



Emotional valence and cortisol impact word memory in youth with mood disorders: Preliminary Data

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BACKGROUND

- Endocrine dysregulation and cognitive biases in memory and attention have been linked to the development of depression in adolescents.
- The mechanisms by which HPA-axis functioning impact the phenomenology of children with mood disorders is poorly understood.
- Studies suggest a heightened HPA-axis response may lead to biased memory performance for emotional content in adults.
- However, it is unknown whether HPA-axis functioning impacts emotion-related memory biases in adolescents with mood disorders.
- We examined the effect of neuroendocrine stress reactivity on word memory between depressed, anxious, and non-affected youth.

HYPOTHESES

1. Depressed and anxious adolescents will differ in neuroendocrine reactivity to a psychosocial stressor compared to control adolescents
2. Exposure to the stress task will contribute biases in emotional memory processing
3. Depressed and anxious adolescents' emotional memory processing will differ when compared to control adolescents
4. Increased HPA-axis reactivity to a psychosocial stressor during the memory task will contribute to biases in emotional memory processing

PARTICIPANTS

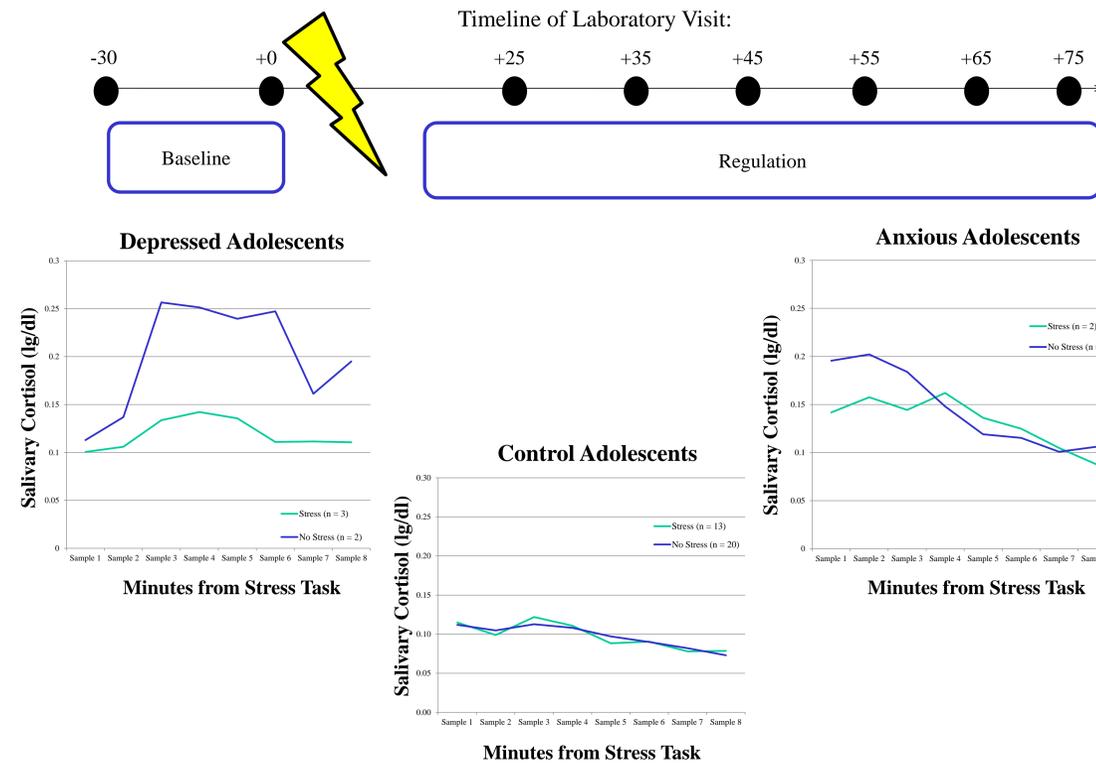
- 46 youths between the ages of 9-16 (Mean 12.8; 2.8) who met criteria for depression, anxiety, or no disorder were randomized to complete either a laboratory stressor or a control non-stressful condition.
- Participants and their parents participated in a full psychiatric interview (ISCA-D) to determine diagnostic eligibility for the study.

MEASURES

- Interview Schedule for Children and Adolescents-Diagnostic Version (ISCA-D; Sherrill & Kovacs, 2000):** semi-structured clinical assessment for current and past symptoms of mood, anxiety, psychosis, eating, and disruptive behavior disorders based on the DSM-IV-TR (APA, 2000).
- Child Depression Inventory- Parent Report (CDI-P; Kovacs, 1992)**
- Salivary cortisol**
- Socially Evaluated Cold Pressor Test** (Schwabe, Haddad, & Schachinger, 2008)

