Habituation of Involuntary Imagery as a Function of Stimulus Threat and Frequency

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INTRODUCTION

- The Reflexive Imagery Task (RIT; see review in Bhangal et al., 2016) has been employed to investigate how high-level cognitions can enter consciousness in an involuntary and insuppressible manner. In the basic version of this task, a subject is told to not subvocalize the names of objects. Then, an object is presented for 4 s, and the subject presses a button if he or she subvocalized. In most of the trials (~80%), the subject fails and subvocalizes.
- Bhangal et al. (2016) demonstrated that habituation can take place, whereby repeated presentation of an object leads to easier suppression of subvocalization (i.e., fewer RIT effects).
- This study investigated how the RIT habituates and varies as a function of the danger level of each object.

METHOD

Subjects

- Sixty-five San Francisco State University students (M_{age} = 22.6, SD = 5.33) participated for course credit.

Stimuli

- Stimuli consisted of 20 Low Danger and 20 High Danger Snodgrass drawings, based on ratings of valence (positive vs. negative) and threat (safe vs. dangerous; Brousseau & Buchanan, 2004). Each stimulus was also selected for high 'name agreement.'

Procedures

- Subjects were instructed to keep their focus on the center of the screen at all times. They were informed that they would see a series of objects, and that they should not think of the name of each object. If they did think of the name, they pressed the spacebar with their left hand as soon as they thought of it. Instructions appeared on the screen: "*Do Not Think of the Name of the Object.*" When the subject was ready, they pressed the return key and a fixation cross (+) appeared in the center of the screen for 700 ms. This was followed by an image that remained on the screen for 4 s. If the subject thought of the name of the object, they pressed the spacebar. This process was completed 10 consecutive times for each of the 40 stimuli. The order of presentation of the different stimuli was random.
- After all trials were completed, each subject was asked to rate how dangerous each stimulus was: "*On a scale from 0 to 8, with 0 being not dangerous and 8 being extremely dangerous, how dangerous is this object?"*

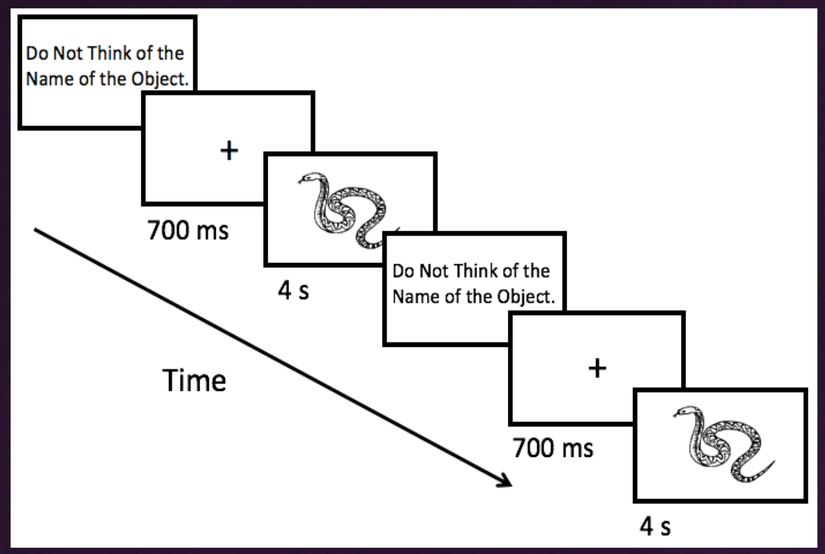

Figure 1. Schematic depiction of a typical trial. Only two of ten presentations are depicted. Image not drawn to scale.

