

Constructing **Credible** Comparison and Treatment Groups

Albert Yung-Hsu Liu
Mathematica Policy Research

TAACCCT Evaluation and Measurement Convening
August 7 and 8, Chicago, Illinois

Overview

- Review of internal validity
- Challenges in constructing credible comparison and treatment groups
- Framework for constructing credible comparison and treatment groups
- Minimizing “discrepancies”
- Picking cohorts for each group

Well-Designed Experimental Groups

- Treatment groups should be coherent
 - Constant treatment intensity

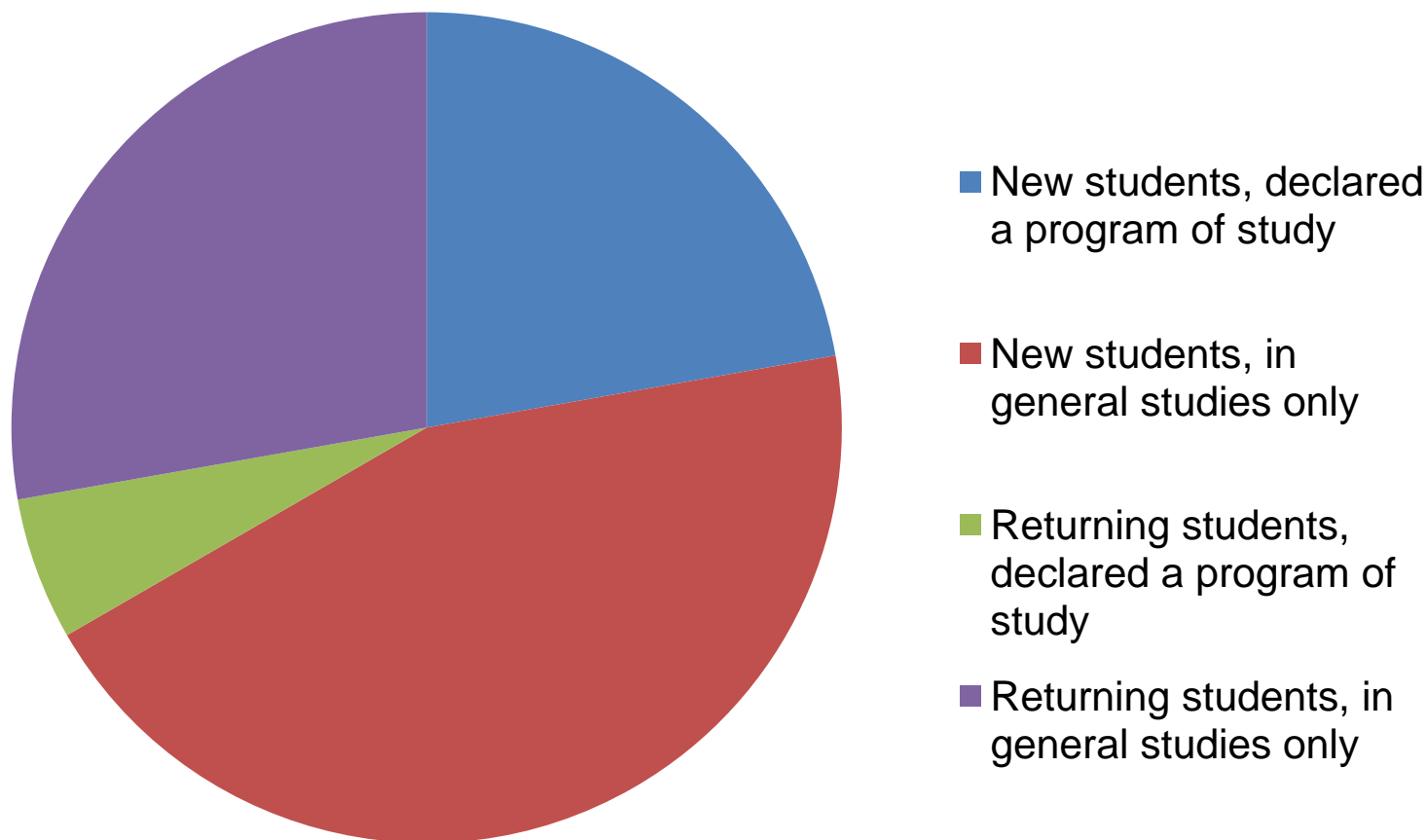
- Grantees are required to construct comparison groups
 - Serves as the counterfactual condition
 - Similar in all ways except the intervention

