



Cognitive- versus Emotion-Based Involuntary Cognitions: An Informative Contrast for the Reflexive Imagery Task



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Introduction

The Reflexive Imagery Task (RIT; Allen et al., 2013) reveals that, following the activation of certain action sets, conscious contents can arise in response to external stimuli in an involuntary, systematic, and nontrivial manner (Allen et al., 2013). In the original version of the task (based in part on Wegner, 1989), participants are presented with visual objects and instructed to not subvocalize the names of these objects. On a majority of trials, participants cannot suppress subvocalizations. In other variants, participants cannot suppress counting the number of letters comprising the object names (Merrick et al., 2015).

Perhaps some conscious contents are more likely to arise involuntarily than others. In our experiment, we contrasted cognitive- and emotion-based conscious contents. The latter tend to be less amenable to 'direct cognitive control' than the former. It has been proposed that mental processes that are amenable to direct cognitive control are, interestingly, more susceptible to ironic processing.

After being trained to perform a word-manipulation task similar to Pig Latin (e.g., "CAR" becomes "AR-CAY"), participants were instructed to not transform stimulus words in this way. In a comparison condition, participants were presented with emotion words (e.g., SAD) and instructed to not feel the corresponding emotion.

Method

Participants. San Francisco State University undergraduate students ($n = 35$; 27 females) participated for course credit.

Stimuli. The stimuli consisted of 20 words of well-known object names (e.g., BOOK) and 20 words describing emotion (e.g., HAPPY). The presentation of stimuli was counterbalanced across participants and presented in random order.

Procedures. All participants completed two conditions: the Word Manipulation condition and the Emotion condition.

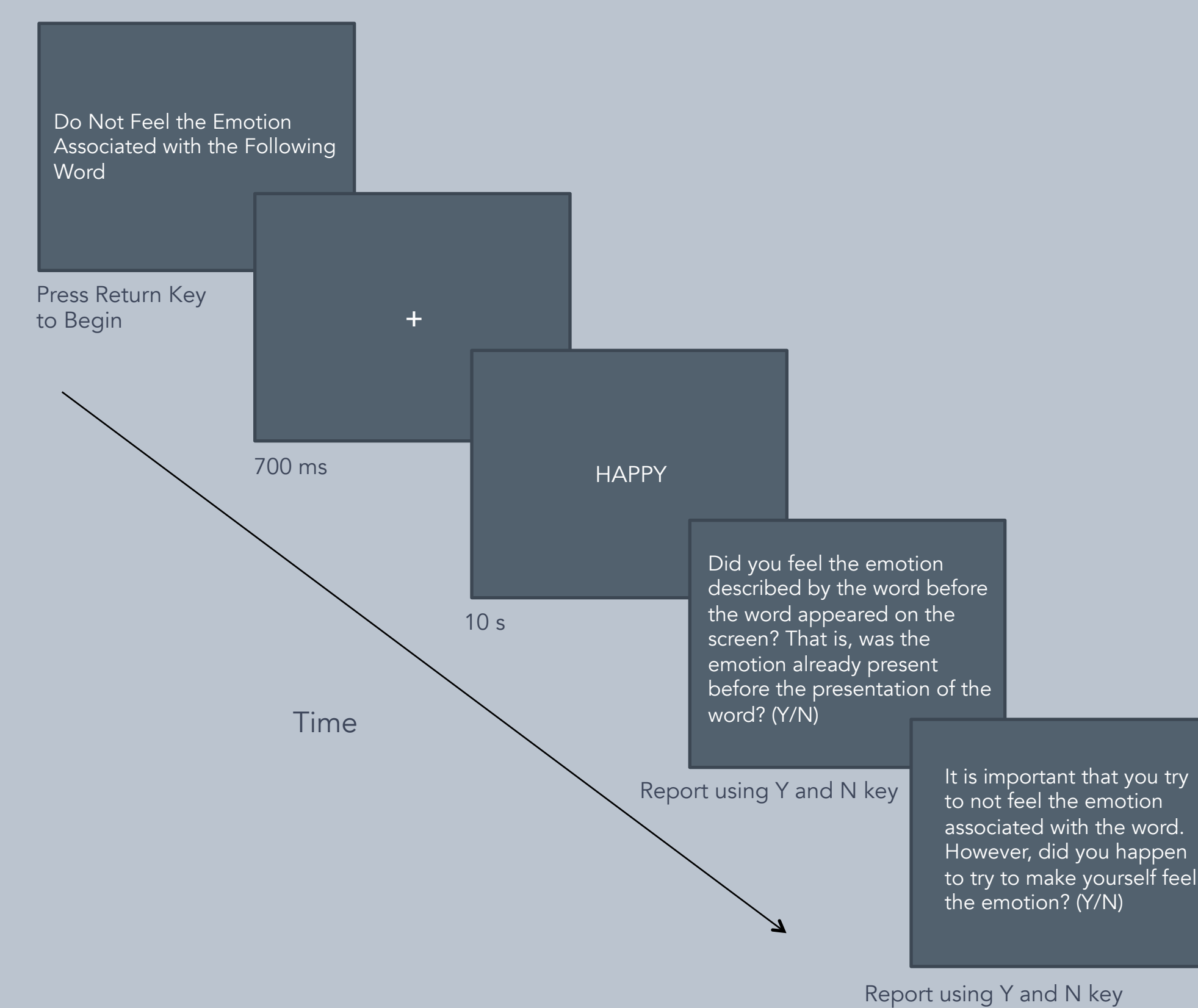
In the Word Manipulation condition ($n = 20$), participants were instructed to not think of the transformed version of the presented word on each trial (10 s). During trials, participants indicated with a button press when they happened to think of the transformed version of the presented word. Following each trial, participants were asked a question regarding their performance (Figure 1).

