Using SmarterMeasure Data to Help Measure the Impact of Other Student Services

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Dr. Mac Adkins, Moderator

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GATEWAY TECHNICAL COLLEGE

Housekeeping

- Participants will be muted
- Use chat in Zoom to ask questions
- Webinar will be recorded
- Please participate in survey

2002
Year Established

1000+
Client Institutions Served

1,500,000+
Assessments Proctored

6.5 Million
Students Assessed for Readiness

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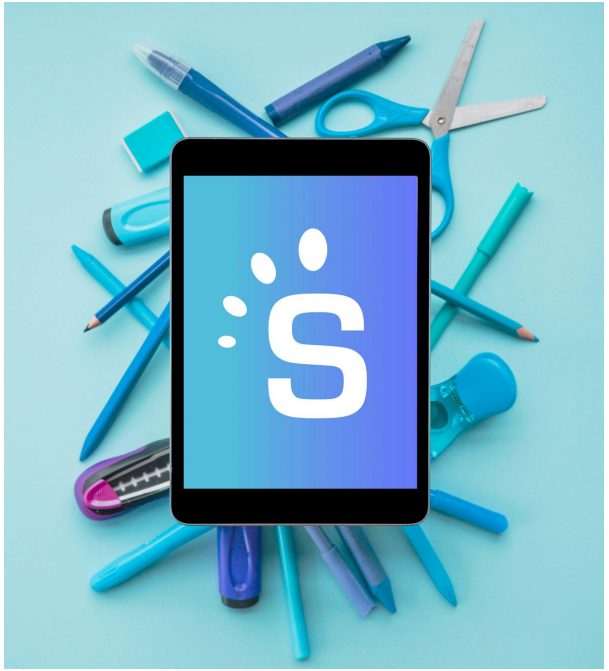
Assessment Services

SmarterMeasure
First to market and industry leader in non-cognitive assessment and taken by over 6 million students

SmarterProctoring
First and only complete proctoring management system that accommodates all proctoring modalities

Agenda

1. Introduction to the SmarterMeasure Learning Readiness Indicator
2. Implementation Plan
3. Quasi-experimental Research Designs
4. Tutoring Outcomes Analysis



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Poll - Familiarity and Comfort Level With Data

Scales and Subscales

INTERNAL

Individual Attributes

Motivation, control over procrastination, willingness to ask for help, locus of control, time management, persistence, academic attributes

Learning Preferences

Based on the multiple intelligences model

EXTERNAL

Life Factors

Availability of time, support from family and employers, appropriate place for studying, health, finances

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Scales and Subscales

SKILLS

Reading
On-screen reading rate and recall

Technical Competency
Skills test of digital learning skills and the degree to which technology is integrated into a person's life

LMS Competency
Familiarity of and skills with using a learning management system

Technical Knowledge
Knowledge of terms related to learning in a technology rich environment

Keyboarding
Rate and accuracy

OTHER

Cognitive
Math readiness – Fractions, factoring, decimals, equations, percentage, integers currency, time, geometry, computation

Writing readiness – Grammar, usage, style, structure, apprehension

Additional
Essay questions, self-rating items, student resource inventory

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Poll - RESULTS

Implementation Plan

Gateway Technical College

- Southeast Wisconsin - tri-county area: Racine, Kenosha, Walworth
- Public 2-year college
- 2022 enrollment: 7,814 program students (3,209 FTEs)
- Open Access - many at risk students
  - 52% economically disadvantaged
  - 18% single parents
  - Mostly part-time, working adults
  - Est. 40% housing insecure and 31% food insecure
- 62% retention rate (year 1 to year 2)
- 45% 3rd year graduation rate

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A Solution for Retention: First Year Seminar

Gateway to Success

- *1 credit course*
- *Mandatory for all associate degree and technical diploma students*
- *Course Description:*

In this course, students explore the Gateway Technical College community. They examine college resources and services, investigate skills that lead to academic success, and identify strategies for achieving educational and personal goals.

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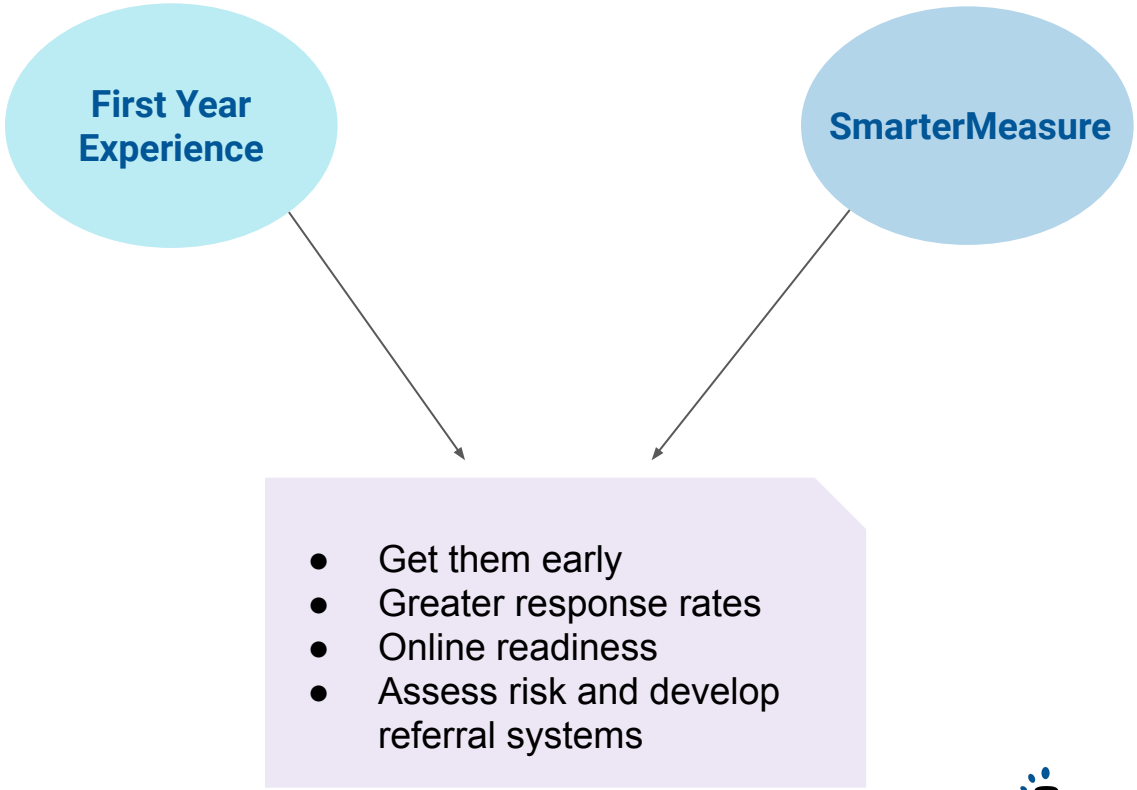
Leveraging the SmarterMeasure Assessment for Retention



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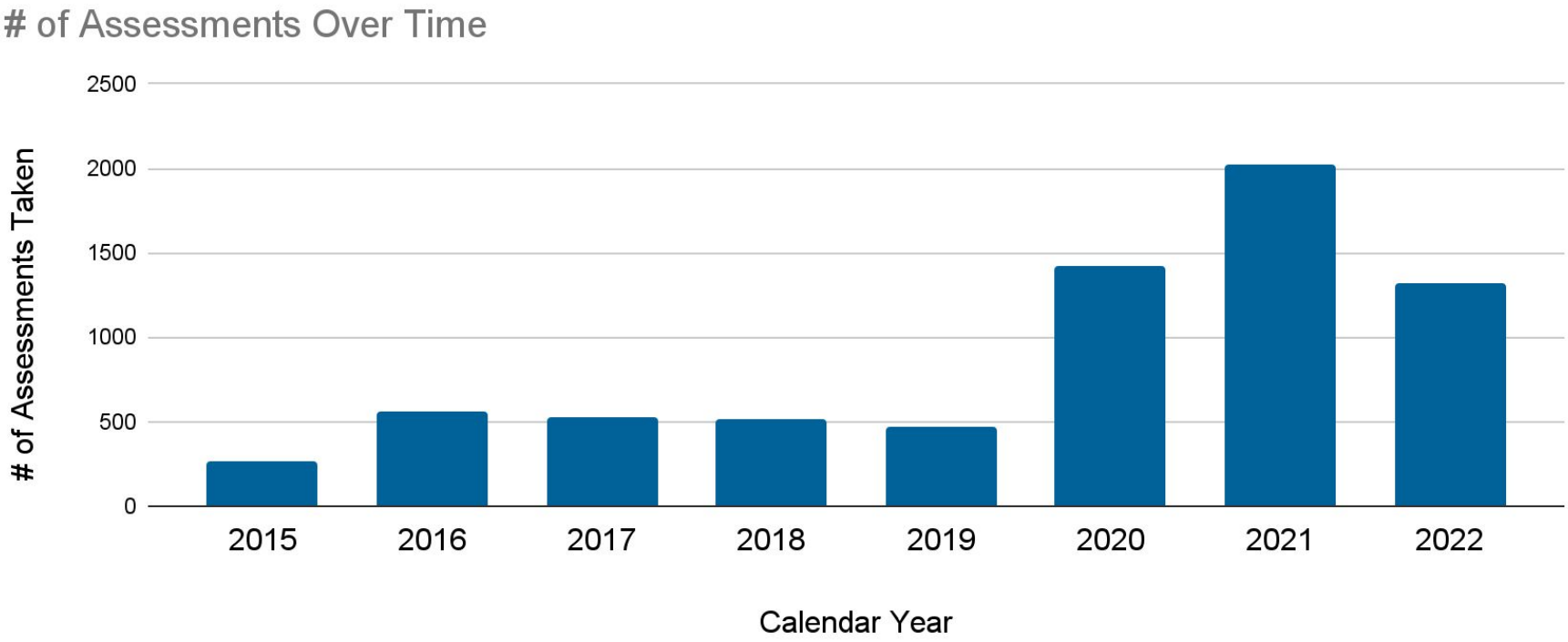
Assessment volume increased with the start of Gateway to Success



