



Boundary Conditions for the Positive-Skew Preference in Risky Decision Making

Kendra L. Seaman¹, Sade J. Abiodun²

¹Center for Vital Longevity, University of Texas at Dallas, ²Center for Cognitive Neuroscience, Duke University



Introduction

- **Positively-skewed gambles** involve large but unlikely gains coupled with a small but likely losses.
- Compared to other equivalent gambles, people:
 - prefer positively-skewed gambles^{1,2}
 - display positive arousal¹ and greater activation in the Nacc.^{1,2}
- Animal research suggests greater preference for more strongly-skewed gambles.³
- We varied the degree of skewness from *weak* to *strong* to determine if this affects positive skew preference.

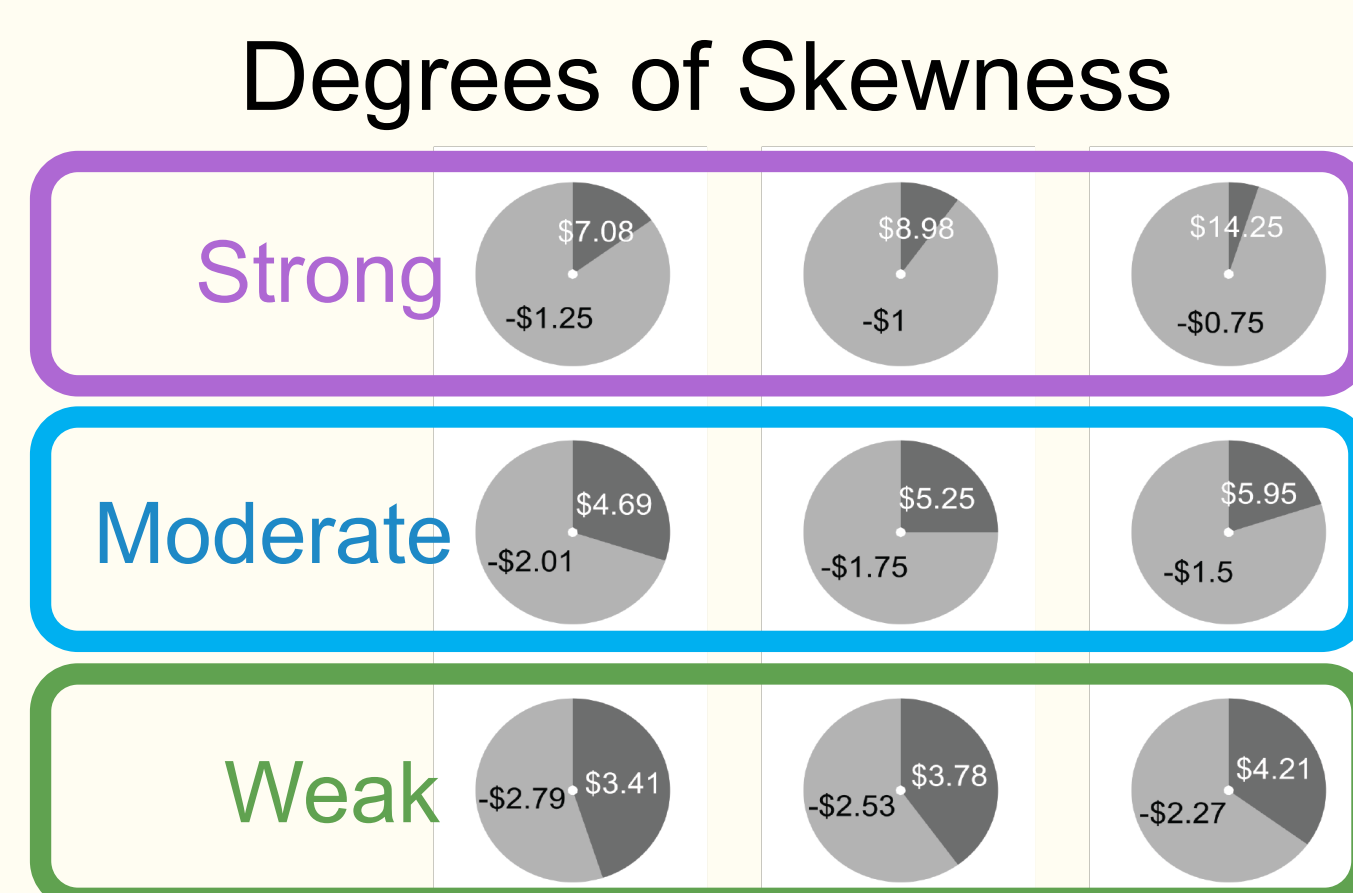
Methods

Participants

- Online study, $N = 209$, Ages 22 - 85
- No psychiatric/neurological illness or head injury.

