Influence of Dietary Habits and Empathy on Visual Processing of Pictures with Different Emotive-Affective Values

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Background. Empathy, typically defined as the ability to understand and experience the emotional states of others, is necessary to successfully navigate in our social environment. It has been demonstrated that people with different dietary habits, due to ethical reasons, such as vegans and vegetarians, experience a higher level of empathy compared to omnivores.
Objective. We investigated the role of empathy in influencing neural substrates of visual processing of elements potentially characterized by different emotive-affective values in subjects with different dietary habits, using functional magnetic resonance (fMRI).
Methods. Using a 3.0 Tesla scanner, 3D T1-weighted and fMRI scans were acquired from 20 omnivores, 19 vegetarians, and 21 vegans. During fMRI, pictures belonging to four different categories of elements including objects, natural landscapes, animals and humans were presented to the study participants. Average fMRI activity during visual processing of each category and differences in the patterns of activation within- and between- study groups were assessed. Correlations with empathy, as assessed with the Empathy Questionnaire (EQ), were also explored.
Results. EQ was higher in vegans compared to the other study groups. During animal *vs* human pictures view, compared to omnivores, vegans showed increased activations of the bilateral fusiform gyrus and bilateral frontal regions. Compared to vegetarians, vegans experienced an increased activation of bilateral frontal regions, bilateral lingual gyrus, right supramarginal gyrus, right cerebellum and left fusiform gyrus. Compared to both vegetarians and omnivores, vegans showed an increased activation of the left fusiform gyrus. Significant correlation was found between higher activity in frontal regions and EQ scores.
Conclusions. Visual processing of pictures with different emotive-affective values differs between subjects with different dietary habits due to ethical reasons. A higher level of empathy seems to contribute to the modulation of such a process.