Final Project
Data Science for Social Impact | Fall 2017

NEW YORK UNIVERSITY

Overview
The goal of this project is to give you practice grappling with many of the concepts we have discussed this semester at the intersection of Data Science and Social Impact. To achieve this you will be assigned to a group of three. Each group will work through a series of tasks related to an actual data-driven research project.

Choosing a project
As a group, you need to choose a project based on the following criteria:

1) You may use refereed journal articles only
2) Data and code must be available (see list of resources below)
3) The results must have the potential for social impact
4) The analyses can't be so complicated that you don't understand the replication

Tasks
Imagine you are the researchers who conducted the study in the journal article you've chosen. Please respond to the following prompts as if you are the research team.

1) **Intro:** What motivated the primary research question you chose (just choose one!). [≈1/2 page]
2) **Stakeholders.** Which groups or individuals would you identify as the most important stakeholders for this research (cannot be more than ten)? Describe what you think the incentives and motivations were for each. [≈1 page]
3) **Describe the available data.** How did you arrive at these data? Did you have to form research partnership?
    a. If a research partnership was involved, *imagine* what sorts of collaboration issues were involved? Were confidentiality issues at play? Did you have to get IRB approval? Was anyone opposed to sharing the data? [≈1page]
    b. If a research partnership was not involved, imagine a follow-up study on the same topic that required forming a research partnership. What sorts of collaboration issues would be involved? What confidentiality issues would be at play? Would you have to get IRB approval? Would anyone have been opposed to sharing the data? [≈1page]
4) **Data/policy fit.** Suppose you had little control over the data collected. Describe some disconnects between the data and what you care about. Do the measurements/survey items reflect the concepts/research goals that you care about? Is the sample representative of the population you care about? Does the research design allow for causal interpretations to be made?
   What thoughts do you have about the likelihood that the results will be misinterpreted or misused? If there is a risk of misinterpretation or misuse, who might be doing the misinterpreting? [≈1.5 pages]
5) **Reproducibility**. Replicate the analyses in the paper using a statistical analysis software package. Note any problems in the code and/or data that was provided. Make sure to document your code and submit it as part of the final set of materials. [Submit new code as separate document and include a paragraph or two in your document describing any challenges or thoughts about the process of trying to reproduce the results.]

6) **Modeling.** Talk us through what you imagine happened when deciding what analyses to run or what hypotheses to test. Do you think the code represented every analysis that was actually run? Were some analyses likely left out of the published version of the paper? [≈.5page]
   Run five more analyses for the same research question making plausible changes to aspects of the analysis such as who is in the sample, variable definitions, what subgroups it was run on, or what inputs are included in the model (among other possible changes). Report the results from the new analysis side by side with the reported results in the paper. [≈1.5 pages including a relevant table or figure comparing the results]
7) **Social Impact**. What is the potential social impact of the results? How would you turn these research results into policy or practice? [≈.5 pages]
8) **Communication**. Prepare presentations of the results to two groups:
   a. Stakeholders. Create a summary of the results on 1 page that could be presented to one of the groups of stakeholders at a meeting. It should not use technical language, should be as honest as possible, and have pretty visualizations.
   b. Academic peers. Create a 10 minute visual presentation (powerpoint, Prezi, beamer, etc) of the research covering the categories above to present to your peers in this class.
   c. Your professors (us!). Turn in a written report (12 point Times New Roman font at 1.15 spacing) addressing all of the issues above (see guidance above about how much to write on each topic).

Resources I:
Here is a list of resources for finding a data-driven social impact article with code and data available:

American Economic Association journals
Angrist Data Archive
Harvard Dataverse

Resources II:
If you are unable to find a paper you like on your own, we have identified a number of possibilities for you below.

1. Beyond the Classroom: Using Title IX to Measure the Return to High School Sports
Betsey Stevenson, 2010
PSC Working Paper Series, PSC

Author's calculations based on data from National Longitudinal Survey of Youth, 1979 (NLSY79). This article assesses the effect of welfare reform on teenage pregnancy, childbirth, and school dropout using a nationally representative longitudinal
survey, the National Longitudinal Survey of Youth, 1997 (NLSY97).

