The Effects of Stress on Reflexive Processing

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Introduction

- **Reflexive vs. Reflective Processing**
  - When presented with repetitive, predictable outcomes, reflexive processing assists in generating automatic behaviors requiring minimal effort.
  - When learning a new task or when presented with unexpected outcomes, reflective processing assists in creating and modifying rule-based frameworks for successful behavior.

Stress and Framing Effects

- Acute stress has deleterious effects on reflexive processing and increases biased behavior.
- However, the effects of stress on reflexive processing in emotional contexts and contexts of varying feedback (punishing vs. rewarding) is unconfirmed.

Hypotheses

1. Stress will enhance reflexive performance in both punishing and emotional contexts.
2. Stress will result in exaggerated punishment learning biases when in emotional contexts.

Design Overview

- Participants completed 4 tasks in counter-balanced order after either a stress manipulation or control manipulation.

Methods

- **Valence**
  - **Punishing – Minimize Losses**
  - **Rewarding – Maximize Gains**

- **Feedback Type**
  - Emotional
  - Non-Emotional

- **Emotional Feedback**
  - Punishing: Minimize Losses
  - Rewarding: Maximize Gains

Results

- **Worse performance in Emotional conditions**
  - Emotional performance deficit was not mediated by stress.
  - Stress reduced the negative effects of punishing feedback.

- **Worse performance in Punishing conditions**
  - Higher heart rate during the cold pressor test indicated a stress response.

Summary

- Overall, participants performed worse when the task was punishing in context.
- This effect was attenuated by stress; stressed participants performed better when faced with punishing feedback relative to controls.
- Overall, participants performed worse when the task was emotional in context.
- This effect was not mediated by stress.
- Emotional context did not exaggerate stress related biases on punishment processing, contrary to our hypotheses.

Conclusions

- Stressed individuals show greater habitual reflexive behavior in punishing contexts. This may be one way addiction is perpetuated by stress.
- Future research could take advantage of a socially-evaluated stressor, thus adding an emotional, naturalistic component to the stress induction.
- Measurement of cortisol levels would also be useful in providing a measure of stress levels during the cognitive tasks.

References

3. Rozin, P., & W. Todd Maddox and Marissa Gorlick for their advice and mentorship. Thank you to Paige Cleven for her design expertise.