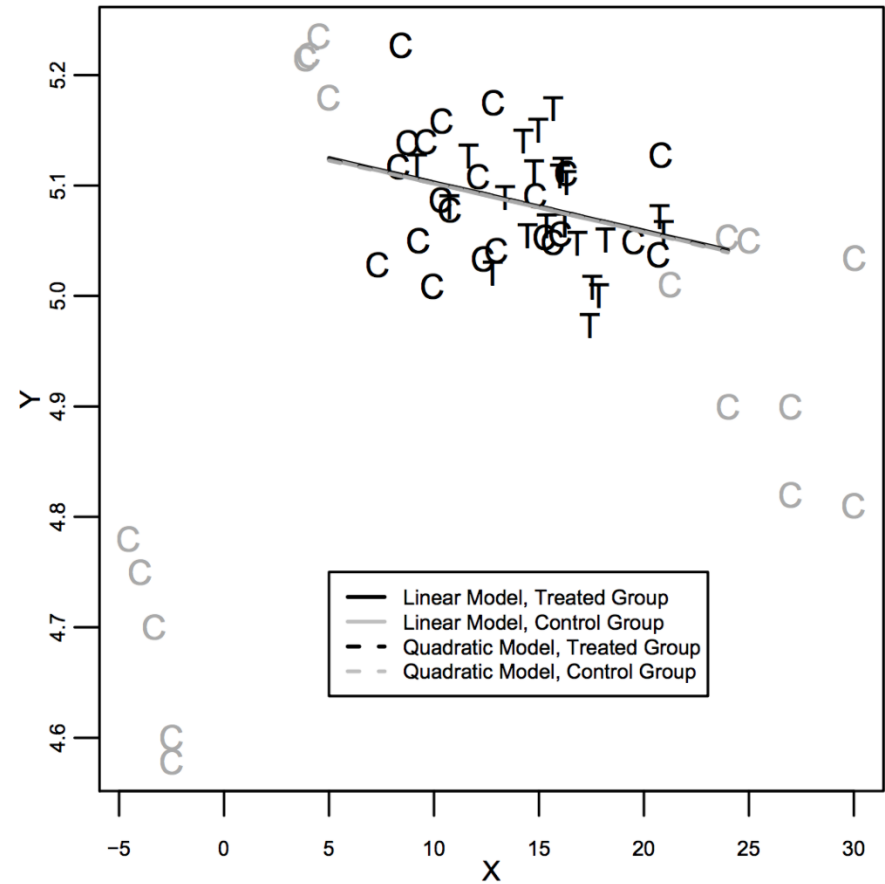
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Coarsened Matching

