

INTRODUCTION

Depression

Depression is a sustained negative mood state that affects attention (Etkin, 2013)

Rumination

Rumination is a characteristic of depression involving the repetitive thinking of one's negative mood

- Frequent rumination is linked to lengthier and more severe depressive episodes
- It is theorized that frequent rumination may be linked to working memory deficits

Working Memory(WM)

WM is a capacity sensitive system that allocates attentional resources to attend to stimuli

- In an EEG recording, WM can be observed physiologically as the slow wave neural activity produced during the item retention period in a WM task (McCollough et al., 2007)

Hypothesis

It is hypothesized that rumination would moderate WM task performance

METHODS

Participants

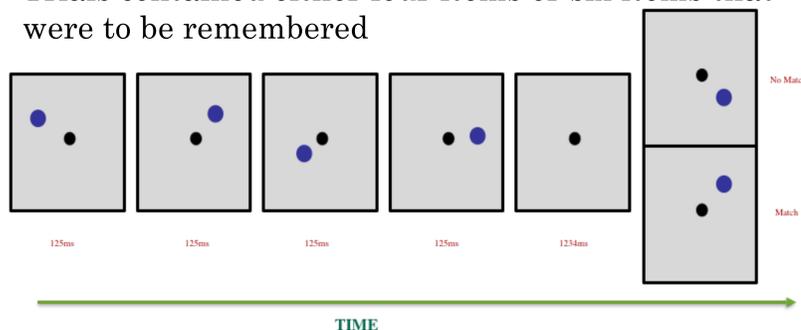
- N=77
- Avg Age: 23.9
- Sex: 19% M 81% F

Measures

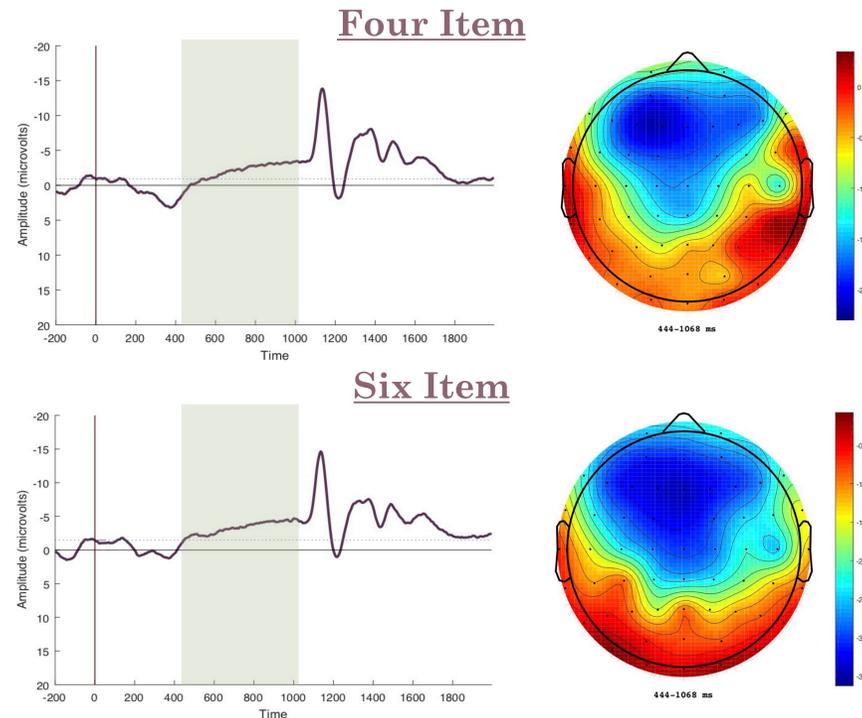
- Ruminative Response Scale (RRS)
- Beck's Depression Inventory (BDI)

WM Task

- A series of blue circles appear in variety of locations
- After a brief delay, participants must respond to a match/no match probe based on their recollection of the item locations
- Trials contained either four items or six items that were to be remembered



RESULTS



T-test

Four Item & Six Item Conditions for Channel F1

Paired Samples

Four Item ($M=-2.337$, $SD=2.960$)
Six Item ($M=-3.463$, $SD=3.644$)

$t(76)=2.07$, $p=.001$

Correlations

Measures with Total Accuracy

Measures	Accuracy	P-Value
BDI	0.042	0.714
RRS	0.083	0.473

ANOVA

Mean Amplitude Across Item Conditions

Measures	Between Subjects Effect
BDI	$F(1,75)=0.955$, $p=0.332$
RRS	**$F(1,75)=4.982$, $p=0.029$, **$r(75)= -0.238$

DISCUSSION

- BDI scores did not significantly influence behavioral performance or neural activity.
- The greater activity displayed in the six-item condition vs. the four-item condition suggests the slow wave is capturing working memory maintenance.
- RRS scores were not found to impact accuracy levels. Higher RRS scores predicted greater activity amplitudes. This indicates cognitive efficiency is being affected.
- We may then conclude that high ruminators require more effort than low ruminators to achieve the same accurate performance level, regardless of condition.
- In short, rumination was found to cause poor cognitive efficiency, which provides support for our hypothesis.
- These results imply that effective performance is not impacted by rumination, only efficient performance.
- Taken together, this suggests that depression as a whole cannot solely provide information on the cognitive deficits associated with the disorder; however, by separating the underlying mechanisms, a greater insight into understanding these deficits can be gained.

REFERENCES

- Etkin, A., Gyurak, A., & O'Hara, R. (2013). A neurobiological approach to the cognitive deficits of psychiatric disorders. *Dialogues in clinical neuroscience*, 15(4), 419.
- McCollough, A. W., Machizawa, M.G., & Vogel, E. K. (2007). Electrophysiological measures of maintaining representations in visual working memory. *Cortex*, 43(1), 77-94.