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Tutoring at Gateway

- Tutoring offered onsite and virtually (e.g., Zoom)
- Appointments and drop-in tutoring available
- General hours of operation (adjusts semester-to-semester based on demand) M-Th 9am - 7pm; Fri 9-2
- Professional tutors and peer tutors available
- Avg. duration - 1.6 hours per session
- Most common courses - English Comp 1 and Quantitative Reasoning

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Tutoring at Gateway

- Assessing student goals for the tutoring session
- Assessing student's current skills and scaffolding new skills
- Use strategies that empower students to learn and apply to concepts
- Use of reciprocal questioning
- Retrieval practice and feedback centered on growth mindset language
- The person doing the work is doing the learning (modeling behaviors but not doing the work for the student)
- Continuous communication between tutors, leadership, and classroom instructors
- Utilize data to drive tutor hiring and hours of tutor offerings (time, subject, and length of hours)
- A majority of our tutors are content specialists, not professional educators (current constraint)

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Tutoring at Gateway

What makes for an effective tutoring program at Gateway:

"Continuous communication between tutors, leadership & classroom instructors."

"Retrieval practice and feedback centered on growth mindset language."

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Program Evaluation & Research Design

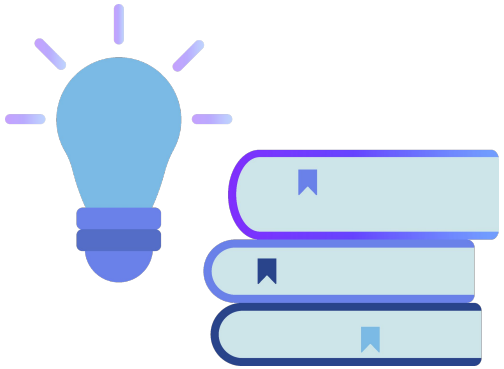
Research Question

Is tutoring an effective intervention?

If so, how effective is it?

Does it increase course pass rates?

Is it related to retention or graduation in any way?



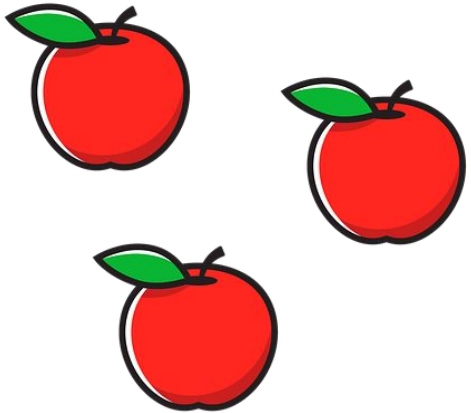
Experimental Design

Treatment group (the real drug)

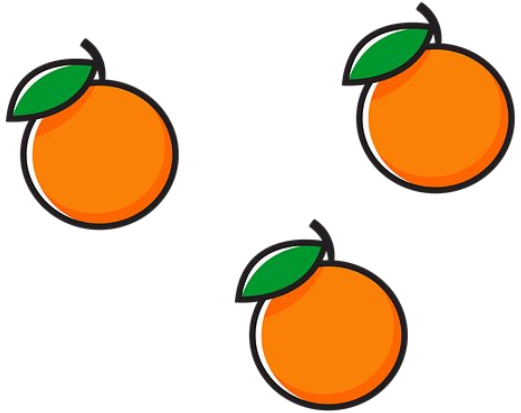
Control group (the placebo)

Simple Comparison

Tutoring Recipients

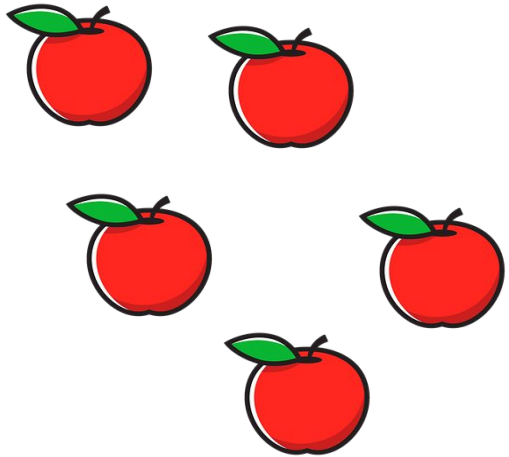


Those who didn’t receive tutoring

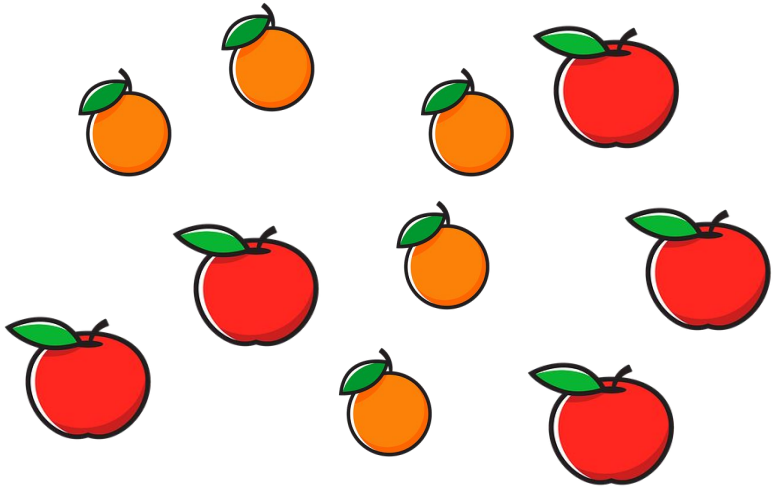


Matching Comparison Group

Tutoring Recipients
(treatment group)



Those who didn’t receive tutoring
(Apples = comparison group)



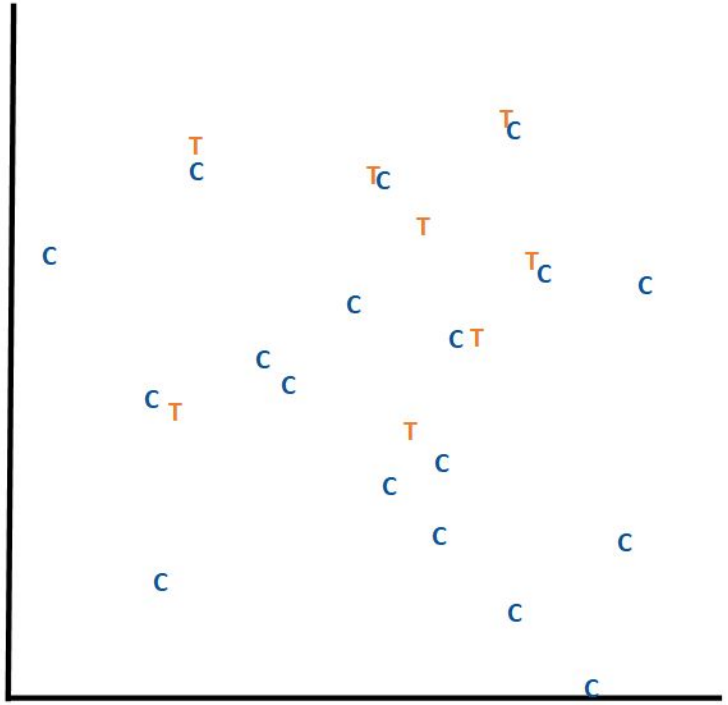
Matching Comparison Group

Tutoring Recipients
(treatment group)

idn't receive tutoring
comparison group)

Quasi-Experimental Design

Simple Comparison Group



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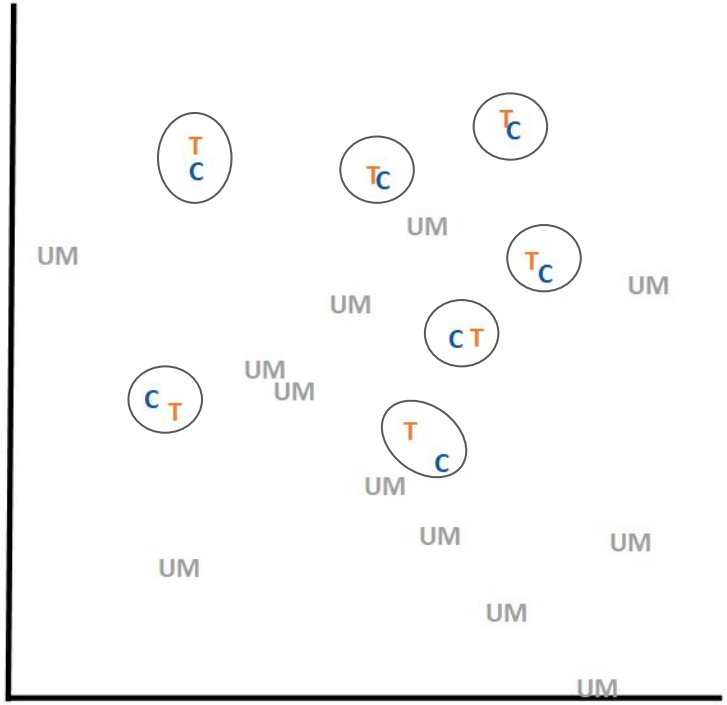
Matching Comparison Group



"Nearest Neighbor"

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Why Use the SmarterMeasure Assessment?

