

Abstract

In a longitudinal study using undergraduates (N=836), we examined the abilities of objective (ONS) and subjective (SNS) numeracy to predict financial outcomes. We hypothesized that being more proficient in ONS and/or SNS would be associated with better financial outcomes due to superior calculations (ONS) and/or greater motivation (SNS). Additionally, we manipulated numeracy (taking a statistics course vs. not) to investigate possible improvements, in ONS, SNS, and financial outcomes over the semester. Results indicated that taking the statistics course protected students from detrimental changes in SNS and lower scores in SNS predicted detrimental changes in financial outcomes over the semester. Additionally, taking a statistics course appeared to provide a protective effect to detrimental changes in financial outcomes one year later.

Intro

Prior research has demonstrated that greater **objective numeracy** (the ability to understand and use basic probability and mathematical concepts) is important for experiencing better financial outcomes (e.g., greater retirement saving, avoidance of predatory loans; Banks & Oldfield, 2007; Sinayev & Peters, 2015).

However, objective numeracy may not be sufficient for experiencing good financial outcomes. Motivation and confidence to deal with numbers may also be important. One way to assess these constructs is through **subjective numeracy** (one's perceptions of one's numeric ability and a preference for numbers). Recent research has shown that lower- vs. higher-SNS individuals are less motivated and less confident in numeric tasks, controlling for objective numeracy (Peters & Bjälkebring, 2015). Additionally, lower- vs. higher-SNS individuals have more negative emotional reactions to numbers.

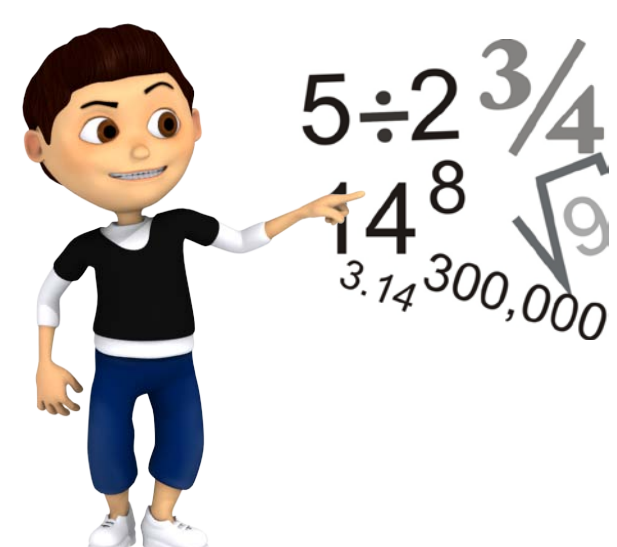
No known research has examined the possible separable impacts of ONS and SNS on financial outcomes, and it's unclear which skills might matter most. Improved outcomes could be due to superior calculations (ONS) and/or greater motivation or confidence (SNS).

Research Aims

1) Examine the impact of both objective and subjective numeracy on financial outcomes.

❖ Which numeric competence matters most?

- ❖ ONS? Superior numerical reasoning
- ❖ SNS? Motivation, confidence, persistence

