Altered N170 Response in a Facial Oddball Task in Persons with High Depressive Symptoms

Korbinian Riepl1,2, Patrick Mussel3, Johannes Hewig1, Christopher G. Beevers2, and David M. Schnyer2
1: University of Würzburg, Germany; 2: The University of Texas at Austin, USA; 3: Freie Universität Berlin, Germany
korbinian.riepl@uni-wuerzburg.de

Introduction
• DSM-V main symptoms of depression are depressed mood and diminished interest/pleasure in activities
• Correspond well to
  • Negative attention bias (e.g., Beevers et al., 2015)
  • Anhedonia (e.g., Rizvi et al., 2016)
  • Loneliness is a huge problem (e.g., Richard et al., 2017)
• Goal: Electrophysiological evidence for the presence of negative attention bias/anhedonia in early face processing

Methods
• Facial oddball task: 300 trials
  • Indication of valence via a button press: 1550 ms
  • While 80% of faces were in one gender (e.g., female), 20% were in the other gender (e.g., male)

Results
• Extreme groups with very high and very low depressive symptoms (mean from prescreening and time of testing)

<table>
<thead>
<tr>
<th>Experimental group</th>
<th>Control group</th>
</tr>
</thead>
<tbody>
<tr>
<td>N (female/male)</td>
<td>21 (16/5)</td>
</tr>
<tr>
<td>Age (in SD)</td>
<td>19.10 (1.00)</td>
</tr>
<tr>
<td>SES (SD)</td>
<td>26.81 (7.66)</td>
</tr>
<tr>
<td>SES range</td>
<td>17.5 – 43.0</td>
</tr>
</tbody>
</table>

• Dependent variable: N170 (indicating face recognition; 186-206 ms poststimulus on electrodes P7, P8, PO7, and PO8)

• Low amplitude differences between MainGender and OddballGender trials predict high depressive symptoms in happy faces ($r = -.275; p = .043$) or neutral faces ($r = -.384; p = .007$), but not in sad faces ($r = .105; p = .740$).

• Further effects:
  • INT Oddball*Position*Hemisphere ($F_{1,38} = 7.968; p = .008$): significant oddball effects on P8 and PO8, but not on P7 and PO7
  • ME Valence ($F_{2,76} = 10.420; p < .001$): amplitudes sad > happy > neutral

Discussion
• Already ca. 200 ms poststimulus strong attentional focus on negative, unexpected faces in the group with high depressive symptoms
• In early and therefore highly automatic process
• Results contradict often-cited popular belief that depression is solely a disorder of higher cognitive processes

Literature
doi:10.1371/journal.pone.0181442

Poster Download
go.uniwue.de/riepl-2019c