SmarterMeasure Scales Utilized

INTERNAL

Individual Attributes
Motivation, control over procrastination, willingness to ask for help, locus of control, time management, persistence, academic attributes

SKILLS

Technical Competency
Skills test of digital learning skills and the degree to which technology is integrated into a person's life

Technical Knowledge
Knowledge of terms related to learning in a technology rich environment

EXTERNAL

Life Factors
Availability of time, support from family and employers, appropriate place for studying, health, finances

Selecting a Matching Tool

- We chose the SmarterMeasure assessment for these reasons:
  - Non-cognitive traits
  - Feasibility
  - Timing
  - Response rates

Side note - if you use this methodology to evaluate programs that have certain eligibility requirements, make sure you account for those in your matching process as well

E.g. if you have a support program for women in STEM, then your matching comparison group should also only include women in STEM

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Data Preparation and Analysis

The Step-by-Step Process

01

Prepare the Data

02

Run SPSS Case-Control Matching

03

Compare outcome variables between groups

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Prepare the Data

Student Data

- Enrollment records
- Course completion rates
- Retention and graduation rates

Tutoring Data

- Dates of use
- Duration of each session
- Course

Smarter-Measure Scale Data

- Individual Attributes
- Life Factors
- Technical Competency
- Technical Knowledge

Combine into master data set

Connect data sets using Student ID

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Identify Matching Groups Using SPSS

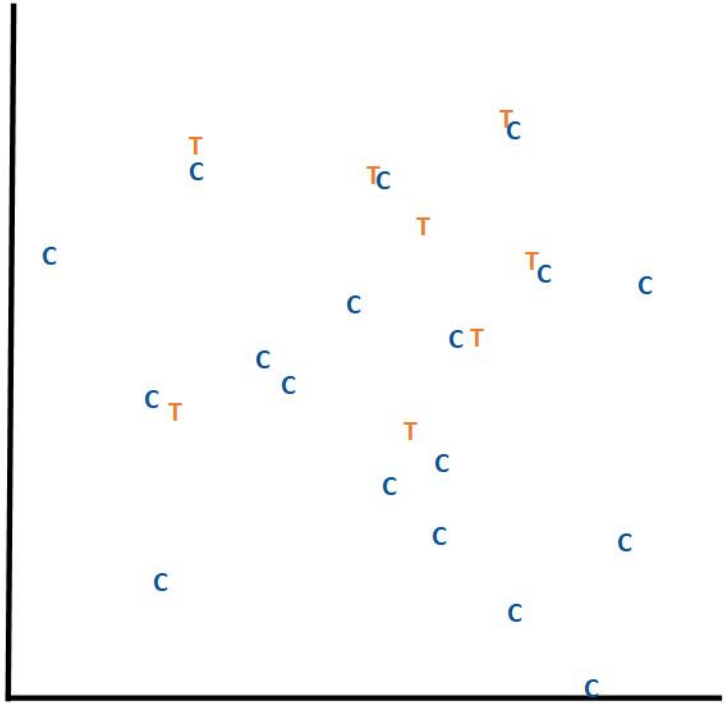
Master Data Set *(all students)*

Intervention Group *(Students who used tutoring)*

Comparison Group *(Matched students who did not use tutoring)*

Unmatched Students *(Students who were not matched)*

Identify Matching Groups Using SPSS



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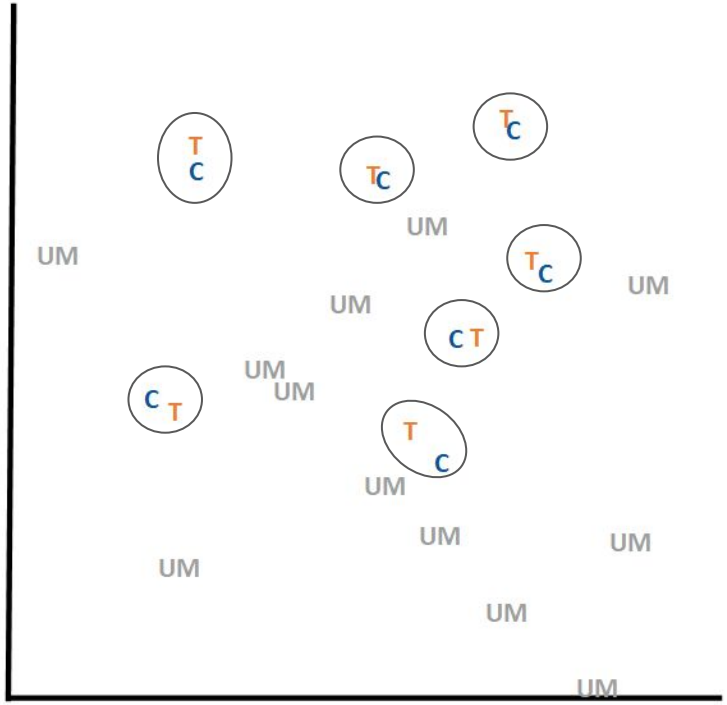
Identify Matching Groups Using SPSS



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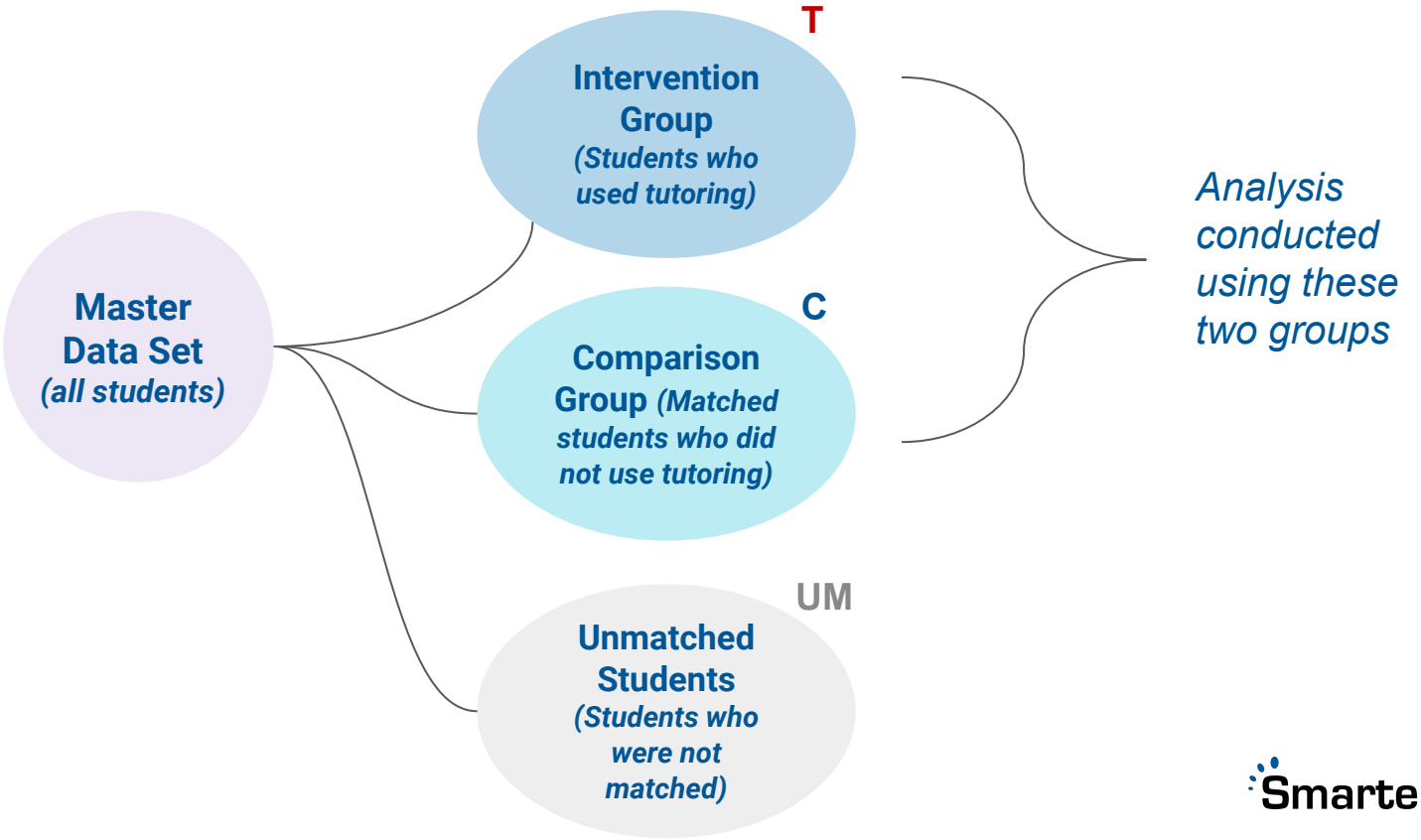
Identify Matching Groups Using SPSS



