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An Analysis of First-Year Experience Courses Using Propensity Score Matching

CAIR Conference 2021
Lake Tahoe, CA

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Office of Assessment and Institutional Effectiveness

CALIFORNIA STATE UNIVERSITY FULLERTON

Outline

- UNIV 100 Background
  - UNIV100 details
- Objective
  - Analyze if UNIV100 has any effect on outcomes
- Research method
  - Data selection, PSM, and how we used it
- Overview of Findings
  - Results after PSM matching and comparing outcome variables

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Does your campus offer a First-year Experience course?

Yes

No

Not sure

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Why do you think First-year Experience courses are important?

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What research or assessment has your campus done on First-year Experience courses?

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Have you used Propensity Score Matching before?

Yes

No

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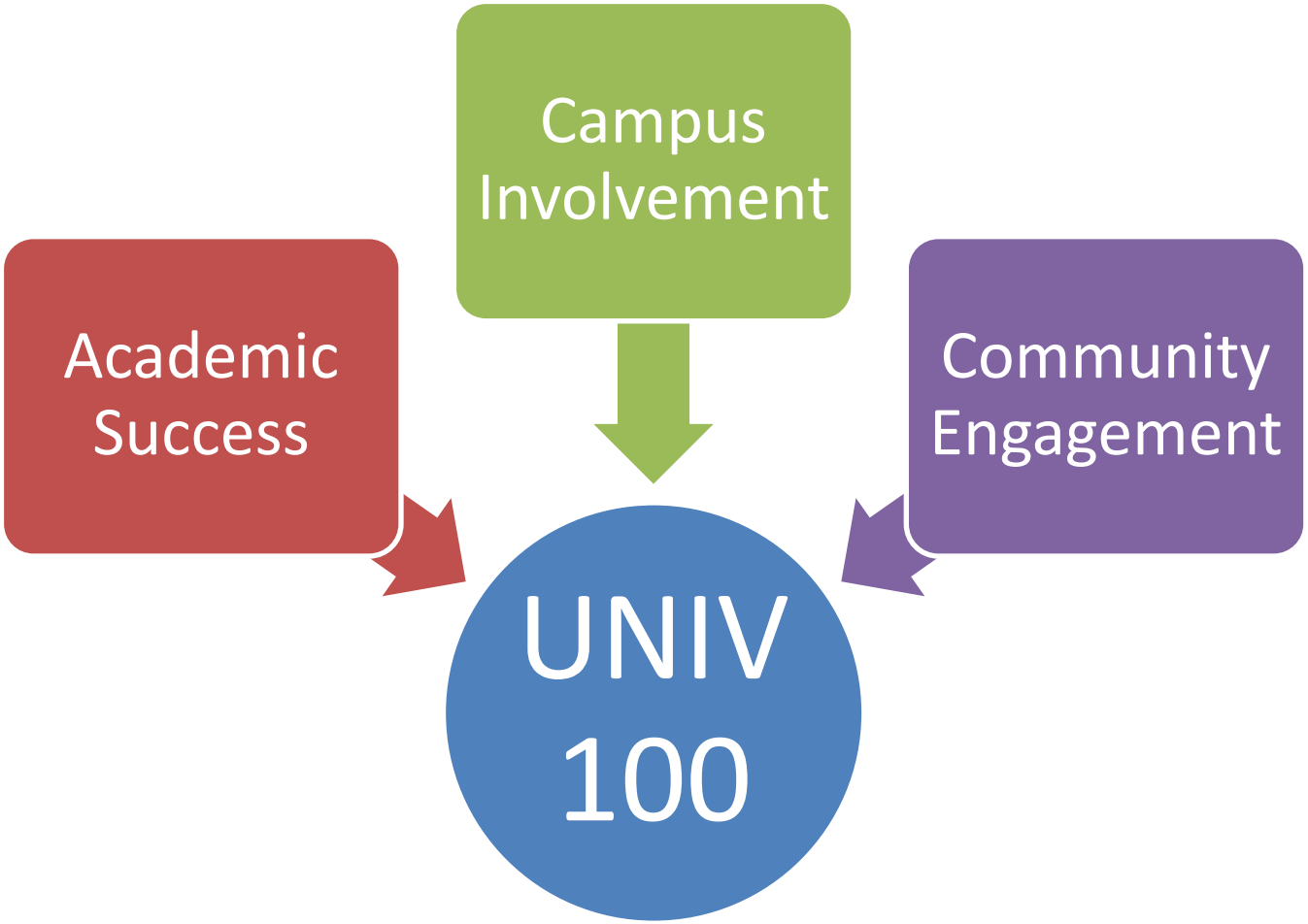
Why Enroll in UNIV100?



