

Effects of Mindfulness and Experiential Avoidance on Stroop Task Response Time

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Abstract

This study examined the effects of mindfulness and experiential avoidance on a Stroop task. Mindfulness is the conscious awareness of nonjudgmental processing of internal and external stimuli while experiential avoidance is the attempt to ignore negative processing of internal stimuli (e.g., contradicting sentences, trauma, procrastination, etc.). The Stroop Effect is the idea of task-irrelevant automatic processing, which takes place before task-relevant processing (e.g., reading words before its color). Participants in this study included 81 students from a public university in the south. All participants completed demographic questionnaires and several other measures online pertaining to the aforementioned focus. Data on levels of mindfulness and experiential avoidance were first collected, after which participants were then asked to complete the Stroop Effect tasks. Data was analyzed using a simple linear regression. No significance was found for the effects of mindfulness or experiential avoidance on response times for the Stroop Effect task.

Literature Review

- In a Stroop task, participants are presented with color words printed with either a congruent ink color (e.g., the word "green" printed in green ink) or an incongruent ink color (e.g., the word "blue" printed in red ink) and asked to indicate the color of the ink while ignoring the printed word (Sumiya & Healy, 2004).
- The Stroop Effect occurs when incongruity between the ink color and printed word leads to a delay in individuals' response time (Wang, Fan, Liu, & Cai, 2016).
- Levels of mindfulness and experiential avoidance affect cognitive processing capacity (Kang, Gruber, & Gray, 2013).
- If mindfulness is low, cognitive resources may be limited and response times will be slower due to the inability to properly resolve the conflicts involved in the Stroop task (Shichel & Tzelgov, 2018).

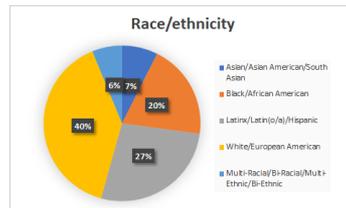
- Increased experiential avoidance likewise could mean less cognitive resources and slower responses (Shichel & Tzelgov, 2018).
- Research Question #1:** Does mindfulness impact response time on a classic Stroop task?
- Hypothesis 1:** Individuals who score higher on the Mindful Attention Awareness Scale (MAAS) will show 1) decreased response times in the congruent Stroop task trials and 2) decreased response times in the incongruent Stroop task trials.
- Research Question #2:** Does experiential avoidance influence response time on a Stroop task?
- Hypothesis 2:** Individuals who score higher on the Brief Experiential Avoidance Questionnaire (BEAQ) will show greater response times in the 3) congruent Stroop task trials and 4) in the incongruent Stroop task trials.

Methods

Participants

- Participants included 81 undergraduate students currently enrolled at a southern public university.
- Age ($M = 23$, $SD = 3.91$, Range = 19-45).
- 86.4% identified as seniors, 11.1% as juniors, and 2.5% as other.

Figure 1: Race and Ethnicity



- 79% of participants identified as Heterosexual, 1.2% as Gay, 3.7% as Lesbian, 1.2% as Queer, 11.1% as Bisexual, 1.2% as Asexual, and 2.5% as Other.
- GPA ($M = 3.46$, $SD = .62$, Range = 2.7-3.79).

Procedures

- Participants completed several measures through PsychData, an online platform used to conduct internet based research; 98 items were measured in total.
- The Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003) and the Brief Experiential Avoidance Questionnaire (BEAQ; Gamez et al., 2011) were completed.
- Participants also completed 10 CogLab assignments online through Cengage including the Stroop task.

Figure 2: The Stroop Effect (Goldstein, 2019)



Measures

- Mindful Attention Awareness Scale (MAAS; Brown & Ryan, 2003)
 - The 15-item Mindful Attention Awareness Scale ($\alpha = .85$) was scored on a 6-point Likert scale (1 = *almost always*, 6 = *almost never*) and included questions such as "I snack without being aware I am eating."
- Brief Experiential Avoidance Questionnaire (BEAQ; Gamez et al., 2011)
 - The 15-item Brief Experiential Avoidance Questionnaire ($\alpha = .78$) was scored on a 6-point Likert scale (1 = *strongly disagree*, 6 = *strongly agree*) and included questions such as "the key to a good life is never feeling any pain."

Results

- Hypotheses were analyzed using a simple linear regression to test for reaction time based on mindfulness. No significance was found when there was word/font congruence ($R^2 = .02$, $F(1, 79) = 1.55$, $p = .22$) nor incongruence ($R^2 = .04$, $F(1, 79) = 2.95$, $p = 0.09$).

- Hypotheses were analyzed using a simple linear regression to test for reaction time based on experiential avoidance. No significance was found when there was word/font congruence ($R^2 = .01$, $F(1, 79) = .86$, $p = .37$) nor incongruence ($R^2 = .00$, $F(1, 79) = .02$, $p = .88$).

Discussion

- The non-significant results for the congruent and incongruent tasks could be due to limited remaining perceptual capacity caused by participants completing other CogLab assignments before the Stroop task assignment (Shichel & Tzelgov, 2018).
- Mindfulness can weaken categorization and decrease automatic processing which could allow individuals more time to evaluate decisions (Kang et al., 2013).
- Experiential avoidance can alternatively increase impulsive behavior, effectively reducing response times on the Stroop task (Chapman et al., 2006).

Limitations

- Mindfulness and experiential avoidance scales were not completed at the same time as the Stroop task and therefore may not accurately portray actual mindfulness or experiential avoidance levels.
 - Results may show greater accuracy if the scales are presented directly before completion of the Stroop task.
 - Decreasing or removing additional CogLab assignments could increase remaining perceptual processing capacity.
 - Standardization of testing conditions may provide more valid and reliable results.

Future Research

- Future research could focus on the effects that different emotions such as anxiety have on the ability to quickly resolve the conflicts within the Stroop task.

References

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