For the Emotion condition ($n = 20$), participants were instructed to not feel the emotion described by the word on each trial (10 s), but to indicate by button press if they felt the emotion described by the word significantly more than before the word appeared on the screen. Following each trial, participants were asked two questions regarding the task (Figure 2).

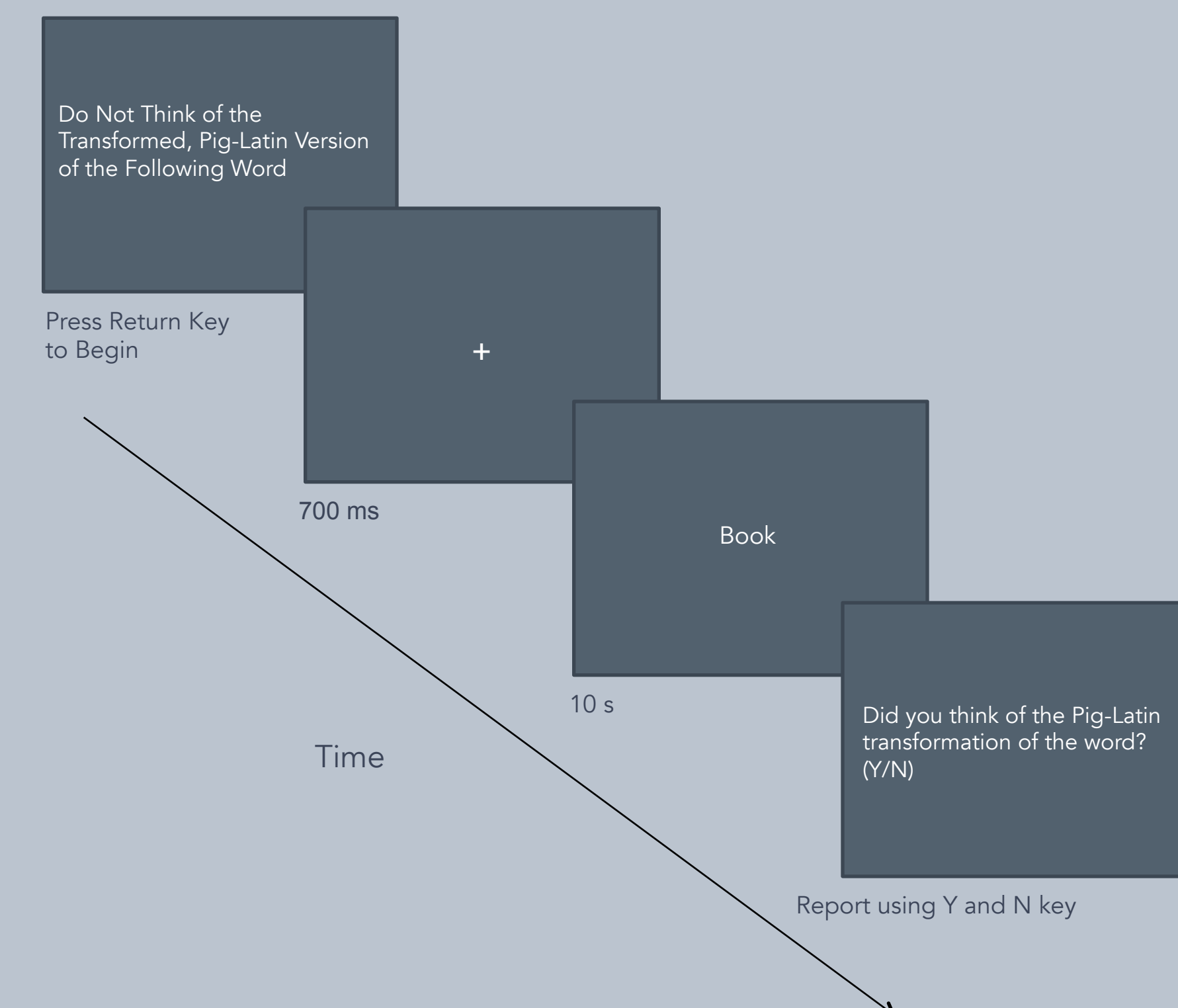
Sample Stimuli

Word Manipulation Condition	Emotion Condition
Ball	Angry
Cake	Anxious
Door	Disgusted
Fire	Excited
Heart	Happy
Ring	Sad
Top	Surprised