UNIV 100 At CSUF

CATALOG YEARS
FALL 2021 & BEYOND
48-49 Units Total

Area A - Core Competencies
9 units

Oral Communication	A.1
Written Communication	A.2
Critical Thinking	A.3

Area B - Scientific Inquiry & Quantitative Reasoning
12-13 Units

Physical Science	B.1
Life Science	B.2
Laboratory Experience	B.3
Mathematics/Quantitative Reasoning	B.4
Implications & Explorations in Natural Sciences & Math/Quantitative Reasoning++	B.5

Area C - Arts & Humanities
12 Units

*3 units from C.1; 3 units from C.2; 3 units from C.3; and 3 units from either C.1 or C.2***

Introduction to the Arts	C.1
Introduction to the Humanities	C.2
Explorations in the Arts or Humanities ++	C.3

***Designated high-unit majors may waive this requirement. See an advisor for more info.*

Area D - Social Sciences
9 Units

Courses must be completed from at least 2 different disciplines

Introduction to the Social Sciences	D.1
American History, Institutions & Values	D.2
Explorations in Social Sciences++	D.3

Area E - Lifelong Learning & Self Development
3 Units

Area F- Ethnic Studies
3 Units

Area Z - Cultural Diversity
One GE Course in B, C, D or E must double-count as a Z

Graduation Requirement
An American Government course is required for students in this Catalog Year

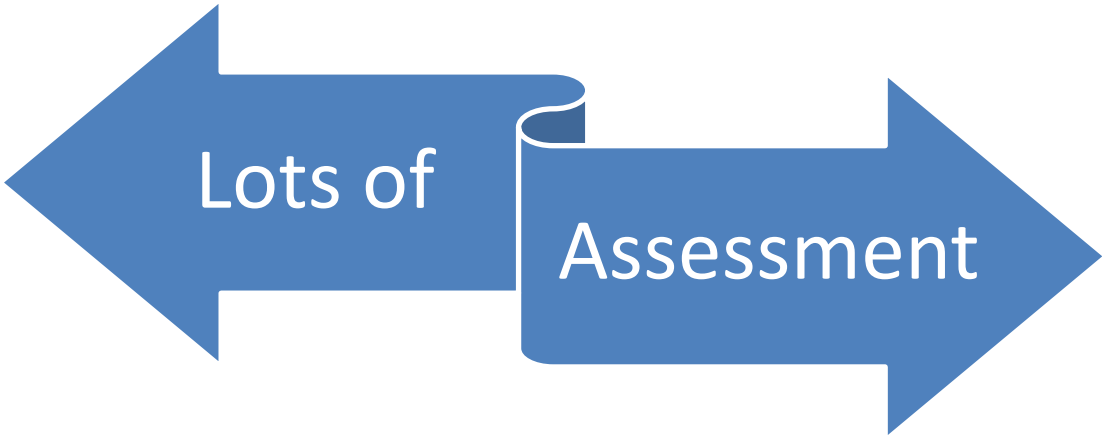
Courses in the following areas require a grade of C- or higher to earn GE credit:

- A.1 Oral Communication
- A.2 Written Communication
- A.3 Critical Thinking
- B.4 Mathematics/Quantitative Reasoning

