SEX DIFFERENCES IN FACIAL EMOTION LABELLING IN DEPRESSED AND HEALTHY INDIVIDUALS

Calista Leung¹, Alexander Terpstra¹, Trisha Chakrabarty¹

Introduction

- Major depressive disorder (MDD) is a clinical mental illness characterized by negative cognitive biases and maladaptive emotion regulation strategies (Lemoult & Gotlib, 2018) affecting more than 300 million people worldwide (World Health Organization, 2018).
- Well-established finding for bias in emotional material with depressed populations
  - Longer reaction times when labelling sad facial expressions (Gollan, Pane, McCloskey, & Coccaro, 2008), perceptual bias towards negative emotions (Liu, Huang, Wang, Gong, & Chan, 2012).
- Current literature identifies a difference in emotion labelling between sexes in healthy population but not depressed population
  - Healthy women are faster and more accurate at emotion labelling compared to their male counterparts (Wingenbach, Ashwin, & Brosnan, 2018).
- The present study examines whether sex differences arise in facial emotion labelling between sad and happy faces in MDD and HC. Such knowledge can inform current diagnostic procedures or treatment outcomes.

Methodology

- 71 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.
- A 2 x 2 ANOVA comparison and regression analysis was conducted
  - Observed “happy” choices along the expression continuum were fitted to a sigmoid function.
  - MADRS scores were used as a mediating variable (high MADRS scores indicate increased symptom severity).
- 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:

Results

BIAS

- Interaction between diagnosis and sex in shiftpoint is insignificant (p = 0.60)
- Simple main effect between MDD (N = 47, SD = 28.96, X̄ = 37.88, SD = 27.96) and HC (N = 24, SD = 21.39, X̄ = 34.99, SD = 21.39) is insignificant (p = 0.18)
- Simple main effect between males (N = 24, SD = 27.85, X̄ = 37.88, SD = 27.85) and females (N = 47, SD = 21.39, X̄ = 34.99, SD = 21.39) is insignificant (p = 0.38)
- Symptom severity had no influence on bias.

SENSITIVITY

- Interaction between diagnosis and sex in slope is insignificant (p = 0.61)
- Simple main effect between MDD diagnosis (N = 47, X̄ = 37.88, SD = 27.96) and HC (N = 24, X̄ = 34.99, SD = 21.39) is insignificant (p = 0.51)
- Simple main effect between males (N = 24, X̄ = 37.88, SD = 27.85) and females (N = 47, X̄ = 34.99, SD = 21.39) is insignificant (p = 0.51)
- Increased MADRS scores may be linked to greater sensitivity in depressed females

Discussion

STRENGTHS

- Provides baseline to develop future research.
- Diagnoses are not self-reported but are clinically assessed.
- Facial labelling task included real human faces instead of computer-generated expressions, increasing validity.
- Use of MADRS scores allows for prediction based on symptom severity instead of presence/absence of diagnosis.

LIMITATIONS

- Observed effect size for sex and sensitivity was 0.18, despite our obtained power being 0.32.
- A sample size of 240 would have been required to obtain a power of 0.8 — this study needed more participants.
- 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.

Healthy Controls vs. MDD

Symptom Severity

N = 82 (55 F, 27 M | 47 MDD, 35 HC )

There appear to be no significant differences between sexes in labelling bias or sensitivity to sad versus happy faces in both MDD and HC subsets.