Word Manipulation Condition (Figure 1)

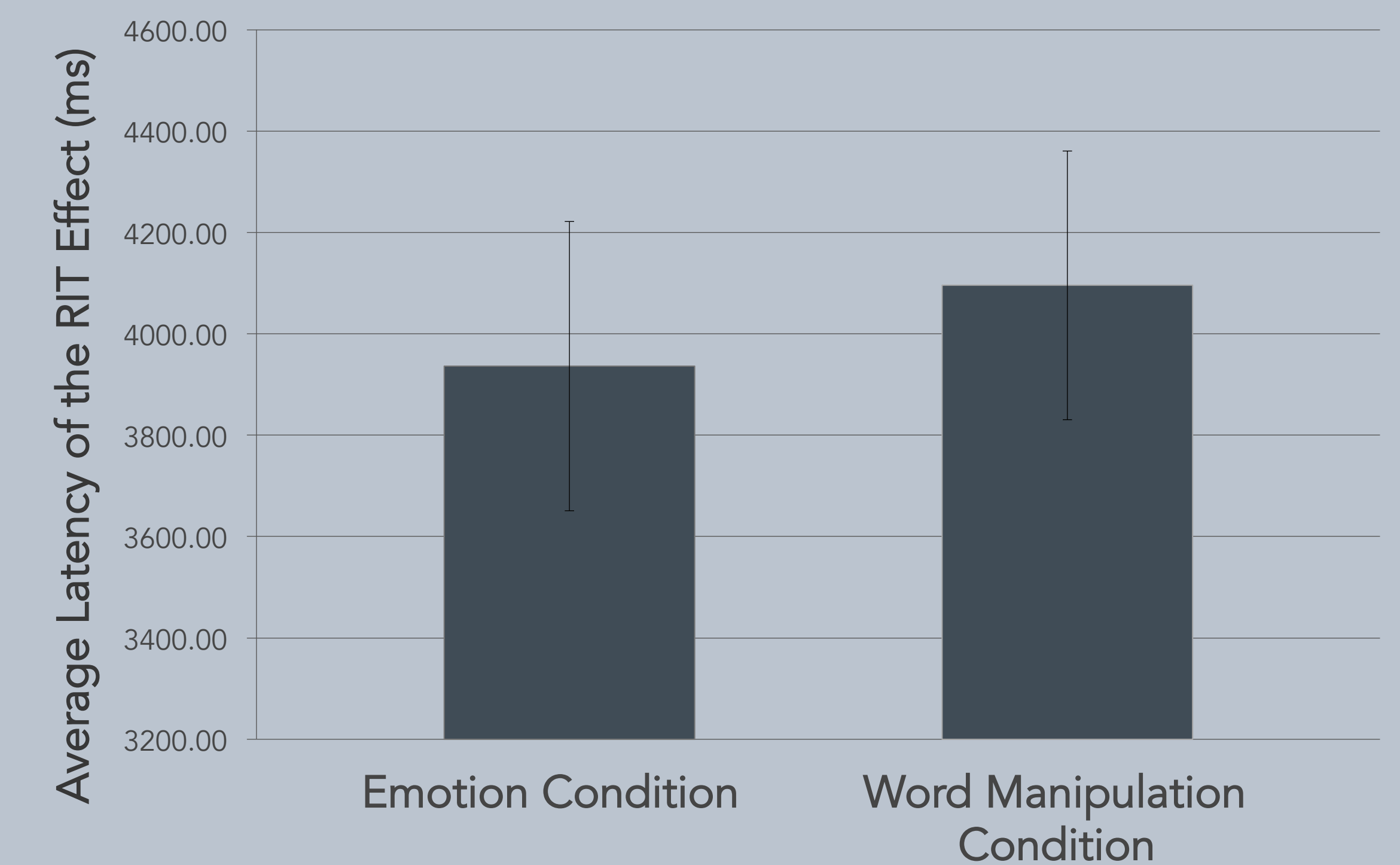


Emotion Condition (Figure 2)

