

The sense of smell is closely related to human psychological functioning. Odors from the environment evoke older, more emotional and more vivid memories than sounds or visual objects. This close bond between olfaction and emotions arises from the direct connections between olfactory- and emotion-related brain areas. This interplay between emotions and the sense of smell is also present in persons experiencing symptoms of psychiatric disorders. For instance, altered functioning of the sense of smell has been observed in people with depression or anorexia. Analogous relationship in case of anxiety disorders received much less scientific attention, even though they are the most prevalent psychiatric disorders in the general population. The available data is limited to people with post-traumatic stress disorders, obsessive-compulsive disorder, and panic disorder, and suggest each anxiety disorder is accompanied by changes in the functioning of the sense of smell. However, it still remains poorly understood how is smell functioning connected to symptoms of two other highly prevalent types of anxiety disorders – generalized anxiety disorder (GAD) and social anxiety disorder (SAD) – and what mechanisms underlie such connection.

The proposed project aims to fill in this gap. In the course of three studies we will verify the hypotheses that state and trait anxiety is related to altered processing of odors and that systematic stimulation of the olfactory system will decrease severity of anxiety symptoms. Studies will employ experimental design as well as measures of physiological arousal to investigate the mechanisms underlying the olfaction-anxiety relationship.

Study 1 will answer the question whether induction of anxiety in people without anxiety disorders affects olfactory sensitivity. The aim of the study will be verification if activation of thinking about odor-related environmental threat will guide the attention towards odors and briefly increase olfactory sensitivity.

Study 2 will include people experiencing GAD and SAD symptoms and healthy controls to verify how olfactory functioning is related to severity of anxiety symptoms. Additionally, we will measure heart rate variability during odor perception – a physiological marker of psychological well-being that will provide additional information on biological basis of the investigated relationship.

Study 3 will be an experimental investigation of longitudinal design, which will verify whether repeated exposure to odors, i.e., olfactory training, might mitigate anxiety symptoms and affect processing of olfactory stimuli in a group of people with GAD and SAD anxiety symptoms.

The expected outcome of the project is a deeper understanding of the mechanism underlying the link between the sense of smell and symptoms of anxiety. The broaden interdisciplinary knowledge bridging psychology, neuroscience, and sensory studies will not only fill an existing gap, but might constitute a basis for designing further interventions easing symptoms of people with anxiety disorders. This might be of especial importance considering unstable socio-economic situation leading to increased number of people experiencing anxiety.