



Why Do Some Engineering Students Study Alone?

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+ Background (K-12 & Industry)

“Working in groups is important!”

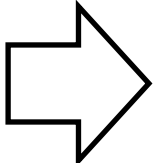
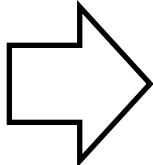
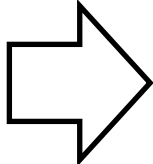


+ Background (Higher Education)

“Working in groups is a mixed bag ... sometimes good, sometimes detrimental”



+ So What?

1. Studying alone in STEM 
2. Lack of community connection 
3. Lack of belonging 
4. Eventual or immediate DROP OUT of STEM

Previous studies looking at DROP OUT use academic indicators; few studies look at how these other factors (above) relate to performance & retention.



GOAL: Find a way to easily identify students that study alone who are also at risk of STEM dropout.

RESEARCH QUESTION #1

What are the primary differences between engineering students who study alone by choice and those who do not study alone by choice?

RESEARCH QUESTION #2

How can engineering students who study alone not by choice be easily identified?

+ Data Collection & Initial Analysis

1. Cross-sectional surveys

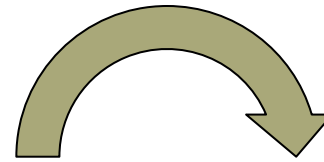
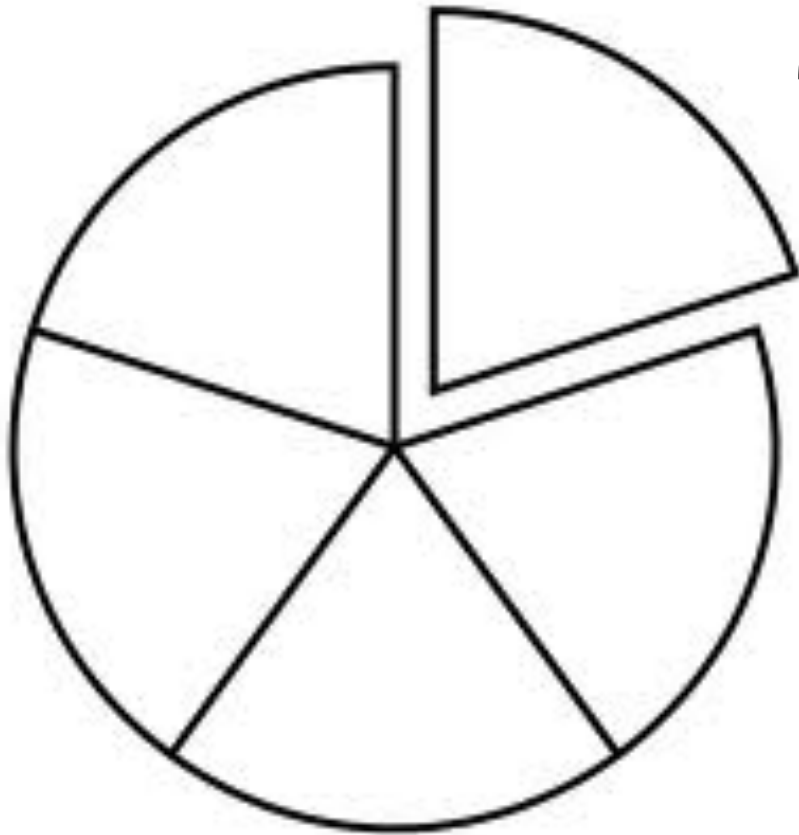
- 435 sophomore, junior & seniors in undergraduate engineering majors



2. Individual interviews

- 38 sophomore, junior & seniors students
- Interview transcripts coded & analyzed using constant comparison method