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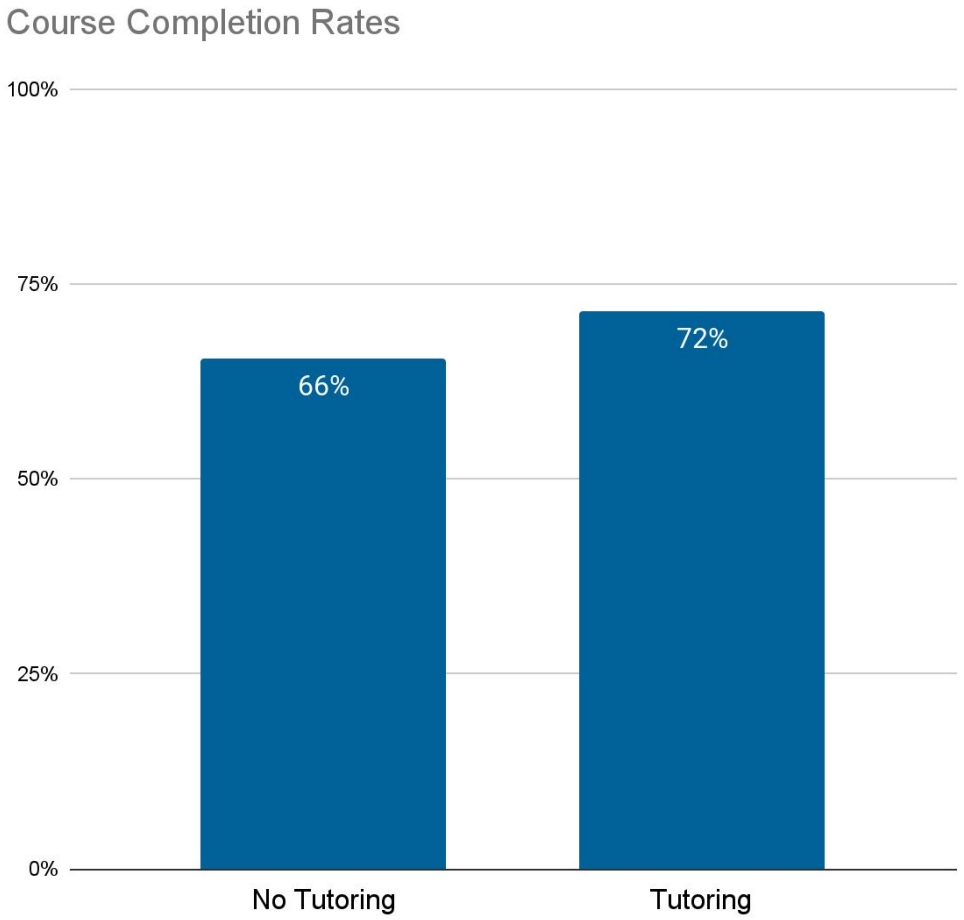
Outcomes Analysis

Students who used any amount of tutoring during their first year at Gateway had almost 6 percentage points higher course completion rates than those who used no tutoring.

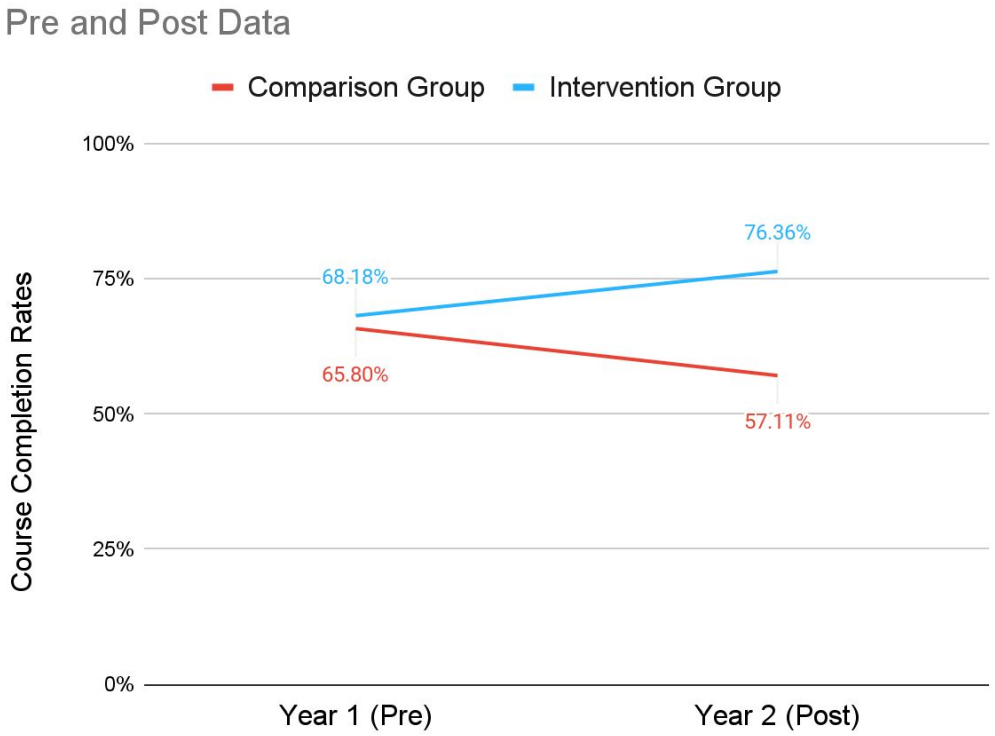


Year 1 (pre-assessment):

Neither group used tutoring

Year 2 (post-assessment):

- *The tutoring group experienced an 8.2 pp increase in course completion rates*
- *The comparison group experienced an 8.7 pp decline in completion rates.*



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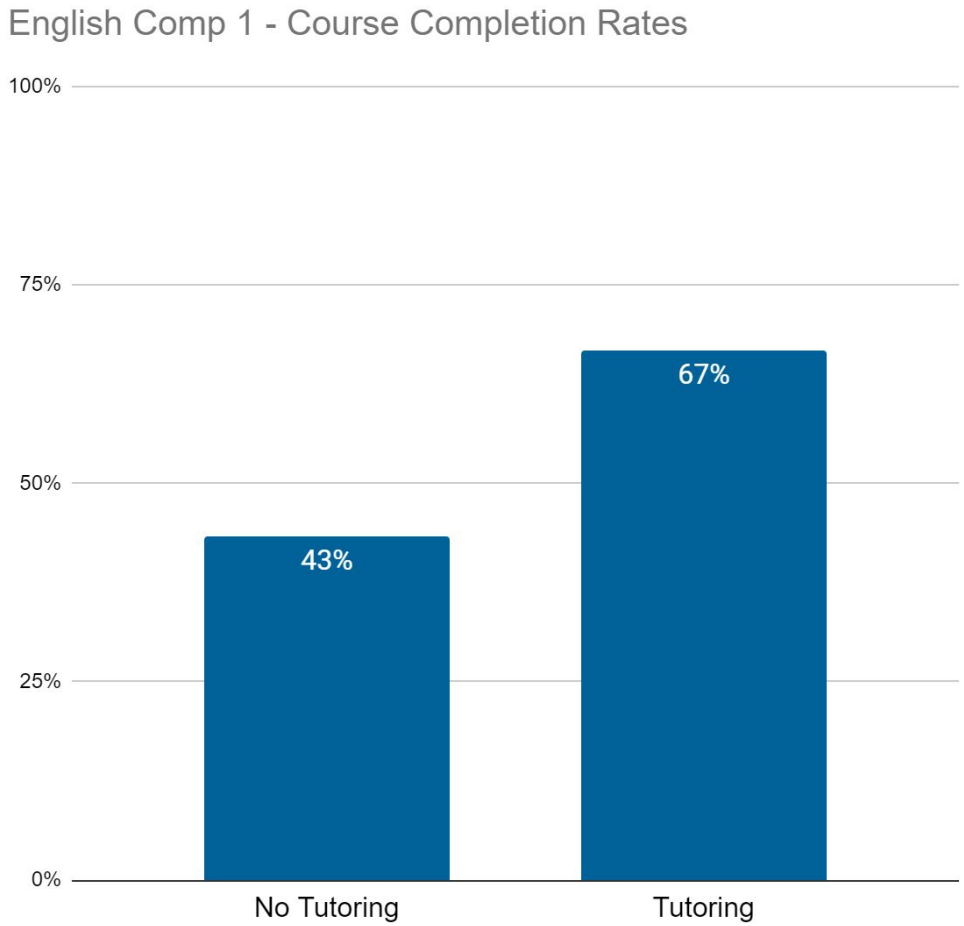
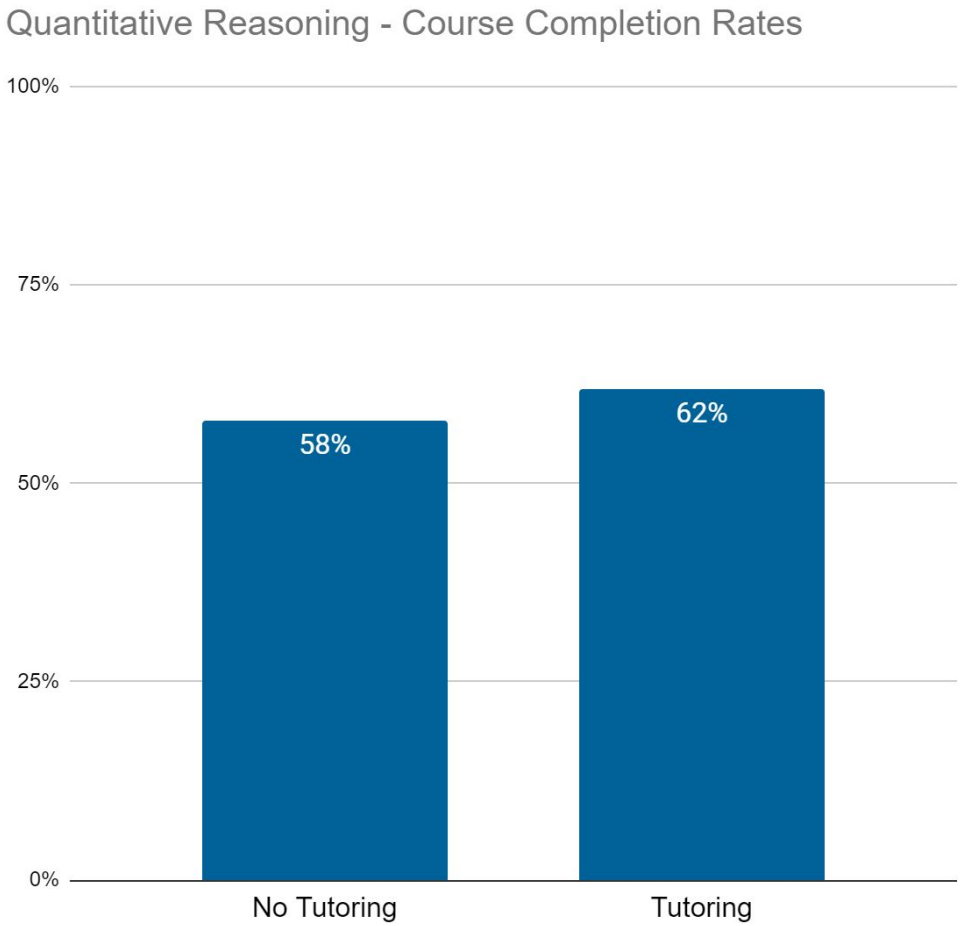
Students who received tutoring for English Composition 1 had 24 percentage points higher course completion rates.

