



A Mixed Methods Approach Towards Defining A Student's Ranges of Self-Efficacy

AAPT Talk This Poster


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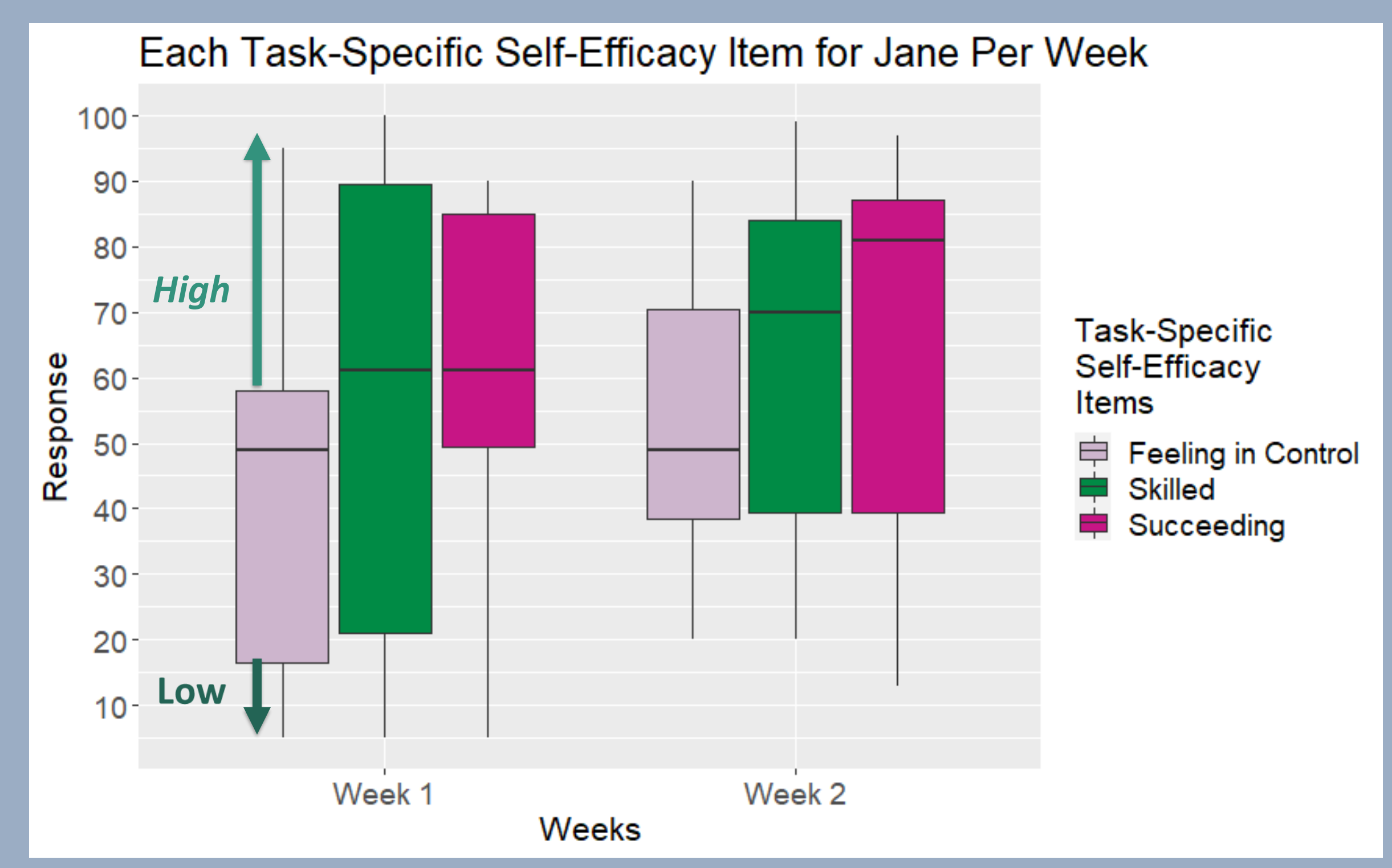


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Boundaries of a student's IQR can define high and low SE, and student's responses to daily journal prompts corroborates these definitions.

