

EXPLORATION OF SELF-AGENCY BY NEWBORNS AND 2-MONTH-OLDS

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This study captures the developmental origins of self exploration and self-efficacy. We tested when young infants start to discriminate the congruence or incongruence of contingent auditory feedback associated with their own action (i.e., sucking).

Participants were newborn (N=14) and 2-month-old (N=18) infants. They were placed between two speakers while sucking on a rubber pacifier attached to a pressure transducer. After a 90-second baseline where they had the opportunity to suck and explore the soft rubber pacifier introduced in their mouth with no contingent sound, infants were tested successively in two 90-second experimental conditions with different auditory feedback following each suck.

In one condition (Contingent + Analog Condition), each time infants applied a minimum amount of pressure on the pacifier, they heard a simultaneous trill of discrete computer generated sounds (approx. 75 dB) that ascended and descended in pitch-frequency and matched the actual pressure variation applied orally on the pacifier by the infant. In this condition there was a perfect spatiotemporal overlap of the positive pressure variation applied on the pacifier and the sound frequency change the infant heard via the speakers. In the other condition (Contingent Only Condition), each time infants applied a minimum amount of pressure on the pacifier, they heard a two second trill of discrete sounds with randomly distributed pitch frequency. This pattern of sounds was contingent with the infant's sucking, but did not match the actual pressure variation applied orally by the infant on the pacifier. In this latter condition, auditory feedback was temporally contingent but spatially incongruent (non-analog). Following these two test conditions, infants were tested in a second baseline with the pacifier introduced in their mouth for sucking but with no auditory feedback.

From the computer recordings of positive pressure applied to the pacifier, we analyzed the frequency of sucks above threshold, frequency of sucks at threshold, mean amplitude and width of sucks, as well as the standard deviation of peak width and amplitude.

Results indicate that newborns did not suck differentially between the two experimental conditions. In contrast, 2-month-olds modulated their sucking depending on the conditions. Specifically, 2-month-olds, but not newborns, generated significantly more low frequency and wider sucks in the Contingent + Analog Condition. These findings provide evidence that by 2-months, infants are actively engaged in exploring their own agency and the traces of their own action.