14.320: Recitation 7
The Research Workshop

Martina Uccioli[1]

March 23, 2023

[1]This material draws extensively on Viola Corradini's recitation slides - many thanks to her and to previous generations of 14.320 TAs.

Agenda

- What is the research workshop
- Assign a paper to each of you
- Demo of a presentation

Research workshop

You will present a research paper.

Purpose:

- Seeing how tools you learn in class are used in actual research
- Familiarising with frontier research in empirical economics
- Practising presenting a paper

Research workshop - logistics

- Papers can be chosen from the main reading list (excluding starred and BIP'ed) or from the 14.320 supplemental reading list
  - Full list of papers here. (they should all be on canvas)
- Each of you will be assigned one paper
- Presentations should last 15 minutes
  - Plan for 12' and leave time for questions

Assignment of presentation slots

1. You rank the papers and presentation dates

Assignment of presentation slots

1. You rank the papers and presentation dates

2. We assign papers with random serial dictatorship (which we know is strategy-proof and Pareto efficient)

Assignment of presentation slots

1. You rank the papers and presentation dates

2. We assign papers with random serial dictatorship (which we know is strategy-proof and Pareto efficient)
   - Everyone will be assigned a random number (seed: 41193)
   - The student with lowest number gets her top choice; the student with the second lowest number gets his top choice among those remaining; and so on.

Assignment of presentation slots

1. You rank the papers and presentation dates

2. We assign papers with random serial dictatorship (which we know is strategy-proof and Pareto efficient)
   - Everyone will be assigned a random number (seed: 41193)
   - The student with lowest number gets her top choice; the student with the second lowest number gets his top choice among those remaining; and so on.

3. I will assign dates tonight
   - Also using random serial dictatorship (seed: 11021993)
   - But subject to the topic constraint (e.g we'll do papers that use RD after we have covered RD in class)

Rank your papers!

Now you have 10 minutes to rank at least 30 papers from the list and submit your ranking using this form: https://forms.gle/jYSgDG2qb1znFaiv5

- Use the **numbers** associated with the papers, *not* the title / author names
- Separate the numbers using a semicolon (;)

What does a presentation look like?

A typical presentation of an empirical research paper follows this **structure**:

1. Motivation
2. This paper/Research question
3. (Preview of results)
4. (Literature)
5. (Outline)
6. Conceptual framework/Theory
7. Data/Background
8. Empirical strategy/Identification
9. Results
10. Conclusions/Policy Implications

What does a presentation look like? (c'ed)

These are just guidelines. 15' is very little time, and ideally we'd like to have some room for questions/discussion, so can change as you see fit!

Also, for the purposes of this class, maybe try to give more emphasis to empirical strategy and why it helps with causality.

An example: DDK (2011) in 15'

Peer Effects, Teacher Incentives, and the Impact of Tracking: Evidence from a Randomized Evaluation in Kenya

Authors: Duflo, Dupas and Kremer (2011)

Motivation

- Many schools in the world **track students** on the basis of prior achievement
  - This is true both in developing world (e.g. Kenya) as in developed countries (Germany, Italy, some public schools in NYC etc.)

- How could tracking **affect students' learning**? Two potential effects:
  - (direct) **peer effects**
  - teachers changing **target teaching level** (match effect)

- A priori **ambiguous** which one dominates and why.

This paper

This paper asks:

1. **Average impact of tracking**: What is the effect of tracking on the learning of students?
2. **Heterogeneity in effect of tracking**: Does tracking equally benefit all students? Is this good or bad for lower achieving students? Does this increase inequality in achievement?
3. **Mechanisms**: What role do direct **peer effects** play? What role do **teachers' incentives** play? How does teaching respond to tracking?

To assess the causal effect of tracking, use a **RCT** that assigns some schools to "tracking" treatment (split sections according to baseline scores).

Conceptual framework

Students outcomes:

$$y_{ij} = x_{ij} + f(\bar{x}_{-ij}) + g(e_j)h(x_j^* - x_{ij}) + u_{ij} \tag{1}$$

where y_{ij} is endline scores of student i in class/teacher j; x_{ij} is baseline scores.

- Peers can have:
  - direct effect $f(\bar{x}_{-ij})$
  - indirect effect through target teaching level $g(e_j)h(x_j^* - x_{ij})$

Conceptual framework - cont'd

Teachers choose effort e and target teaching level x^* to maximize payoff:

$$P(\{y_{ij}\}_{i \in j}) - c(e)$$

- payoff function $P(.)$ can be:
  - convex $\rightarrow$ target teaching towards higher achieving students
  - linear $\rightarrow$ target teaching towards median student (within each section)
  - concave $\rightarrow$ target teaching towards lower achieving students

- What does this represent?
  - Extrinsic incentives: rewards based on students' test scores at primary school exit exam $\rightarrow$ focus on students likely to take it
  - Intrinsic incentives

Data, sample, experimental design

- Sample: 10,000 1st grade students in 121 primary schools, with 2 first grade sections each

- Experimental design: randomly assign 61 schools to track students on the basis of past achievement
  - in tracking schools: 2 sections, one with high achievers, one with low.
  - in non-tracking: 2 sections, with both high and low achievers. Students randomly assigned to each section within school.

Main empirical strategy

1. **Average effect of tracking**:

$$y_{it} = \alpha T_j + X_{ij}\beta + \epsilon_{ij}$$

where y_{ij} is endline test scores, T_j dummy for whether school j is in tracking arm.

2. **Differential effects** for lower achieving students:

$$y_{it} = \alpha T_j + \gamma T_j \cdot B_{ij} + X_{ij}\beta + \epsilon_{ij}$$

where B_{ij} is a dummy indicating students in bottom half of baseline scores.

