Effect of regulatory fit and expertise on fitness outcomes

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Research Goal and Overview

Previous research on regulatory fit has found positive performance effects for participants experiencing a regulatory match as opposed to a mismatch. Using exercise tasks we manipulated regulatory focus and created matching or mismatching reward structures in a controlled setting.

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)

Regulatory Fit and Exercise
- Health messages congruent with one's chronic regulatory focus led to more fruit and vegetable intake (Latimer, Rench, et al., 2008; Spiegel et al., 2004).
- Participants in a regulatory fit perform better in soccer penalty shooting and 3-point basketball shots (Unkelbach, Memmert, & Plessner, 2009).
- Few studies look at exercise behaviors in a controlled setting. The present study looks to generate regulatory fit to improve performance in exercise tasks.

Experiment Overview

Participants
- 164 TCNJ undergraduates participated for course credit or $8 for one hour of participation (51.5% female)

Regulatory Focus
- Induced promotion or prevention focus through health messages

Promotion:
Students can optimize their health by being physically active. Studies have shown that exercising during the day improves blood circulation, which can promote healthiness. Approaching physical activity with a weekly exercise routine is a goal with many outcomes, including optimizing heart and lung functions. Achieving weekly exercise goals is an aspiration you can meet to help you look and feel your best.

Prevention:
Students can protect their health by not being physically inactive. Studies have shown that not exercising during the day does not improve blood circulation, which can prevent healthiness. Avoiding physical activity without a weekly exercise routine can have many outcomes, including risk for heart and lung disease. Not failing to meet weekly exercise guidelines is what you ought to do to protect against poor health.

Task Reward Structure used to create Regulatory Match/Mismatch states
- Participants were put in Promotion focus with Gains reward structure (N = 44) or with Losses reward (N = 41); or in Prevention focus with Gains reward (N = 40) or with Losses reward (N = 40)
- Researchers the number of repetitions:
  - Gains: counted up the number of repetitions completed by ones (1, 2, 3, etc.) out loud
  - Losses: counted down the number of repetitions remaining by ones (80, 79, 78, etc.) out loud

Measures
- To measure chronic focus, participants were given the Regulatory Focus Questionnaire (RFQ; Higgins et al., 2001), the Lockwood Scale (Lockwood, Jordan, & Kunda, 2002), and the Roese Scale (Roese, Hur, & Pennington, 1999)
- Global Physical Activity Questionnaire (GPAQ; Armstrong & Bull, 2006) used to determine weekly exercise patterns.
- Participants were asked on 6-point scales whether they considered themselves to be an exercise expert (1 = Not at all, 6 = Definitely).

Exercise Task
- Before starting each exercise task, participants were asked to repeat a mantra of "I aspire to promote my healthiness" (promotion condition), or "I am obligated to prevent my unhealthiness" (prevention condition)
- During the tasks participants listened to a recording of this mantra on repeat (average rate of 7.5 repetitions per minute); the recorded voice gender matched the participant's gender
- Consistent with the induced focus condition, participants were told they were able to earn (promotion condition) or avoid losing (prevention condition) a pedometer (monetary value $1) if they succeeded in a randomly selected exercise task, to be chosen at the end of the study.
- The researcher demonstrated the exercise (sit ups and squats), asked the participant to repeat the exercise mantra, played the sound clip when participant began exercising, and counted repetitions aloud.

