People with depression are more idiosyncratic in their neural event boundaries

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BACKGROUND

- Two competing framings of a central depression symptom:
  - Negative Interpretation Bias – depressed individuals develop a bias that causes them to have more dysphoric perceptions.\(^1\)
  - Absent Positive Interpretation Bias – depressed individuals lose a protective rosy-tinted lens that once supported optimistic perceptions.\(^2\)
- Prior work has shown that similar neural activity reflects similar interpretations.\(^3\)
- Can we use associations between neural similarity and depressive tendency to support either of the competing framings of depression symptoms?

METHODS

- Data obtained from a publicly available dataset on OpenNeuro\(^4\)
- Two measures of neural similarity:
  - Inter-subject representational similarity analysis (IS-RSA) used to correlate depressive tendency with neural similarity:
    - ISC (Inter-subject Correlation) and Event Segmentation Alignment
- Two measures of behavioral similarity:
  - Inter-subject Correlation (ISC) and Event Segmentation Alignment
  - Trait-level Emotion Questionnaires

RESULTS

- Depressed subjects are more idiosyncratic in their event segmentation:
  - ISC and event segmentation alignment reflect neural similarity but pick up on different nuances.
  - AnnaK model is better at drawing out individual differences in depression.
  - Trait-level emotional dysphoria may inform how people engage with stimuli.
  - Idiosyncratic neural activity in depression is more pronounced in DMN.
  - Could a protective positive interpretation bias be nested in the DMN?

DISCUSSION

- ISC and event segmentation alignment reflect neural similarity but pick up on different nuances.
- AnnaK model is better at drawing out individual differences in depression.
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REFERENCES


Low Self-Reported Stimulus Valence and High Trait-Level Depression both Drive Idiosyncratic Neural Event Segmentation.

Individuals that are more depressed are more idiosyncratic in their recall: Importantly, an IS-RSA between depressive proclivity and free-recall data showed that subjects who are more depressed are also more idiosyncratic in their stimulus appraisals. This indicates that the observed trends in neural activity are also reflected in the way subjects talked about and remembered each movie:

- Defeat: \(r_\text{IS} = -0.040; p = 0.180\)
- Growth: \(r_\text{IS} = -0.128; p < 0.0001\)