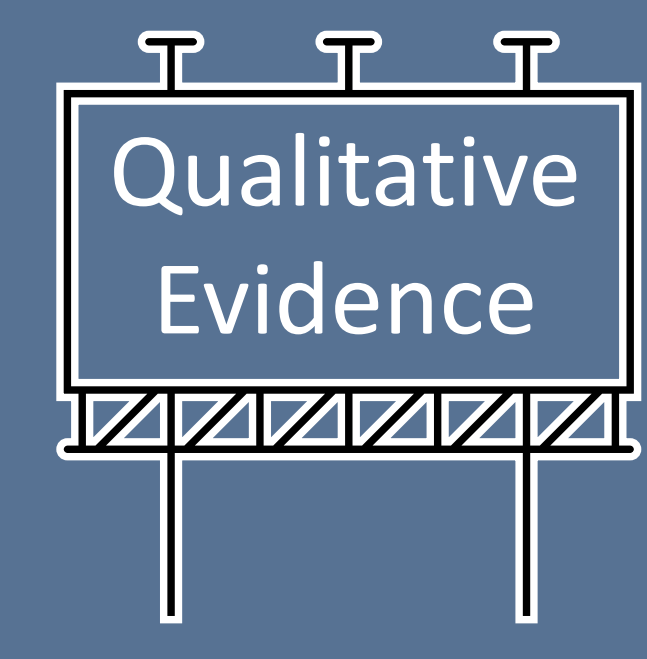
Calculate IQR (middle 50% of data):



Utilizing IQR Criteria to identify HIGH moments of SE:

Jane's reported task associated with each notification:

	Notification Number	Reported Task
Week 1	8	[Physics Course] class
	13	Feeding baby getting ready to math class
Week 2	2	[Physics Course] homework
	16	[Physics Course]



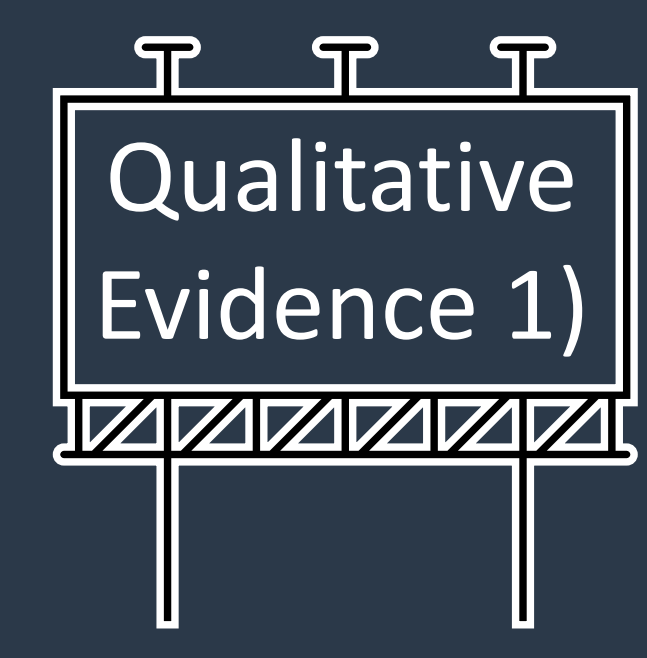
"Yesterday in [Physics Course] I felt confident in my knowledge and experience and it felt useful and I know it was meaningful to my career path." – Jane, Week 1, Reflection 3
 "[Physics Course]... they take time to ensure all students understand fully and are invested in their students..." – Jane, Week 1, Reflection 1

Jane scores tasks located within her physics course as moments of high SE.

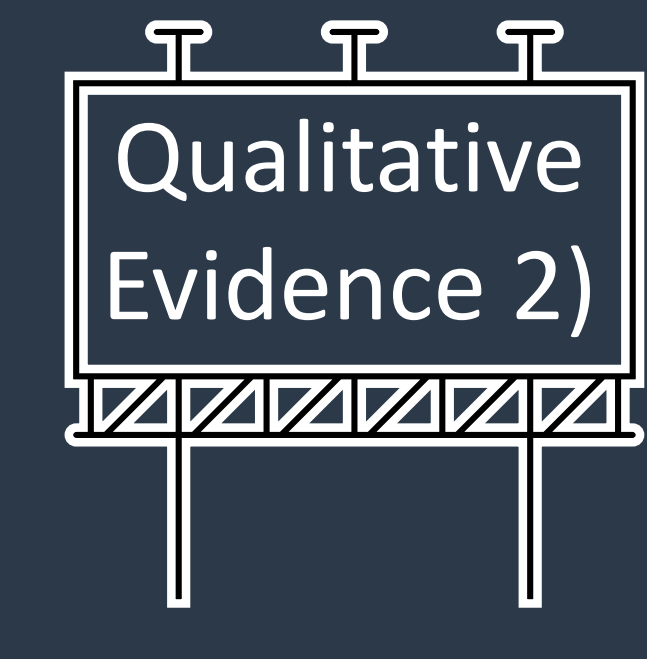
Utilizing IQR Criteria to identify LOW moments of SE:

Jane's reported task associated with each notification:

	Notification Number	Reported Task
Week 1	3	Nursing a baby in [Math Course]
	4	Nursing my baby just finished [Computational Course] homework
	7	Nursing my baby and [Math Course] homework
	19	[Math Course] class
Week 2	3	Feeding my baby and [Physics Lab] homework
	4	[Computational Course] homework
	13	[Math Course] recitation



"The math classes are very difficult to ask questions in and are overwhelming in the way they teach/treat students.... [Computational Course] is too fast paced and jumps from concept to concept too fast they have help rooms but the pace of the content leaps seem too overwhelming." – Jane, Week 1, Reflection 1



"If I had been in a real classroom with access to real people, I would feel much more in control and capable of learning and focusing on the material.The struggles of my personal life interferes much more with online learning than with in person classes and learning." – Jane, Week 1, Reflection 2

1) Jane scores tasks located within her math & computational courses as moments of low SE.
 2) Jane scores tasks as low when she is multitasking – personal life task & academic task

Motivation:



Commonly, researchers have defined high and low self-efficacy¹ (SE) by comparing groups^{2,3} or across time⁴
 • Do not explore how to define high and low SE for an individual student

Research Question:

How do we identify high and low moments of SE for an individual?
 ↓
 Utilizing *interquartile range (IQR)* for defining high, normal, and low SE (submitted to PERC)

Mixed Methods:

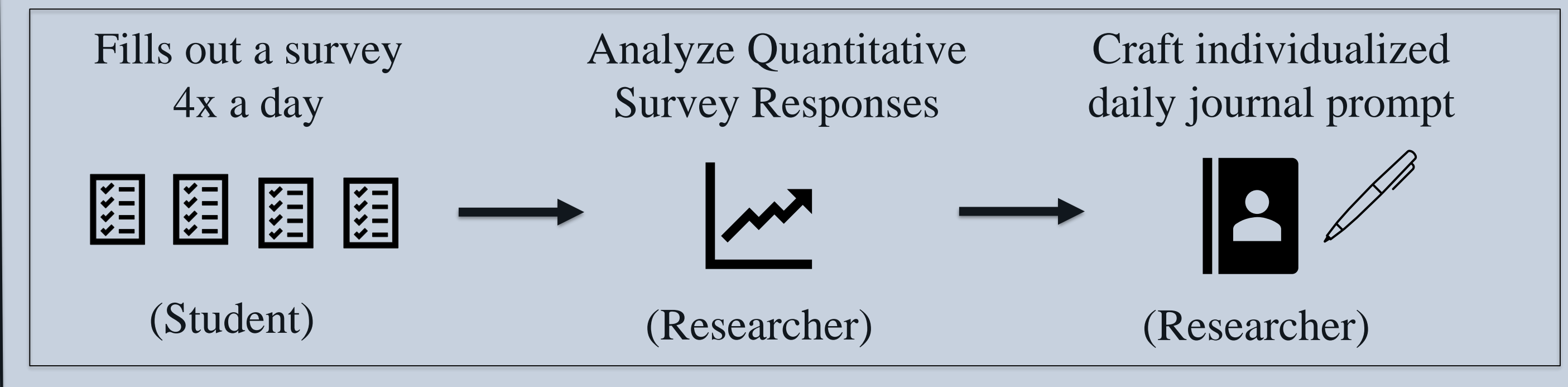
Context:

- Fall 2020 semester
- Large research-intensive university
- 6 Participants
- \$50 dollar incentive for 80% completion rate per week

