

GRADES, ATTRACTION, AND CONSUMER INTEREST: DECODING STUDENT EVALUATIONS



NYC DATA SCIENCE
ACADEMY

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2/14/18

MOTIVATION

- For better or worse, the model in higher education has changed forever
 - 'consumer' era (retention and enrollment)
- Many industries have captive audiences and mixed reviews
 - airlines, medical professionals, cable/TV → *can feedback still be used effectively?*
- What do you do when the consumer doesn't understand the industry and/or their needs?
- Can we use this information to stimulate dialog and raise expectations/increase understanding?

HOW ARE STUDENT EVALUATIONS USED IN HIGHER EDUCATION?

- At R1/R2/Carnegie Doctoral Institutions, they are fairly inconsequential, except in the extremes & then only rarely in tenure/promotion cases (TT faculty)
- As of 2011 more than 1/2 of all faculty are part-time and another 20% are NTT - 70% of faculty positions don't have the protection of tenure
 - Poor evaluations are not an option when you are contingent
 - NTT/Adjuncts teach more courses than TT/Tenured
- → students are used to taking courses from faculty who fear bad evaluations

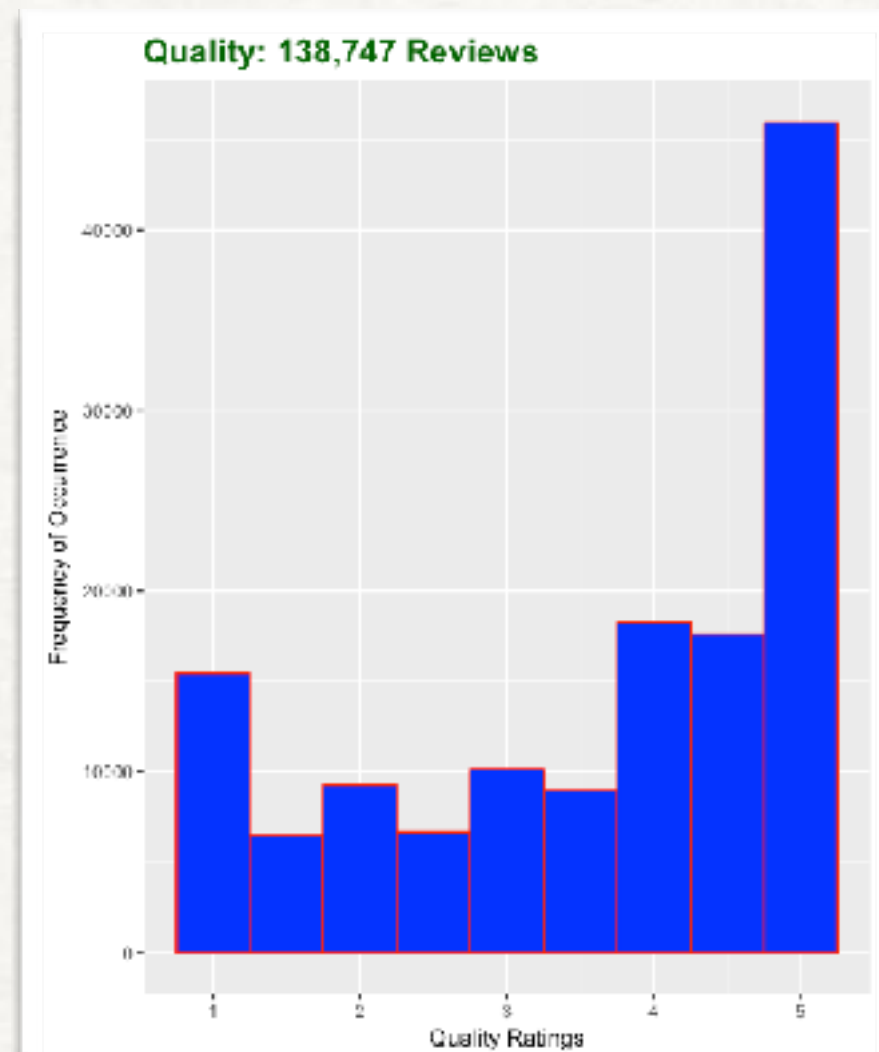
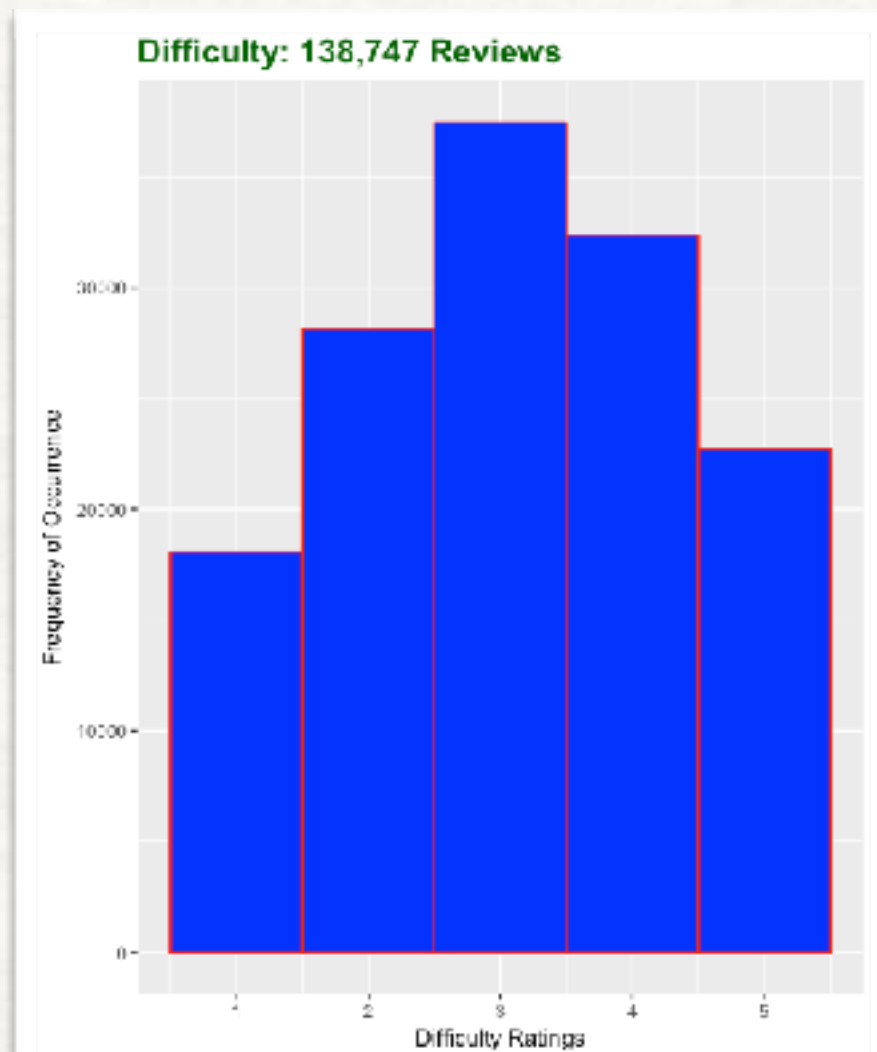
DATA