Skewed Gambling Task

- 9 certain vs. risky choices



- EV varied between participants.

Post-Task Strategy Questions³

- 1: "Strongly disagree" to 5: "Strongly Agree"
- *Affective-Based Strategy*: "I solved the task on a gut level."
- *Deliberative-Based Strategy*: "I tried to solve the task mathematically."

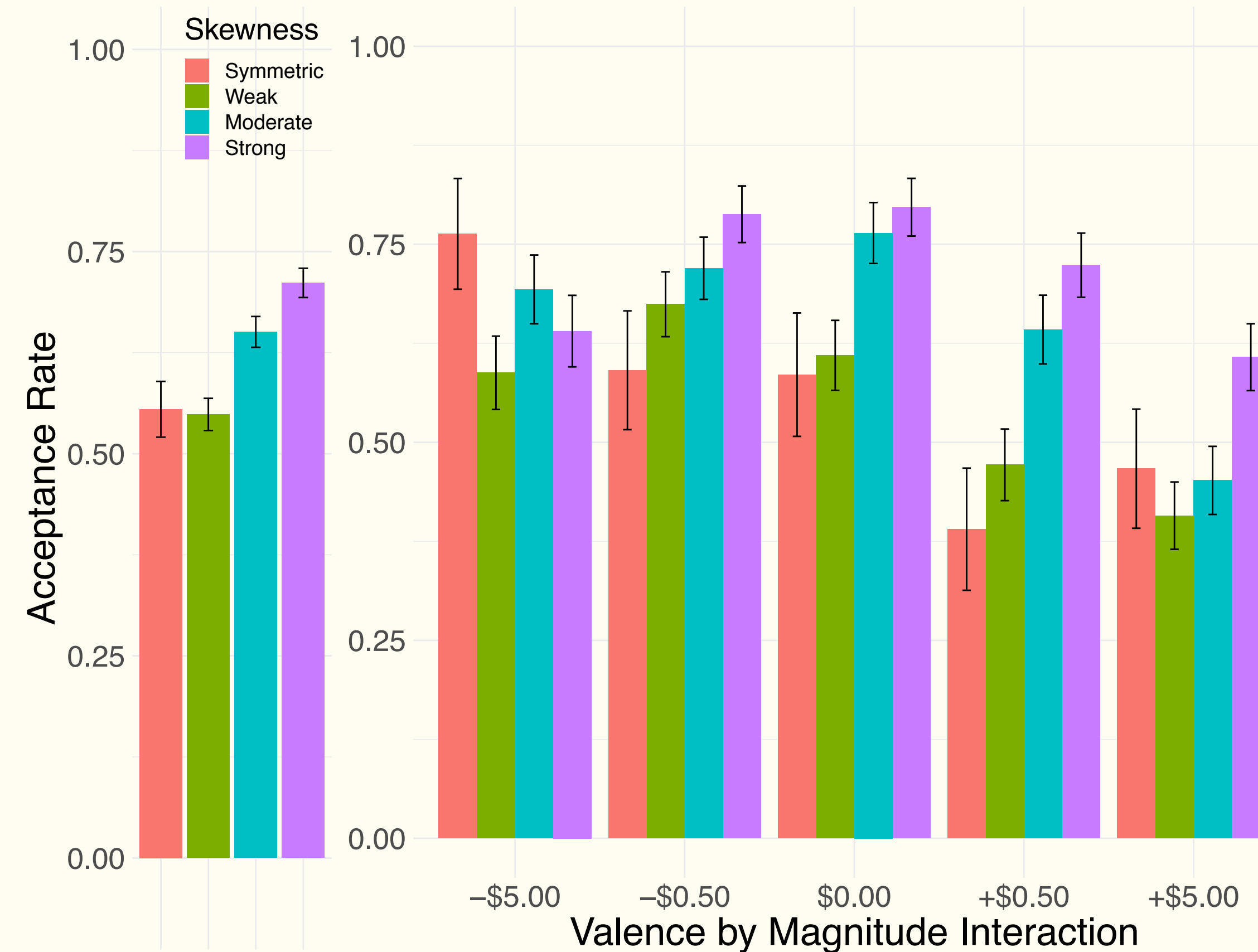