Hypotheses and Results

Hypotheses
- Regulatory fit states will result in improved performance
  - Promotion: counting up repetitions > counting down repetitions
  - Prevention: counting down repetitions > counting up repetitions
- Novices will show regulatory fit effects whereas experts will not because experts are well-practiced
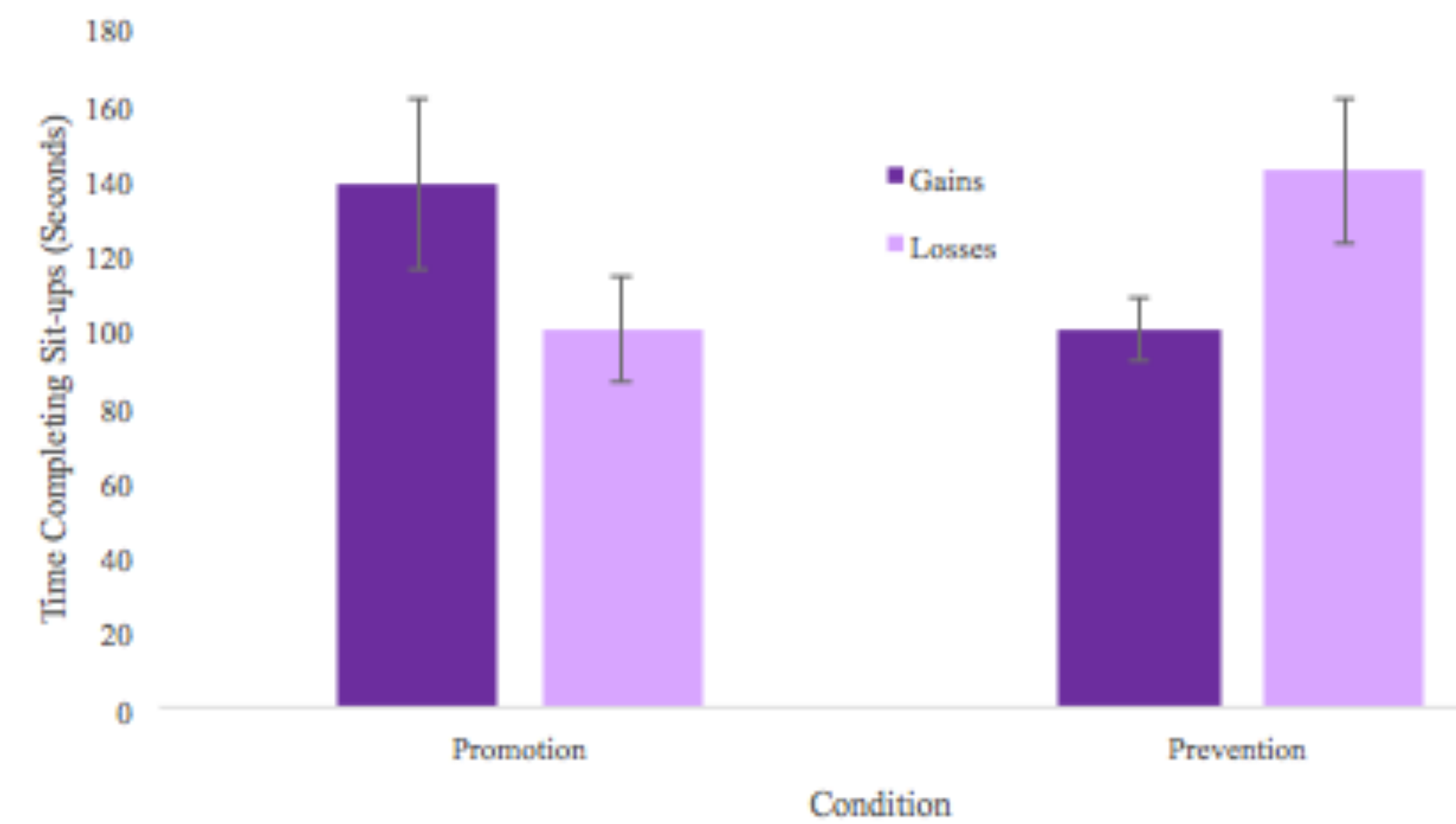

The low expertise participants in regulatory match conditions endured longer, exercising for a longer period of time, than participants in mismatch conditions.

$F(1,164) = 8.66$, $MSE = 3331.25$, $p = .004$, $\eta_p^2 = .08$.

Promotion Gains completed sit ups longer then Promotion Loses: $F(1,164) = 3.99$, $MSE = 3331.25$, $p = .047$, $\eta p2 = .09$.

Prevention Loses completed sit ups longer than Prevention Gains: $F(1,164) = 4.68$, $MSE = 3331.25$, $p = .032$, $\eta p2 = .09$

Figure 1. Low expertise participants by condition with time completing sit-ups. Error bars represent standard error.

Participants in regulatory match conditions, as opposed to regulatory mismatch conditions, quit the task at a slower rate.

$F(1,164) = 3.13$, $MSE = 960.04$, $p = .079$, $\eta_p^2 = .04$.

