Stereotype fit effects in verbal standardized test performance

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Research Goal and Overview

We examined how gender stereotypes induce regulatory focus states to influence regulatory fit effects in standardized test performance. Men and women completed verbal GRE problems while trying to gain or not lose points.

Introduction

Regulatory Focus
- A motivational mechanism that tunes sensitivity to gains and losses in the environment (Higgins, 1997)
  - Promotion focus increases sensitivity to gains
  - Prevention focus increases sensitivity to losses

Regulatory Fit
- Regulatory fit exists when there is a match between focus and environment (Maddox, Markman, & Baldwin, 2007; Maddox, Baldwin, & Markman, 2006; Grimm, Markman, Maddox, & Baldwin, 2009).

	Gains	Losses
Promotion Focus	Match	Mismatch
Prevention Focus	Mismatch	Match

- A regulatory fit influences task performance differently depending on the type of task being performed (Grimm et al., 2008; Maddox & Markman, 2010). Prior work has demonstrated that a regulatory match produces more cognitive flexibility (Grimm et al., 2008; 2009).

- If the task requires cognitive flexibility, like the verbal GRE, math GRE, or rule-based classification, then a regulatory match produces better performance than a regulatory mismatch.

Stereotype Threat
- Negative task-relevant stereotypes lead to performance decrements (Steele & Aronson, 1995)
  - For example, women tend to under perform compared to men on math tests (Spencer et al., 1999)
- Positive and negative stereotypes activate different motivational states (Seibt & Forster, 2004)
  - Positive stereotype induces a promotion focus
  - Negative stereotype induces a prevention focus

