

A second explanation for the semblance hypothesis

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To understand the brain, we must explore how its unique function – the generation of first-person internal sensations such as perception, memory, and thought – takes place.

Associative learning between two stimuli is expected to induce certain changes (within a few milliseconds; see FAQ for explanation) that enable one of the paired stimuli (the cue stimulus) to evoke the first-person feature of the second stimulus's memory (also within a few milliseconds). It is reasonable to assume that during associative learning, certain changes must occur at sites where associatively learned sensory stimuli converge within the brain. This raises several key questions: “Is there a cellular location where neuronal processes carrying associatively learned sensory inputs can meet and undergo specific, identifiable changes during learning?” “If such changes occur at this site (in just a few milliseconds), can one stimulus (the cue) use them to generate the internal sensation of the second (in the same brief timeframe)?” “At what structural sub-location, and through what mechanism, does the cue stimulus give rise to internal sensation as a first-person experience?” “Are there any pre-conditions for generating such internal sensation?” “What underlies the sensory qualities – or qualia – of these internal sensations?” “What unifies the internal sensations generated from different sensory convergence points that allow the cue stimulus to evoke the memory of the second?”

It is known that the brain operates only in a narrow range of frequency of oscillating extracellular potentials (as revealed by EEG). Hence, “How does the unifying mechanism connect to the narrow frequency range of frequency of oscillating extracellular potentials at which both learning and memory retrieval occur?” “In essence, is there a mechanism that integrates internal sensations from multiple convergence sites to form coherent memory?” “How is the mechanism behind internal sensation linked to behavioral motor activity (for example, during memory retrieval)?” “Can a single, unified mechanism be extended to account for various brain functions in an interconnected way?” If examined carefully, one would expect to identify a mechanism at the sites of sensory input convergence that explains all these aspects. Through an inquiry aimed at solving the above, a further testable mechanism was derived. This testable hypothesis was termed the semblance hypothesis.