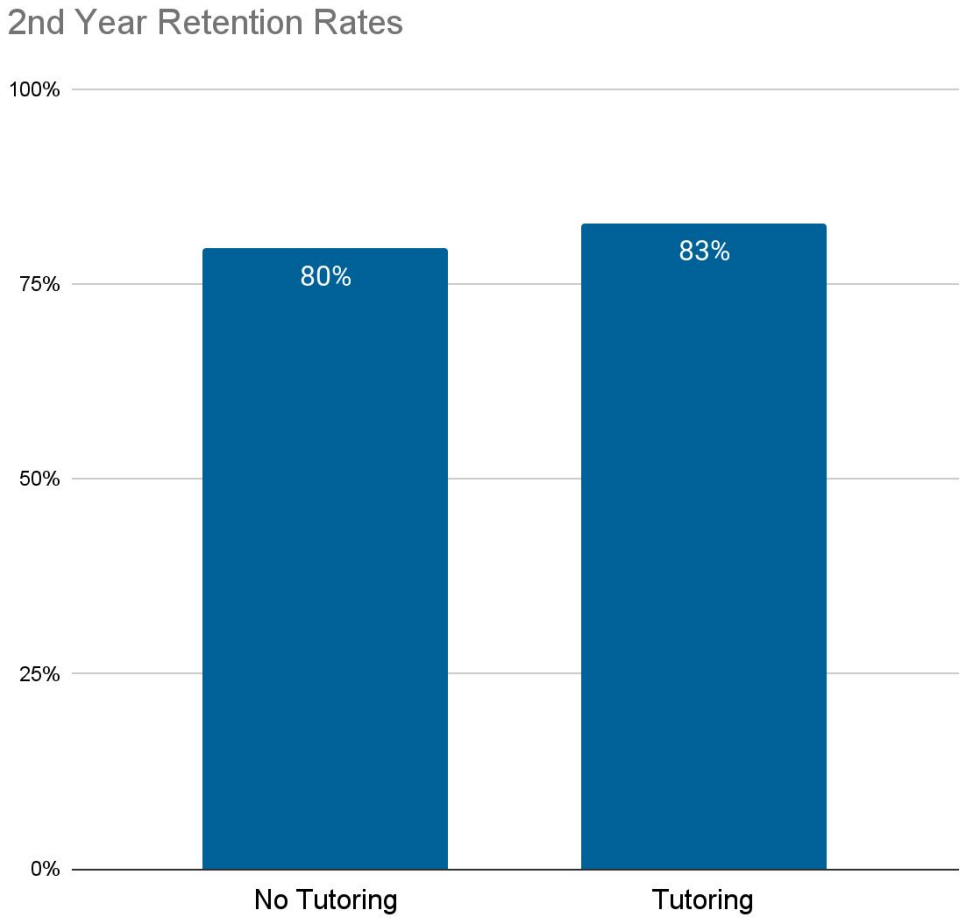


Students who used tutoring for Quantitative Reasoning had 4 percentage points higher course completion rates.



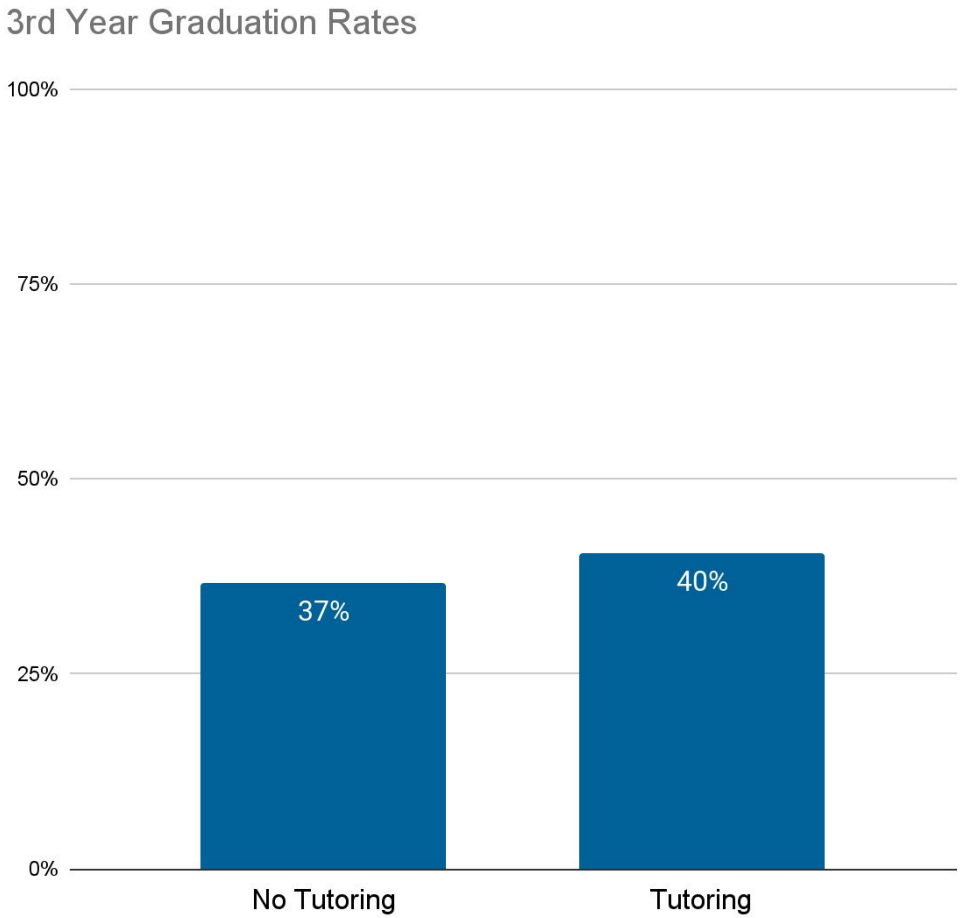
Students who used any amount of tutoring during the first year had slightly higher 2nd year retention rates.

The difference was not statistically significant (could be a result of chance).



Students who used tutoring had 3 percentage points higher graduation rates.

The difference was not statistically significant (could be a result of chance).



Assessment Comments

- Tutoring demonstrates a **positive impact on course completion rates** overall.
  - On a course level, this was especially true for English Comp 1 but also for Quantitative Reasoning to a lesser extent.
- **Any impact on retention and graduation rates was inconclusive**.

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Next Steps

Future IR Goals

- Implement data warehouse to improve the data collection and transformation process
- Case-control assessment of…
  - Orientation
  - Academic advising (it's not mandatory at Gateway)
  - HEADS UP mentoring program
  - Promise Program
  - Scholarship/Emergency grant recipients
- Regression analysis for students who receive more than one form of intervention

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Future Retention Goals

- Early risk assessment
- Automated service referrals
- Integrate into advising and support processes

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Questions and Answers

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SmarterMeasure - Dr. Mac Adkins