Cognitive Abilities

- Expanded 15-Item Numeracy Scale⁵
- Graph Literacy Scale⁶

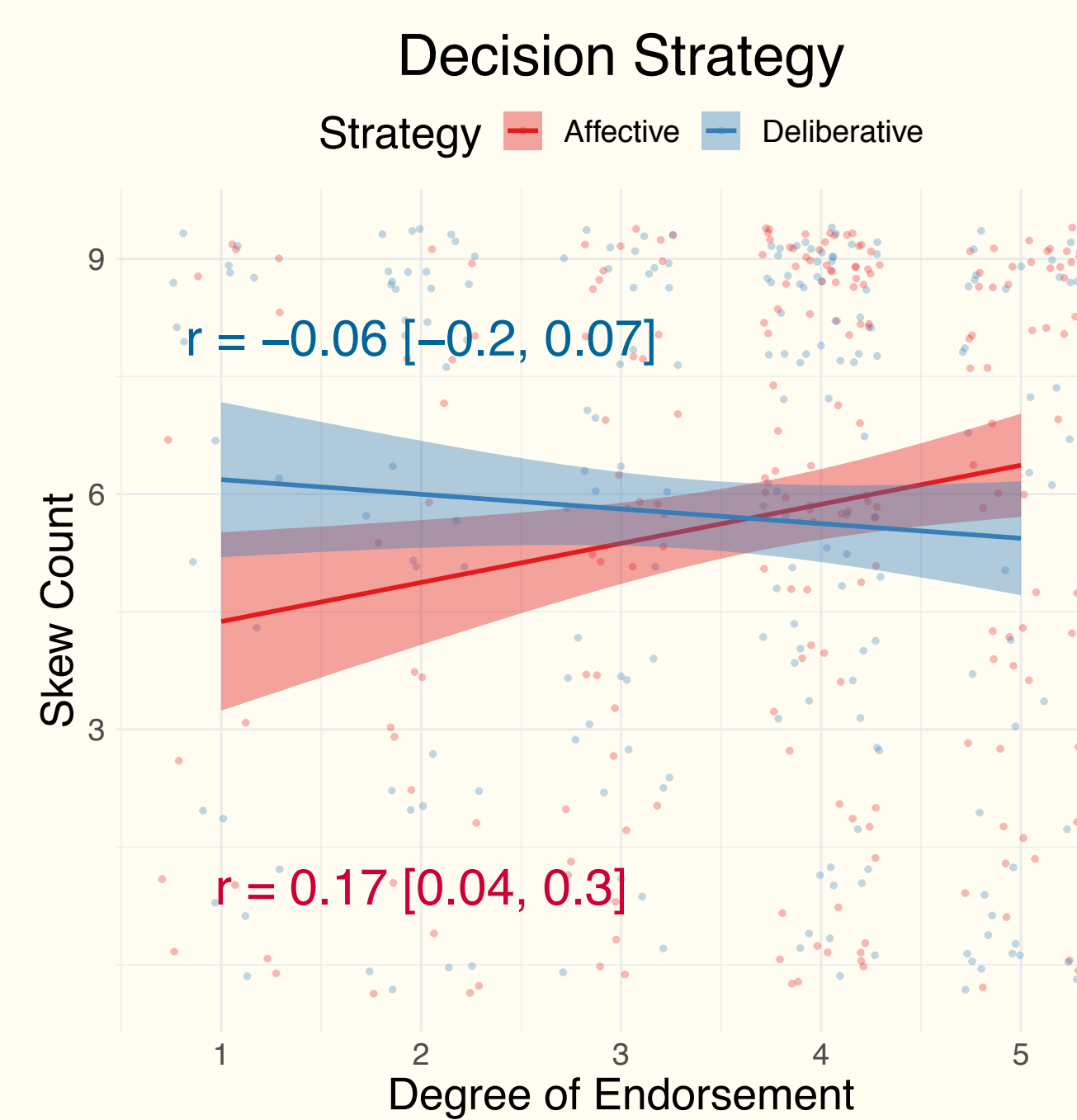
Real-World Decision Making

- 1: "Not at all able to resist" to 7: "Very able to resist"
- *Pressure resistant*: "How able are you to resist high-pressure sales tactics when buying investments?"