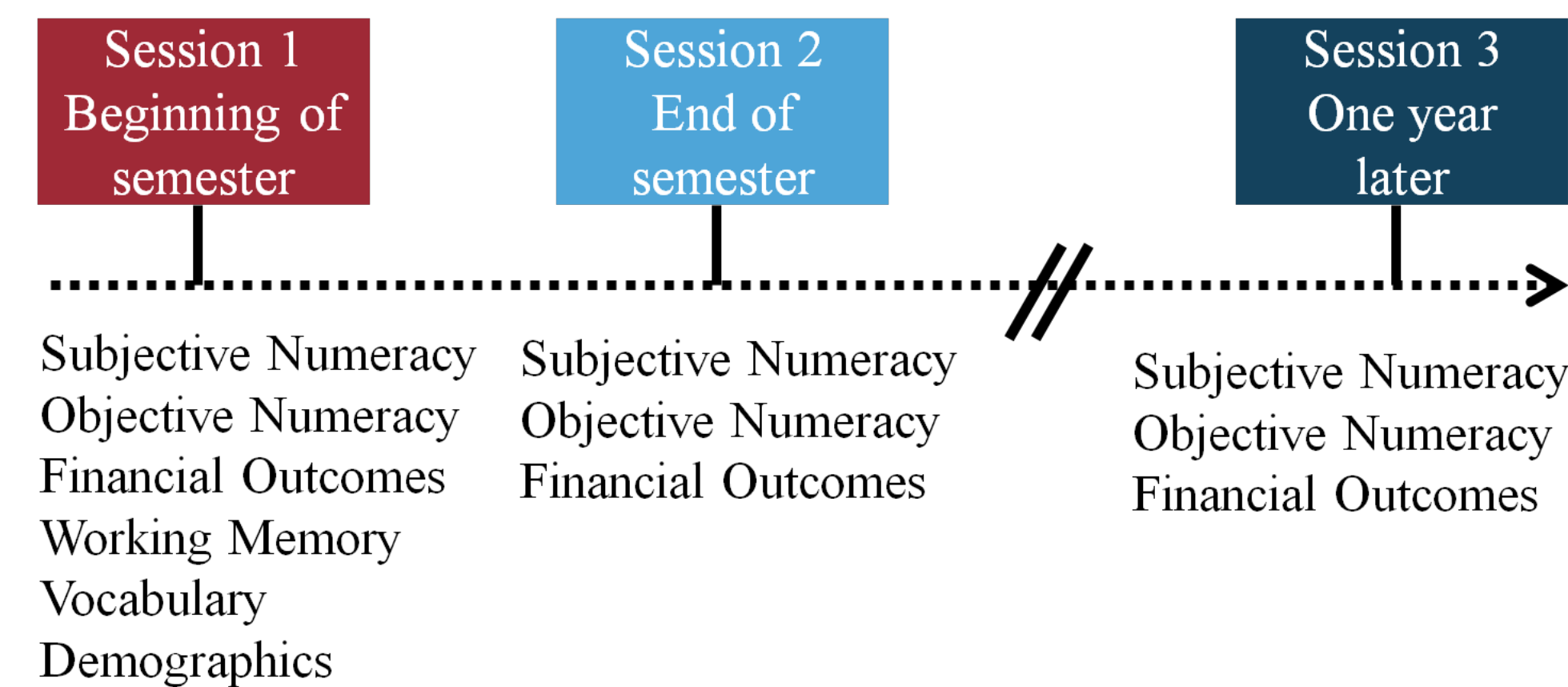


2) Attempt to manipulate objective and subjective numeracy to improve financial outcomes over time.

- ❖ Taking Statistics course vs. not

Methods

Students enrolled in a statistics (N=290) or introductory psychology course (N=546) completed the following measures at three time points:



❖ ONS – 18-item math test (Weller et al., 2013)

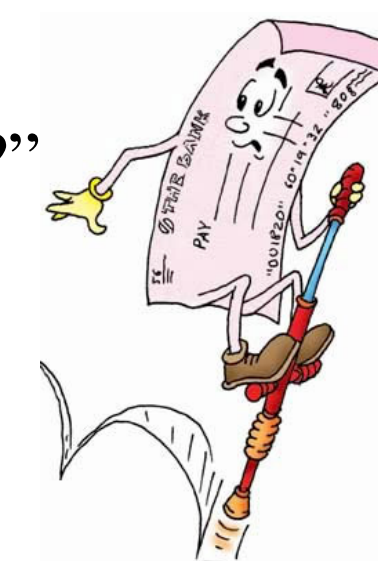
- ❖ e.g., “If the chance of getting a disease is 10%, how many people would be expected to get the disease out of 100?”

❖ SNS – 8-item self report (Fagerlin et al., 2007)

- ❖ e.g., “How good are you at working with percentages?”
- Not at all (1) to Extremely good (6)

❖ 10 Negative Financial Outcomes

- ❖ e.g., “had an overdraft or bounced check?”
- ❖ e.g., “experienced more than \$5,000 in credit card debt?”