All other GE courses require a grade of "D" or higher to earn GE credit

++ upper-division categories; 3 units required in each

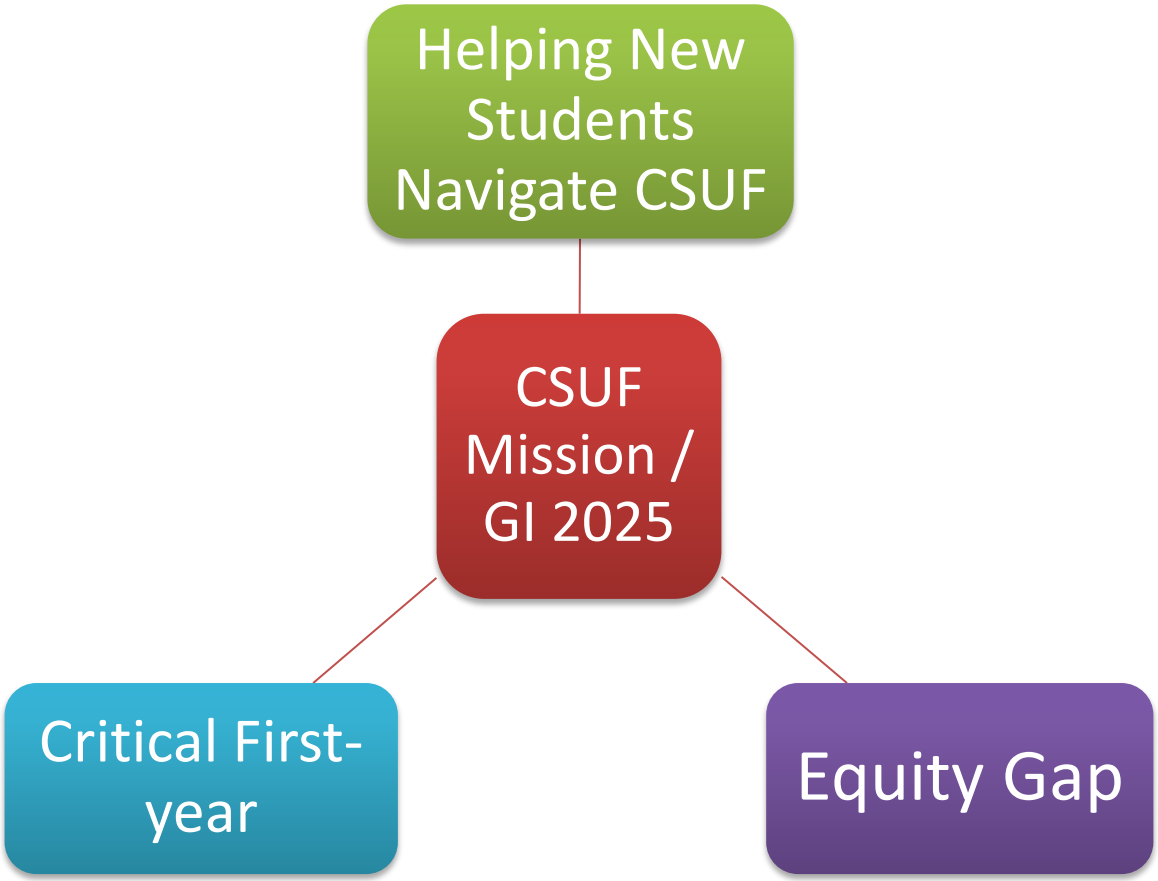
Elements of UNIV 100



Peer Mentor

MOTIVATION
ADVICE
TRAINING
SUCCESS
MENTORING
GOAL
DIRECTION
SUPPORT
COACHING

Why Research UNIV100?



Relevant studies

- Kuh (2008) studied high quality first-year experience courses
- Friedman & Alexander (2007) studied first-year linked sections
- Jamelske (2009) studied a 2006 cohort in a Midwestern public university
- Porter & Swing (2006) conducted an FYE cross-institutional study
- Clark & Cundiff (2011) note that there are five typical class formats

