Acceptance promotes effective emotion regulation through experiencing intensive unpleasant reactions to negative social stimuli: an fMRI study

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Introduction Acceptance is an emotion regulation (ER) strategy that allows us to be open to on-going emotional experiences without trying to modify or suppress them (Williams & Lynn, 2010). Neuroimaging studies of acceptance are somewhat inconsistent but pointed out the role of executive prefrontal regions, the posterior cingulate and the precuneus (Goldin et al., 2019; Messina et al., 2021).

Aims Our aim is to investigate the associations between individual differences in acceptance and the neural response to negative and neutral social stimuli.

Methods 28 healthy, young adults filled in the Hungarian version (Miklósi et al., 2011) of the Cognitive Emotion Regulation Questionnaire (CERQ)(Garnefski et al., 2001), and participated in an ER task. We presented pictures with a negative and a neutral caption, respectively, and participants had to shift (reappraise) from the negative social context to the neutral one. Outside the scanner, they rated each picture (with both captions) on two affective dimensions (valence and arousal).

Results We found a moderately strong negative correlation between the Acceptance score of CERQ and valence ratings of pictures with negative caption (r = -.52); a moderately strong positive correlation between Acceptance and arousal ratings in the negative condition (r = .50); and a weak positive correlation between Acceptance and valence ratings in the neutral condition (r = .38).

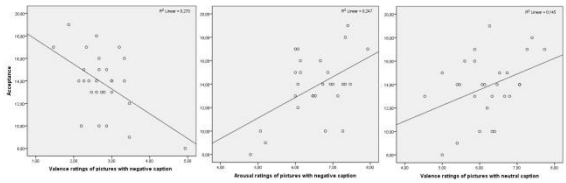

Figure 1: Correlations between Acceptance and ER task-related variables (valence and arousal ratings)

We found activation in the inferior frontal regions, in vision-related areas (occipital gyri, cuneus, lingual and fusiform gyri), in the insula, in the caudate and in the cerebellum in both conditions (Negative > Baseline; Neutral > Baseline). Additionally, activation in the bilateral dlPFC and dmPFC; in the supplementary motor area, in the frontal eye fields; in the hippocampus and in the middle-inferior temporal regions was found to be specific to the negative condition.

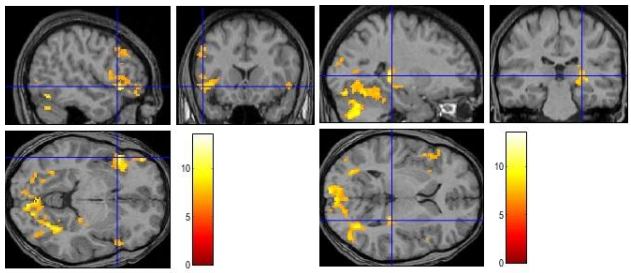

Figure 2: Neural response to social pictures with negative caption in the bilateral medial frontal gyri (left) and the right hippocampus (right)

Conclusions The inferior frontal gyrus activation in both conditions refers to the implementation of (re)appraisal strategies, while the insula represents the mean by which a cognitive strategy can modulate the arousal associated with emotions. In response to viewing a negative social context, the dlPFC and dmPFC might serve as a control system to implement implicit regulatory strategies. Acceptance as an emotion regulation strategy is associated with an intensive affective involvement (i.e., experiencing intensive unpleasant emotions). It does not reduce the primary evoked emotion but promotes the implementation of implicit emotion regulation strategies connected to the dlPFC and dmPFC. Consequently, acceptance contributes to an automatic and effective emotion regulation.

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