Assessment/Data/Problem Solving  
Fall 2018 Semester  
15:230:615  
3 Credits  

Instructor: Bruce D. Baker  
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Office Hrs: As per request  
Ex Help: As per request  

Mode of Instruction:  
X Lecture  
___ Seminar  
___ Hybrid  
___ Online 

Texts  
Required  

Recommended:  

Assignments and Grading  

In this class, you will have three major assignments, each of which will involve data analysis and the preparation of a policy brief or internal memo, coupled with a brief presentation to your administrative team or board of education (purely hypothetical situation, but real data). Each assignment will be equally weighted toward the final grade and each grade will include a 20% rating based on other student’s ratings of the “clarity and understandability” of your presentation and brief or memo, and the extent to which your analyses and presentation are “convincing” or “compelling.”

There will be numerous other smaller assignments to liven up class discussions, but these assignments will not receive independent grades. These assignments will include such things as finding a really bad analysis to discuss and debunk in class.

The three major class assignments are as follows:
Assignment 1: Using Indicators, Rankings and Ratios to evaluate the Condition of Education in New Jersey

Are New Jersey schools a model for the nation or are they corrupt, dysfunctional and underperforming? Much these days depends on whose blog you read, which radio station you listen to or newspaper or online news source you most frequently read. For this assignment, students will be place into teams of two and the teams will be split down the middle – as nearly as possible – such that half of the teams will have the goal of preparing policy briefs explaining why New Jersey schools are failing miserably while the other half will prepare policy briefs explaining how New Jersey schools are doing quite well.

You will be preparing what is referred to as a “Data Driven Policy Brief” in Chapter 2 of the text. You will be applying the data analysis tools of chapters 3 – 5 – developing and/or using existing indicators, ratios and descriptive statistics to make your case. We will not, in this assignment be looking at “relationships” among variables – not yet, that is. You are expected to draw on a combination of financial data, student outcome data, and other possible data evaluating how much is spent on schools in New Jersey, how good or bad New Jersey teachers are, how rich or not New Jersey course offerings might be, and how well or not well New Jersey students perform.

Assignment 2: Using relationships in data to analyze, evaluate and debunk

A lot of measureable things are statistically related, but a lot of these relationships between measures are either utterly meaningless, or tell a far more convoluted tale than what they would appear to tell. For example, one can show with data on state average per pupil spending and data on state average SAT scores that states that spend more on schools have lower average SAT scores. Therefore, spending more on schools obviously makes them worse. Clearly, this is absurd on its face, but then why the relatively strong negative relationship between state average spending and state average SAT scores? Well, for many reasons. First, higher spending states tend to be in the Northeast, even after adjusting for regional wage variation. Much larger shares of students actually take the SAT in northeastern states. In low spending states in the south and plains, less than 10% - the top 10% interested in selective eastern colleges – take the SAT. On average, higher spending states have higher shares of kids taking the SAT. And, on average, in states with higher shares taking the SAT, average SAT scores go down, because more lower performing students take the test. So, perhaps spending more doesn’t cause SAT scores to go down.

Now it’s your turn. You can either find a specific “spurious” relationship analysis to critique and debunk or you can begin your analysis by constructing an interesting spurious relationship that requires more thoughtful discussion and analysis. Either way, you need to begin this brief by finding a relationship between two measures about schooling that is not necessarily what it appears to be on its surface. After presenting the original analysis and false conclusions that might be drawn from it, you will then explore other relationships among variables which add to the story and provide
additional insights. For example, in the above example, looking at the relationship between spending and participation rates and participation rates and average scores pretty much clears things up.

For this assignment, you will prepare another Data Driven Policy Brief, and you will make use of the data relationships tools found in Chapters 6, 7 and 8 of the textbook.

**Assignment 3: Analysis in the New Jersey Data Context**

For this assignment, I want you to take full advantage of publicly available data sources and do a full-length policy brief which should a) include multiple data sources and b) include both descriptive and inferential tools. This assignment is wide open and may take a variety of forms, but has a few basic requirements.

Key elements of the assignment include:

1. Brief review of relevant literature including similar analyses applied to different contexts
2. To the extent possible, data on any given issue must be reconciled across multiple sources or alternative measures intended to address similar concepts/issues.
3. All sources and all analyses must be thoroughly documented, but much of that documentation may be embedded in footnotes and technical appendices. Nonetheless, it must be there, and must be understandable.
4. Use of data from multiple sources and recommended use of data at multiple levels of the system (state, district, school, individual).

Following is a list of possible data sources, which includes the option to request specific data from me, based on my vast library.

Publicly available web downloads:

1. NJDOE Data Site: [http://www.state.nj.us/education/data/](http://www.state.nj.us/education/data/)
   a. Enrollment and demographics files
   b. School report cards
   c. Financial data (note data change, non-comparable in most recent year)
2. Publicly available for download via NCES
   a. Common Core of Data (Build a Table Function) [http://nces.ed.gov/ccd/bat/](http://nces.ed.gov/ccd/bat/)
3. Data on State and Local Taxes
4. IRS Tax Filings of Non-Profit Organizations
Possible pre-approved policy brief topics:

a) Teacher turnover by location, grade level, school type, teacher type, etc.

