

## **Between Controlled and Uncontrolled Hallucination: the Spectrum of Psychosis within the Framework of Predictive Processing**

There has been a growing trend in psychopathology to conceptualize mental disorders as spectra rather than as distinct categories, a shift that is reflected in the latest clinical classifications (Tanaka, 2024). This perspective has typically been discussed in the context of neurodiversity and personality disorders; however, in recent years, there has been increasing confidence in applying a similar framework to psychotic disorders (Guloksuz & van Os, 2018). According to this approach, psychosis should be understood as a spectrum ranging from subclinical or mild symptoms, commonly referred to as psychosis-like experiences, to severe hallucinations or delusions. While this perspective is supported by clinical observations, it should also be integrated into a broader model of cognition.

The aim of the poster is threefold. First, we argue that the emerging concept of the psychosis spectrum aligns with the theoretical framework of predictive processing (PP). According to PP, the brain functions as a prediction engine, continuously generating and updating predictions about the world in order to minimize prediction errors – signals that reflect the accuracy of the internal model in mapping the agent’s external and internal environment (Friston, 2010; Seth, 2021). Within this model perception and action are strongly interdependent and rely on inferential processes, on ongoing competition between different patterns of interaction with the environment, in which the cognitive system identifies and prioritizes actions that are most pragmatic given the most probable representation of reality. In the case of controlled hallucination the generative model (an internal hallucination) predicts the external causes of sensory input and, in the event of a discrepancy (prediction error), updates itself accordingly. When the cognitive system fails to adequately adapt its internal model to the world, for example, by excessively immunizing it against revision despite strong inconsistencies with sensory data, this may be understood as a loss of control over internal hallucinations. This loss of control can vary in severity, creating a whole spectrum of cases.

Second, we demonstrate that a comprehensive explanation of these mechanisms must take into account the environmental factors in which an agent is embedded. This perspective reveals that the distinction between subthreshold and clinical states is non-discrete, as is the boundary between pathological and normal cognition. Consequently, perception and cognition can be viewed as existing along a continuum of varying degrees of valid (or controlled) hallucinations.

Finally, we draw attention to the subpersonal level and the biological mechanism involved in the phenomena described, namely cortico-subcortical loops. Their functioning is consistent with predictive processing models (Luu, et. al. 2023), and empirical evidence indicates that disruptions within these circuits are associated with prediction impairments, hallucinations, and delusions.

We suggest that this integrative approach enables mutual enrichment: theoretical frameworks from cognitive science can provide a coherent structure for understanding mental disorders, while clinical observations may reveal rare or extreme conditions that serve as informative test cases for refining theoretical models.

## References:

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