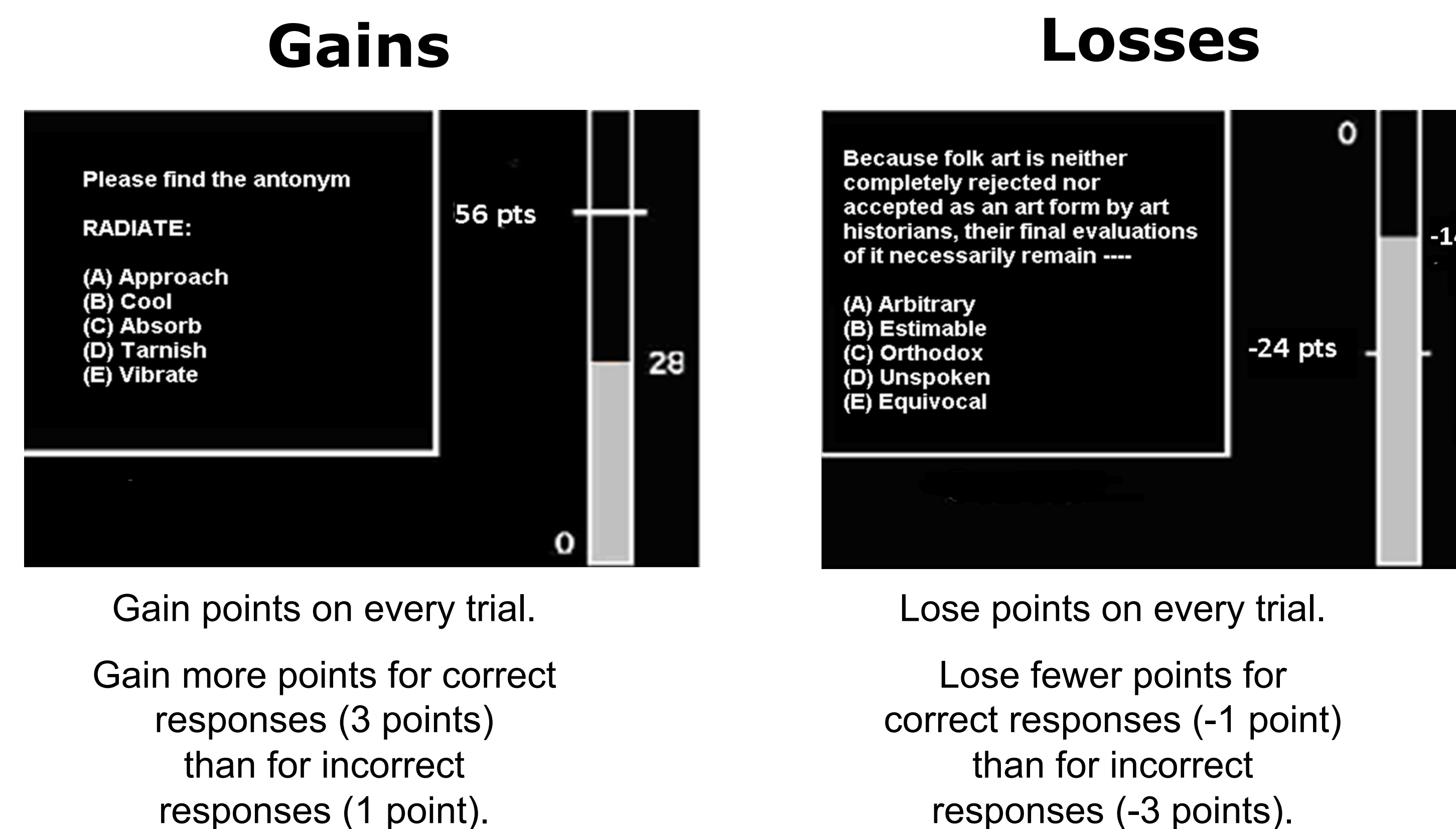## Experiment Overview

Participants
- 159 undergraduates participated for course credit (79 Females and 80 Males distributed across groups)

Chronic Stereotype
- Participants were asked to identify their gender as either "Male" or "Female" at the beginning of the study
  - Women have a positive verbal stereotype
  - Men have a negative verbal stereotype