Prevention Losses performed better than Prevention Gains: $F(1,164) = 3.15$, $MSE = 960.04$, $p = .078$, $\eta p2 = .12$
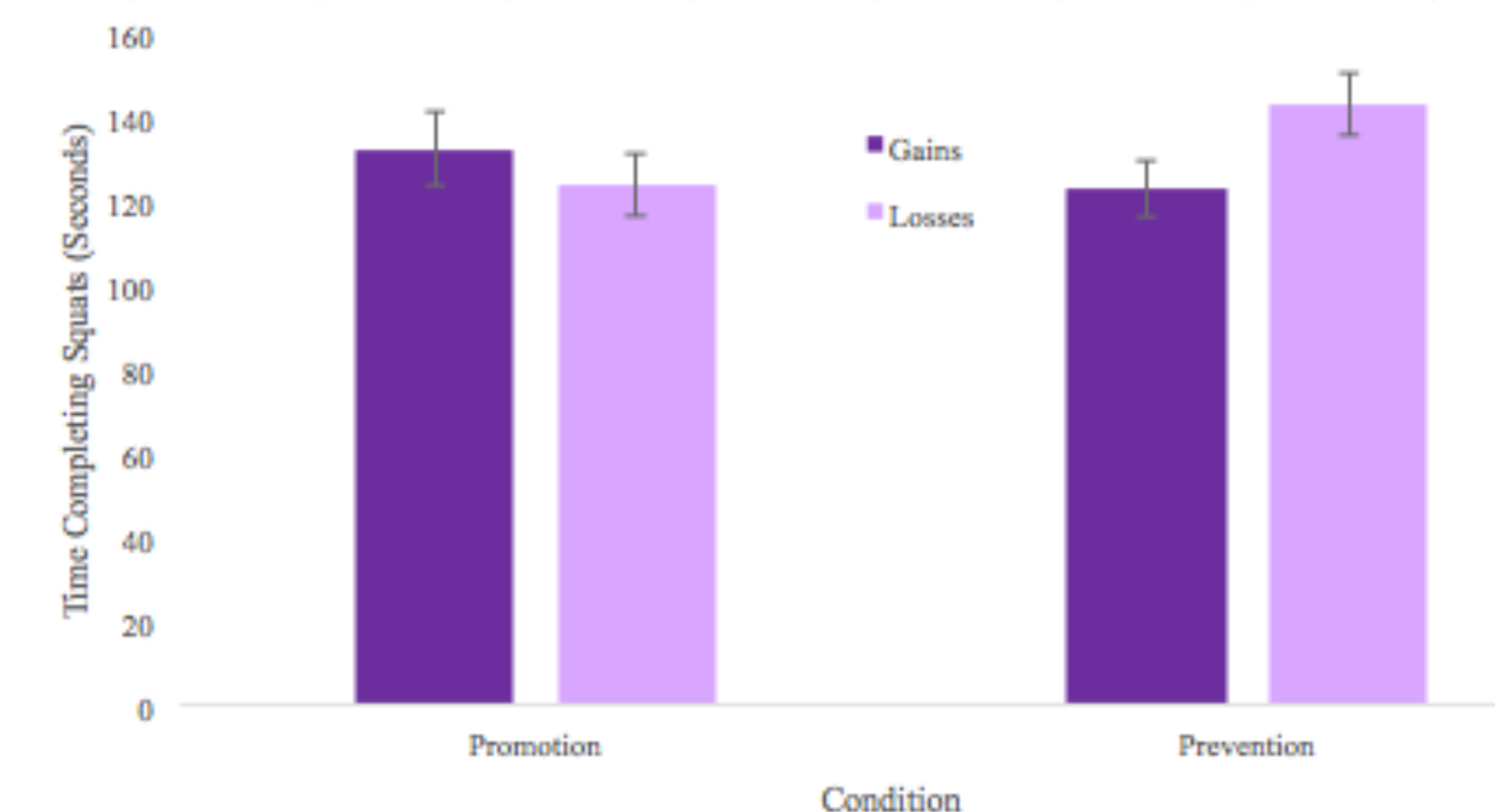

There was no interactive effect for high expertise between focus and reward for sit-ups and squats

Sit ups: $F(1,164) = <.01$, $MSE = 3331.25$, $p = .956$, $\eta_p^2 = <.01$.
Squats: $F(1,164) = .04$, $MSE = 960.04$, $p = .833$, $\eta_p^2 = <.01$.

Figure 2. Low expertise participants by condition with time completing squats. Error bars represent standard error.

Concluding Remarks

- We predicted and found that regulatory match states would increase exercise performance for low exercise expertise participants
  - Completing sit-ups and squats in regulatory match conditions resulted in participants enduring in exercise longer as compared to participants in mismatch conditions
- As predicted, we did not find effects for participants with high exercise expertise.
- Findings suggest that generating regulatory fit can help the average, low-expertise person improve his or her health.

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