

# **How Short term memory and the cerebral cortex function together to predict and interpret reality**

## **Executive Summary**

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## **Executive Summary: How Short-Term Memory and the Cerebral Cortex Predict and Interpret Reality**

This webinar explored the dynamic interplay between short-term memory (working memory) and the cerebral cortex in shaping our perception of reality. The key takeaway is that our experience of the world is not a passive reception of sensory data, but rather an active, predictive process.

The cerebral cortex, responsible for higher-level cognitive functions, receives a constant stream of sensory information. Short-term memory acts as a crucial intermediary, temporarily holding and actively manipulating this information, providing the context for the cortex's predictive mechanisms. The brain continuously generates hypotheses about what will happen next based on past experiences (long-term memory) and current sensory input (short-term memory). This "predictive coding" is constantly refined by comparing predictions with actual sensory feedback. Discrepancies between prediction and reality result in adjustments, and lead to experiences such as surprise or fear.

The seamless integration of short-term and long-term memory systems is essential for accurate prediction. Damage to either system, particularly the prefrontal cortex (crucial for working memory), can significantly impair cognitive function, such as decision-making. While this predictive model is powerful, it's not perfect and is susceptible to biases shaped by individual experiences and beliefs. In essence, our perception is a continuous construction, reflecting the intricate interaction between these two brain regions. Understanding this process illuminates the complexity of human cognition and the remarkable predictive capabilities of the brain.