Hypotheses

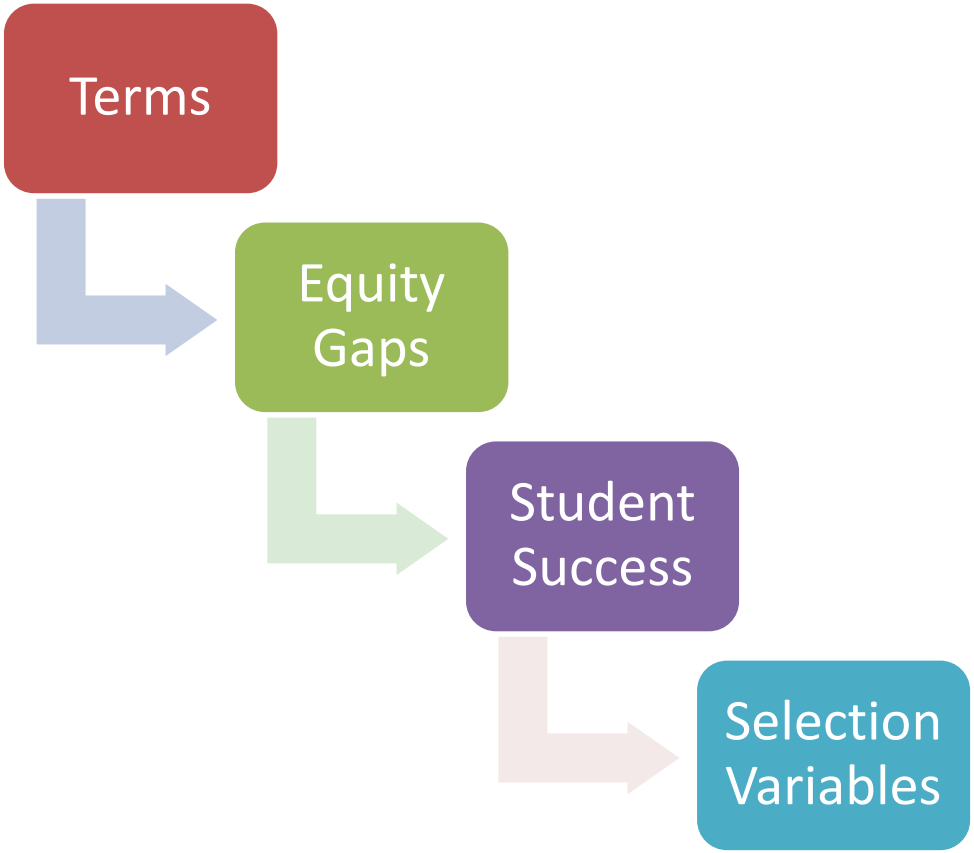
H_1

Students who take FYE will have a **higher one-year retention rate** than students who do not take FYE