+ Findings



Academic Solitaries

18.4% of 38 students interviewed reported studying alone

+

Academic
Solitaries

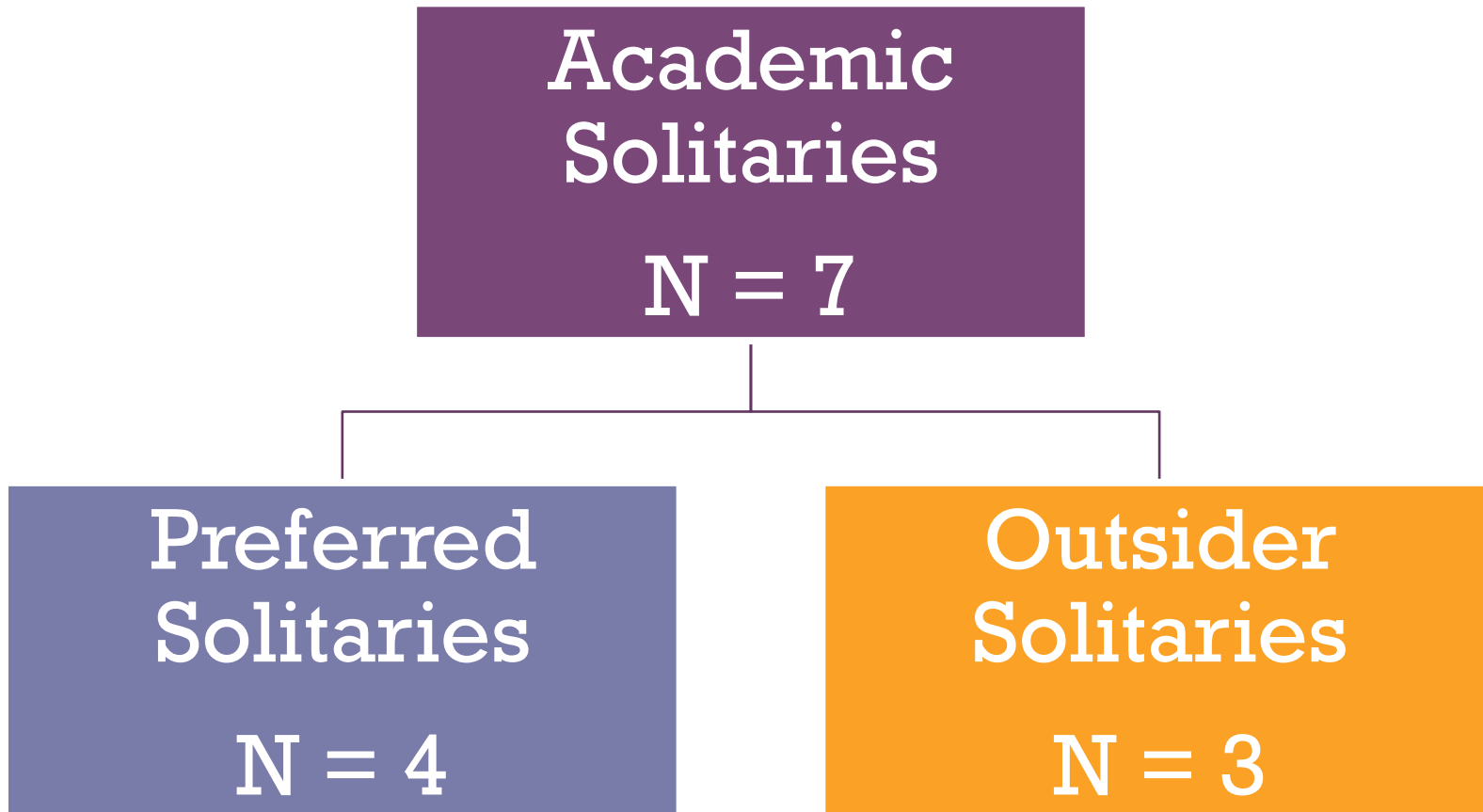
$N = 7$

Preferred
Solitaries

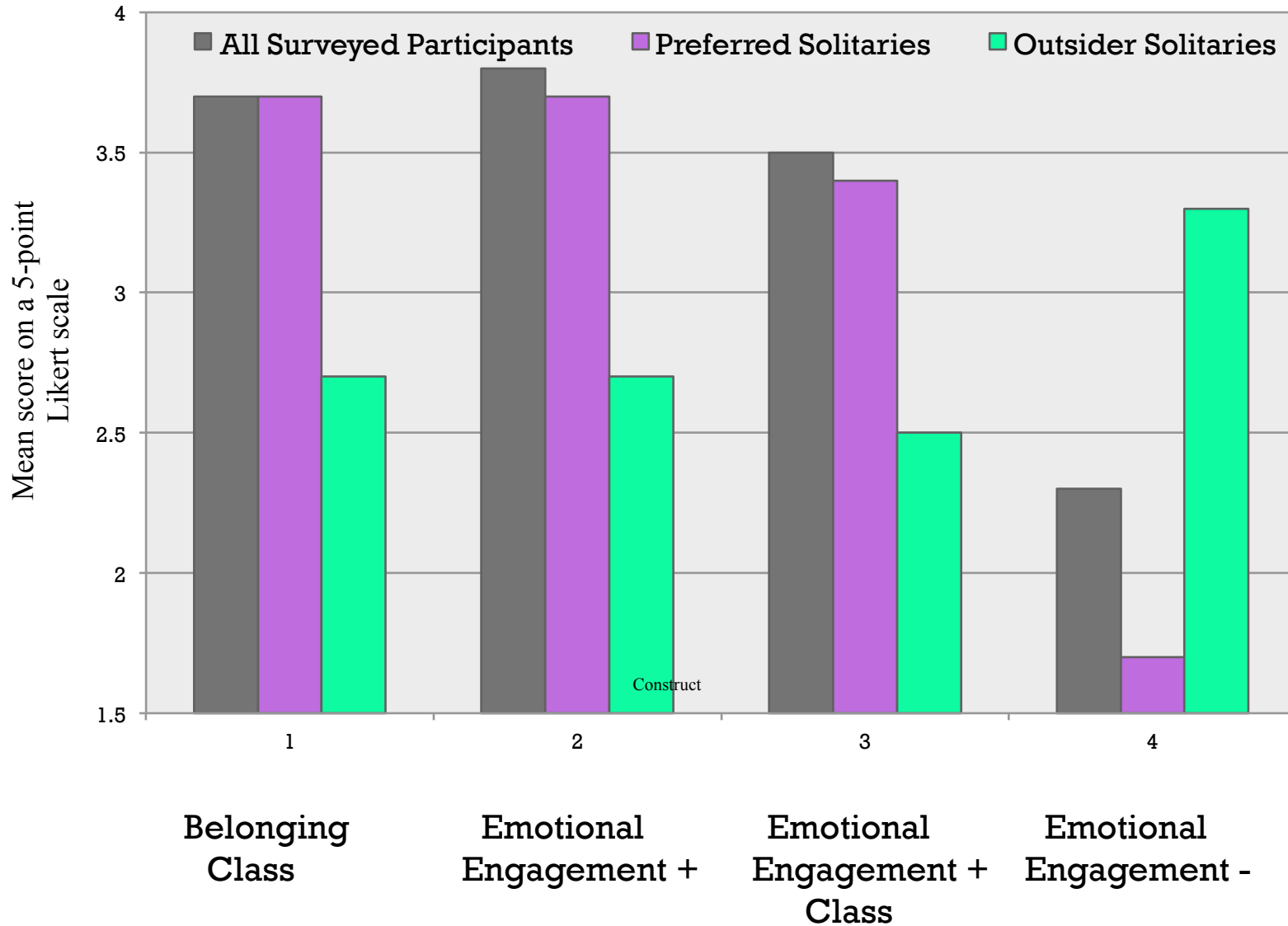
$N = 4$

Outsider
Solitaries

$N = 3$



+ Mean Survey Scores



+ Research Question #1

What are the primary differences between engineering students who study alone by choice and those who do not study alone by choice?



Preferred Solitary

- Chooses to study alone
- Often sees working with others as a hindrance



Outsider Solitary

- Prefers to study with others
- Perceives barriers to studying in groups

+ Research Questions #2

How can engineering students who study alone not by choice be easily identified?



Find students who score ≥ 2 Standard Deviations *below* the Mean in the following survey constructs:

- Belonging to Class
- Positive Emotional Engagement
- Positive Emotional Engagement in Class

And ≥ 2 Standard Deviations *above* the Mean in:

- Negative Emotional Engagement in Class

+ In Other Words...

If we identify students who feel

LESS

- ◆ Support
- ◆ Acceptance
- ◆ Comfort
- ◆ Membership
- ◆ Enjoyment
- ◆ Good
- ◆ Interested

MORE

- ◆ Worried
- ◆ Discouraged

we are more likely to narrow the pool of students at risk of drop out
and channel resources to this smaller group for more effective
outcomes

+

Implications

Whether or not a student studies in a group is not the important factor.

A student's sense of **BELONGING** is the important factor.

When planning interventions, we must remember that there is no “one size fits all” for belonging.



Thank You!

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