Psychological Mechanisms of Skewed Decision Making Across Adulthood: Time Pressure on Cognitive Control

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Introduction

- **Positive-skew bias**: people tend to prefer positively-skewed gambles.
- Older adults tend to have a stronger positive-skew bias.
- This could be because of selective loss avoidance.
- Under time pressure, individuals have less time to engage cognitive resources, potentially reducing this positive-skew bias.
- Time pressure effects are stronger for older adults than for younger adults.
- **We hypothesize that positive-skew bias will decrease for older adults under time pressure, but not younger adults.**

Methods

**Participants:**
37 participants (25-85 years old) out of 78 have been recruited from the Dallas Metro area. Participants over the age of 55 were screened using the MoCA.

**Task:**
- Conditions:
  - Time Pressure
  - 2 seconds
  - No Time Pressure
  - 4 seconds
  - 10 blocks, each with:
    - 9 positively-skewed
    - 9 negatively-skewed
    - 2 symmetric

**Analysis:**
Skew Bias Score = Positive Skew Acceptance Rate − Negative Skew Acceptance Rate

Baseline model

\[ \text{Skew bias score} = b_0 + b_1\text{(condition)} + e_{ij} \]

Age model

\[ \text{Skew bias score} = b_0 + b_1\text{(age)} + b_2\text{(condition)} + b_3\text{(age x condition)} + e_{ij} \]

Preliminary Results

- **No pressure condition:**
  - Younger adults display a positive skew bias, but older adults display a negative skew bias.
  - Our sample displays a negative-skew bias.
  - This preference increases with age.

- Under time pressure,
  - All bias disappears.
  - Older and younger adults have similar preferences.

- Our current sample is majority ‘older’ adults.
- Our “Age” model provides a better fit for the data.
  - Age (b=−.11) and age x condition (b=.07) are statistically significant (p < .001).
  - Condition was not significant on its own (p=0.432).
  - Current analysis is underpowered.

Conclusion

- Our sample does not seem to prefer positively skewed gambles the way that previous literature suggests.
  - This may be due to environmental factors such as COVID-19, but it may also be due to differences in task design.
  - Prior studies used round dollar amounts (e.g. $1.25) and common odds (e.g. 75%/25%)
  - We used more precise dollar amounts and odds
  - Possible fluency effects
  
  \[ \text{Skew bias score} = b_0 + b_1\text{(age)} + b_2\text{(condition)} + b_3\text{(age x condition)} + e_{ij} \]