Attentional biases and mood

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Author Note

Abstract

belief about mood disorders like depression is that they do not just affect mood–they alter how we process and interpret information more generally. One example is illusory correlation (IC): the tendency to falsely associate rare negative events with rare categories, such as linking negative outcomes to minority groups, even when both are statistically balanced. In people with depressive symptoms, this bias may be intensified—not because of worse memory or logic, but because of deeper shifts in how the brain weighs information. Depressed individuals tend to focus more on negative stimuli and may update beliefs in overly rigid or skewed ways, consistent with Bayesian models of biased priors and likelihoods. However, the neural mechanisms behind this distorted pattern recognition remain poorly understood. In this study, we combine EEG recordings with hierarchical Bayesian modeling to explore how depression shapes the formation of illusory correlations.

Keywords: Illusory Correlation, Depression, attentional biases, EEG

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Introduction

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An illusory correlation occurs when people perceive a relationship between two variables that either does not exist or is much weaker than they believe. This is considered a cognitive bias in which the brain links two things together because they are memorable rather than because they are actually related. (Wu, Huang, Qi, & Lu, 2022). This is considered a cognitive bias in which the brain links two things together because they are memorable rather than because they are actually related. Previous research has demonstrated that mood disorders, such as depression, can enhance the illusory correlation effect. This typically occurs because individuals experiencing depression tend to perceive negative characteristics as more salient or distinct than positive traits, even when they are presented with an equal number of positive and negative traits. (Mitko, Prinzmetal, Esterman, & List, 2015) The question we are asking is: Do individuals with higher depressive symptoms show evidence of more salience to negative pairings (e.g., Bad Group B), compared to those with lower depressive symptoms? Therefore, we hypothesize that people with higher levels of depression show stronger illusory correlation to negative attributes than those who exhibit lower levels of depression.(Matute et al., 2015)

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Method

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Particpants

Participants (N = 35) will be recruited through William and Mary's SONA portal to complete an illusory correlation task while 32-channel EEG data are recorded. Before the experiment begins, participants will be briefed on the study and asked to provide informed consent. They will then be assigned a study ID number to enter into the survey. The survey will be completed in person in the laboratory on a computer using PsyToolkit.

Materials

All materials used during preparation (e.g., prep pads, gloves, blunt-tip syringes, foam inserts) will be safely disposed of immediately after use. Following each session, the room, doorknobs, EEG cap, keyboard, mouse, and other equipment will be sanitized with isopropyl alcohol wipes. The electrode caps are antibacterial and antimicrobial; they will be sanitized with hot water and a cap brush, rinsed, and dried. Electrodes will be cleaned with water and a brush, submerged in an alcohol-based sanitizer solution for two minutes, rinsed, and dried.

Results

I anticipate to find that exercise would moderate the relationship between executive function and vascular burden, such that individuals with higher levels of exercise would exhibit a weaker association between vascular burden and executive function.. Figure 1).

Executive $\longrightarrow$ Vascular

Function Burden
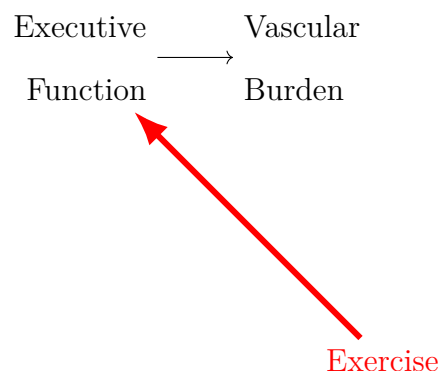
Exercise

Figure 1

Exercise moderates the relationship between executive function and vascular burden

Pervious research has shown that exercise has a huge influence on executive function and vascular risk factors Figure 1.

Sometimes You may also want to display some tabular data in order to illustrate patterns in your data. Fortunately, You can do this right in LaTeX.

Discussion

The results of this study will provide a better understanding of how depression affects attentional biases and the broader impact of these biases on individuals with

Figure 2

This demonstrates the brain

Table 1

Reaction times over training in the experimental and control groups.

		Demographics		
		Sex	Age(M/SD)	Race
Group	Depressed	64.23F	62.93 (7.86)	Black
	Non-depressed	62.93F	65.72 (6.44)	Black

severe depression. In addition, we will examine neural activity during cue, response, and feedback periods, focusing on ERP components including mismatch negativity (MMN), feedback-related negativity (FRN), P300, which reflects categorization and expectation processes, and N400, which reflects semantic processing and interpretation of meaning. The inclusion of the N400 is especially relevant, as our study will use descriptive words to identify positive and negative traits. This will help scientists understand how those with higher levels of depression perceive the attributes of people. This would also be helpful to apply to minority communities, since they have higher levels of depression and experience racial health disparities.

References

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