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Means-End Behavior in Infancy: The Interrelation of Action Production and Action Perception

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Introduction

The traditional view of the development of action understanding is that infants understand others' actions based on their own ability to perform the same action. Alternative theories, however, suggest the reverse order. Infants' therefore come to understand their own actions based on the understanding of other people's actions. This is supported e.g. by studies on AB-errors. In looking-time tasks, infants from early on differentiate between expected and unexpected events (e.g., Baillargeon & Graber, 1988). However, when older children have to solve similar problems in search tasks, they fail (e.g., Diamond, 1985).

The present study was designed to contrast infants' ability to perform an action with their perception and interpretation of the same action. In a within-subject design, 6-month-old infants were tested with two versions of a means-end task. The action production task was adapted from the seminal study by Willatts (1999), who showed that infants start to perform successful means-end behavior at the age of six months. The action perception task was adapted from work done by Baillargeon, DeVos, and Black (1992), in which they showed that 6½-month-olds realize that pulling a support is sufficient to bring an object placed on the support within reach.

Method

Sixty 6-month-old infants (20 girls, 40 boys; mean age: 6 months 2 days) participated in the study. They were presented with an action production and an action perception task. In the action production task, infants had to pull a cloth in order to retrieve a toy placed on the cloth. In the action perception task, infants first saw the video of an actor pulling a support on which an object was placed and which was hidden behind a curtain during the pulling movement. Subsequently an expected and an unexpected final state of the action were presented simultaneously and the looking times to the respective final state were measured. The order of the tasks was counterbalanced between participants.

Results

In the action production task, the results reported by Willatts (1999) were replicated; about one fourth of the infants successfully pulled the cloth and received the toy and an equal number of infants totally failed. In order to analyze the data of the action perception task, infants were divided into two groups by median split based on their performance in the action production task and the looking times of both groups were analyzed separately. Infants in both groups looked reliably longer to the unexpected final state than to the expected final state.

Discussion

The reported findings support the view that perception and understanding of an action is not necessarily dependent on the own competence to perform the action. Two alternative hypotheses appear to be possible in this context: The perception and understanding of others' actions could precede the competence to produce the same action or both competences could be acquired simultaneously and independent of each other.

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