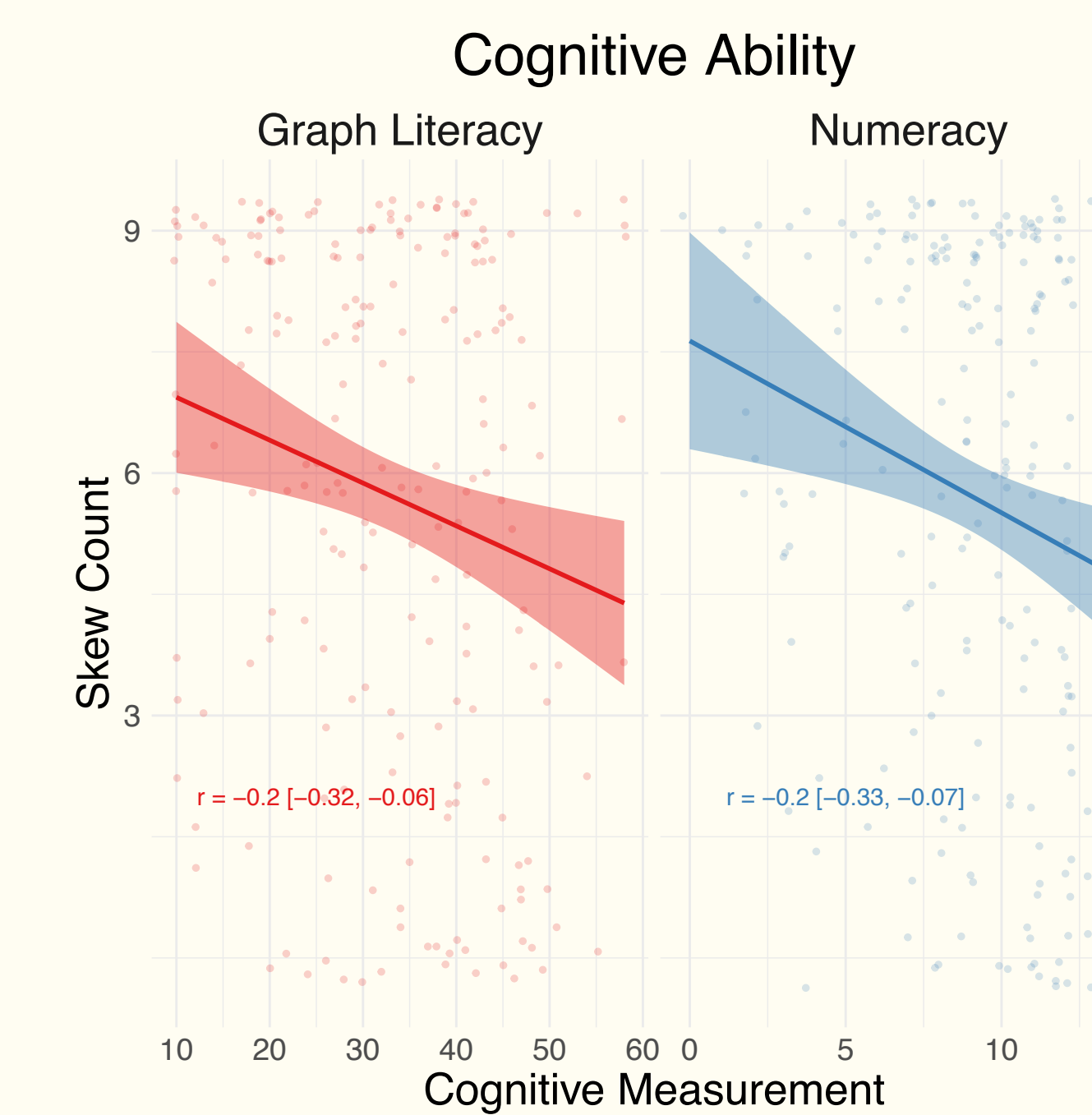
Results



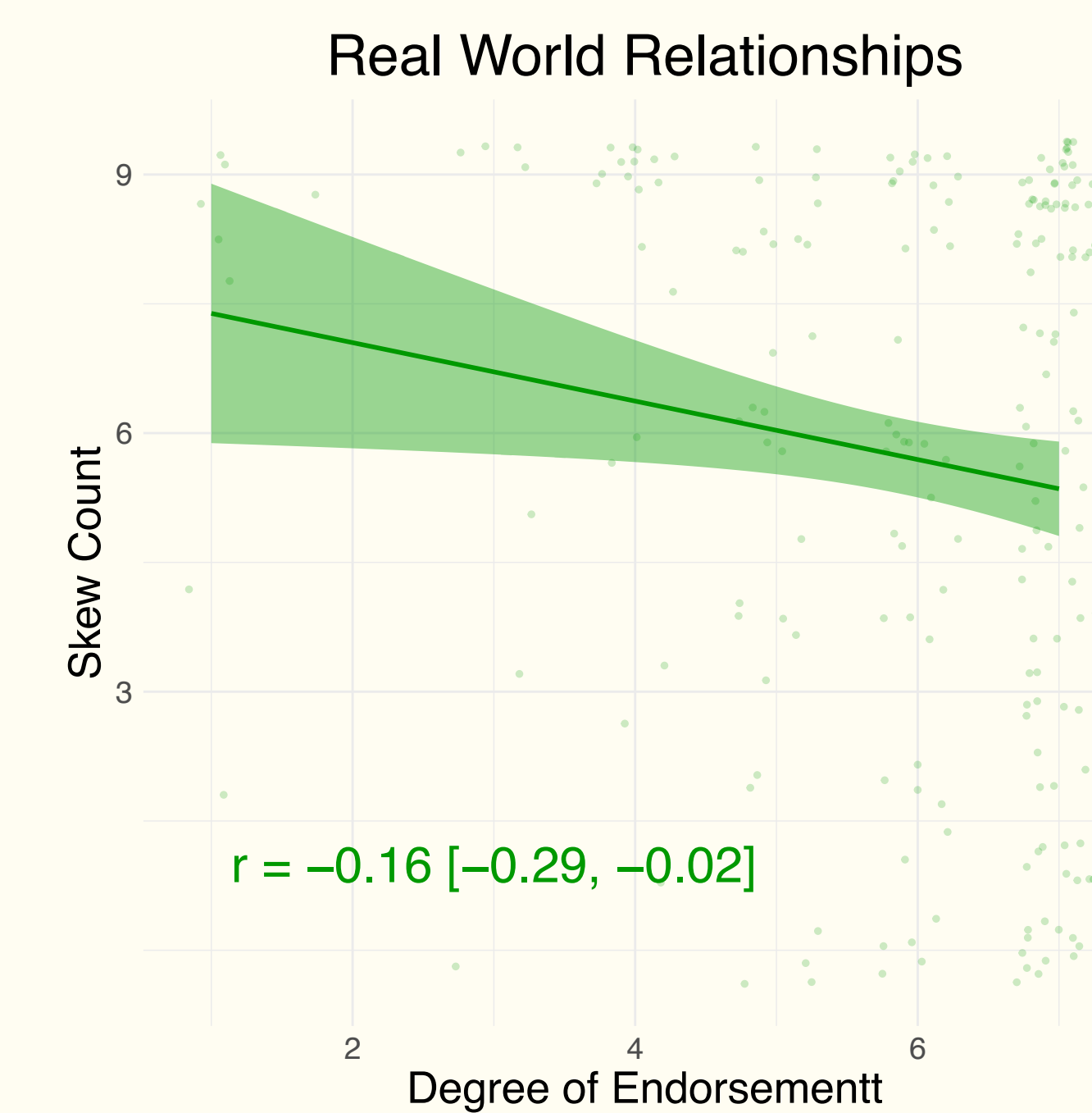
- **More likely to accept moderately- and strongly-skewed gambles over certain outcomes.**
 - This was moderated by valence and magnitude.
 - Trend does not hold for $EV = -\$5.00$ and $+\$5.00$.
 - Unlike prior studies, age was not a significant predictor of skewed gamble acceptance.



- Greater **affective strategy** predicts higher positive skew preference.



- Greater **cognitive ability** predicts higher positive skew preference.



- Greater **pressure resistance** predicts lower positive skew preference.

Conclusions

- **Greater preference for moderately and strongly positively-skewed gambles.**
- Positive-skew preference appears to be driven by:
 - affective strategies instead of deliberative reasoning
 - cognitive abilities instead of affective state
 - confidence instead of experience.

References

- ¹Wu et al 2011
- ²Seaman et al 2017
- ³Strait & Hayden 2013
- ⁴Figner et al 2009
- ⁵Peters et al 2007
- ⁶Garcia-Retamero et al 2016