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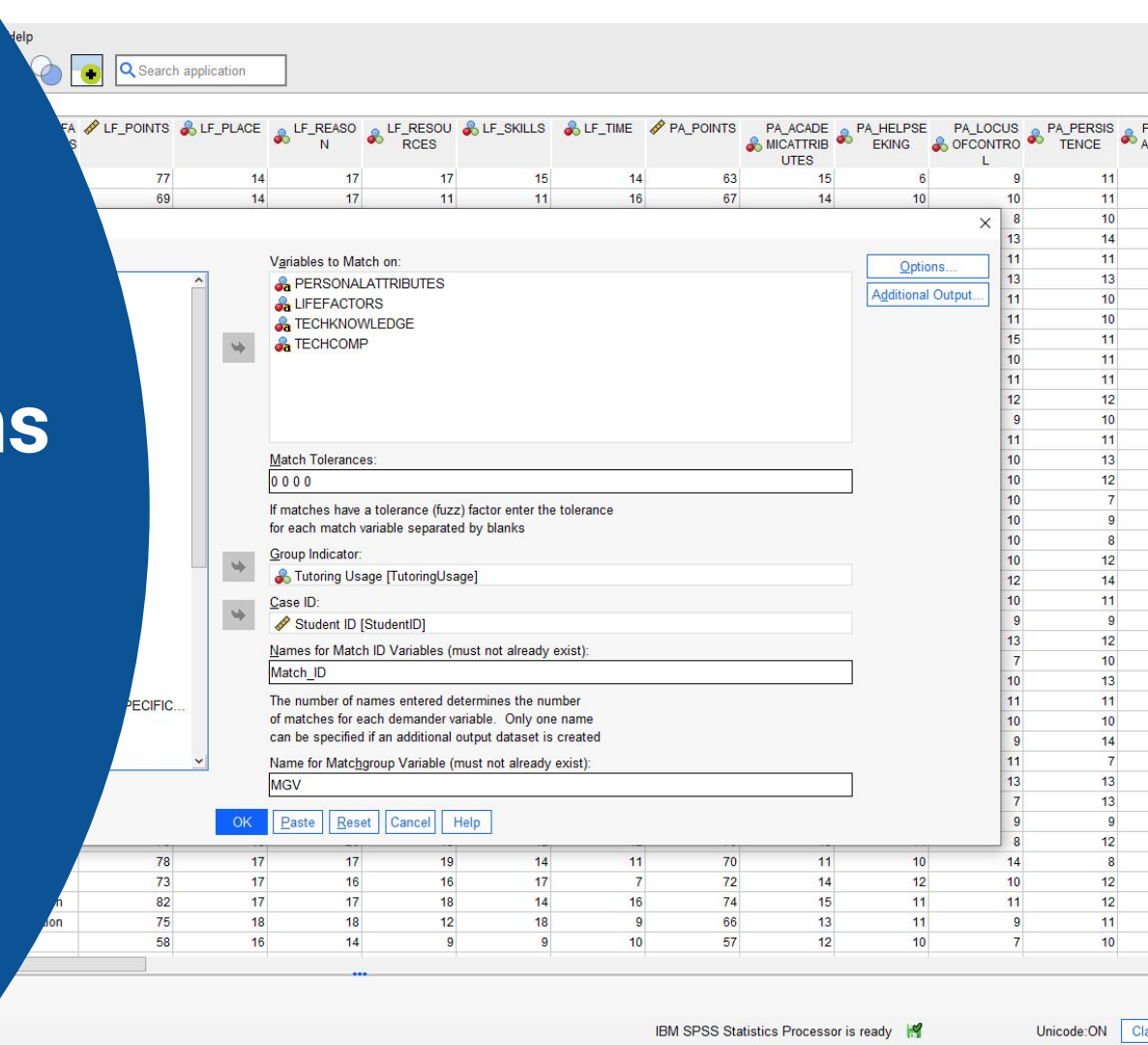
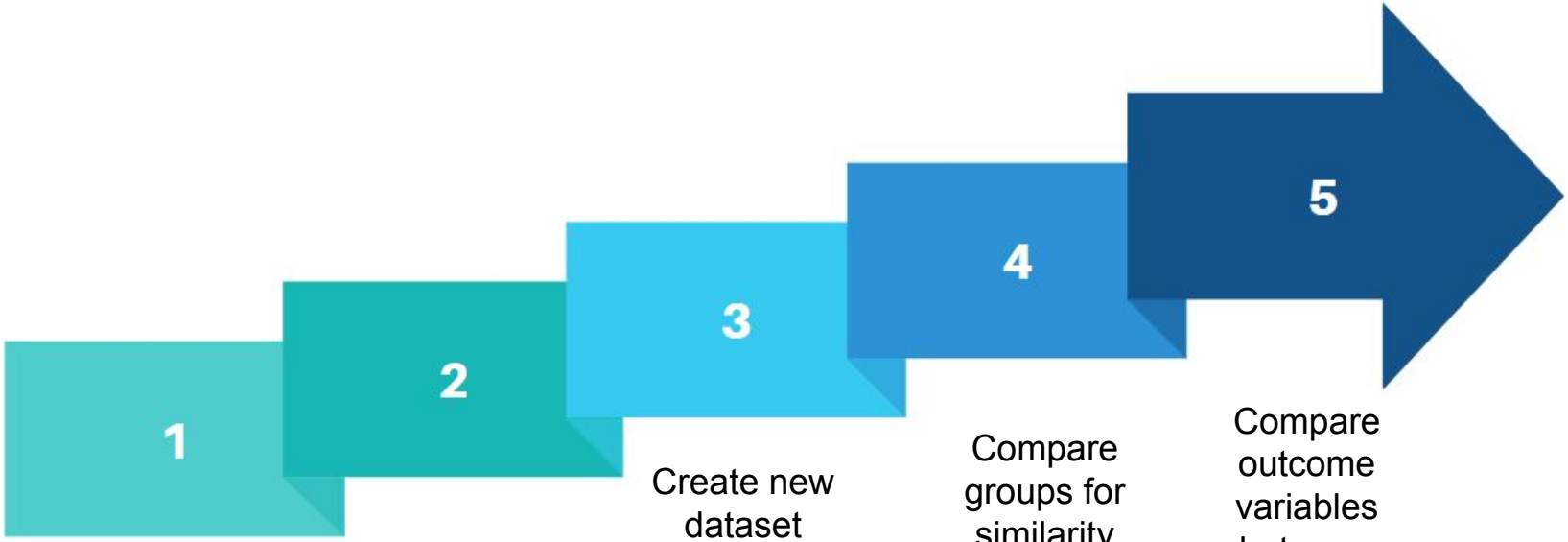
SPSS Instructions for Case-Control Matching



Step-by-Step Process



1. Prepare the Data
2. Run SPSS Case-Control Matching
3. Create new dataset with treatment and comparison group
4. Compare groups for similarity among matching variables
5. Compare outcome variables between groups

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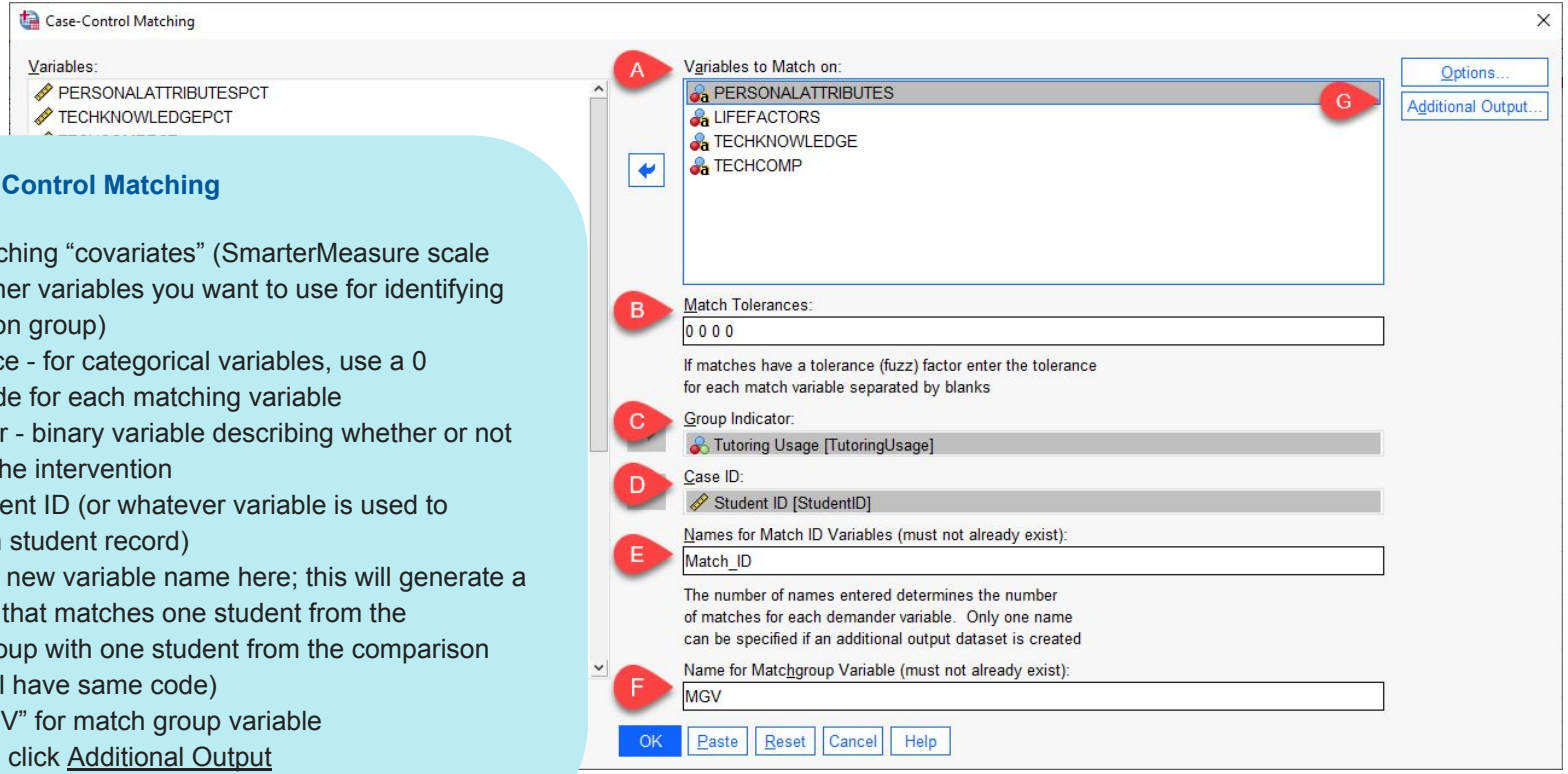
Run SPSS Case-Control Matching



Menu: Data / Case Control Matching

(A) Input your matching "covariates" (SmarterMeasure scale variables or other variables you want to use for identifying your comparison group)

(B) Match Tolerance - for categorical variables, use a 0
- Must include for each matching variable

(C) Group Indicator - binary variable describing whether or not they received the intervention

