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

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. (Wu et al., 2022) 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.

Method

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 those with higher levels of depressive symptoms have a
stronger illusory correlation with negative pairings compared to positive pairings
compared to those with lower depressive symptoms. Figure 1).
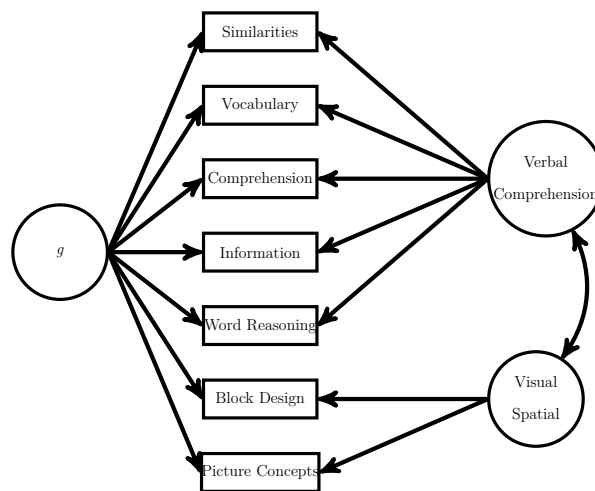
Figure 1

Here is a sample of a TikZ model.

In other cases, you might have an image file you want to bring into your
document. That is pretty easy to do as well as you can see in Figure 2.

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
severe depression. In addition, we will examine neural activity during cue, response,
and feedback periods, focusing on ERP components including mismatch negativity

Figure 2

This is a another figure caption.

Table 1

Reaction times over training in the experimental and control groups.

		Week		
		One	Two	Three
Group	Experimental	1008.435	986.76	859.1
	Control	996.23	901.67	1002.23

(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

Wu, W., Huang, X., Qi, X., & Lu, Y. (2022). Bias of attentional oscillations in individuals with subthreshold depression: Evidence from a pre-cueing facial expression judgment task. *International Journal of Environmental Research and Public Health*, *19*, 14559.