- Used Selenium to scrape Rate My Professor
 - Student reviews — assessment of (clarity + helpfulness) = Quality, Difficulty, 🌶️, comments.... (n = 138,747)
- Beautiful Soup for gradeInflation.com
 - Estimates and calculations of GPA of graduating classes throughout the years
- API requests to College Scorecard at US Dept. Education
 - Cost per- and revenue per FTE, SAT, admission rate, enrollment
 - 25 schools from (Elite, Poly, LA, Regional, R1{Generic})

Schools Analyzed

school name	Abbrev	Id	Classification 1	Classification 2
University of Alabama	Alabama	100751	R1	
Allegheny College	Allegheny	210669	LA	
Case Western Reserve University	CaseW	201645	Poly	E, R1
Clemson University	Clemson	217882	R1	
College of William and Mary	WMary	231624	LA	E
Cornell University	Cornell	190415	Poly	E, R1
Georgia Institute of Technology	GTech	139755	Poly	E, R1
James Madison University	JamesM	232423	Reg	
Kansas State University	KState	155399	R1	
Kenyon College	Kenyon	203535	LA	E
Lehigh University	Lehigh	213543	E	Poly, R2
Michigan University	Michigan	170976	E	R1
Montclair State University	Montclair	185590	Reg	R3
Purdue University	Purdue	243780	E	Poly
Rensselaer Polytechnic Institute	RPI	194824	Poly	E, R2
Siena College	Siena	195474	LA	
Southern Connecticut State University	SConn	130493	Reg	
Towson University	Towson	164076	Reg	
University of California - Berkeley	Berkeley	110635	E	R1
University of North Carolina - Chapel Hill	UNC	199120	E	R1
Vanderbilt University	Vanderbilt	221999	E	R1
Vassar College	Vassar	197133	LA	E
Virginia Polytechnic Institute and State University	VTech	233921	Poly	R1
Washington State University	WState	236939	R1	
Wright State University	Wright	206604	Reg	R3

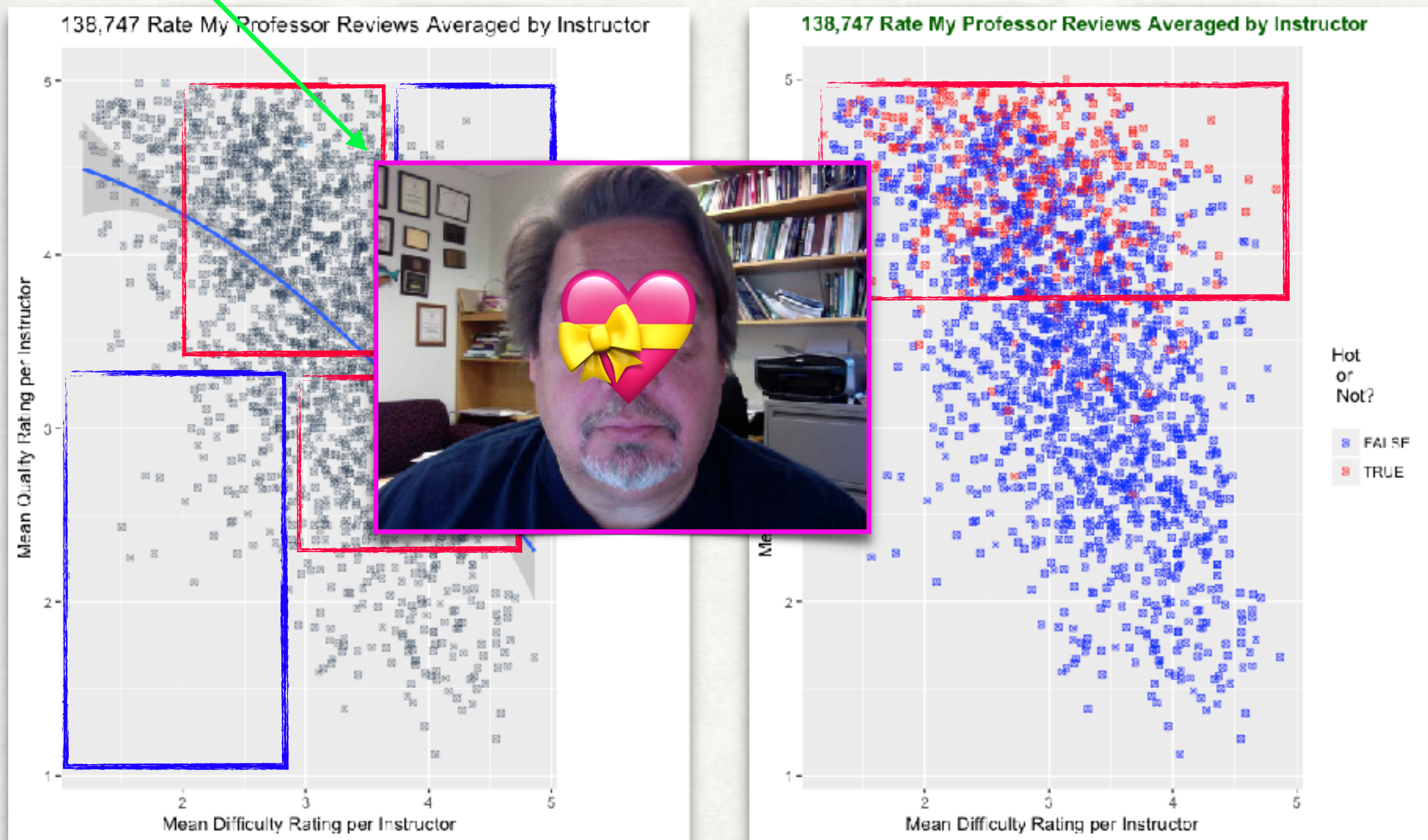
HISTOGRAMS OF QUALITY AND DIFFICULTY



$$r_{xy} = \frac{\sum_{i=1}^n (x_i - \bar{x})(y_i - \bar{y})}{\sqrt{\sum_{i=1}^n (x_i - \bar{x})^2} \sqrt{\sum_{i=1}^n (y_i - \bar{y})^2}} = \frac{s_{x,y}}{s_x s_y}$$