RESULTS

- In a within-subjects Repeated Measures ANOVA with Presentation as one factor and Danger Level as the other factor, there was a main effect of Presentation, F (9, 576) = 66.48, p < .001, η_p^2 = .48, and a main effect of Danger Level, F (1, 64) = 6.57, p = .013, η_p^2 = .09. There was also an interaction between the two factors, F (9, 576) = 2.56, p = .007, η_p^2 = .04 (Figure 2).
- In a second within-subjects Repeated Measures ANOVA with Presentation as one factor and Stimulus Type (Top 10 High Danger with Low Frequency vs. Top 10 High Frequency with Low Danger) as the other factor, there was a main effect of Presentation, F (9, 576) = 54.66, p < .001, and a main effect of Stimulus Type, F (1, 64) = 66.48, p = .003 (Figure 3).

REFERENCES

Bhangal, S., Allen, A. K., Geisler, M. W., Morsella, E. (2016). Conscious contents as reflexive processes: Evidence from the habituation of high-level cognitions. *Consciousness and Cognition, 41,* 177-188.

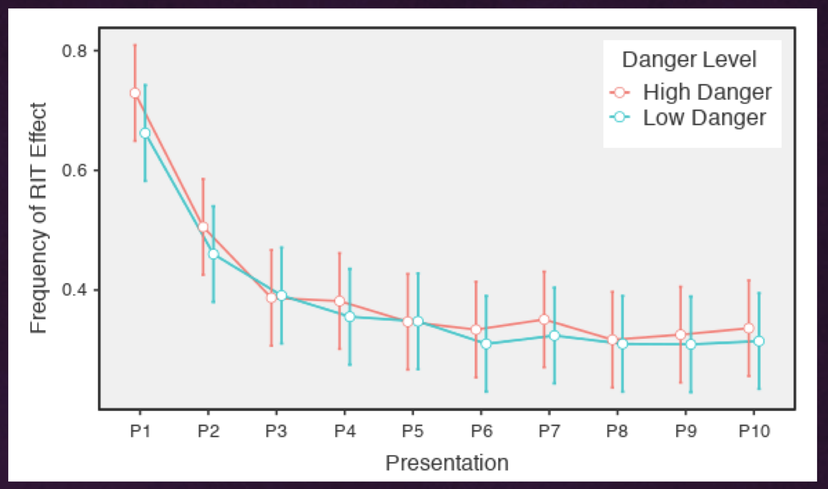

Figure 2.

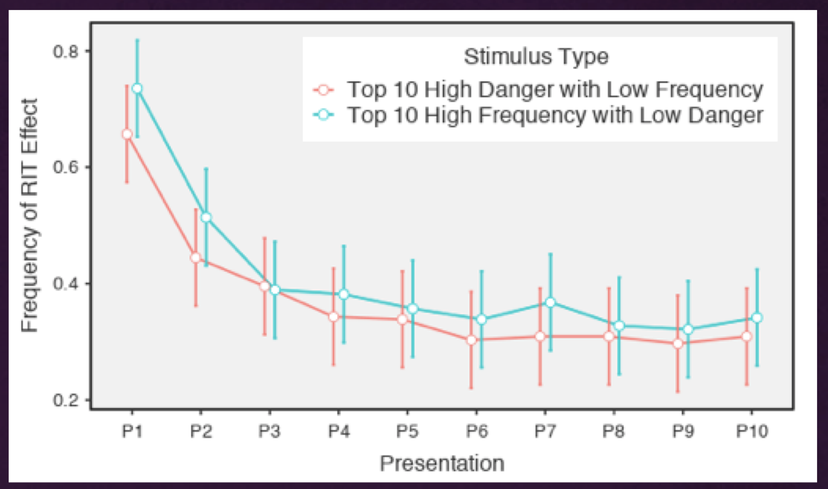

Figure 3.

DISCUSSION

- We replicated the habituation effect of Bhangal et al. (2016) and illuminated how the effect might vary by the danger level of each object. Our second analysis suggests that the effect was driven by Danger, but more data are required for this claim.
- Understanding the nature of these effects and their potential causes will provide a more complete theory of how the mind/brain works.
- The findings also have implications for the understanding of clinical conditions in which involuntary cognitions are debilitating (e.g., rumination in depression, obsessions, and compulsions).