(D) Case ID - Student ID (or whatever variable is used to represent each student record)

(E) Match ID - add new variable name here; this will generate a coded number that matches one student from the intervention group with one student from the comparison group (both will have same code)

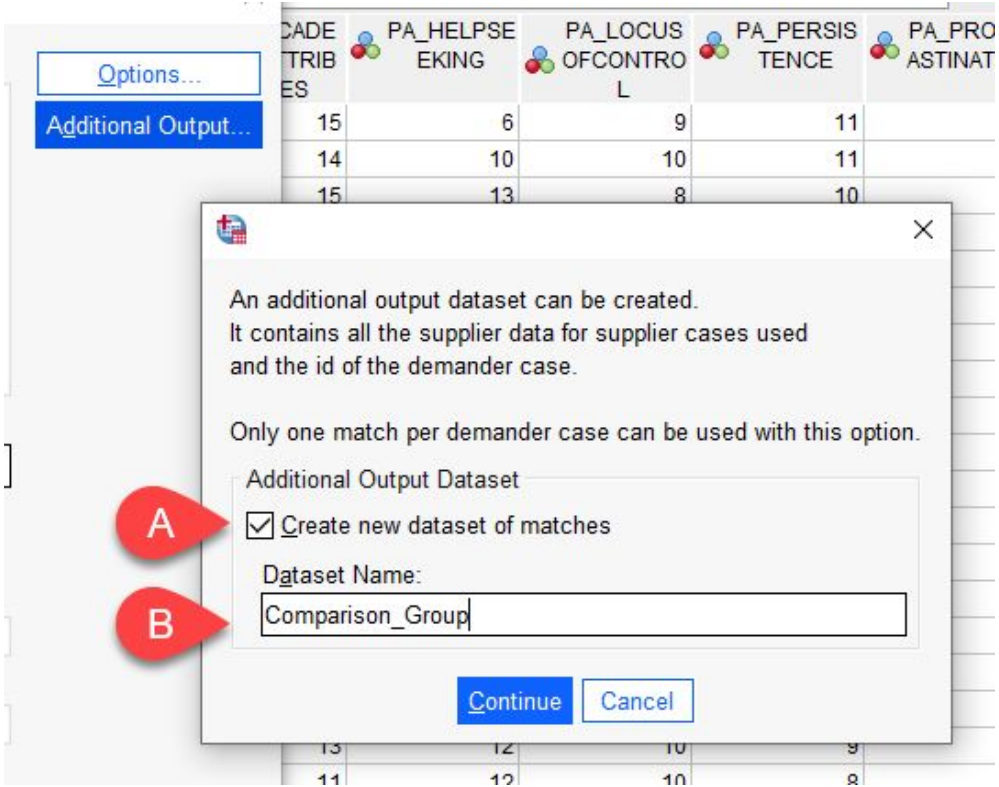
(F) Just unter "MGV" for match group variable

(G) Before closing, click Additional Output

Create Output for Matched Comparison Group

(A) Check the box “Create new dataset of matches”
(B) Give it a name
(C) Click Continue and then Ok

This will open a new SPSS window including only your matched students from the comparison group (those who did not receive tutoring).



Double-Check Your Work

You should now have two SPSS datasets:

1. Your original file (includes all records; the new Match_ID field has some blank rows and some rows with data)
2. Your new data file ("Comparison_Group"; includes comparison group data records; Match_ID field should have data in all rows; tutoring usage or other group indicator variable should be all the 0s)

Also check the sample size of your comparison group. *If your sample is too small for a strong analysis, you may need to decrease the number of matching variables or increase your fuzz tolerance. However, you don't want to make these too lenient, where your comparison group no longer closely matches your intervention group. This should be an iterative process of optimizing your sample size and while limiting fuzz tolerance.*

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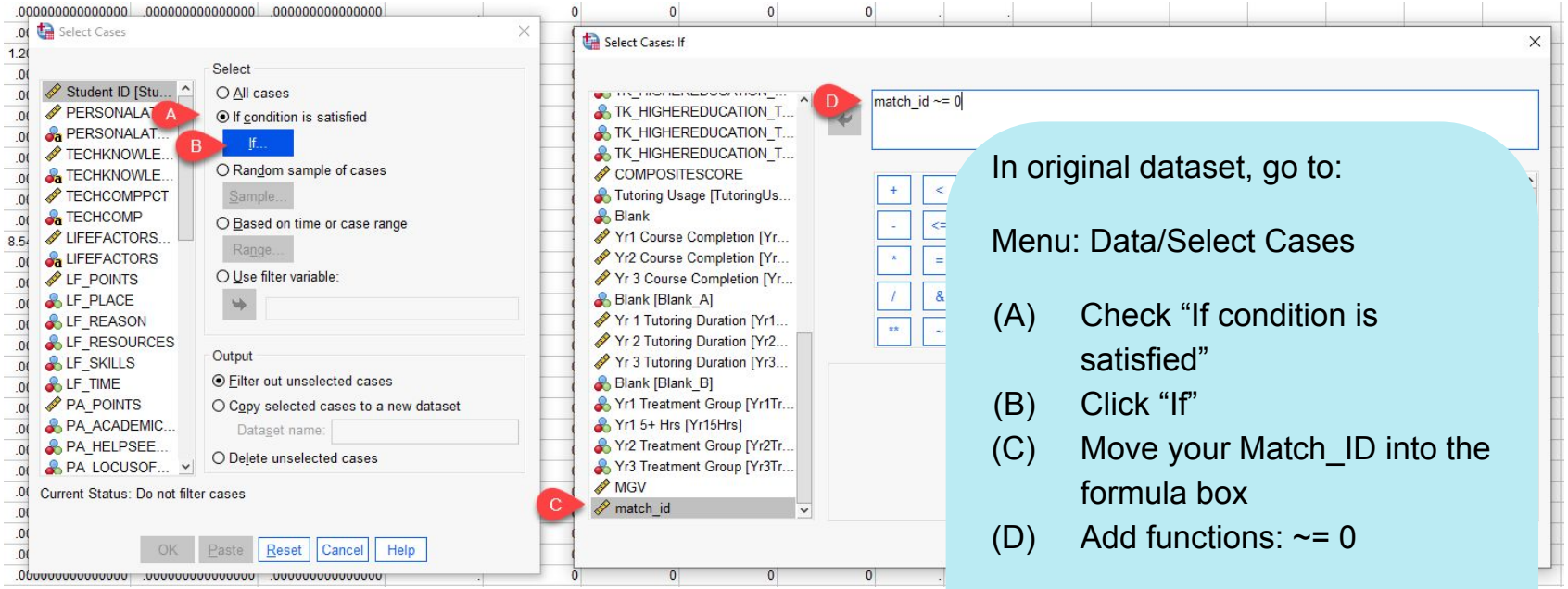
Create output for Treatment Group (part 1)



In original dataset, go to:

Menu: Data/Select Cases

(A) Check “If condition is satisfied”
(B) Click “If”
(C) Move your Match_ID into the formula box
(D) Add functions: ~= 0

This will select the cases where the Match_ID is <u>not</u> null or 0, which selects your treatment group.

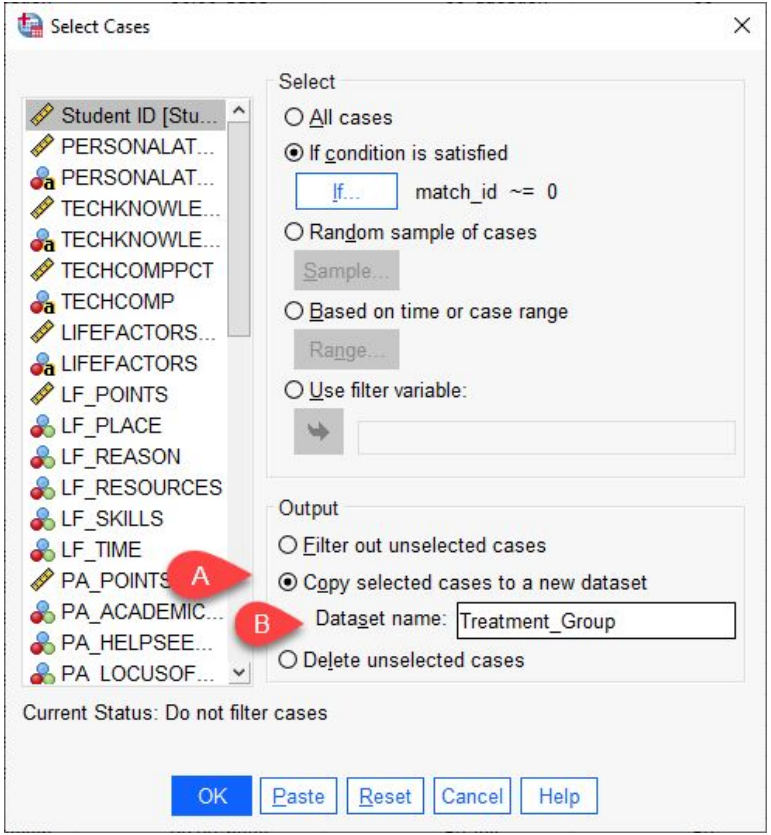
Create Output for Treatment Group (part 2)

In the pop-up, click “Continue,” but don’t click “Ok” yet.

