





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

Korbinian Riepl<sup>1,2</sup>, Patrick Mussel<sup>3</sup>, Johannes Hewig<sup>1</sup>, Christopher G. Beevers<sup>2</sup>, and David M. Schnyer<sup>2</sup> 1: University of Würzburg, Germany; 2: The University of Texas at Austin, USA; 3: Freie Universität Berlin, Germany korbinian.riepl@uni-wuerzburg.de

Introduction

Methods

- 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
- Facial oddball task: 300 trials







- 150 ms  $\forall$  Indication of valence via a button press: 1550 ms  $\uparrow$
- 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)

	Experimental	Control
	group	group
N (female/male)	21 (16/5)	19 (14/5)
Age mean (SD) in years	19.10 (1.00)	19.11 (0.99)
CES-D mean (SD)	26.81 (7.66)	5.26 (2.60)
CES D range	175 /20	

- ME Oddball ( $F_{1;38} = 4.213$ ; p = .047): Amplitudes OddballGender > MainGender trials
- INT Valence\*Oddball\*Depression ( $F_{2;76} = 3.445; p = .037$ ):



CES-D range

17.5 - 43.0 | 0.5 - 10.5

Dependent variable: N170 (indicating face recognition; 186-206 ms poststimulus on electrodes P7, P8, P07, and P08)



- 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
- Significant oddball effects in the depression group only after sad faces, in the healthy group only after happy and neutral faces

• ME Valence ( $F_{2;76} = 10.420$ ; p < .001): amplitudes sad > happy > neutral

Literature

#### 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 solemnly a disorder of higher cognitive processes

### Beevers, C. G., Clasen, P. C., Enock, P. M., & Schnyer, D. M. (2015). Attention bias modification for major depressive disorder: Effects on attention bias, resting state connectivity, and symptom change. *Journal of Abnormal Psychology, 124*(3). doi:10.1037/abn0000049 Richard, A., Rohrmann, S., Vandeleur, C. L., Schmid, M., Barth, J., & Eichholzer, M. (2017). Loneliness is adversely associated with physical and mental health and lifestyle factors: Results from a Swiss national survey. *PLoS One, 12*(7). doi:10.1371/journal.pone.0181442 Rizvi, S. J., Pizzagalli, D. A., Sproule, B. A., & Kennedy, S. H. (2016). Assessing anhedonia in depression: Potentials and pitfalls. *Neuroscience and Biobehavioral Reviews, 65*, 21-35.

## **Poster Download**

## go.uniwue.de/riepl-2019c