H_2

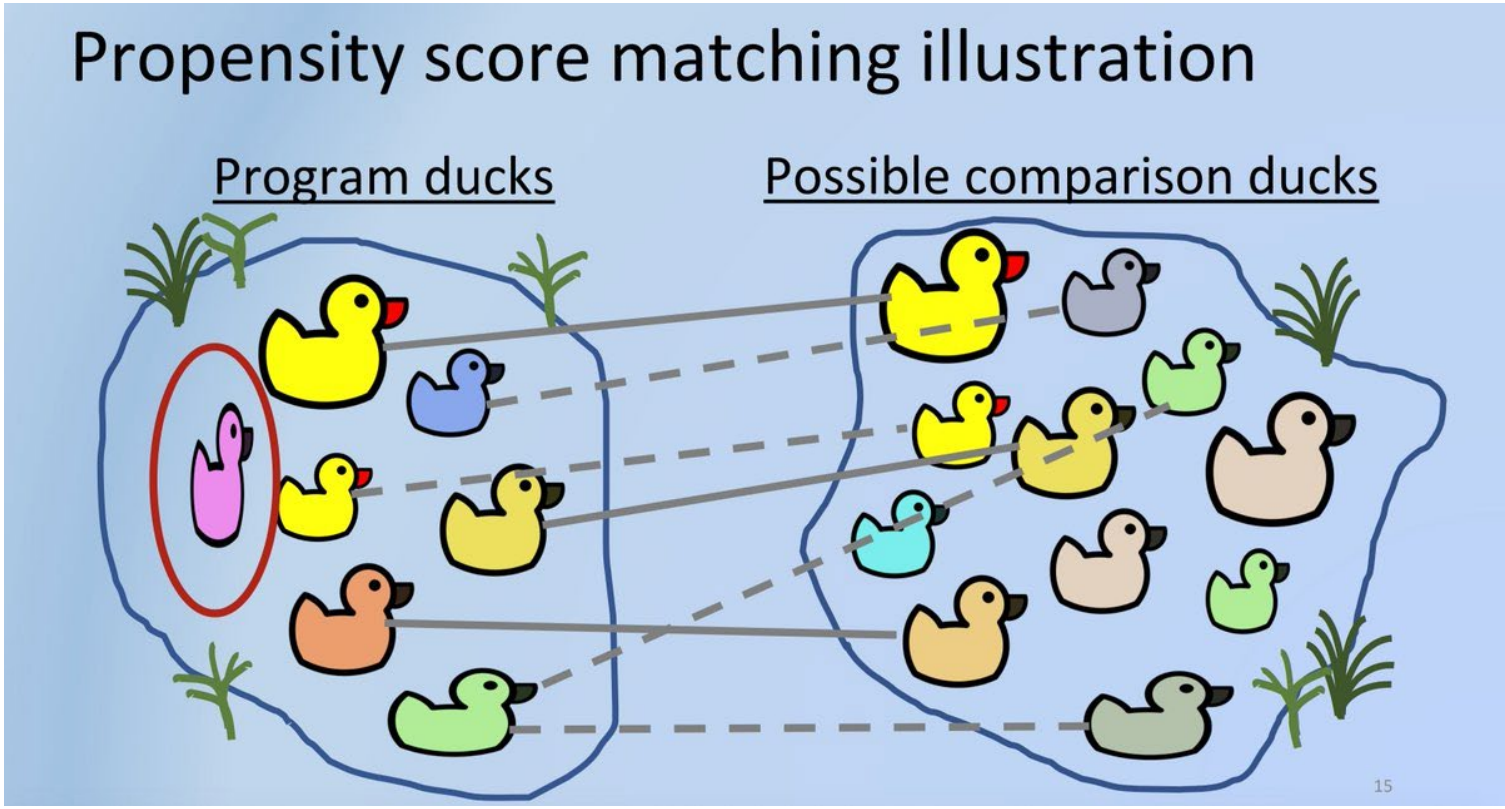
Students who take FYE will have a **higher term GPA** than students who do not take FYE

Data



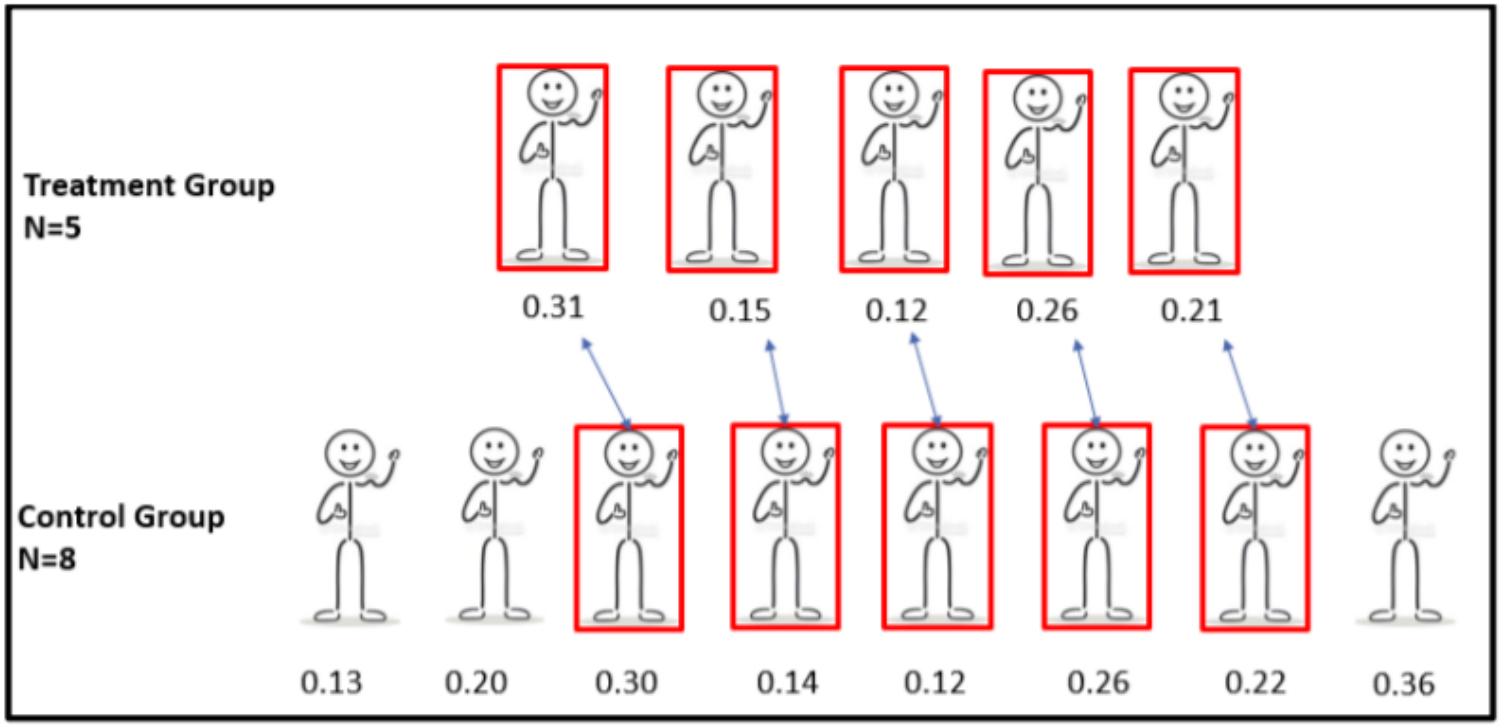
Citation: Ganem & Manasse (2011), Toutkoushian et al., (2019)

