

DEPRESSION SYMPTOM SEVERITY AND SEX DIFFERENCES IN FACIAL EMOTION LABELLING FOR INDIVIDUALS WITH DEPRESSION

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Introduction

- Major depressive disorder (MDD) is a clinical mental illness characterized by negative cognitive biases and maladaptive emotion regulation strategies (Lemoult & Gotlib, 2018) affecting 3.8% of people worldwide (World Health Organization, 2021).
- There is a well-established finding for bias in emotional material with depressed populations
 - Longer reaction times when labelling sad facial expressions (Gollan, Pane, McCloskey, & Coccato, 2008), perceptual bias towards negative emotions (Liu, Huang, Wang, Gong, & Chan, 2012).
- Recent research has pivoted to studying symptoms as part of domains of functioning (Insel et al., 2010), and facial emotion labelling can be used to inform new methods of identifying and diagnosing disorders.
- The present study examines whether sex differences arise in facial emotion labelling between sad and happy faces in MDD and HC., and if labelling accuracy varies according to symptom severity.

Methodology

- 95 participants recruited from outpatient psychiatric clinics and community of the Vancouver Coastal Health region rated a continuum of morphed facial expressions ranging from unambiguously sad to unambiguously happy, as either sad or happy.
- 2 x 2 ANOVA comparisons and regression analyses were conducted
 - Observed "happy" choices along the expression continuum were fitted to a sigmoid function.
 - Sex was used as a moderating variable between symptom severity and bias/sensitivity
 - Separate analyses were conducted with clinically depressed individuals (MADRS score > 20)
- BIAS: The 'shift point' in the expression continuum where the most likely label shifted from 'sad' to 'happy' was used to derive a measurement of bias.
- SENSITIVITY: The slope of the sigmoid function was used to derive a measurement of sensitivity. **High sensitivity** was operationalized as a greater slope that indicated a clear demarcation between 'sad' and 'happy' selections. **Lower sensitivity** was operationalized as a gradual slope that indicated a less clear demarcation between 'sad' and 'happy' selections.

For more information on bias and sensitivity:



References

- Gollan, J. K., Pane, H. T., McCloskey, M. S., & Coccato, E. F. (2008). Identifying differences in biased affective information processing in major depression. *Psychiatry Research*, 159(1-2), 18-24.
- Insel, T., Cuthbert, B., Garvey, M., Heinssen, R., Pine, D. S., Quinn, K., Sanislow, C., & Wang, P. (2010). Research domain criteria (RDoC): toward a new classification framework for research on mental disorders. *American Journal of Psychiatry*, 167(7), 748-51.
- Lemoult, J., & Gotlib, I. H. (2018). Depression: A cognitive perspective. *Clin Psychol Rev*, 69, 51-66. <https://doi.org/10.1016/j.cpr.2018.06.008>
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- World Health Organization. (2021, September 13). Depression. <https://www.who.int/news-room/fact-sheets/detail/depression>

Does symptom severity influence facial emotion labelling bias and sensitivity to sad versus happy faces between males and females in MDD and healthy controls?

Males with clinical depression showed poorer sensitivity in distinguishing between sad and happy faces as symptom severity increased. Symptom severity did not impact facial emotion labelling in females with depression.

Discussion

STRENGTHS

- Results indicate that differences in emotion labelling may arise when individuals present more severe symptoms
- A patient's ability to correctly label emotional expressions can be used as a diagnostic marker with further research

FUTURE RESEARCH/LIMITATIONS

- Individuals with bipolar spectrum disorder can be included into analyses with YMRS scores in order to compare with current analyses, as prior research indicates similar patterns of bias in emotion labelling
 - Our protocol did not recruit patients presenting severe manic symptoms
- The facial labelling task may not be sensitive enough
 - Only contains female faces, and only two expressions (sad and happy). Further analyses can include other basic emotions (disgust, surprise, fear, anger) to support presence of sex differences in emotion labelling.

Results

*clinical depression was defined as obtaining a MADRS score greater than 20

BIAS

- Interaction between diagnosis and sex in shiftpoint is not significant in HC and MDD ($p = 0.87$)
- Interaction between moderate/severe symptoms and sex in shiftpoint is not significant in clinically depressed group ($p = 0.71$)

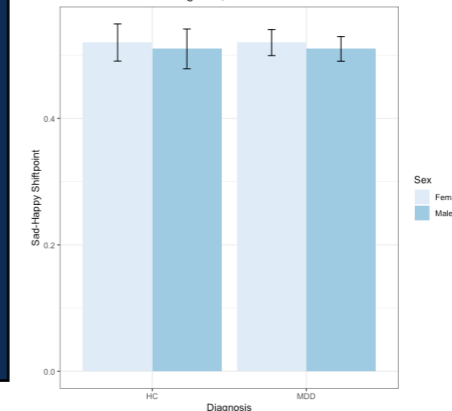
SENSITIVITY

- Interaction between diagnosis and sex in slope is not significant in HC and MDD ($p = 0.08$)
- Significant interaction between moderate to severe symptoms and sex in slope for clinically depressed group ($p = 0.04$)

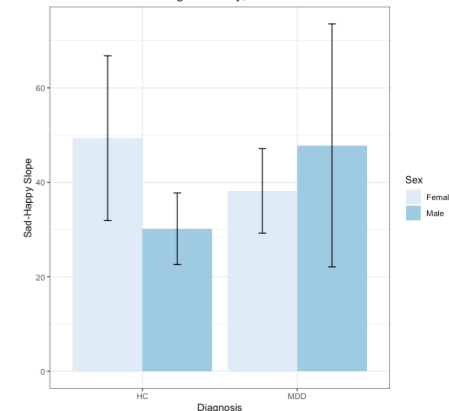
Healthy Controls vs. MDD

*N = 95 (63 F, 32 M)

Facial Emotion Labelling Bias, HC vs. MDD



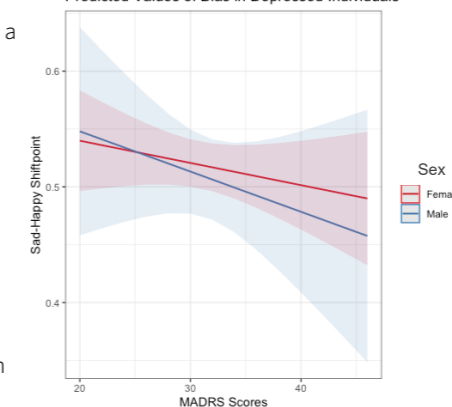
Facial Emotion Labelling Sensitivity, HC vs. MDD



Clinically Depressed

*N = 57 (43 F, 14 M)

Predicted Values of Bias in Depressed Individuals



Predicted Values of Sensitivity in Depressed Individuals