Task Reward Structure
- Participants completed 20 multiple-choice GRE verbal problems presented on a computer screen with five possible answers
- There were three types of verbal problems: sentence completions, antonyms, and analogies
- After their answer was chosen, participants received immediate feedback of either "Correct" or "No, the correct response is ___" and tracked their progress using a point meter on the screen
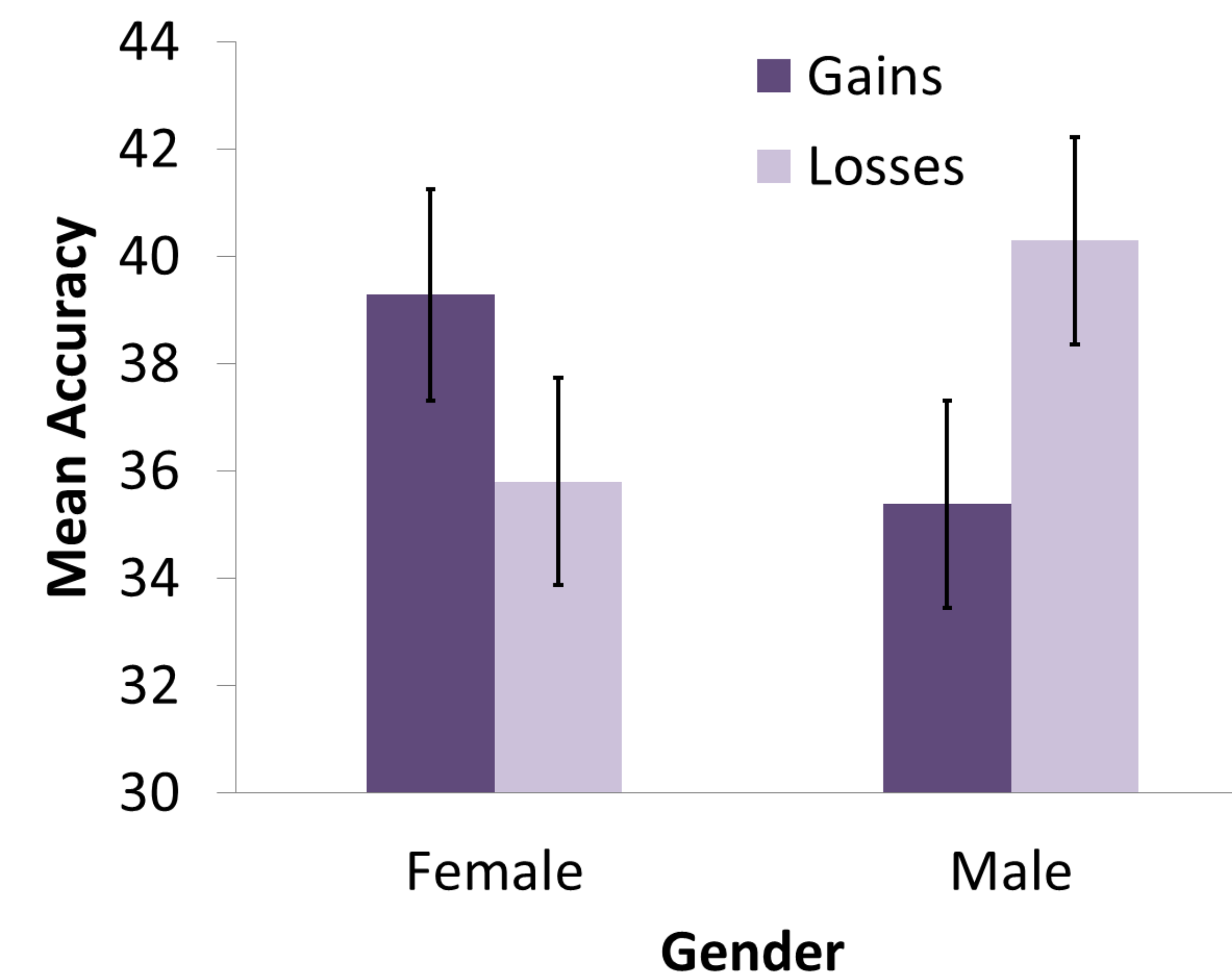
Gains

Gain points on every trial.

Gain more points for correct responses (3 points) than for incorrect responses (1 point).

Losses

Lose points on every trial.

Lose fewer points for correct responses (-1 point) than for incorrect responses (-3 points).

Stereotype Fit vs. Mismatch states

	Gains	Losses
Women/Promotion Focus	Match	Mismatch
Men/Prevention Focus	Mismatch	Match

Hypothesis

- Regulatory match states will be created for:
  - Women focused on gaining points
  - Men focused on not losing points
- Regulatory match groups will perform better on the verbal GRE problems relative to those groups in a regulatory mismatch

Results

We obtained a significant interaction effect for Stereotype (Positive, Negative) and Reward Structure (Gains, Losses) for overall accuracy, $F(1, 151) = 4.83$, $p = .030$, $\eta_p^2 = .031$.

Math SAT scores were positively associated with solving antonyms ($p = .046$) and moderately associated with solving sentence completions ($p = .053$).

Verbal SAT scores were positively associated with solving sentence completions ($p < .001$) and analogies ($p < .001$).

	1	2	3	4	5
1. Accuracy					
2. Sentence Completion	.80***				
3. Antonym	.61***	.31***			
4. Analogy	.67***	.26***	.12		
5. Math SAT	.20*	.15	.16*	.11	
6. Verbal SAT	.39***	.35***	.05	.36***	.51***

*$p < .05$; ***$p < .001$

Concluding Remarks

- We predicted and found that stereotypes induced regulatory focus states and interacted with the reward structure for verbal GRE problems
  - Women performed better in the gains version of the task compared to the losses version
  - Men performed better in the losses version of the task compared to the gains version
- Interestingly, Math SAT scores were positively associated with solving antonyms and Verbal SAT scores were positively associated with solving sentence completions and analogies

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