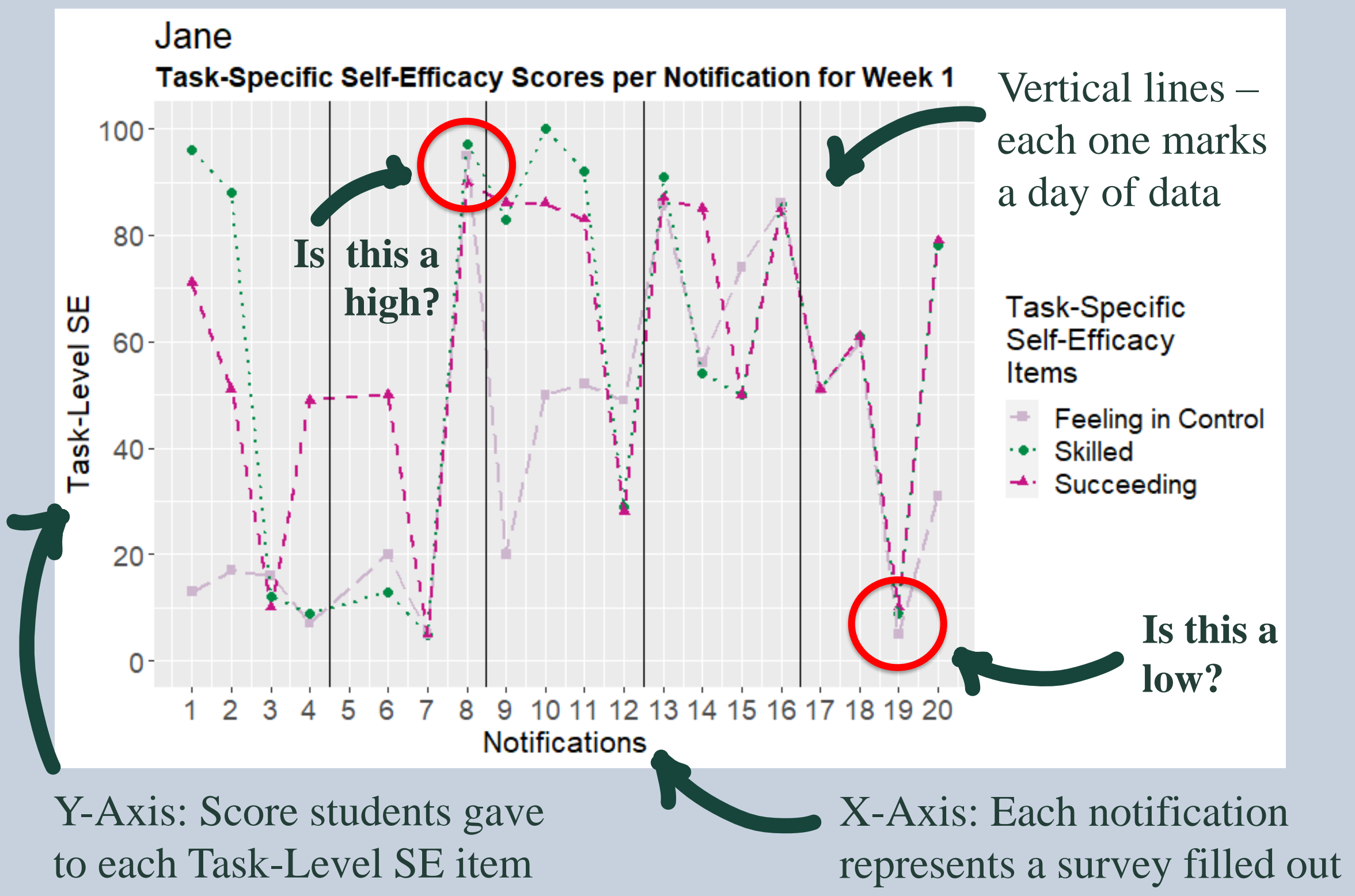
Jane:

- White, female physics major
- Community college transfer student
- Chosen because...
 - Variance in quantitative data
 - Enrolled in physics, computational, and math courses

Methodology of Study:



- **Experience Sampling Method⁵**
 - Technique studies in-the-moment experience of individuals
 - Individuals provide responses to survey items at several random moments throughout each day of the week when prompted



Future Work:

- Potential use – build interventions to support the development of self-efficacy
- Does this work for other students?
 - Continue analysis of Fall 2020
 - Analyze Fall 2021 Study ~ 12 students

Acknowledgements:

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References:

