



Acceptance vs. Suppression of Intrusive Cognitions in Undergraduates with Obsessive-Compulsive Characteristics



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Abstract

Intrusive cognitions were prompted in high- and low-Obsessive-Compulsive (OC) participants by showing an emotionally evocative video. Participants were then instructed either to suppress or accept any intrusive cognitions during the experiment. Participants monitored the number of intrusions during a 5-minute rest period, and then performed a variant of the Stroop task that included emotion-relevant words.

Self-reported intrusions during the rest interval were greater for the high-OC group and the acceptance group. During Stroop task errors, the ERN was apparent as a maximal frontal negativity, and was significantly larger for the suppression group than the acceptance group. Additionally, the more self-reported intrusions during rest (possibly reflecting acceptance) significantly predicted a lower ERN amplitude of the difference waveform.

Introduction

- ❑ **Intrusive Cognitions:** “any distinct identifiable cognitive event that is unwanted, unintended, and recurrent. They interrupt the flow of thought, interfere in task performance, are associated with negative affect, and are difficult to control” (Clark & Rhyno, 2004).
 - ❑ A hallmark symptom of obsessive-compulsive disorder (OCD).
- ❑ **Suppression:** Individuals attempt to use thought suppression to control unwanted cognitions (Rachman & de Silva, 1978), however, this strategy may actually produce a preoccupation that exacerbates the very problem (Wegner, 1994).
 - ❑ Individuals with OCD are distinguished by especially intense attempts to resist their obsessions (Rachman, 1997).
- ❑ **Acceptance:** Hayes and colleagues (1996) have proposed that many human problems stem from attempts to control or diminish internal experience; hence they suggest that clients should be made aware of the problems inherent in attempting to control cognitions, and a stance of acceptance and willingness should be practiced instead (1999).
- ❑ **The Anterior Cingulate Cortex (ACC):** a brain region that can be hyperactive in individuals with OCD (Ursu et al., 2003). This area is also uniquely activated during attempts at thought suppression (Wyland et al., 2003).
 - ❑ The error-related negativity (ERN) is a response-locked negativity that indexes activity in the ACC, and appears to reflect the salience of an error made during a simple decision-making task (Gehring et al., 1993).
 - ❑ “In addition to contributing to effortful attention and response monitoring, the ACC may be involved in the emotional evaluation of events and actions” (Tucker, et al., 2003).
- ❑ **ERN and OCD:** An enhanced ERN has been observed in individuals with OCD (Gehring et al. 2000), and under-graduates with OC-like characteristics (Hajcak & Simons, 2002)
- ❑ **The purpose of this study was to extend these findings by comparing two strategies that participants may use in response to intrusive cognitions: suppression and acceptance. The impact of these strategies was observed on the amplitude of the ERN during a modified emotional Stroop task.**

Method

Subjects

- ❑ 54 University of Arizona students (28 female) participated
 - High- and Low-OC groups: selected from among the top and bottom 6% of Introductory-level students on the Obsessive-Compulsive Inventory-Revised (OCI-R).
 - Mean scores: High = 36.47, Low = 2.19

Physiological Recording

- ❑ EEG
 - Recorded from 25 scalp electrodes using a standard EEG cap
 - Amplified with gain=500, sampling rate= 1000 Hz
 - Filtered online at 0.05Hz and 200Hz
- ❑ EOG was recorded below each eye and at the nasion
- ❑ EEG and EOG were reference online to Cz, EEG was re-referenced offline to linked mastoids; EOG was re-referenced to bipolar montage (Nasion versus Left VEOG).

EEG Analysis

- ❑ Artifacts were rejected after visual inspection
- ❑ Files were digitally filtered with a 15Hz low-pass filter (96dB/octave).
- ❑ Eyeblinks were corrected using a regression algorithm (Semlitsch, et al., 1986)
- ❑ 500 ms epochs were created and baseline corrected, beginning 100 ms before the response
- ❑ ERN amplitude was determined as the most negative response in the 0-150ms window post-response, with all channels locked to Fz
- ❑ Difference waveforms were computed by subtracting the correct trial waveforms from the incorrect trial waveforms

Procedure

- ❑ Participants were prepared for psychophysiological recording and signals were verified.
- ❑ Participants were seated alone in a sound-attenuated chamber and watched a 1 minute 30 second emotionally evocative video clip intended to create feelings of disgust and vivid memories.



- ❑ Part 1
 - ❑ Participants were randomized to receive either Suppress or Accept instructions, and then sat quietly for 5 minutes and reported with a button press the number of times an intrusive image from the video “popped” into their minds.
- ❑ Part 2
 - ❑ Participants performed a modified emotional Stroop task. Words were either Neutral, Disgust-related, Congruent, or Incongruent.

Hypotheses (Part 1)

- ❑ Hypothesis 1: Suppression will be effective in the short-term in suppressing intrusive cognitions.
 - This effect may be moderated by Hi- or Lo-OC status.
- ❑ Hypothesis 2: Self-reported discomfort will be greater in the Suppression condition

Hypotheses (Part 2)

- ❑ Hypothesis 1: Suppression will enhance the ERN for the Suppression group
 - This effect will be moderated by the Hi- or Lo- OC status.



