Written Exam at the Department of Economics winter 2019-20

Science of Behavior Change

Final Exam

December 17, 2019

(2-hour closed book exam)

Suggested answers.

Answer 1

- a) The average treatment effect (ATE) is a measure used to compare treatments (or interventions) in randomized experiments and evaluation of policy interventions. The ATE measures the difference in mean (average) outcomes between units assigned to the treatment and units assigned to the control.
- b) As we discussed in class, ATE does not allow researchers to estimate the percentiles of the distribution of treatment effects or other moments such as the variance (vs. heterogeneous treatment effects) and, unlike measures based on percentiles such as the median, the ATE is sensitive to outliers, i.e. observations whose value greatly differs from the rest. Moreover, "experiment population" is not necessarily a random sample of the entire population (selected according to observables). Thus, since the effect of the treatment is measured on a sub-population, we only learn the effect of the treatment on the particular sub-population from which the sample is drawn.
- c) The ITT might be the relevant estimate in some situations, because it provides researchers with a measure of how much the intervention is "converting" into outcomes, as it considers the difference in outcomes between those who were initially assigned to treatment and the control group, irrespectively of whether they complied with their treatment assignment. Researchers can also estimate the Local Average Treatment Effect (LATE). Local Average Treatment Effect (LATE) measures average treatment effect for individuals induced into treatment. Note, however, that the average treatment effect measured by the LATE is only valid for that particular subpopulation (the compliers), and might differ from the ATE for the whole population, limiting its generalizability.

Answer 2

a) The authors recruited parents of children aged 3-5 enrolled in one of eight subsidized preschools in Chicago to participate in the Parents and Children Together (PACT) program. For six weeks, the PACT program lent 169 parents an electronic tablet with a pre-loaded app that included 500 children's books. While open, the app automatically audio and video recorded the parent and child reading. Within each preschool center, parents were randomized to either a treatment group or control group.

The **treatment**, designed to increase the time that parents spent reading to their children, used three behavioral tools:

 A commitment device: each week parents recorded on a website an individual goal for how much time he or she would spend using the reading app during the next week.
Reminders: every weekday, parents regularly received text messages reminding them to work toward their time goal and stressing the importance of reading.

3) A **social incentive**: at the end of the week, parents learned how their actual tablet use compared to their goals. Parents who met their weekly goal received a congratulatory text and all parents received a text announcing the tablet number of the parent who read the most to his or her child, an anonymous form of social recognition.

In addition, the tablets included information on the importance of parents' reading to their children.

Parents in the <u>comparison</u> group did not set goals or receive any text messages from researchers, and their tablets included information on hygiene instead of reading.' To measure the impact of the PACT program on parents' reading efforts, researchers used data collected by the app on the time spent reading and the number of books completed. Researchers also surveyed parents on their parenting beliefs and administered questions that measured parents' patience levels.

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- b) Over the six weeks of the PACT program, parents in the treatment group spent 88.3 more minutes reading with their children than parents in comparison group, who spent an average of 63.3 minutes. This represents a one standard deviation difference (see column 1). Moreover, parents in the treatment group completed 16.6 more books than parents in the comparison group, who read 14.8 books (column 2). Within the treatment group, 96 percent of parents used the app at least once, compared to 84 percent of parents in the comparison group (column 3).
- c) The authors implemented a time-preference task designed to measure parents' time discount rate to examine whether parents with a higher discount rate read less and responded more to their treatment. Indeed, the behavioral tools had a greater effect on

less patient parents, who tend to undervalue the future. For the less patient half of parents, the behavioral tools and information increased time spent reading by 124.5 minutes, almost three times as much as the effect for more patient parents. This suggests that behavioral tools might be particularly useful for parents who believe that spending time reading with their child is important, but choose to delay investing in these activities.

Answer to Question 3:

This question has not a correct answer a priori. This question gives the student the possibility to show that he/she can use his/her competencies for solving practical problem. Students should:

- a) define the context in which the intervention is going to happen (when, where and who is the target agent).
- b) briefly think through the behavior change and articulate the specific behavior that he/she wants to change as a result of the intervention (*a specific and measurable behavior*).
- c) map the decision-making process: different stages that people go through; various frictions and possible bottlenecks.
- d) make a linkage between that map that he/she has just drawn, the process that he/she has just identified, and some of the concepts that we discussed in this course.
- e) describe the intervention in detail
- f) describe the design of an experiment that can test the intervention and present how to organize the data analysis.