Quality ~ Difficulty: $r(138740) = -0.45, p = 0$

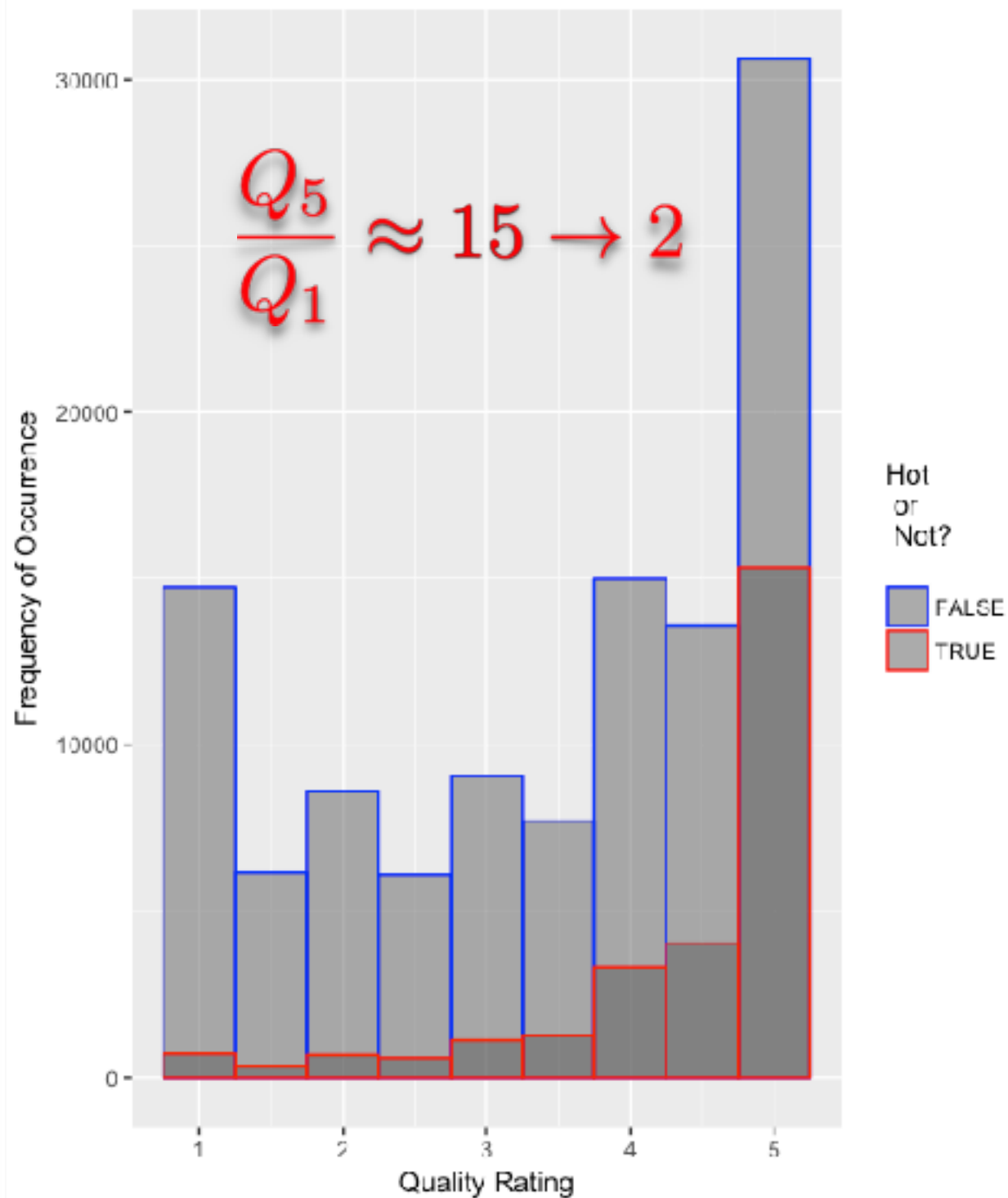
INFLUENCE OF DIFFICULTY ON PERCEIVED QUALITY



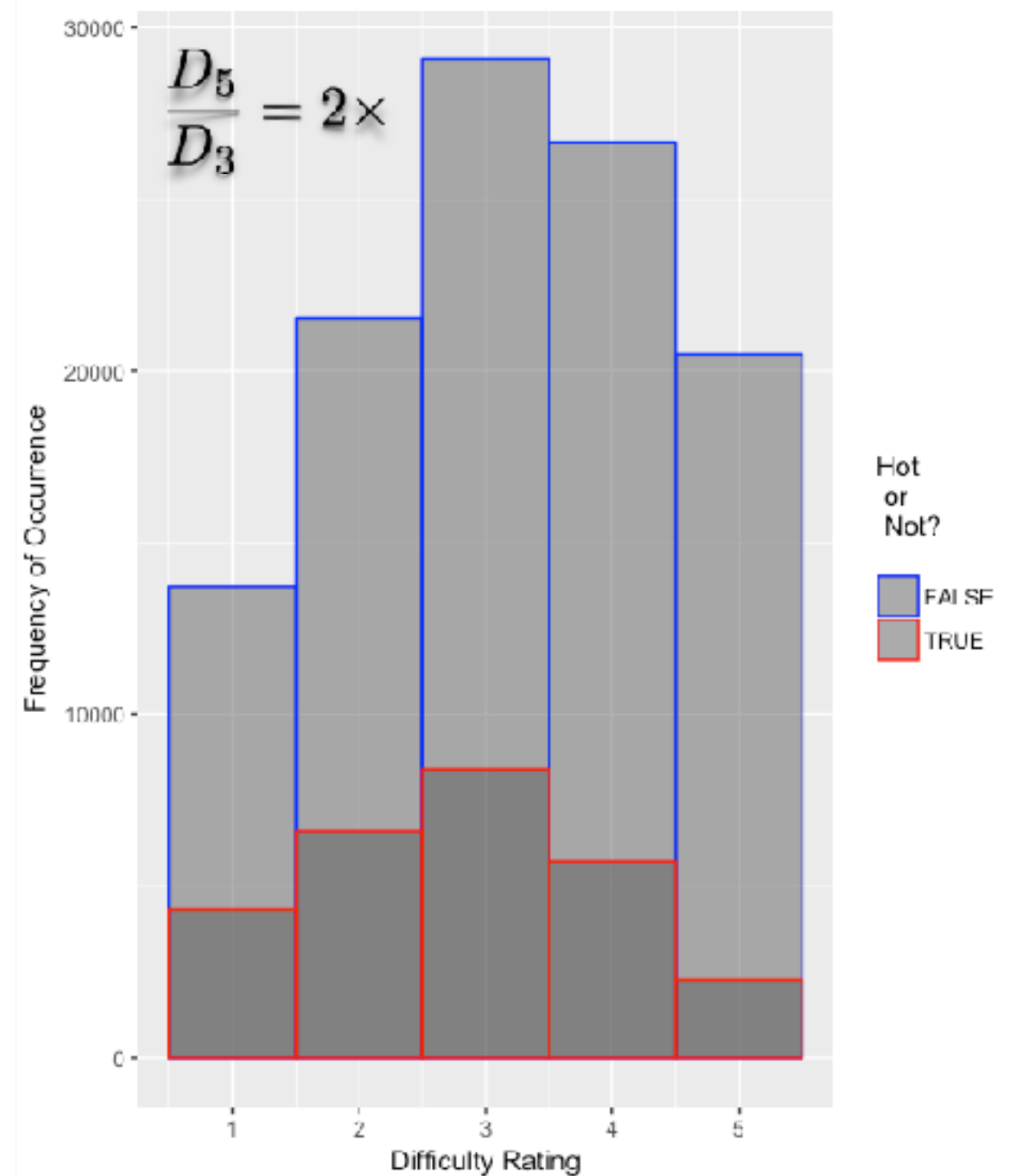
It's important for students to think about what they mean with these terms and for faculty not to be dismissive of the lessons {even though they can be painful}