PSM rationale



Citation:
https://www.hvresearch.org/

PSM matching



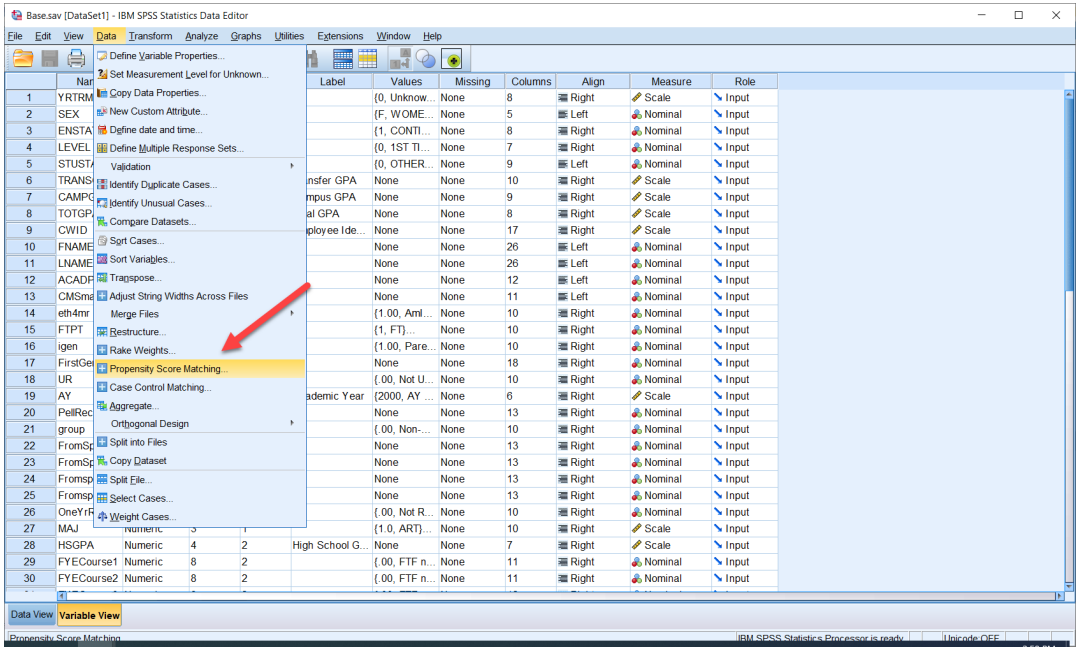
Citation: Thomas Gant, Keith Crowland (2017)