❖ Financial Outcome Score = % of negative outcomes experienced across the items

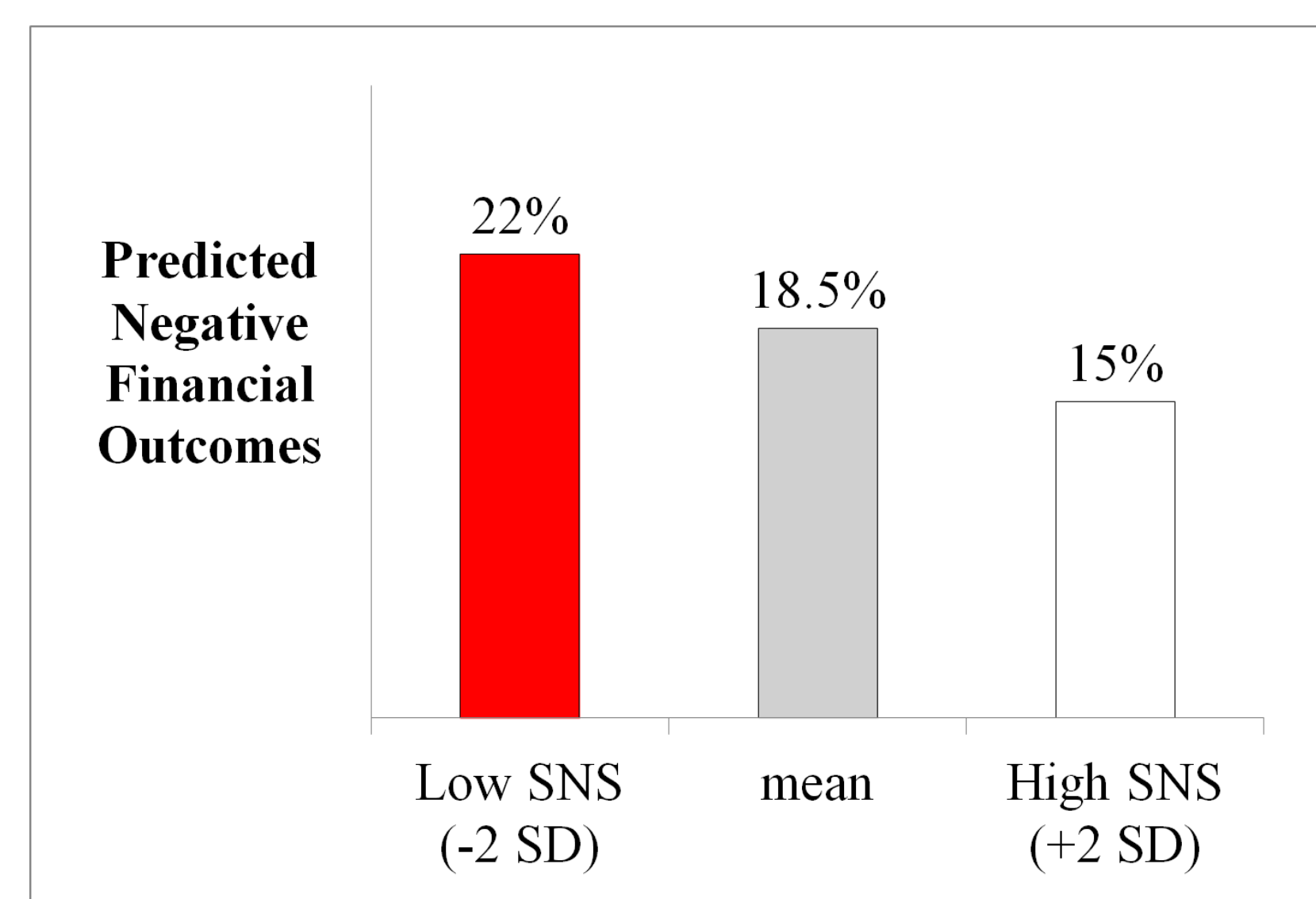
Results

- Sample 63% female; mean age= 19.9
- Mean Financial Outcome Score = 18.5%, meaning participants experienced an average of 18.5% of the negative financial outcomes we assessed.

First Aim: What predicts financial outcomes?

- Lower vs. higher SNS had worse financial outcomes, controlling for general intelligence and ONS (p<.01, Figure 1). ONS was not predictive.

Figure 1. Predicted Financial Outcome Scores are worse for individuals lower in SNS.