HISTOGRAMS REVISITED AND COLORED BY 'HOTNESS'

Quality: 138,747 Reviews

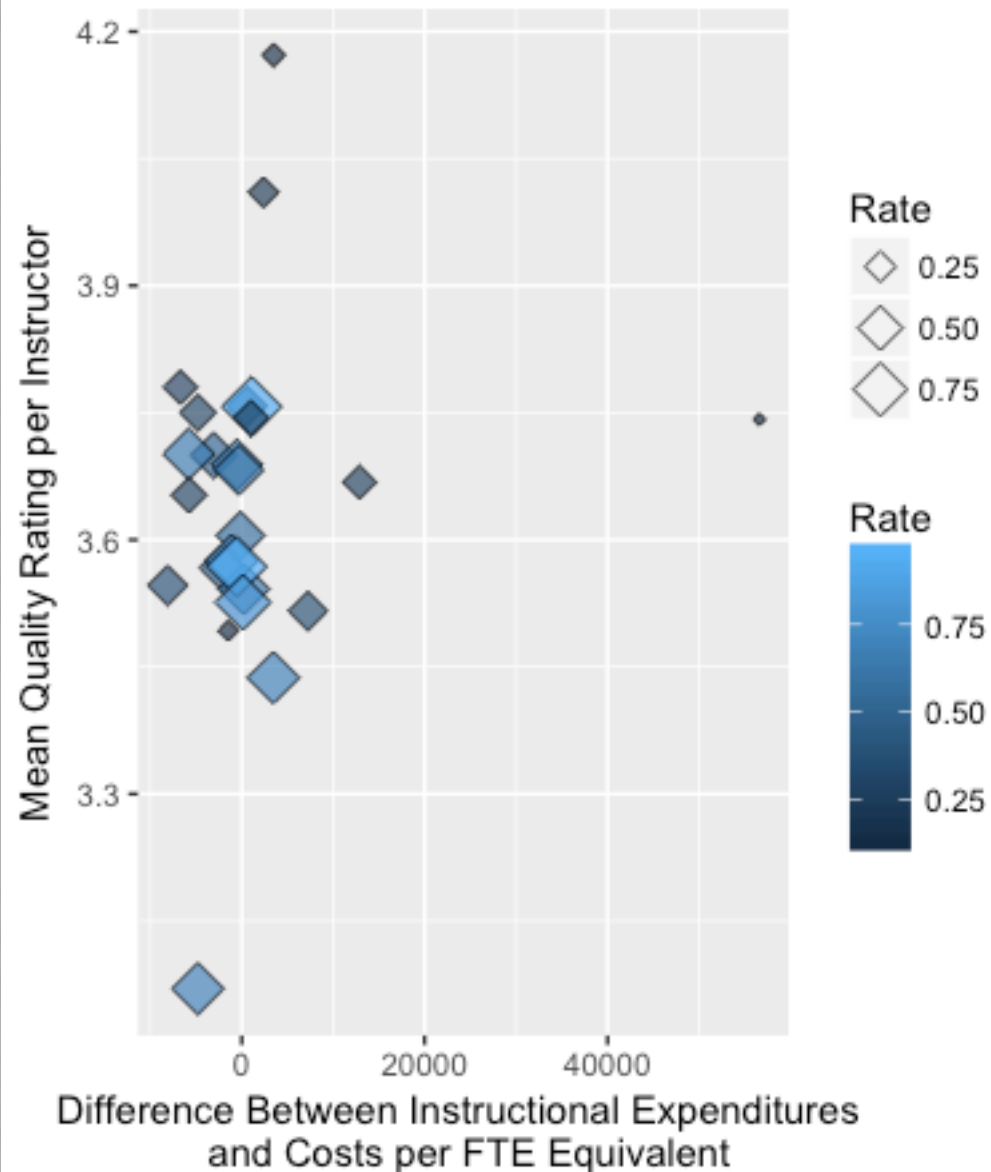