2. Welfare Reform and Teenage Pregnancy, Childbirth, and School Dropout
Lingxin Hao and Andrew J. Cherlin, 2004
Johns Hopkins University

This study estimates the effect of welfare reform on adolescent behaviors using a difference-indifferences approach. After defining the prereform and reform cohorts and considering the life

course development of adolescent behavior by following each cohort from age 14 to age 16, we compare the welfare-target and nontarget populations in the two cohorts. The difference in-differences estimates are obtained using an event history model. Our analysis suggests that welfare reform has not reduced teenage fertility and school dropout. We find modest evidence that welfare reform is associated with higher risk of teenage births for girls in welfare families and higher risk of school dropout for girls in poor families. A combination of a difference-in-differences approach and a life course perspective can be a useful way to delineate the effect of societal level change on family phenomena. Most of the attention paid to the Personal Responsibility and Work Opportunity Reconciliation Act (PRWORA), commonly known as welfare reform, has focused on mothers' transitions from welfare to work and on the time limits, sanction, and work requirements instituted to promote this transition. Improving the well-being of children and adolescents, however, was an important subsidiary goal

3. Do male dropouts benefit from obtaining a GED, postsecondary education and training?
Murnane and Willet, 1999
NBER

The authors use the longitudinal data from the NLSY to investigate whether the wage trajectories of male high school dropouts are affected by the acquisition of the GED credential, by postsecondary education and by training.

4. Cash Transfers, Behavioral Changes, and Cognitive Development in Early Childhood: Evidence from a Randomized Experiment
Karen Macours, Norbert Schady and Renos Vakis, 2012
American Economic Journal: Applied Economics

Cash transfer programs have become extremely popular in the developing world. A large literature analyzes their effects on schooling, health and nutrition, but relatively little is known about possible impacts on child development. This paper analyzes the impact of a cash transfer program on early childhood cognitive development. Children in households randomly assigned to receive benefits had significantly higher levels of development nine months after the program began. There is no fade-out of program effects two years after the program ended. Additional random variation shows that these impacts are unlikely to result from the cash component of the program alone.

http://www.aeaweb.org/articles.php?doi=10.1257/app.4.2.247

5. Investing Cash Transfers to Raise Long-Term Living Standards.
Gertler, Paul J., Sebastian W. Martinez, and Marta Rubio-Codina. 2012.
American Economic Journal: Applied Economics, 4(1): 164–92.

Using data from a randomized experiment, we find that poor rural Mexican households invested part of their cash transfers from the Oportunidades program in productive assets, increasing agricultural income by almost 10 percent after 18 months of benefits. We estimate that for each peso transferred, households consume 74 cents and invest the rest, permanently increasing long-term consumption by about 1.6 cents. Results suggest that cash transfers can achieve long-term increases in consumption through investment in productive activities, thereby permitting beneficiary households to attain higher living standards that are sustained even after transitioning off the program. (JEL D14, H23, I38, O12)

http://www.aeaweb.org/articles.php?doi=10.1257/app.4.1.164

6. Are Female Leaders Good for Education? Evidence from India.
Clots-Figueras, Irma. 2012.
American Economic Journal: Applied Economics, 4(1): 212–44.

This paper shows that the gender of politicians affects the educational levels of individuals who grow up in the districts where these politicians are elected. A unique dataset collected on politicians in India is matched with individual data by cohort and district of residence. The political data allow the identification of close elections between women and men, which yield quasi-experimental election outcomes used to estimate the causal effect of the gender of politicians. Increasing female political representation increases the probability that an individual will attain primary education in urban areas, but not in rural areas, and not in the sample as a whole.

http://www.aeaweb.org/articles.php?doi=10.1257/app.4.1.212

7. Are High-Quality Schools Enough to Increase Achievement among the Poor? Evidence from the Harlem Children's Zone.
Dobbie, Will, and Roland G. Fryer. 2011.
American Economic Journal: Applied Economics, 3(3): 158–87.

