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COGNITION, BEHAVIOR AND MEMORY

Brain signatures of statistical information acquisition in the absence of behavioral learning

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Statistical information, i.e. the recurrent co-occurence of events or stimuli, underlies multiple aspects of life, and is a robust source of information for learning. Behavioral results after training in artificial grammars, have shown that infants and adults sense, store and use statistical information to acquire different aspects of the trained grammar. What happens though, when statistical aspects of the training stimuli are not learned? Does this imply that recurrent stimuli information has not been sensed and/or stored by the brain? In the present study, 7 year-old children (N=13) were briefly trained in an artificial grammar task involving learning the designations of several figures. Behavioral responses after training were at chance level, evidencing absence of learning. Electroencephalographic recordings during testing were used to calculate Intersite Phase Clustering, a measure of synchrony between electrode sites. Results showed increased interhemispheric synchronization when testing trials displayed an incongruence between the figure shown and the designation heard. This increase of synchronized activity may facilitate neural integration and information exchange between regions, necessary to solve the incongruence of stimuli shown. More importantly, it is evidence that statistical information was indeed sensed and stored, even in the absence of behavioral learning.