In the original dialog box…

(A) Select radial for “Copy selected cases to a new dataset”

(B) Give new dataset a name such as “Treatment_Group” or “Intervention_Group”



Double-Check Your Work

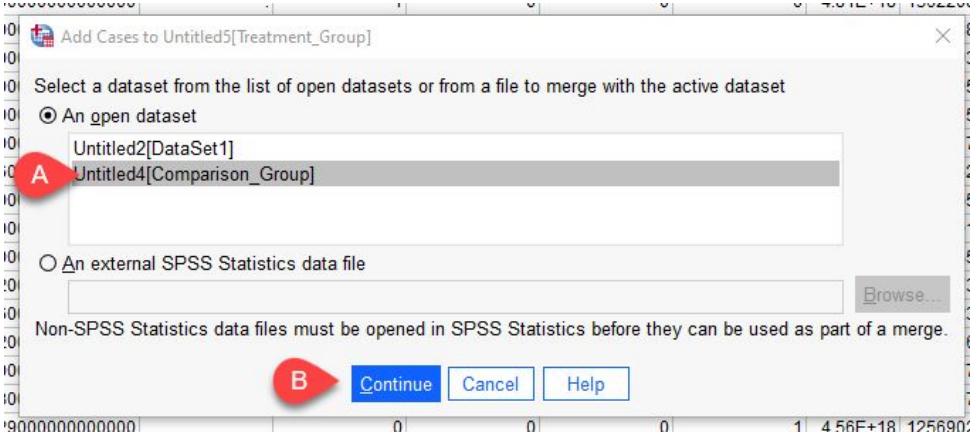
You should now have three SPSS datasets:

1. Your original file (includes all records; the new Match_ID field has some blank rows and some rows with data)
2. Your new data file (“Comparison_Group”; includes comparison group data records; Match_ID field should have data in all rows; tutoring usage or other group indicator variable should all be 0s)
3. Your new data file (“Treatment_Group”; includes treatment group data records; Match_ID field should have data in all rows; tutoring usage or other group indicator variable should all be 1s)

Merge Treatment and Comparison Groups to Create New Final Data Set

In your treatment group file, click on the Menu: Data / Merge Files / Add Cases

(A) Select the Comparison_Group data set
(B) Click Continue
(C) Click Ok on the next pop-up



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Double-Check Your Work

In the Treatment_Group dataset, you should now also have the Comparison_Group data added into the data.

Items to check:

- Every single row should have data in the Matching_ID field
- For the original group variable you had selected (for us, “Tutoring Usage”), you should have all the 1s in the first several rows, and all the 0s in the last several rows

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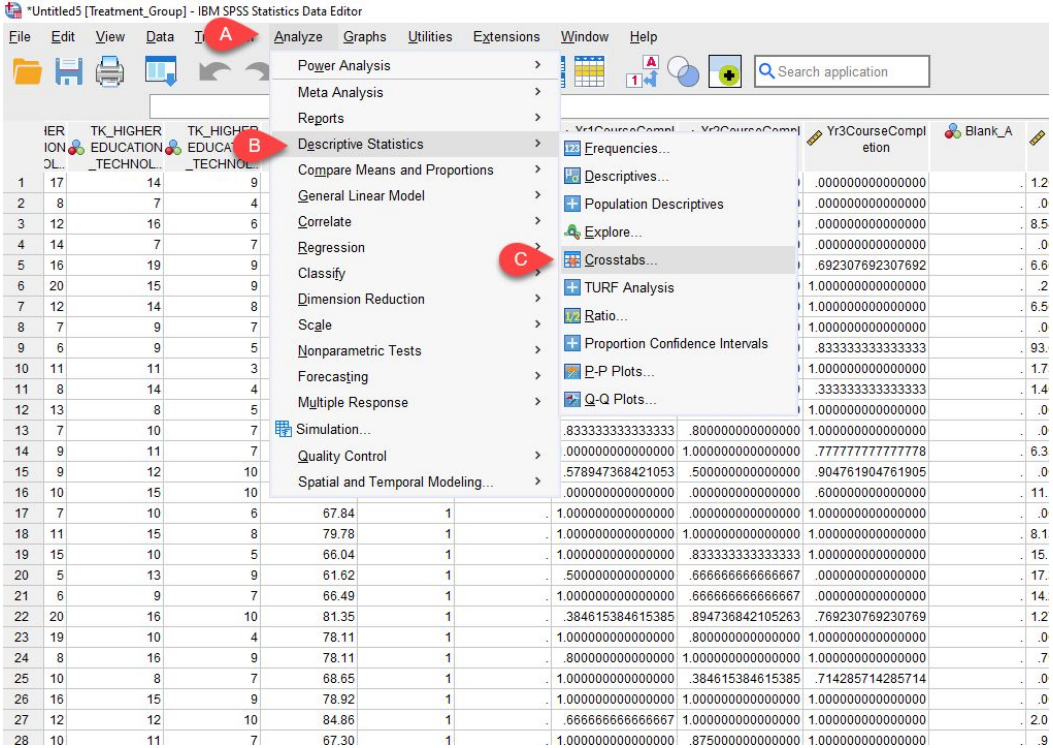
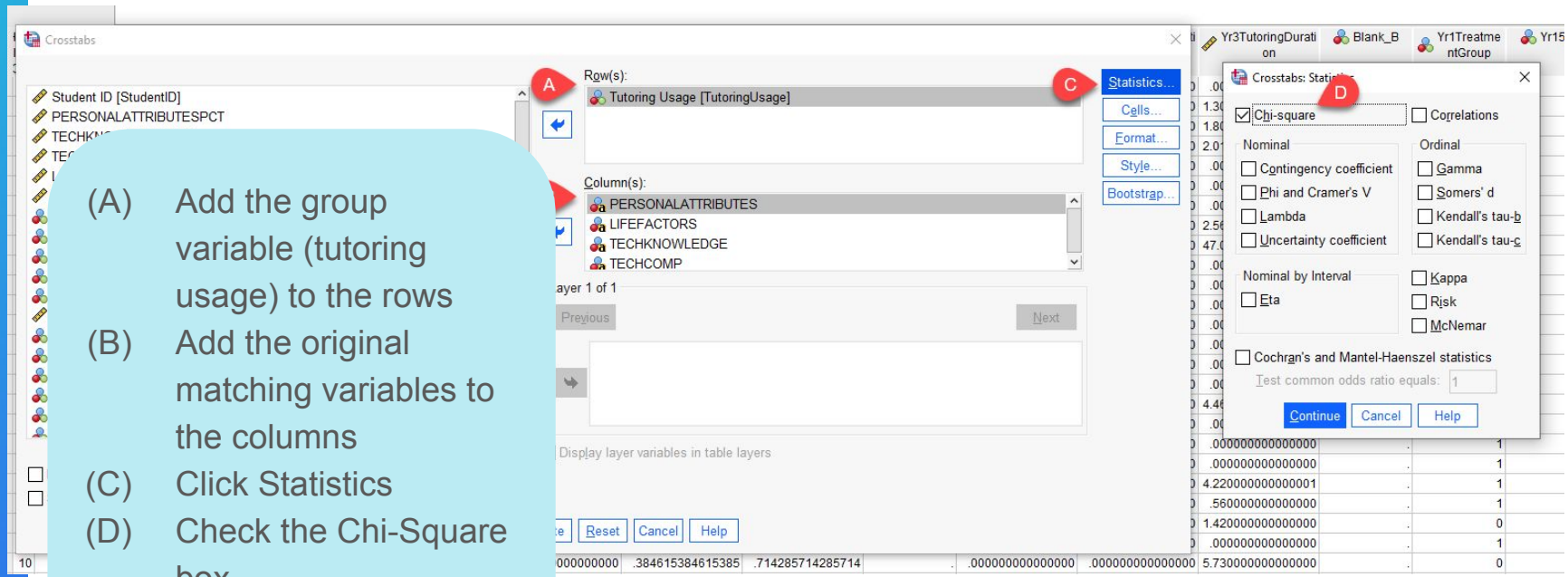
Compare Groups for Similarity of Matching Variables

For categorical data, we will run a chi-square test to make sure that the distribution of students in the different SmarterMeasure scales are well-matched between the intervention and comparison groups.

(A) Click Analyze
(B) Descriptive Statistics
(C) Crosstabs



Compare Groups for Similarity of Matching Variables



(A) Add the group variable (tutoring usage) to the rows

(B) Add the original matching variables to the columns

(C) Click Statistics

(D) Check the Chi-Square box

Click Continue and then Ok

Note - use chi-square if the variables are categorical; use t-test if the variables are numerical

Compare Groups for Similarity of Matching Variables

The SPSS output will provide the following charts for each variable.

Yellow Circle - your cross tab should show the same number of students in each category (fail, pass, questionable) for both the students who used and did not use tutoring.

Green Circle - the p-value should be 1.000, showing that the treatment and comparison groups are not significantly different when it comes to this variable

Check these charts for every single variable used in the matching process. If you find variables that are significantly different between students who did and did not use tutoring, then something went wrong, and you'll need to re-run the matching procedures.

Tutoring Usage * PERSONALATTRIBUTES

Crosstab

Count

		PERSONALATTRIBUTES			
		fail	pass	question	Total
Tutoring Usage	0	140	25	251	416
	1	140	25	251	416
Total		280	50	502	832

Chi-Square Tests

	Value	df	Asymptotic Significance (2-sided)
Pearson Chi-Square	.000[a]	2	1.000
Likelihood Ratio	.000	2	1.000
N of Valid Cases	832		

a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 25.00.

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Save SPSS File and/or Export to Excel

Assuming everything looks good, you can now save the final SPSS file. Give it a new name (don't use "treatment group") since now it includes both the treatment and comparison groups.

This final combined file is what you will use for analyzing your student outcome variables (e.g. course pass rates; retention/graduation rates).

You can also export the data to excel if you prefer to run your analyses in different statistical packages such as R.

Note - You do not need to keep the other SPSS files unless you would like a record of your work.

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