COPY ME, COPY YOU: INVESTIGATING THE DEVELOPMENT OF FACIAL MIMICRY IN INFANCY

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Background: Our tendency to spontaneously copy or 'mimic' others' actions, plays an important role in our social interactions. However, despite the important social functions mimicry serves, surprisingly little is known about its development. In recent years, evidence has started to accumulate for the idea that the perceptual-motor couplings that support mimicry are formed through correlated sensorimotor experience, obtained through observing one's own actions, and through imitative social partners. For example, de Klerk et al., 2019 showed that infants' facial mimicry as measured by electromyography (EMG) was positively associated with their mothers' tendency to imitate their facial expressions. These results are consistent with the idea that mimicry is supported by perceptual-motor couplings that are formed through repeated experience with seeing and doing actions. However, because this was a correlational study, it does not provide conclusive evidence for the idea that correlated sensorimotor experience with a specific action plays a causal role in supporting mimicry of that action. Additionally, as this study did not measure motor cortex activation it is unknown how the observed facial mimicry related to activation of the corresponding motor representations in the brain.

Aims: The present project aims to test the causal role of sensorimotor experience in mimicry development by systematically manipulating 4-month-olds' experience with their own facial actions, and measuring the effect on their motor cortex activation and facial mimicry when they observe others' facial actions.

Method: Infants in the mirror group received two weeks of daily sensorimotor experience with their own facial actions via a toy mirror, while infants in the control condition played with the same toy without the mirror for the same amount of time. Before and after this intervention, we measured infants' facial mimicry using EMG and their sensorimotor cortex activation using electroencephalography (EEG) while they observed videos of other infants' facial actions.

Preliminary results: The preliminary results show that, as predicted, infants in the mirror condition showed a greater increase in motor cortex activation during the observation of other infants' facial actions than the infants in the control condition. However, this greater neural activation did not seem to translate into a greater increase in facial mimicry in this group.

Keywords: Facial mimicry, Infancy, Imitation, EMG, EEG

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