

Assessing the Effectiveness of Office Hours: A Causal Approach

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Question

- Nearly all instructors hold regular office hours
- Many institutions require office hours
- Many studies indicate they are an important part of student-faculty interaction (Mook 2002, Lundberg 2004, Umbach 2005, etc.)

Fundamental Question: Do office hours actually lead to measurable improvements in student outcomes?

Challenge: Causality

Nearly all research on office hours is **observational**

- Compare average outcomes of students who attend to those who do not
- Control for demographic and academic attributes

Problem: **unobservable** selection biases causes students to choose to attend or not → correlated with outcomes

Solution: Instrumental Variables (IV)

Use a statistical technique (IV) which induces **quasi-random** variation in office hours attendance

- Some process “selects” some students to be more likely to attend office hours than other
- Estimate this relationship, then use to predict attendance
- Using predicted (rather than actual) attendance leads to a **causal interpretation**

Analogy: Experiment

An experimenter randomly puts some people in a treatment group (access to office hour) and others in a control (less access).

- We can then compare the performance difference between these two groups
- We can also compare their office hours attendance

Adjusting the performance difference by attendance difference yields impact of office hours.

Example

Suppose outcome is avg in grade and we track fraction attending office hours:

Group	Office Hours	Avg Grade
Control	0.4	80%
Treatment	0.7	85%

$$\text{Effect is } \frac{(0.85-0.80)}{(0.7-0.4)} = 16.7\%$$

Our Instrument: Schedule

We use the fact that students at UBC have very busy schedules and do not know office hours in advance

- Students whose obligations conflict with office hours have lower ability to attend
- Students whose obligations do not conflict have higher ability to attend

Controlling for major, course load (etc.) this is plausibly out of the student's control → quasi-random.

Key Assumption

We need to believe that **conditional** on the controls office hours availability is unrelated to outcome variable (grades, engagement in course)

Planned Study Population

Project in data-collection phase:

- First-year undergraduate economics students
- Conducted via survey in 2019W1
 - Collected demographic, academic, engagement, and schedule variables
- Studying impact on academic achievement and qualitative experience in course

This poster: primarily **methodological**

Creating Instruments: Soft Interventions

Easy to create instruments when testing new tools:

- Randomize a “soft” nudge to encourage use of tool or intervention
- Use nudge as an instrument, after tracking change in uptake

Advantages: limited invention required, low-cost, largely observational

Implementation

Straightforward extension of linear regression methodologies

- Supported in most common statistical packages (R, STATA, SPSS)
- Not computationally or mathematically demanding

Care **does need to be taken** when interpreting results and assessing instrumental validity → external validity