Results

Part 1

Hypothesis 1: Suppression will be effective in the short-term for suppressing intrusive cognitions.

This effect may be moderated by Hi- or Lo-OC condition.

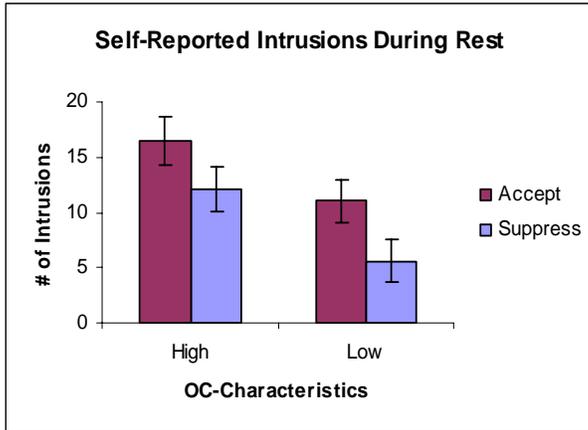


Figure 1. The Suppression group reported significantly fewer intrusions than the Accept group during the 5-minute rest period ($p < .02$). Also, the Low-OC group reported significantly fewer intrusions than the High-OC group ($p < .005$). The interaction was not significant.

Hypothesis 2: Self-reported discomfort will be greater in the Suppression condition.

Although the Suppression group self-reported more discomfort than the Acceptance group the effect was not significant ($p = .18$).

Part 2

Hypothesis 1: Suppression will enhance the ERN for the Suppression group

This effect will be moderated by the Hi/Lo-OC condition.

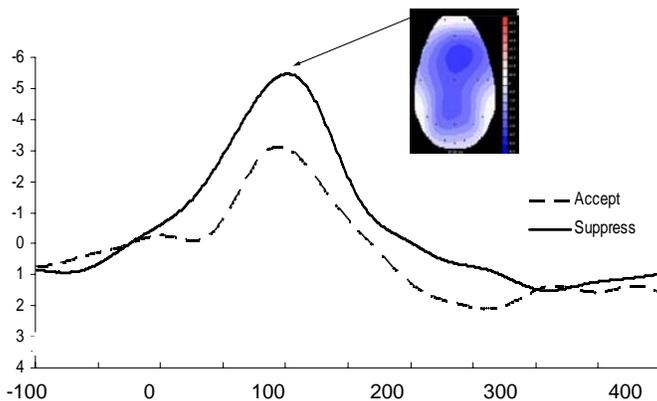


Figure 2. ERN Difference waveforms (error-correct) at Fz. The Suppression group exhibited a significantly larger ERN amplitude during Stroop task errors compared to the Acceptance group ($p = .03$). There was no main effect for the Hi/Lo-OC groups on the ERN difference amplitude.

NOTE: The mean number of "total errors" for each group is: Hi-OC, 31.9; Lo-OC, 28.7; Acceptance, 30.2; Suppression, 30.4. None of these are significantly different.

Results (cont.)

The self-reported number of intrusions during the rest interval is another way of conceptualizing suppression vs. acceptance with a continuous measurement variable. The participants who reported fewer intrusions may be demonstrating suppression, whereas a higher number of intrusions could be indicating acceptance.

Correlation of Self-reported Intrusions and ERN Difference Amplitude

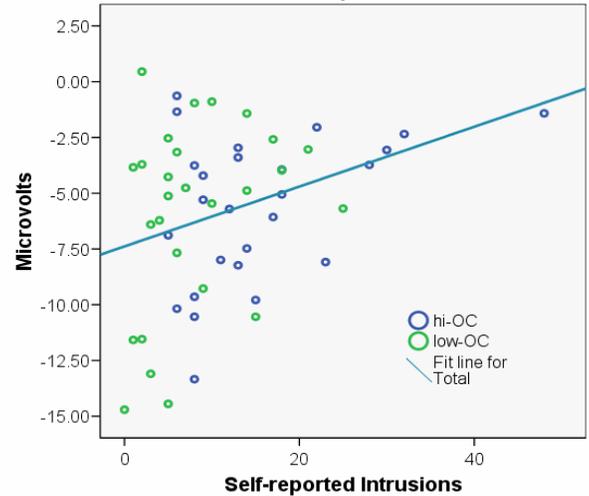


Figure 3. The number of self-reported intrusions during the rest interval significantly correlated with the ERN amplitude ($r = .36$, $p < .02$). The number of self-reported intrusions did not correlate with the amplitude of the waveforms on correct trials ($r = .069$, $p = .623$).

Discussion

This experiment investigated whether using an acceptance or suppression strategy in response to intrusive cognitions would be reflected in the amplitude of the ERN during errors on a Stroop task. Results showed that participants are able to suppress thoughts during a rest interval, however, during a subsequent task the effects of the suppression can be seen. Although the suppression group and the acceptance group made an equivalent number of errors on the Stroop task, the suppression group demonstrated an enhanced ERN, a marker for increased anterior cingulate cortex activation. Research has noted that individuals with OCD are characterized by hyperactivity in the ACC, and that they also engage in strong attempts to resist those thoughts. These results provide further evidence of that link.

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Handouts available: www.psychofizz.org