Difficulty: 138,747 Reviews

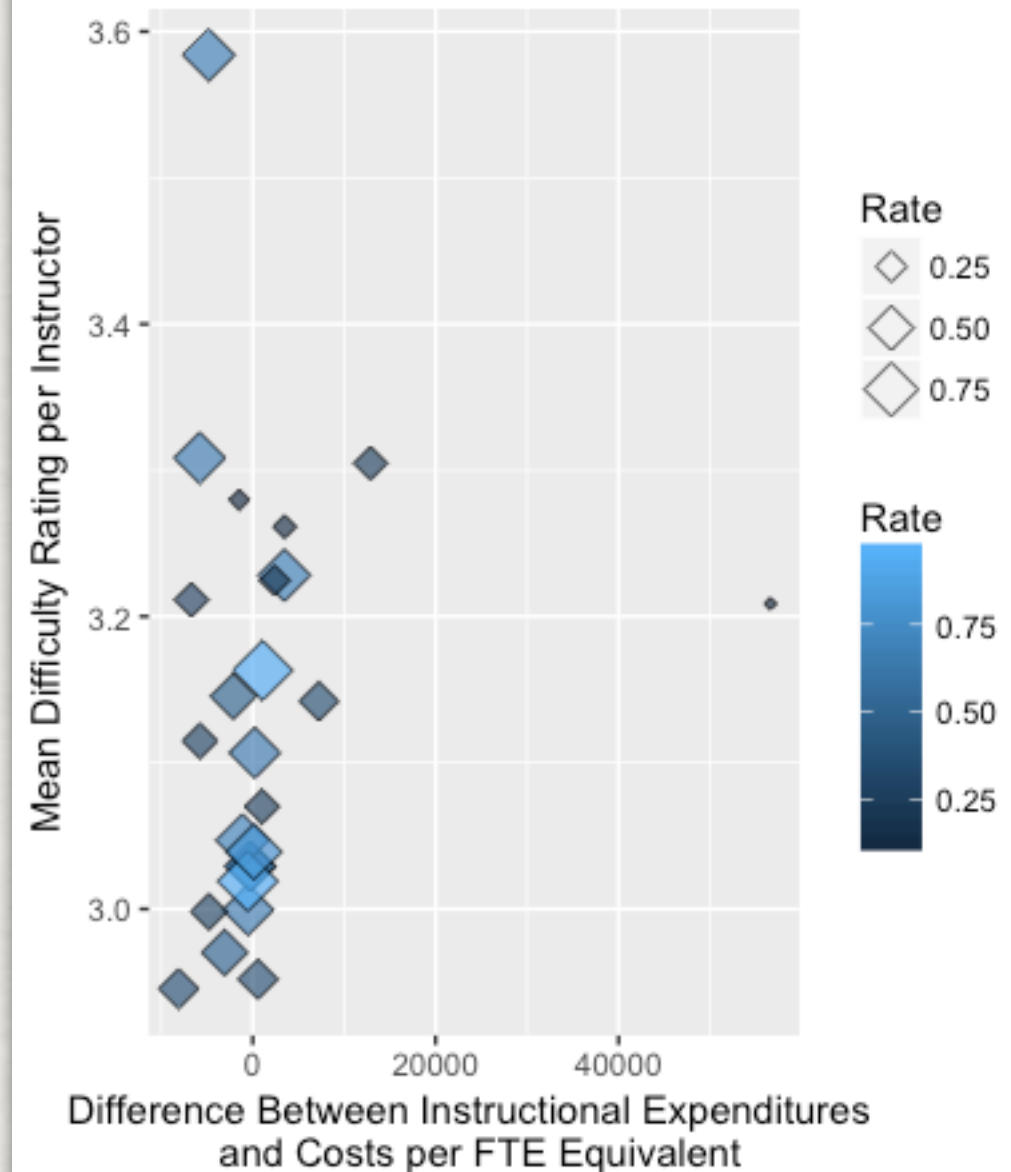


HOW TO RESPOND?

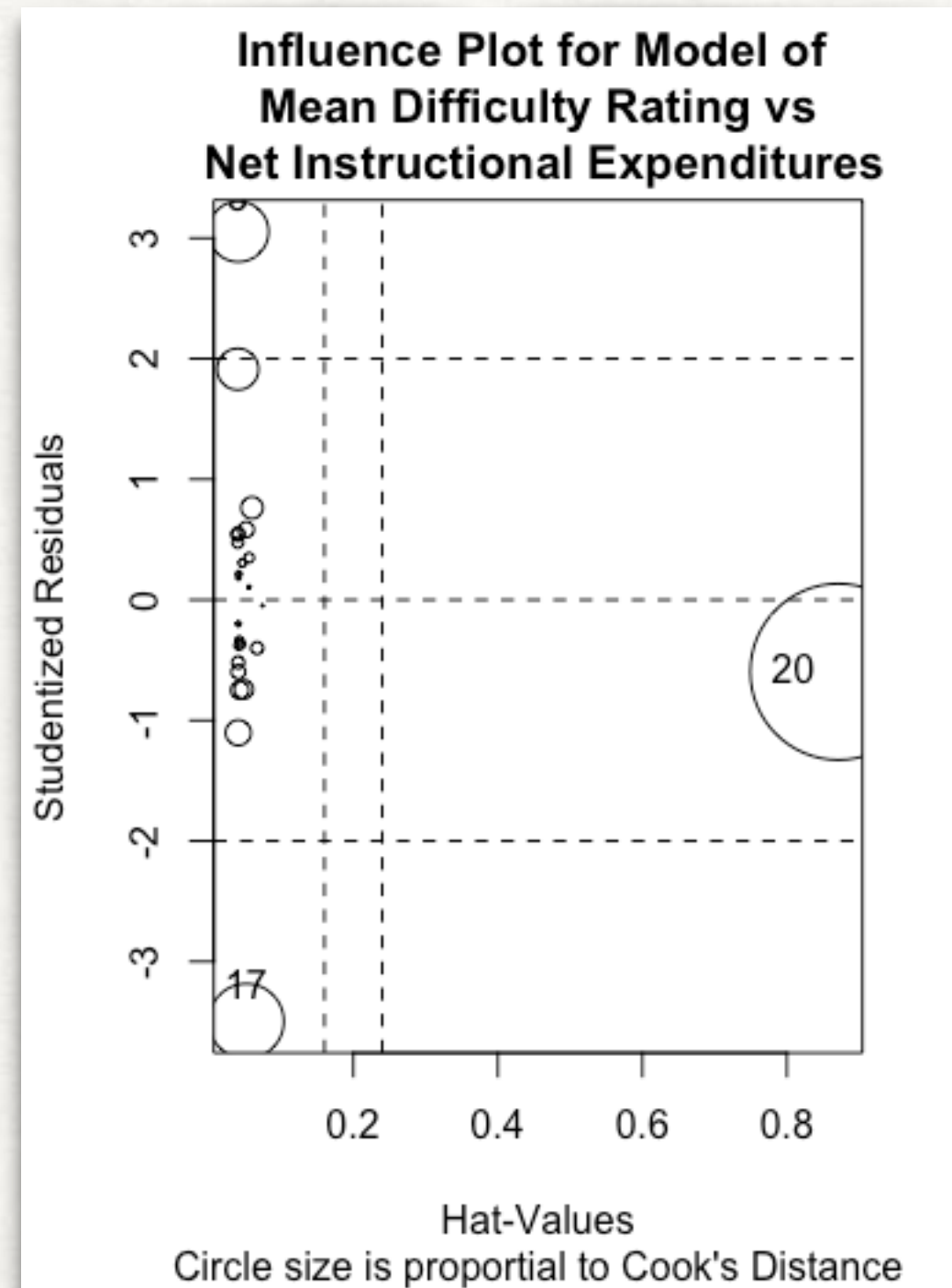