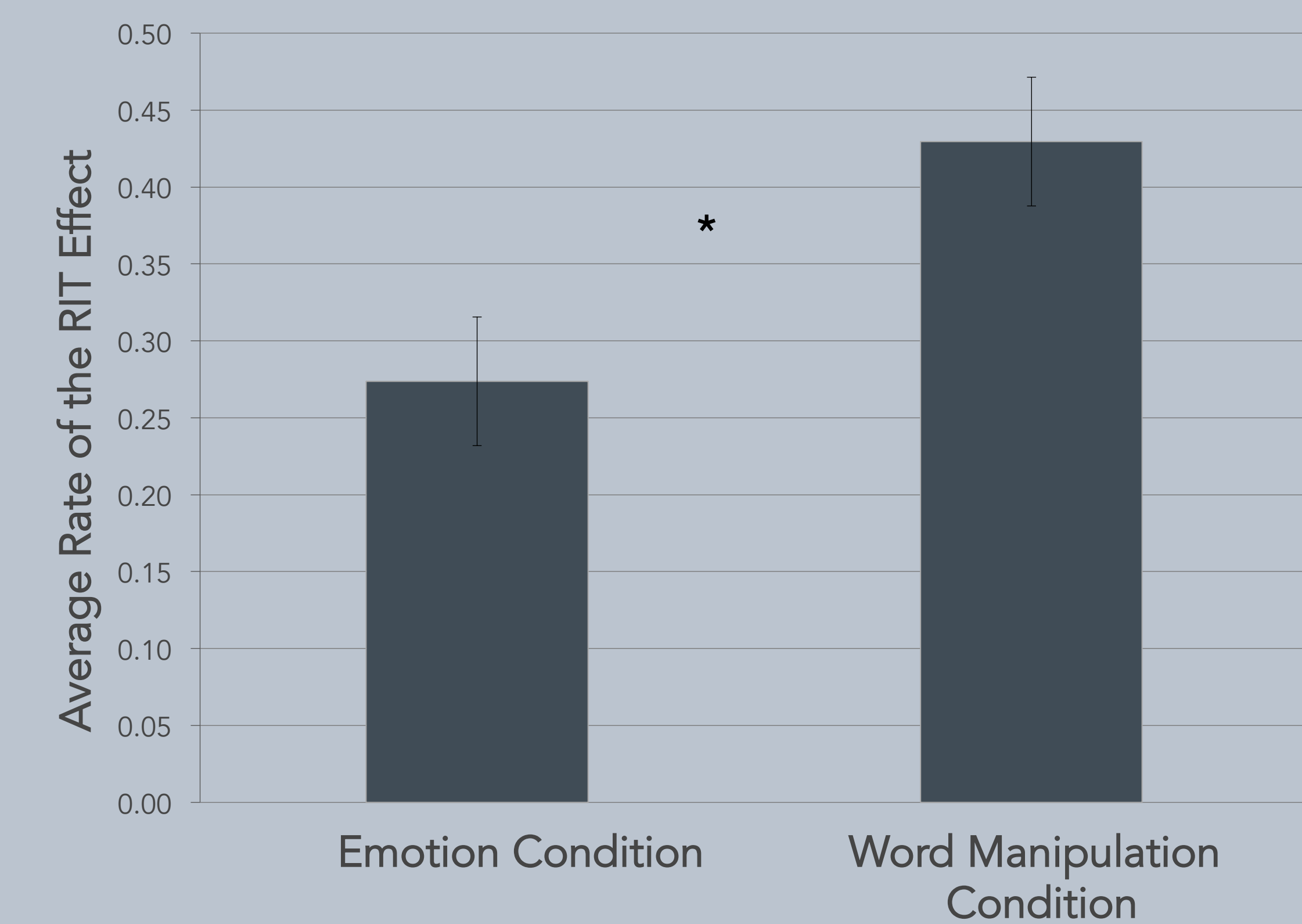


Results

Latency of the RIT Effect



Proportion of the RIT Effect



Discussion

The RIT is a rich and robust phenomenon that reveals the conditions under which contents enter consciousness (Allen et al., 2013). We investigated an informative contrast involving the RIT effect: the suppression of involuntary cognitive processes (e.g., symbol manipulation) versus the suppression of involuntary emotional processes. Interestingly, the RIT effect arose significantly more frequently in the Cognitive condition (which involved simple manipulation and frontal cortex) than the Emotion condition.

The results are consistent with the view that there is an inherent, qualitative difference between the cognitive domain and the emotion domain: Processes amenable to direct cognitive control are the most susceptible to ironic effects. It would not be adaptive for emotions to be amenable to direct cognitive control (e.g., to 'turn off' guilt by will); hence, emotional processing is less susceptible to ironic effects in the RIT.

The findings of this study have implications for research on emotional processing (e.g., attention, emotion-regulation) and psychopathology (e.g., rumination, obsession).