

In this project, we undertake a study on the mechanisms of perceptual aberrations in a group of people diagnosed with schizophrenia and in a group of healthy people with hallucinatory-like experiences relatively often. The project is based on perception models that indicate the significant role of top-down processes (e.g. cognitive expectancies) in shaping perceptions in various modalities. These models assume that the percepts are not the result of the passive reception of environmental stimuli. Rather, human cognitive (top-down processes) processes are in constant dynamic interaction with information flowing from the environment. Especially in situations of perceptual uncertainty (e.g., blurred shadows in a dark forest), the cognitive expectancies can significantly affect the final perception. In such conditions, our image of reality can be distorted by experienced perceptual illusions. The role of cognitive expectancies is to reduce errors that may occur in circumstances of high perceptive uncertainty. The consequence of the discrepancy between the cognitive attitude and the external stimulus is perceptual anomalies or perception disorders. There is a whole range of different perceptual anomalies (e.g. illusions, changes in color intensity, depth, etc.). Auditory hallucinations are one of the most-studied perception disorders.

Currently, perception models are adapted to the understanding of pathological conditions, in particular, perception disorders in the form of auditory hallucinations. Interestingly, hallucinations, as well as experiences lying on their continuum, occur both in clinical states (psychosis of the schizophrenia spectrum) and in non-psychiatric patients. The main goal of our project is to test, by using experimental methods (our team's experimental task), the impact of cognitive expectancies on false auditory observations in a population of people with schizophrenia experiencing auditory hallucinations (study 1) and the population of healthy people having frequent hallucinatory-like experiences (study 2). In the first study, we will select people with a high frequency of hallucinatory-like experiences ($n = 45$) from the population of people aged 18-45 ($n = 1000$) and compare them in experimental tasks with people with a low frequency of such experiences ($n = 45$). In the study of the clinical group, patients with hallucinations ($n = 45$) will be compared to a properly selected group of patients without hallucinations ($n = 45$) and healthy people ($n = 45$). Two studies will allow investigating whether the impact of cognitive expectancies on false auditory perceptions occurs only in the group of people with clinical hallucinations or is a more universal risk factor for perceptual anomalies experiences and is observed in healthy people.

In addition, in our study, for the first time, we will combine the theoretical model described above with the model saying that hallucinations are associated with difficulties in differentiating the source of information (so-called source monitoring). The effect is well documented and shows that hallucinations are associated with confusing internal sources (I did it) with external sources (they did it), which is consistent with the experience of hallucinations as originating from external sources.

This study is an extension of our team's research into the effects of cognitive expectancies on false auditory perceptions in schizophrenia. Such a design of our study that combines clinical and non-clinical groups allow for empirical verification of theoretical predictions regarding the impact of cognitive processes (top-down) on perception. The combination of two theoretical models also allowed for a better understanding of perceptual distortions, in particular in auditory modalities. The research is carried out with a leading center in Germany (Hamburg), and its results are planned for publication in reputable scientific journals.