Results Continued

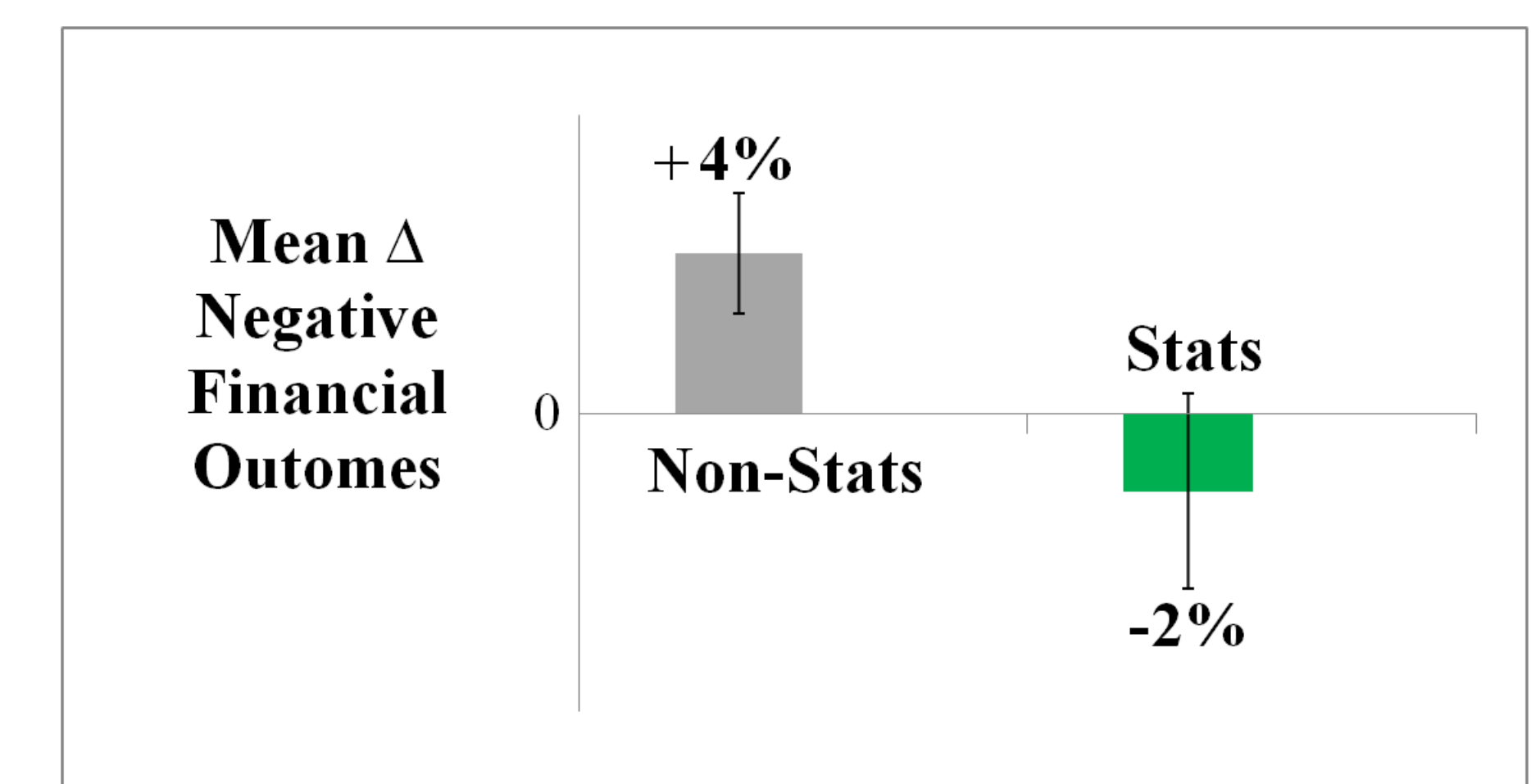
Second Aim: Does taking a statistics course improve objective or subjective numeracy?

- Statistics training *did not* improve ONS over the semester.
- Statistics training provided a small **protective effect** to declines in SNS over the semester (p=.05). Statistics students had stable SNS (meanΔ= -.06, CI -.14 to .03), but non-statistics students decreased in SNS (meanΔ= -.15, CI -.21 to -.09). Declines in SNS predicted increases in negative financial outcomes over the semester (p<.01). The indirect effect, however, was *NS*.

What happens a year later?

- Statistics training provided a small **protective effect** on financial outcomes one year later (p<.05, N=247, Figure 3).
- No significant effects involving ONS or SNS by statistics condition.

Figure 2. Non-Stats students increased in negative financial outcomes a year later and Stats students remained stable. Error bars indicate SE of the means.



Discussion

Subjective Numeracy Matters

A person's belief in their numeric ability was more important than actual ability in predicting financial outcomes and changes in those outcomes over time.

Benefits of Taking a Statistics Course

Statistics training provided a protective effect to detrimental changes in SNS during the semester and in financial outcomes a year later.

Future Analyses

Finished collecting and coding students' academic courses taken and grades received. Next steps include incorporating this academic data into analyses.

References

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