Harlem Children's Zone (HCZ), an ambitious social experiment, combines community programs with charter schools. We provide the first empirical test of the causal impact of HCZ charters on educational outcomes. Both lottery and instrumental variable identification strategies suggest that the effects of attending an HCZ middle school are enough to close the black-white achievement gap in mathematics. The effects in elementary school are large enough to close the racial achievement gap in both mathematics and ELA. We conclude with evidence that suggests high-quality schools are enough to significantly increase academic achievement among the poor. Community programs appear neither necessary nor sufficient. (JEL H75, I21, I28, J13, R23)

http://www.aeaweb.org/articles.php?doi=10.1257/app.3.3.158

8. Impact Evaluation of Food for Education Program in Bangladesh, 2000
Akhter Ahmed, 2000
International Food Policy Research Institute (IFPRI)

The Impact Evaluation of Food for Education (FFE) survey was conducted in Bangladesh in 2000 to evaluate the effect of a conditional transfer of food to poor families that was designed to increase school attendance. The survey covered 600 households in 60 villages in 30 unions in 10 thanas, and 110 schools in the same 30 unions from which the household sample was drawn. Ten thanas were first randomly selected with probability proportional to size (PPS), based on thana-level population data from the 1991 census, and two FFE unions and one non-FFE union were selected per thana. From each union, two villages were randomly selected with PPS using village-level population data from the 1991 census. Because the focus of the FFE program was on economically disadvantaged areas, the sample of non-FFE unions was also selected from neighboring economically disadvantaged areas. This means that the subsequent sample cannot be regarded as representative of rural Bangladesh as a whole, but it does broadly characterize the conditions in the poorest upazilas in the country.

http://www.ifpri.org/dataset/impact-evaluation-food-education-program-bangladesh-2000

9. The Effect of Images of Michelle Obama's Face on Trick-orTreaters' Dietary Choices: A Randomized Control Trial

This paper evaluated the microfoundations of a personality-inspired public health campaign's influence on minors through a multi-year randomized control trial. The authors estimated that viewing a photograph of Michelle Obama's face relative to control conditions caused children to be 19% more likely to choose fruit over candy. They concluded that Michelle Obama's initiative to reduce childhood obesity has influenced children's dietary preferences. The authors mentioned that whether this influence extends beyond Halloween trick-or-treating in New Haven, CT on the porch of an economics professor requires further research.

https://dataverse.harvard.edu/dataset.xhtml?persistendId=doi:7910/DVN/2NJV2P

10. Tennessee STAR project

The Student/Teacher Achievement Ratio (STAR) was a four-year longitudinal class-size study funded by the Tennessee General Assembly and conducted by the State Department of Education. Over 7,000 students in 79 schools were randomly assigned into one of three interventions: small class (13 to 17 students per teacher), regular class (22 to 25 students per teacher), and regular-with-randomly assigned to the classes they would teach. The interventions were initiated as the students entered school in kindergarten and continued through third grade.

https://dataverse.harvard.edu/dataset.xhtml?persistId=hdl:1902.1/10766

11. One Laptop per Child at home: Short-term impacts from a randomized experiment in Peru

This paper presents results from a randomized controlled trial whereby approximately 1,000 OLPC XO laptops were provided for home use to children attending primary schools in Lima, Peru. The intervention increased access and use of home computers, with some substitution away from computer use outside the home. Children randomized to receive laptops scored about 0.8 standard deviations higher in a test of XO proficiency by showed lower academic effort as reported by teachers. There were no impacts on academic achievement or cognitive skills as measured by the Raven's Progressive Matrices test. Finally, there was little evidence for spillovers within schools.

https://www.aeaweb.org/articles?id=10.1257/app.20130267

13. The Effects of Test Translation on Young English Learners' Mathematics Performance
Joseph P. Robinson

Using a nationally representative sample of kindergarteners and first graders, this study asks if native-language test translations help English language learners (ELLs) demonstrate their mathematics skills. ELLs frequently encounter testing hurdles because they are not proficient in English, the predominant language of assessments. Low scores on these assessments can limit ELLs' academic opportunities through inappropriate track placements and decreased confidence. This study uses a rigorous quasi-experimental design (regression discontinuity design) and finds that Spanish-speaking ELLs perform significantly better on mathematics assessments when tested in Spanish (instead of English) in kindergarten and first grade (Cohen's ds > 0.85). Because these and other findings suggest that test translations may provide ELLs with opportunities to demonstrate their mathematics knowledge, policy makers should consider adding translations to the list of available accommodations.