For example, much has been made of high rates of teacher turnover in charter schools. Is this generally true in New Jersey? Is there variation across charter schools and are there factors associated with that variation? How do charters compare to traditional public schools in the area?

Primary data source: NJ Staffing files from my private library

Additional data: NJ enrollment files

b) Comparisons of school performance and demographics, etc.

For example, across different contexts, which measures of student characteristics are most associated with school level differences in performance? Do different measures work better for different circumstances (for example, across districts as opposed to across schools within districts?).

Primary data source: multiple years of NJ report cards

c) Evaluation of teacher salary structure and labor market context

For this one, you would need to use the individual teacher data file to make comparisons of teacher salaries, given experience and degree levels, etc. among schools and districts competing in specific labor markets. You might also compare administrative salaries. Relevant questions include what factors affect salaries or affect them most. How do those factors vary across schools or districts? Examples provided in class.

Primary data source: NJ Staffing files from my private library

d) Student attrition rates in middle and secondary schools

Analysis of student attrition has gained increased attention with interest in understanding how/why some high performing charter schools achieve the results they do. That is, do some high performing charter schools have high test scores to a large extent because of high rates of cohort attrition, specifically attrition of lower performing students. You will not have access to the level of detailed data you would need to do the most precise analysis on this topic, but you can address certain issues, like whether charter attrition is more or less than attrition in nearby schools serving the same grade levels.
Primary data source: multiple years of NJ report cards & enrollment files

Note: you should explore the debate/discussion over the Mathematica (http://www.ncspe.org/publications_files/OP195_3.pdf) and Miron (http://www.ncspe.org/publications_files/OP195_3.pdf) studies of attrition in KIPP charter schools.
For any Masters Degree student substituting this Course for Decision Analysis Demonstration Task

New Jersey School Report Card

Introduction

The New Jersey Report Card Database includes report card data for various years. For this project you will examine New Jersey Report Card data for the most recent year. To locate these data, pull up on the New Jersey School Report Card file for the most recent year.

Firstly, you must download the New Jersey Report Card for the most recent year to your computer or flash drive. You can download the data file in Excel format either zipped or unzipped. If your computer has decompression software, you can download the file as zipped and open it later. Otherwise, you may download the file already unzipped which will take a little longer to download.

Secondly, when you visit the above site, please review the Data Layout in Excel. The Data Layout shows how the New Jersey Report Card data file for the most recent year is organized. Once you open the Data Layout, click on the tabs along the bottom of the page to review the contents of the New Jersey Report Card data file for the most recent year. Click again on the first tab at the far left of the page to find a list of sub-files that are contained in the New Jersey Report Card data file for the most recent year.

Also click on the assessment tab and you will find a list of variable names on the assessment sub-file. These variable names are located in the first column called Field. Variables names are placed as column headings in Excel. Notice how the first three columns of the New Jersey School Report Card data file for the most recent year contain indicators for County, District, and School, to uniquely identify every public school in New Jersey.

Finally, close the Data Layout to which you may return later for reference as needed and open the downloaded New Jersey Report Card for the most recent year. The New Jersey Report Card for the most recent year in Excel should look familiar because you have worked with many similar files already. If you have a problem opening the New Jersey Report Card for the most recent year please notify the instructor. Otherwise, continue with the project.

The New Jersey School Report Card for the most recent year

The assessment tables of the New Jersey Report Card contain disaggregated statewide assessment data by school, district and socio-economic group (DFG). Using Pivot Tables and Filters, you will analyze data for the most recent year on this sub-file to gain
more familiarity with digital technology and New Jersey school performance data. New Jersey stores assessment data in a particular form that you can analyze by first using the Excel Filter command. Access the New Jersey Report Card for the most recent year, click on the assessment tab for the previous year, and play with the file using the Auto Filter Command. Later you will be invited to design Pivot Tables, too. Try Auto Filter now.

**Filtering**

The Data=>Filter=>AutoFilter command in Excel is a powerful utility tool for manipulating a worksheet and limiting rows of data that you may wish to analyze. Notice that when you click on any column heading and then launch AutoFilter, small triangles representing pull-down menus appear at the head of each column, allowing one to filter the worksheet according to choices available on each pull-down menu. Apply the AutoFilter command to the assessment worksheet for the most recent year by selecting various pull-down options. Also notice that you can select rows for certain socio-economic groups - DFG - school years, testing programs, subjects, or levels such as school or district. Try filtering your data to isolate DFG A districts and schools. Do not resave.