Main results: Tracking helps everyone (but high achieving students more)

	Total score				Math score		Literacy score	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Panel A. Short-run effects (after 18 months in program)								
(1) Tracking school	0.139 (0.078)*	0.176 (0.077)**	0.192 (0.093)**	0.182 (0.093)*	0.139 (0.073)*	0.156 (0.083)*	0.198 (0.108)*	0.166 (0.098)*
(2) In bottom half of initial distribution × tracking school			−0.036 (0.07)		0.04 (0.07)		−0.091 (0.08)	
(3) In bottom quarter × tracking school				−0.045 (0.08)		0.012 (0.09)		−0.083 (0.08)
(4) In second-to-bottom quarter × tracking school				−0.013 (0.07)		0.026 (0.08)		−0.042 (0.07)
(5) In top quarter × tracking school				0.027 (0.08)		−0.026 (0.07)		0.065 (0.08)
(6) Assigned to contract teacher		0.181 (0.038)***	0.18 (0.038)***	0.18 (0.038)***	0.16 (0.038)***	0.161 (0.037)***	0.16 (0.038)***	0.16 (0.038)***
Individual controls	No	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	5,795	5,279	5,279	5,279	5,280	5,280	5,280	5,280

Main results: Tracking helps everyone (cont.)

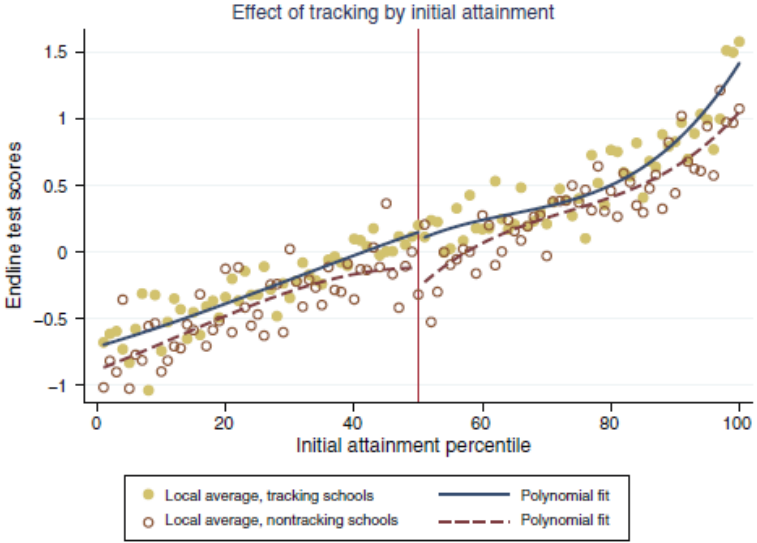

FIGURE 3. LOCAL POLYNOMIAL FITS OF ENDLINE SCORE BY INITIAL ATTAINMENT

Unpacking mechanisms: empirical strategy

To unpack role of **peer effects and teacher incentives**: use **RD** in tracking schools.

Idea: students just above and just below the median baseline score in tracking schools are very very similar, but they get assigned to different sections.

- Direct peer effect should favor student just above
- Indirect peer effect: ambiguous, depends on convexity/concavity of payoff function:
  - If convex, favors student just below $\rightarrow$ offsetting effect
  - If concave, favors student just above $\rightarrow$ reinforcing effect
  - If linear, they are both equally distant from target level

Unpacking mechanisms: empirical strategy (cont.)

Estimating equations:

- Reduced form equation

$$y_{ij} = \delta B_{ij} + f(p_{ij}) + X_{ij}\beta + \epsilon_{ij}$$

where $f(p_{ij})$ is a flexible function of the percentile of baseline scores

or

- corresponding 2SLS

$$y_{ij} = \kappa \bar{y}_{-ij} + f(p_{ij}) + X_{ij}\beta + \epsilon_{ij}$$

where B_{ij} is used as an instrument for $\bar{y}_{-ij}$.

RD results

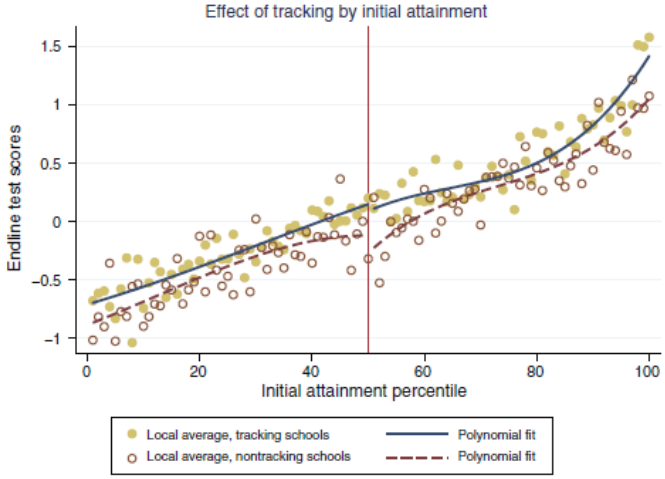

FIGURE 3. LOCAL POLYNOMIAL FITS OF ENDLINE SCORE BY INITIAL ATTAINMENT

Median students in tracking schools scored similarly regardless of whether assigned to top or bottom section (but do better than their counterparts in nontracking schools)

Conclusions

- Understanding benefits of tracking important for educational policies $\rightarrow$ this paper provides first experimental evaluation of it.

- Tracking benefits everyone (both high and low baseline students)
- Although it benefits more higher baseline students

- Evidence consistent with both direct and indirect peer effects:
  - All student benefit from stronger peers (direct effect)
  - Convex teacher incentives: teachers focus on students at the top of the distribution within each class (indirect effect)