Before Matching



After Matching

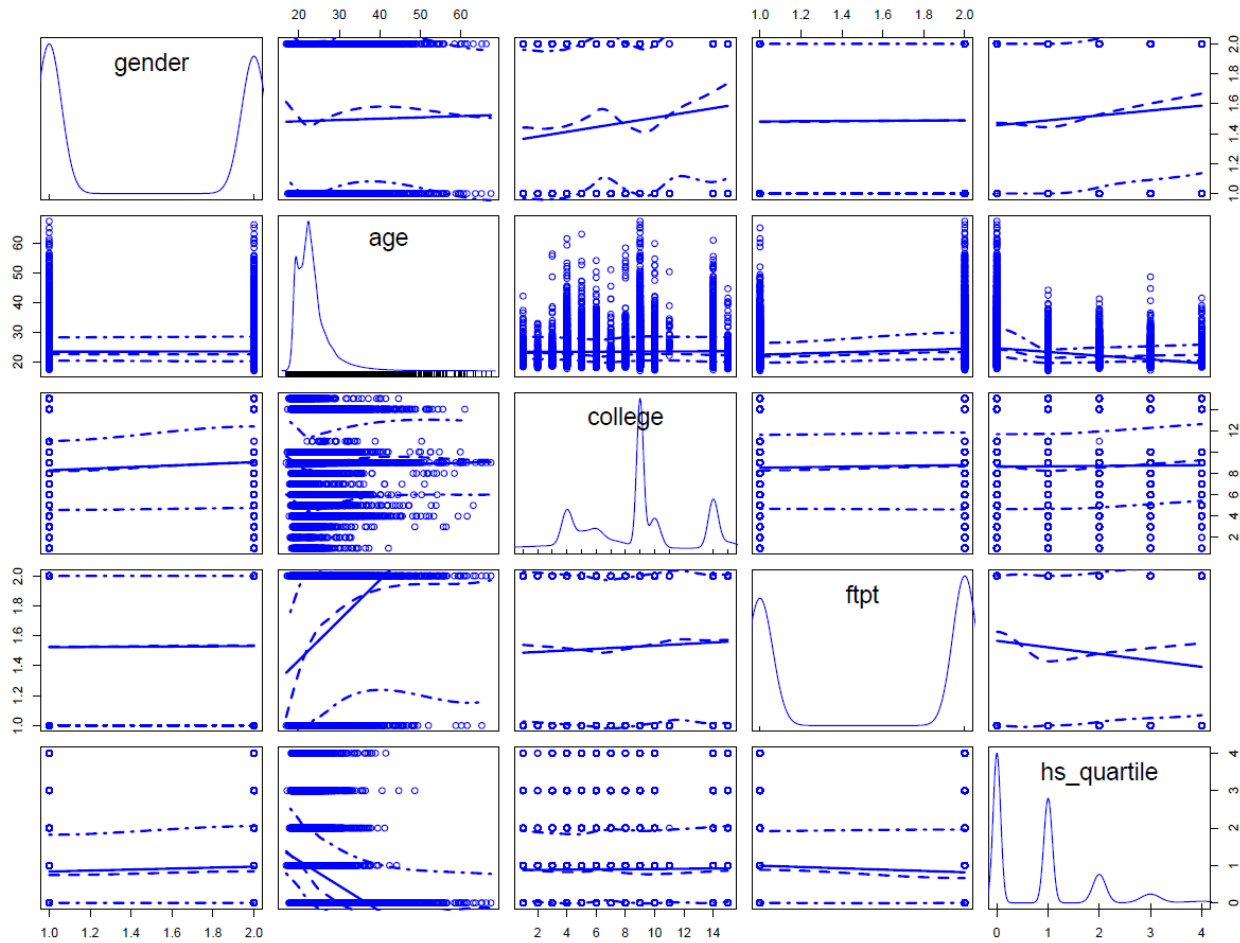


(Ho, Imai, King, Stuart, 2007)