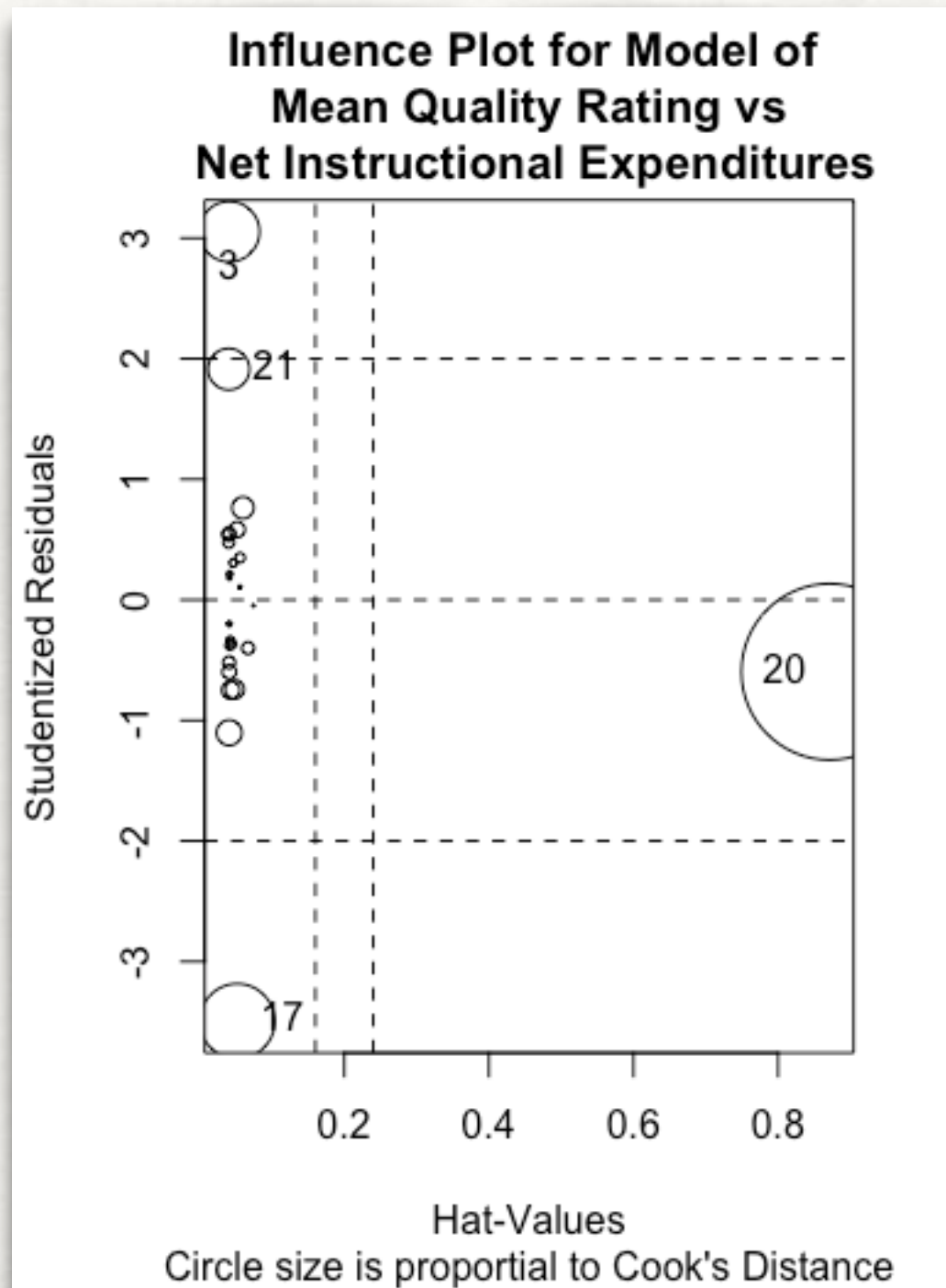
Examining the Influence of Net Instructional Expenditures on Quality Rating