Comparison Group Challenges

- Potential programs of study are diverse
 - Degree or certificate
 - Industry
 - Training program length

- Potential study participants are diverse
 - Declared program of study
 - General studies only
 - New students
 - Returning students

Hypothetical **Types** of Students



Common Comparison Groups

- Types of comparison groups
 - The same colleges at the same time
 - Different colleges at the same time
 - The same colleges at different times

- Questions for grantees
 - Which type was in your proposal?
 - Is your comparison group right for you?

The Same Colleges at the Same Time

- Comparison group typically consists of
 - Students who declared a program of study only
 - Unclear if students in general studies should be in treatment or comparison group
 - Are new students only
 - Returning students in treatment group do not have constant treatment intensity

- Typical distribution of student types
 - Many students who declared a program of study
 - Many new students

Different Colleges at the Same Time

- Comparison group typically consists of
 - Students who declared a program of study and students in general studies only
 - Are new students only
 - Returning students in treatment group do not have constant treatment intensity
- Typical distribution of student types
 - Few students who declared a program of study
 - Many new students

The Same Colleges at Different Times

- Comparison group typically consists of
 - Students who declared a program of study and students in general studies only
 - Are new students only
 - Returning students in comparison group may attend school when TAACCCT funds are in use

- Typical distribution of student types
 - Few students who declared a program of study
 - Many new students
 - Few returning students

Assessing Threats to Internal Validity

	Risk of Selection into Program	Risk of Selection into College	Risk of History Threat
The Same Colleges at the Same Time	X		
Different Colleges at the Same Time		X	
The Same Colleges at Different Times			X

Propensity Score **Matching** Methods

- Comparison and treatment groups
 - Should be similar in all ways except the intervention
 - Must be similar in average age and percent male
 - Maybe similar in training program length

- Propensity score matching methods
 - Use weighted averages for comparison group
 - Weights are calculated using statistical methods
 - Minimizes differences in observables
 - Requires a statistical expert

An Example to Build Intuition

	Treatment Group	Other Group 1	Other Group 2	Comparison Group
Average Age	40	30	60	40
Percent Male	50	40	70	50
Training Program Length	1 year	0.75 year	1.5 year	1 year
Weight		$\frac{2}{3}$	$\frac{1}{3}$	

Picking Cohorts for Each Group

- Grant period is 3 years (36 months)
 - Year 1 (2012): planning year
 - Year 2 (2013): use TAACCCT funds
 - Year 3 (2014): use TAACCCT funds
- Treatment group can be drawn from year 2 and year 3 cohorts
- Comparison group can be drawn from
 - Year 2 and year 3 cohorts
 - Year 1 cohort and earlier cohorts

Implicit Grant Period Constraints

- One-year programs in year 3 cohort and two-year programs in year 2 cohort
 - Cannot observe all employment outcomes
 - Cannot get data on all employment outcomes
- Two-year programs in year 3 cohort
 - Cannot observe any outcome
 - Cannot get data on any outcome
- Exclude these cohorts in Table 2

Summary

- Comparison and treatment groups
 - Similar in all ways except for the intervention
 - Depends on the intervention and your students

- Can use propensity score matching methods
 - Comparison and treatment groups will be similar
 - Requires a statistical expert

- Need to pick cohorts for each group
 - Depends on your comparison group
 - Account for grant period constraints