

9-month-old Infants Learn Action-effect Contingencies by Observation and Use this Knowledge for Their Own Action Control

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Twelve- to eighteen-month-old infants are able to learn action-effect contingencies by observation and rely on these relations in their own action control as recent studies have shown (Elsner & Aschersleben, 2003; Hauf, Elsner, & Aschersleben, 2004). However, younger infants seem to have difficulties to use observed action-effect contingencies for their own action control (Elsner & Aschersleben, 2003).

In the following studies, we addressed the issue of whether infants as young as 9 months relate certain actions to specific effects when they watch another person acting upon objects (Exps. 1 and 2), and whether they use this knowledge to control their own behavior (Exps. 4 and 5).

Method

We applied different paradigms: looking paradigms (Exps. 1 and 2), a reaching paradigm (Exp. 3), and an imitation paradigm (Exp. 4).

Experiments 1 and 2

In Exps. 1 and 2, 9-month-old infants ($N = 48$ each; mean age 9;07 and 9;03) watched a video clip that presented a familiarization phase and a test phase. In the familiarization phase of Exp. 1, they saw a person shaking two objects alternately. One object elicited a sound while shaken, the other one did not. In the familiarization phase of Exp. 2, infants observed a person performing two actions successively on one object: Rolling the object (ball) elicited a sound while shaking did not (or reverse). Thus, in both experiments infants were presented with specific action-effect contingencies. In the test phases, the mapping of actions and effects was reversed for half of the group of infants (non-contingent test trials), whereas for the other half the action-effect contingencies corresponded to the familiarization phase (contingent test trials).

Experiments 3 and 4

In Exps. 3 and 4, the demonstration phases were identical to the familiarization phases in Exps. 1 and 2, except that the actions were performed live in front of the infants. In Exp. 3, 24 9-month-olds (mean age 9;02) observed the experimenter shaking the two objects alternately, one of the two making a

sound. Subsequently, infants were allowed to reach for the objects. In Exp. 4, 24 9-month-olds (mean age 9;05) observed the experimenter shaking and rolling the object, one of the two actions eliciting a sound. In the adjacent test phase, infants were allowed to play with the object.

Results

Experiments 1 and 2

Results revealed longer looking time in non-contingent than in contingent test trials in both experiments ($p < .05$).

Experiments 3 and 4

In Exp. 3, most infants reached for the object that had made a sound while being shaken before (19 vs. 5, $p < .01$).

In Exp. 4, most infants first produced the target action with effect (17 vs. 7, $p < .05$). Moreover, infants performed the target actions more often when they were combined with an interesting acoustical effect ($p = .053$).

Discussion

The reported findings indicate that 9-month-old infants are able to relate specific actions to specific effects and also detect changed action-effect contingencies when they observe another person acting upon objects. Furthermore, they use the observed contingencies for their own action control. The present findings differ from previous ones, probably because the presented actions were more appropriate for this age group.

References

- Elsner, B., & Aschersleben, G. (2003). Do I get what you get? Learning about the effects of self-performed and observed actions in infancy. *Consciousness and Cognition*, 12, 732-751.
- Hauf, P., Elsner, B., & Aschersleben, G. (2004). The role of action effects in infants' action control. *Psychological Research*, 68, 115-125.