Examining the Influence of Net Instructional Expenditures on Difficulty Rating

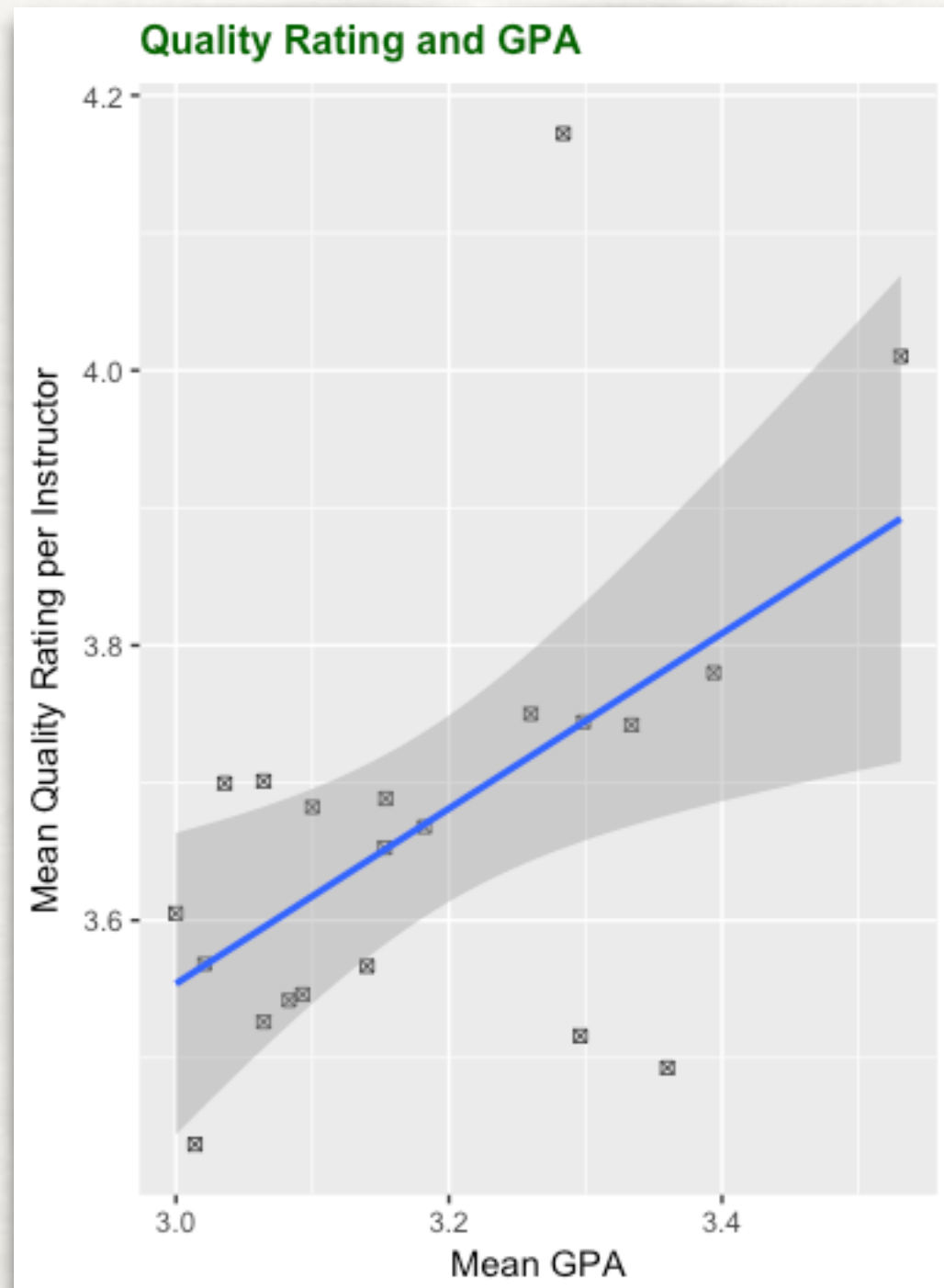


INFLUENCE PLOTS

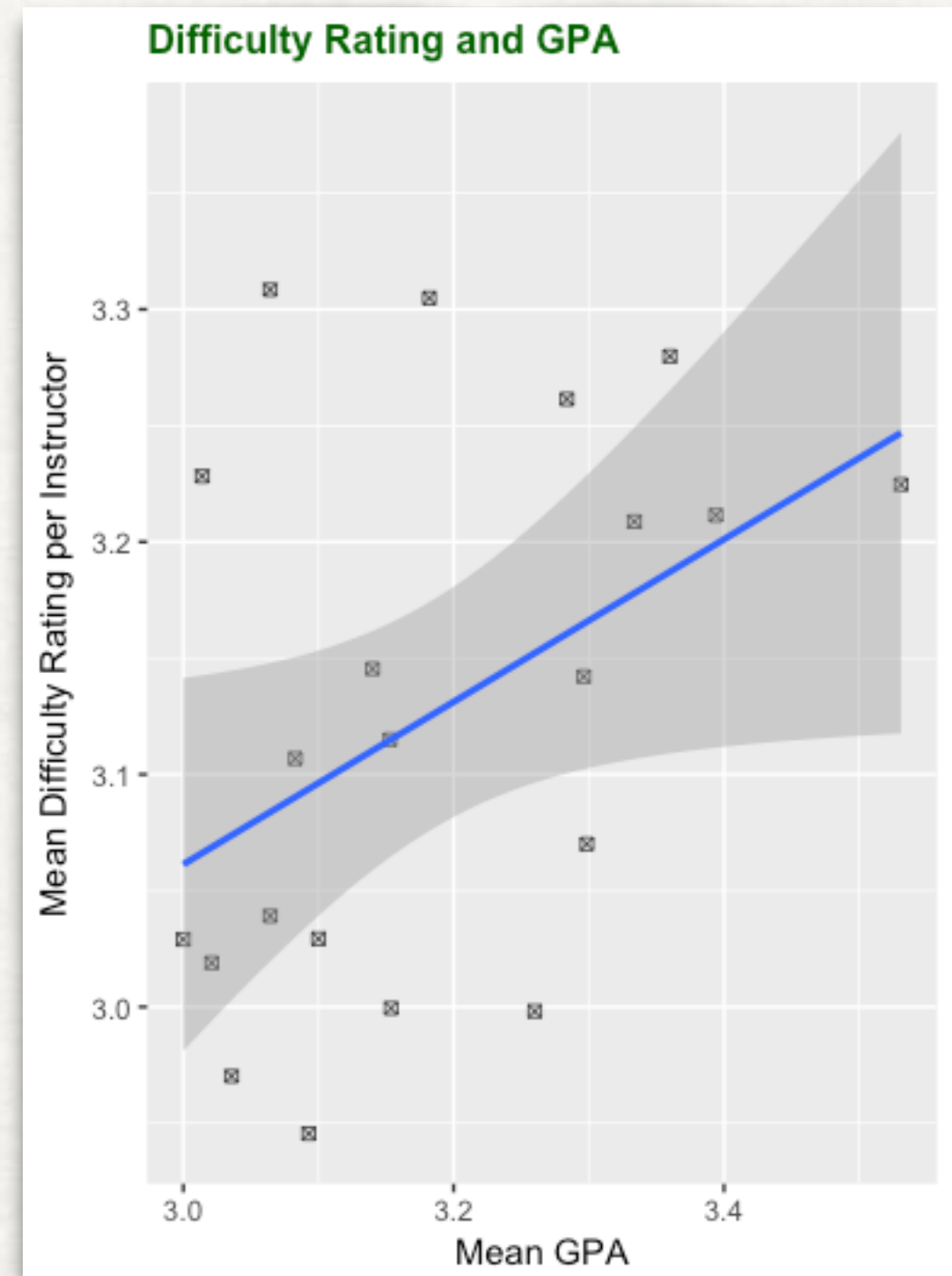


In both cases, removing high influence points only changes r from 0.45 \rightarrow 0.5