**The Project**

Unlike previous projects, Project #3 will require your team to analyze the academic performance of students at the elementary, middle, or secondary level. In particular your analysis should highlight the possible influence of school district socioeconomic background advantages on student performance in language arts literacy and mathematics. This project will give your team leeway in deciding how to apply AutoFilter and Pivot Tables to the data. If you would like to associate the New Jersey Report Card data with the names of particular schools and districts, for your own pleasure, even though naming particular school districts will not be necessary, for Project #3, please visit the following NJ site:

http://www.state.nj.us/education/directory/dl_schools.shtml

After using AutoFilter on the Assessment data, how many districts fell within each of the following DFG categories: A, B, CD, DE, FG, GH, I, and J? (Objective: develop and demonstrate data management skills)

According to the Assessment data, how many districts in each DFG offered the HSPA? (Objective: develop and demonstrate data management skills)

Using Pivot Tables, compare the test performance of New Jersey school districts by DFG. Do students in higher DFG groups consistently outperform those in lower DFG groups? (Objective: develop and demonstrate capacity to handle test-score data.

Do you find any evidence in the data of selective testing? (Objective: develop and demonstrate capacity to make judgments about the quality of test-related data)

How would you analyze and describe the chances of success in reaching the goal of
100% proficiency in language arts literacy and mathematics by 2014: mission accomplished or mission impossible? (Objective: develop and demonstrate capacity to find patterns and to reach judgments about patterns in test-related data)

   a. Majority students?
   b. Minority students?
   c. English language learners?
   c. Economically disadvantaged students?

6. Would you agree that students in the earlier grades are more likely than students in later grades to reach 100% proficiency in language arts literacy and mathematics by 2014? (Objective: develop and demonstrate capacity to reflect on test data for different levels of schooling)

7. Based on your analysis of the Assessment 2005-06 data and previous projects completed in this course, what is your opinion of the AYP targets that are set for schools in New Jersey? Are these well intended and realistic? Well intended, but unrealistic? Not well-intended, and not realistic? Not relevant to the competitiveness of U.S. students nationally and internationally? (Objective: develop and demonstrate understanding school testing and school socioeconomic status)

Demonstration Task (product)

Based on your analysis of the New Jersey Report Card Assessment data, write a memorandum to the board of education presenting the state of academic performance of the public school districts in New Jersey as a whole. Give a thoughtful account of how well NJ school districts are performing, relative the goals of NCLB and whether or not you see bright spots in the results for particular categories of school districts, testing programs, or subjects tested. (Objective: develop and demonstrate analyses of data for purposes of making critical judgments about the performance of school districts)
Tentative Schedule

Sessions 1 – 2: Finding and Presenting Data

Readings:

B&R Chapter 2 - 3

Wainer: How to make a bad graph

Other: http://schoolfinance101.wordpress.com/2011/04/08/dumbest-real-reformy-graphs/

Task for class discussion: Find the most absurd graph you can, preferably related to education policy, reform, research of any type. This graph might be from a web site, a report or even a school board presentation. Look for things like those pointed out by Wainer in his article. Also, take a look at the following blog posts:

Be prepared to make a short presentation in class on the graph you found, explaining precisely why the graph and/or conclusions drawn from it are absurd.

Sessions 3 – 4: Indicators, Ratios & Descriptive Statistics

Readings:

B&R Chapter 4 – 5

School Funding Fairness Indicators: www.schoolfundingfairness.org

Task for class discussion: Find a misinterpreted or poorly presented descriptive/comparative/ranking/indicator graph or table to discuss in class.

Additional, primarily descriptive reports (for browsing):


Session 5: Guided work session

These guided work sessions are intended to allow you to work on your computers in your teams in class, where I can hopefully assist you in overcoming annoying data barriers and technical issues, as well as more substantive issues of framing your research questions and organizing your data to best answer those questions.

Session 6: Team Presentations

Session 7 – 8: Finding & Interpreting Relationships in Data

Readings:

B&R Chapter 6 – 8

Readings on Causal Inference & Extrapolation

Howard Wainer critique of Heritage Foundation’s “Money Doesn’t Matter” argument

Blog posts worth reading

Video of Howard Wainer discussing statistical models for measuring teacher effectiveness: http://www.njspotlight.com/ets_video2/

Task for class discussion: Find a misinterpreted or poorly presented graph of relationships in educational data.

Session 9: Evaluating Change over Time

Readings:

B&R Chapter 9 - 11

The When, Whether and Who in Evaluating Education Reform:

Session 10: Team Presentations

Session 11 – 12: Revisiting Tools for Demo Project

Readings:

B&R pp. 61-64 (filters and pivot tables)

Session 13: Alternative Problem Solving Perspectives – Systems Models

Readings:

B&R Chapter 12 - 14

Session 14: Guided Work Session

Session 15: Final Presentations (Demo Project)
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Clear: Were the figures, oral and written explanations of the figures, data and findings clearly presented and easy to understand (accounting for complexity)? Was the presenter able to respond to questions regarding the figures and explanations in a clear and concise way?
Compelling: Did the brief, executive summary and presentation present a compelling argument and/or set of conclusions to be drawn from the data? Were the conclusions sufficiently supported by the data?

Discussion: What do the following graphs mean?

Source: http://www.dfer.org/2011/03/march_madness_.php#more
Inflation-Adjusted Cost of a K-12 Public Education and Percent Change in Achievement of 17-Year-Olds, since 1970

Raw Data: The More a State Spends on Schools, The Worse Its Kids' SAT Scores


Source: Promotional materials (original) for *The Cartel*