Neuroscience

Short-term memory mechanisms of habituation in the domestic chick (Gallus gallus domesticus)

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Habituation and dishabituation reflect two forms of experience-dependent plasticity. Habituation consists of a response decrement to a reiterated irrelevant stimulus, whereas dishabituation consists in the recovery of the response to the habituated stimulus when a new one is presented. Dishabituation would arise because the model of the habituated stimulus stored in short-term memory (STM) is perturbed by the novel sensory input. Studying the ontogeny of these processes can shed light on the development of the underlying memory mechanisms. We investigated habituation and dishabituation of the freezing response to a sudden acoustic stimulation in newly hatched chicks (N = 36) by comparing two early developmental ages (1 day vs. 3 days after hatching). The results showed that dishabituation was fully present a few hours after hatching, indicating that in this precocial avian species habituation and dishabituation share the same developmental trajectory, and that the underlying STM mechanisms are fully and simultaneously operative soon after birth. Moreover, the amount of habituation, after dishabituation, was larger in 1-day-old than in 3-day-old chicks, in agreement with previous findings showing a rapid attenuation of plasticity soon after birth in this avian species. Our results support the hypothesis that dishabituation represents a disruption of the habituation model stored in STM, but also indicate that dishabituation does not necessarily appear at later stages of development compared to habituation as previously postulated in other species.

Exploring the structural neural background of body ownership

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Body ownership refers to complex multidimensional phenomenon, including the tendency of focusing our attention to bodily senses and also to be conscious of them. There are many studies investigating the functional correlates of body ownership, but they have not discovered the structural correlates yet, which should be responsible for the long term effects in the brain. In our study with 60 participants, we applied the rubber hand illusion (RHI) as an experimental method to objectively and subjectively measure body ownership. The RHI is an ex-