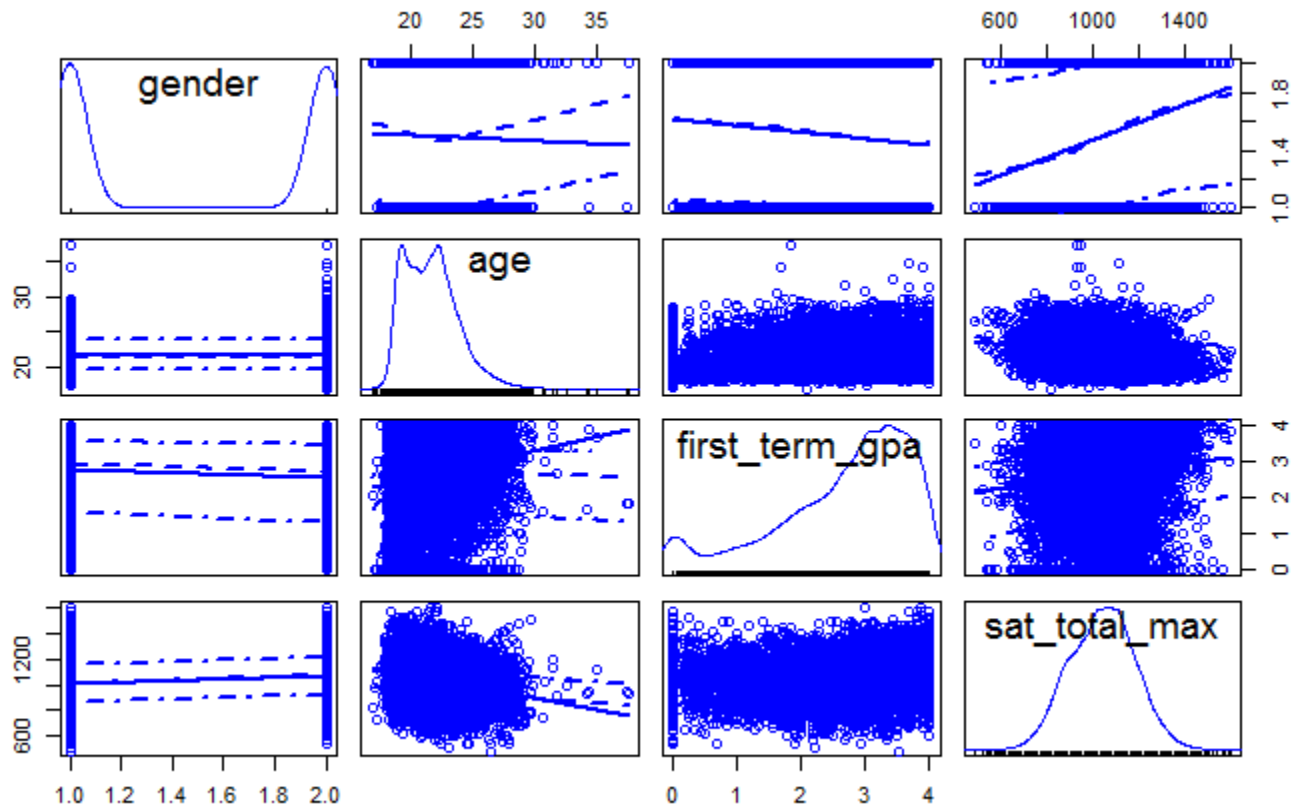
Methods

- Matching variables
 - Gender, age, college, attendance, SAT scores, first term GPA
- Outcome variable
 - Graduated (0,1)
- cem package in R (Iacus, King, & Porro, Giuseppe, 2018)

Multidimensional Histogram



Multidimensional Histogram



Measure Imbalance

- Tr=158, Ct= 37,850
- Multivariate and univariate imbalances
 - L1 [0,1] where perfect balance=0; complete separation from MH=1
 - Statistic reports the difference in means for numeric variables; chi-square differences for categorical variables
 - L1 imbalance measure for each variable
 - Difference in empirical quantiles; not calculated for chi-square
- Balancing process shows intersections of MH. More variables and more missing = less balance

Logistic Regression Models

	Unmatched	Matched
(Intercept)	-5.45*** (0.09)	-18.52*** (0.33)
aapflg	0.28 (0.18)	0.43* (0.19)
genderMale	-0.03 (0.03)	-0.38*** (0.04)
age	0.07*** (0.00)	0.62*** (0.01)
STEMNon-STEM	0.50*** (0.03)	0.20*** (0.04)
STEMUndeclared	-3.48*** (0.19)	-2.90*** (0.38)
ftptPart-time	-0.42*** (0.02)	-0.84*** (0.04)
cumulative_gpa	1.16*** (0.02)	1.52*** (0.03)
AIC	40584.48	15711.44
BIC	40652.84	15779.80
Log Likelihood	-20284.24	-7847.72
Deviance	40568.48	17461.99
Num. obs.	38007	20398

***p < 0.001, **p < 0.01, *p < 0.05

Contact & Resources

- Email: jxm@uh.edu
- [CEM: Coarsened Exact Matching Software](#)
- [CEM Vignette](#)
- [YARRR! The Pirate's Guide to R](#)