

The role of prediction and attention in phantom voice perception

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Investigating the changes in sensory predictive processing, attentional control, and emotion processing as a function of hallucination proneness (HP), with self-voice production as an example, advances our understanding of the neural mechanisms underlying voice hearing. The findings subsumed in this dissertation provide a differentiated theoretical account and give insights that are relevant for future empirical inquiries. Specifically, these findings provide empirical evidence for the existence of a neurophysiological continuum of HP by confirming that individuals with high proneness to hallucinations exhibit alterations in the N100-suppression effect to self-generated own vocalizations, previously shown in voice hearers with a psychotic disorder (Ford & Mathalon, 2004; Ford, Mathalon, Heinks, et al., 2001; Ford, Mathalon, et al., 2001b; Ford et al., 2013; Pinheiro et al., 2018). This may imply that the N100-suppression effect could be a neurophysiological marker that may allow predicting transitions from non-clinical to clinically relevant voice hearing (Oestreich et al., 2015).

By specifically targeting non-clinical individuals who are highly prone to hallucinations, researchers can gain valuable insights into the mechanisms underlying positive symptoms of psychosis. Drawing from the neurophysiological continuum evidence, future research could pinpoint alterations in specific brain regions, neural circuits, and neurotransmitter functioning in non-clinical high HP individuals to establish a basis for the development and the refinement of targeted pharmacological interventions. Furthermore, the advantage of the continuum perspective is that it provides the rationale to study individuals along this continuum who are not diagnosed with a psychotic disorder but exhibit potential precursors in terms of similar symptoms or characteristics. Potentially confounding factors such as medication, illness onset and awareness of illness are not found in these individuals. The acceptance and credibility of the continuum perspective of psychosis rely on empirical evidence. This evidence serves to destigmatize the concept of hearing voices and encourages the acknowledgment that varying degrees of vulnerability are inherent in all individuals (Bentall, 2003; Kessler, 2002).

The research conducted in this dissertation has been disseminated through a variety of channels, including science communication platforms (e.g., FEM-Female

Empowerment at University of Maastricht), international scientific conferences (e.g., The Federation of European Neuroscience Societies (FENS) and Congress of the Schizophrenia International Research Society (SIRS)), and engagement with the general public (e.g., Pint of Science). The findings presented here are openly accessible through publication in journals that adhere to an open access policy. This facilitates the transfer of knowledge and supports the potential for replication of the research. Beyond the scientific community, efforts have been made to make aspects of this research accessible to the general public in the Netherlands. This outreach has included explaining the research in layman language without using scientific jargon during events like "Pint of Science." Additionally, opportunities have been taken to introduce Psychology bachelor students from Maastricht University and Bangaluru City University, India to research methodologies and to the neurofunctional mechanisms underlying voice hearing. Online events have been utilized to showcase the outcome of the empirical studies in seminars discussing the contributions of women in science at Maastricht University.