



From Fear & Loathing to Appreciation & Empowerment: Building Quantitative Literacy among Social Justice Oriented Students

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Quantitative Analysis in Undergraduate Education

Two common social science models:

- Early placement (whoo hoo, I'm done and never have to do math again)
- Late placement (oh god, I've been dreading this) ← US

In both models, the quantitative analysis course tends to be a curricular isolate.





Overview of curricular environment

Our approach:

- We teach quantitative analysis to approximately 75 majors per year
- Students choose between qualitative and quantitative analysis after an introductory methods course
- Overall course learning objectives are to 1) build quantitative literacy through visualizing, describing and interpreting publicly available data, and 2) gain skills to conduct original analysis and interpret findings



Key Assignments: Crucial Elements

Demonstrate power of empirical data in contributing to social change

Integrate quantitative data with topics students are passionate about and/or personally impacted by - such as immigration, criminal justice, mental health

Visualize and interpret publicly available social data, such as the General Social Survey, US Census, Youth Risk Behavior Survey

Illustrate objects you want students to create (e.g. tables, charts, maps) with examples that draw on the same forms of data (e.g. show a map of the racial distribution in San Francisco neighborhoods and then ask them to make one for Los Angeles)

Use statistical software to generate descriptive and bivariate findings on substantive topic using publicly available data

Build written and oral communication skills through describing, visualizing, interpreting, and critiquing analysis and findings, both individually and in groups



Discussion Question

What do you think are the best ways to engage students primarily interested in social service careers in quantitative analysis?

- Read and discuss published reports and articles addressing social justice questions with quantitative data
- Focus course on specific social justice issues (racial segregation, opioid addiction and overdoses)
- Teach students to analyze publicly available data and produce tables, figures, and other visual elements
- Teach students to analyze publicly available data and make inferences about a population based on a sample - with implications for policy and programs

Building Quantitative Literacy



The Rise in Residential Segregation by Income

Foundation reports

Academic articles

Initiation of injectable opioid agonist treatment in hospital: A case report

Great data

Journalistic accounts

Some Colleges Have More Students From the Top 1 Percent Than the Bottom 60. Find Yours.

TheUpshot
A 'Rare Case Where Racial Biases' Protected African-Americans





A particularly good warm-up

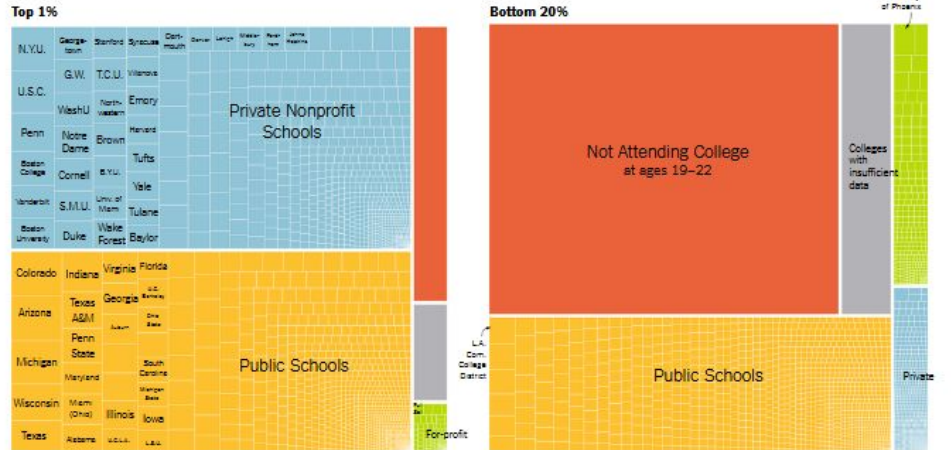
<https://www.nytimes.com/interactive/2017/01/18/upshot/some-colleges-have-more-students-from-the-top-1-percent-than-the-bottom-60.html>

Some Colleges Have More Students From the Top 1 Percent Than the Bottom 60. Find Yours.

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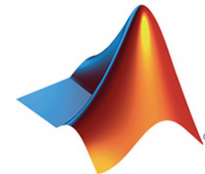
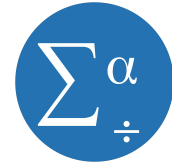
Where the top 1% and the bottom 20% go to college





Software

- Visualization
- Facilitating student interaction
- Practical employment skill
- Excel/spreadsheet software is not a solution
- Isolation from rest of curriculum a problem





What Works Well

Focusing on a social phenomenon that relates to their sense of social justice

- Makes the class more like the rest of the curriculum (but the rest of the curriculum also has to become more like us -- see next slide)
- Covering descriptive stats deeply and in relation to a single subject
- Analyzing a publicly available dataset to generate sociologically relevant findings
- Exploring criticisms of or questions about published reports
- Presenting findings to fellow students



Areas for Improvement

Individual mindsets

- Address high prevalence of quantitative anxiety and negative math mindsets formed during primary and secondary education
- Many students haven't had a math course during their undergraduate education
- Students don't engage with assigned stats textbooks and report frustration

Sociology major curriculum

- Reducing the isolation of the quantitative methods course by integrating more quantitative analysis in other required Sociology major courses

Semester content

- Quantitative literacy and descriptive statistics could cover the 14 week semester
- Inferential logic of inference and concepts like central limit theorem, sampling distributions, degrees of freedom, statistical significance

Future Directions

Reconceptualize assigned texts and reading materials

- Animated videos, podcasts, interactive data dashboards
 - [California Opioid Overdose Surveillance Dashboard](#)
 - [Bunnies, Dragons and the 'Normal' World: Central Limit Theorem](#)
 - Other suggestions?



Revisions to our curriculum plan:

- Lower division course on Social inequalities to introduce (1) measures of inequality, (2) basic descriptive statistics, and (3) literacy in reading tables and simple univariate and bivariate charts
- Opportunities to take quantitative analysis oriented courses as electives
- Substantive-focus quantitative analysis as senior Capstone



Discussion Questions

Questions for us?

Does anyone have a success story to share about teaching social science undergraduate students the logic of inference through a social justice lens, where they acquire practical analytic skills and build knowledge about a substantive topic?



Data relevant to social justice issue

While many places warehouse data relevant to social justice issues (e.g. [BLS unemployment numbers](#), [FBI unified crime statistics](#), [DOE college performance reports](#), etc.), most of these data are difficult for novice users to navigate and/or interpret. We favor places that present (1) clean datasets accompanied by (2) research reports written using those datasets and (3) supporting tools easier for students to use than a standard codebook.

- [Pew Research Center](#)
- NORC resources ([GSS Explorer](#), [VizHub](#), and the [new AmeriSpeak](#))
- [The Upshot \(NYTimes\)](#)