QUALITY AND DIFFICULTY RATING AND GPA



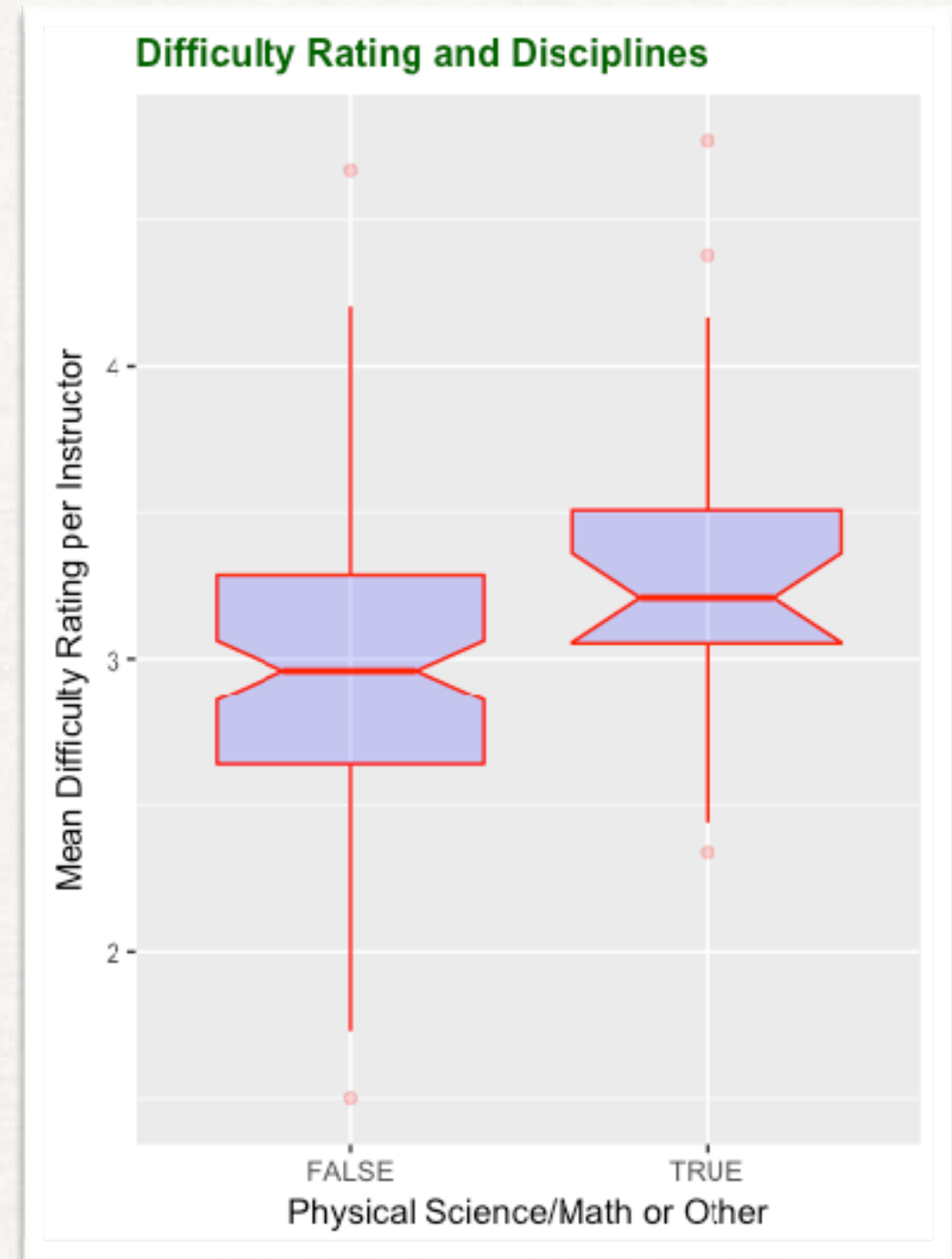
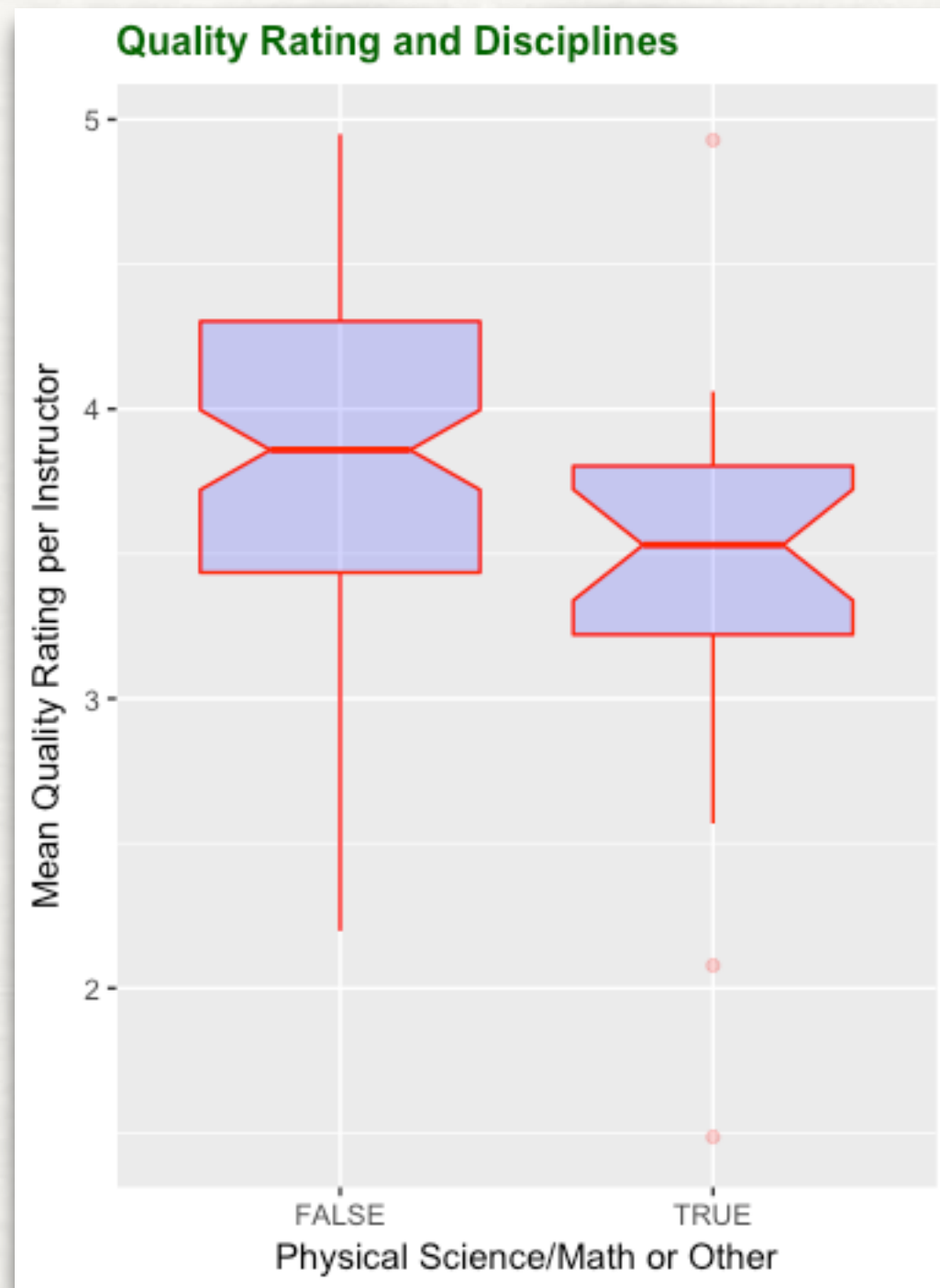
$$r = 0.45, p = 0.01$$



$$r = 0.44, p = 0.046$$

Peculiar result: both Q and D appear to be positively correlated with mean GPA

INFLUENCE OF DISCIPLINES



Notches display 95% confidence interval

LESSONS FROM THE FIELD

- Why is there a support group for people who are employing progressive pedagogical techniques in their classes?
 - "I had to teach myself"
 - "He/She doesn't do anything"
- "Active resistance to interactive engagement is relatively rare, but resistance and low evaluations can happen. Please remember that student evaluation results should be taken with a grain of salt, as they are not necessarily measures of student learning."

CONCLUSIONS

- Quality rating is strongly influenced by 'difficulty', perceived attractiveness, and grades
 - How are outcomes defined for faculty vs students?
 - Amount learned vs GPA
- Lessons to learn:
 - Students and faculty don't have common vocabulary for quality and difficulty
 - Reliance on contingent lecturers puts strain on faculty
- Students and faculty may have to 'agree to disagree', but can always improve clarity of purpose and expectation