PSM Method

Citation: Leite (2019)

Navigating to PSM

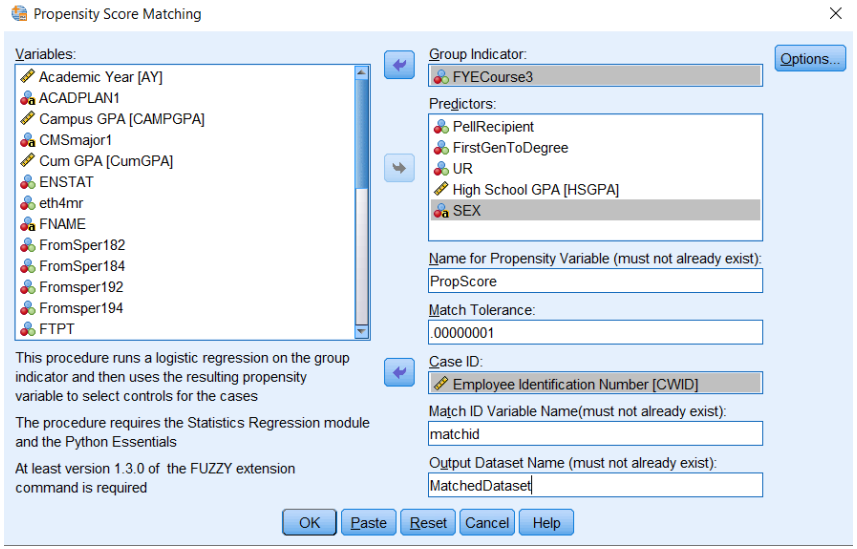
- Use this menu item to navigate to PSM
- PSM in SPSS version 26
- The Python Integration Package



Citation: Field (2013); IBM (2021)

PSM Menu Items

- Syntax + Menu Items to clean up dataset
- Group Indicator is UNIV 100
- PropScore is the propensity score
- Low tolerance level to improve matching



Descriptive term details

- The PSM analyzes students between control and treatment groups
- Reduce selection bias
- After match shows students that matched on the similar characteristics

Before Match	Fall 2017	Fall 2018	Fall 2019
No UNIV 100	3282	3516	3920
UNIV 100	1023	787	772
Total	4305	4303	4692

After Match	Fall 2017	Fall 2018	Fall 2019
No UNIV 100	749	560	586
UNIV 100	749	560	586
Total	1498	1120	1172

Citation: Pan & Bai (2015)

Descriptive variable details

- Fall 17
- Balanced design
- Selection Bias

Before PSM	Female	Male
No UNIV 100 (before)	1942	1340
UNIV 100 (before)	715	308

After PSM	Female	Male
No UNIV 100 (after)	547	202
UNIV 100 (after)	547	202
Pearson Chi-Square Sig. (Diff)		1.00

Before PSM	No Pell	Yes Pell	No First Gen	Yes First Gen	No UR	Yes UR
UNIV 100	1469	1813	1384	1898	1602	1680
No UNIV 100	399	624	389	634	434	589

After PSM	No Pell	Yes Pell	No First Gen	Yes First Gen	No UR	Yes UR
UNIV 100	288	461	273	476	317	432
No UNIV 100	288	461	273	476	317	432
Pearson Chi-Square Sig. (Diff)		1.00		1.00		1.00

Citation: Clark & Cundiff (2011)

Results

- H1: some positive benefits for retention
- H2: stronger results for term GPA

One Year Retention	Fall 2017-18	Fall 2018-19	Fall 2019-20
FTF not take UNIV100	88.3%	86.7%	87.9%
FTF take UNIV100	90.3%	91.9%	87.0%
Pearson Chi-Square Statistic	1.75	9.25	0.25
Pearson Chi-Square Sig	0.186	0.002	0.616

Term GPA	Fall 2017	Fall 2018	Fall 2019
FTF not take UNIV100	2.91	2.90	2.76
FTF take UNIV100	3.15	3.15	3.11
t-stat	-6.91	-6.12	-7.76
Sig. (2-tailed)	0.00	0.00	0.00