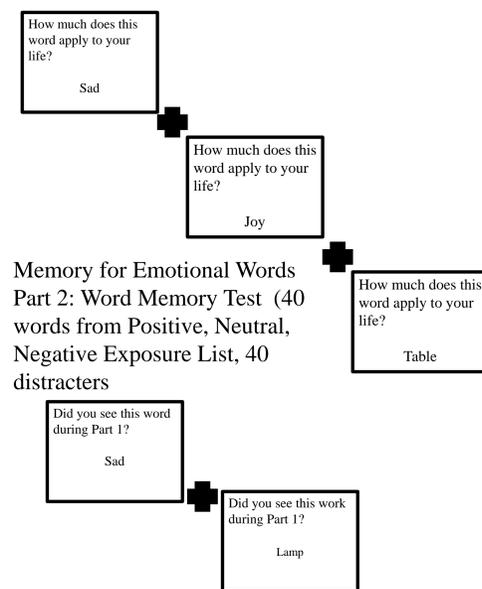
	CDI-Parent Mean (SD)
Total	9.64 (6.58)
MDD (n = 5)	15.0 (10.27)
ANX (n = 8)	12.25 (8.48)
No Internalizing Disorders (controls) (n = 33)	8.24 (4.91)

PROCEDURES: ENDOCRINE SAMPLING



PROCEDURES: COGNITIVE TASK

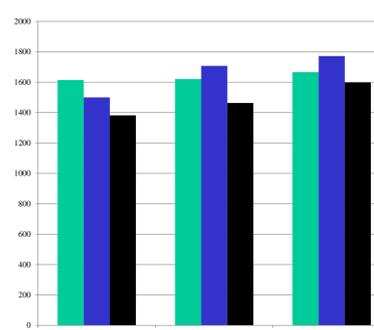
Memory for Emotional Words
Part 1: Exposure to 80 positive, negative, and neutral words. (4 second exposure)



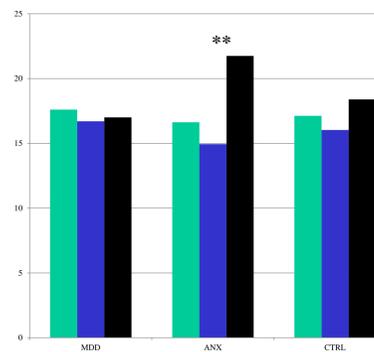
Memory Task Outcomes

- Word Memory: total words recognized; Positive, Negative, Neutral
- Reaction Time: Time to correctly identified positive, negative or neutral words

Reaction Time (ms)

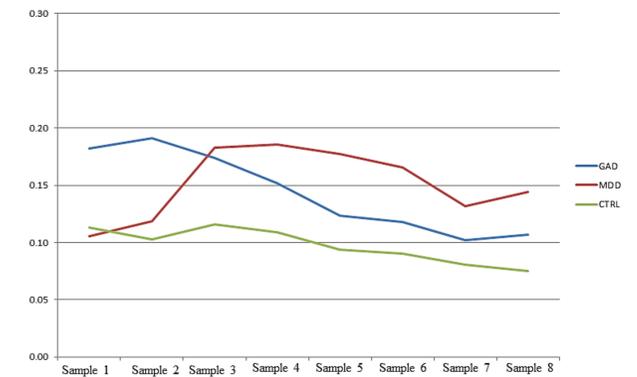


Words Remembered



RESULTS

Hypothesis 1 Confirmed: $F(2,47) = 6.54, p < .01$



MDD participants were exposed to significantly more cortisol during the memory task.

Hypothesis 2: Exposure to the psychosocial stressor failed to contribute to significant differences in neuroendocrine reactivity, therefore Hypothesis 2 failed to reject the null hypothesis.

Hypothesis 3: World Valence and Diagnosis: There was a significant interaction within memory performance between word valence and diagnosis. When asked to recall neutral words, control and anxious participants were consistently better at accurately recognizing these words, compared to emotion words. This "neutral" bias was not significant in the depressed group, however there was a similar trend with better performance in neutral words compared to emotion words.

Hypothesis 4: Word Valence and AUCi: A significant interaction between AUCi and word valence was also found [$F(2,94)=11.69, p < .001$]. Specifically, participants with a lower AUCi gave less correct responses during the memory task for neutral words [$\beta = -0.32, t(44) = -2.42, p = 0.01$]. Interestingly, this association between AUCi and memory was not observed for positive [$t(44) = 0.22, p > .20$] or negative words [$t(44) = -.07, p > .20$].

DISCUSSION

- Anxious and control participants displayed a "neutral bias" by recognizing more neutral than emotion words.
- Suggests either an "emotion interference" or a "neutral facilitation" of memory encoding or retrieval, which is contrary to the emotion-facilitation hypothesis.
- However, most previous research showing enhanced memory performance for emotional stimuli has focused on response time (rather than accuracy), or used pictures instead of words.
- It is possible that neutral words are more common and more easily recognizable than emotion words (i.e. availability effect).
- We also found that this "neutral facilitation" was negatively impacted by HPA-axis activation, a finding consistent with a recent study involving healthy children.
- While we found a strong negative effect of HPA-axis activation on memory, this effect was not specific to emotional words, and was not only observed in mood disordered youth.