Closing thoughts

FYE positive effects

Retention → mild

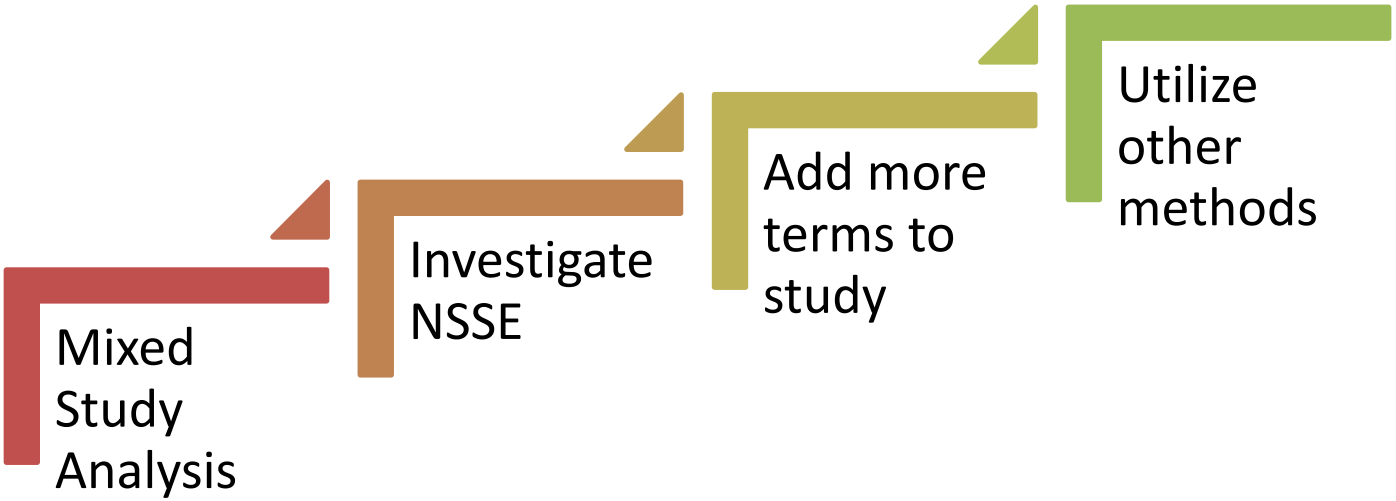
Term GPA → stronger

Equitable comparison

Covid-19 impact

Citation: Clark & Cundiff (2011)

Future research



Thank you for attending

- Questions?

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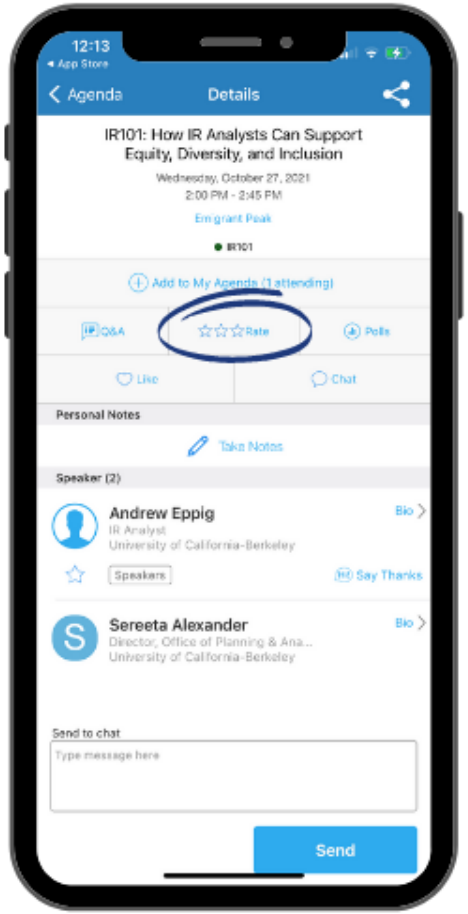
- Select **Session Feedback**
- Select the name of the session that you attended



OPTION 02

Agenda - Session

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