

# Do Infants Prefer Possible Human Movements?

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## Abstract

In a present study, infants of 12, 15 and 18 months were tested in a standard preferential looking paradigm, in which they were shown paired movies of possible and impossible movements of humans. Tentative results indicated that 12- and 18-month-olds had a preference for possible over impossible movements, while 15-month-olds did not show a preference. In a robot version, where the robot made the same movement as the human did, the results were similar. The results were interpreted as the infants might prefer movements that match their own.

## Introduction

There are two main questions about mentalization. One is when do humans first attribute a mental state to others, and the other is when they do, to whom or what do they attribute that mental state (Johnson, 2003). Human infants seem to have some unique expectations. For example, there is much evidence that neonates have expectations about the typical configurations of human faces (Goren, Sarty, & Wu, 1975; Johnson, Dziurawiec, Ellis, & Morton, 1991). Slaughter, Heron and Sim (2002) have demonstrated that 18-month-old infants looked longer at pictures of a scrambled body picture than at a picture of an intact body. They tested the infants of 12, 15, and 18 months in a standard preferential looking paradigm, in which the infants were shown paired line drawings of typical and scrambled body shapes. Results suggested that the 18-month-olds had a preference for the scrambled body shapes. The researchers explained these results in terms of the novelty preference in infancy.

Infants have also special sensitivity to human movement (Bertenthal, Proffitt, & Cutting, 1984). Research has demonstrated that by the time they are three months old, infants can discriminate the light patterns generated by point-light-displays. In the light of these results, infants may also look longer at impossible movements than at the possible movements that they are accustomed to seeing. The purpose of this study was to investigate whether the infants are sensitive to the possible and impossible movements of a human. Moreover, we

compared human stimuli to nonhuman stimuli, such as a robot. We attempted to clarify the relationship between the agent and the pattern of the movement.

## Methods

**Subjects:** Seventeen infants between the ages of 12 and 18 months participated in this study. They were divided into three age groups, 12-, 15-, and 18-month-olds.

**Stimuli:** There were two kinds of agents (robot and human) and two types of movement pattern as video stimuli. One was the movement that humans could do; another was the movement that humans could not do. For example, in the possible movement stimuli, the arms bend normally at the wrist and elbow, while in the impossible condition the arms bend the opposite way.

**Procedure:** We used preferential looking method in this study; infants were shown a video simultaneously showing pairs of both possible and impossible movement. Each infant was given eight trials in which two movies were presented. The looking time of infants to each stimulus was recorded.

## Results and Discussion

Infants' preference for the movement was analyzed with two mixed ANOVAs, run separately for the human and robot figure sets. Age was the three-level between subject factor (12, 15 and 18 months) and two movement patterns (possible and impossible movement) was repeated measure. The results are shown in Fig. 3 and Fig. 4. For the human figures, this analysis for the main effect of types of movements ( $F(1, 14) = 4.23, p < .06$ ) indicates that infants looked longer at possible movements than impossible ones. But no effect for the age ( $F(2, 14) = 2.59, n.s.$ ). For the robot figures, main effect of types of movements ( $F(1, 14) = 5.39, p < .08$ ), indicate that infants looked longer at possible movement than impossible ones. There was no effect for the age ( $F(2, 14) = 1.77, n.s.$ ).

In each video condition, the infants tended to look at the possible movements longer than at the impossible ones. There are two ways to interpret these results.

(1) The infants prefer the movements that match their own .

(2)The shape of robots used in this study, is very similar to that of the human body (humanoid robot), so that infants might have thought that those robots move just like humans.

The infants’ preference for human movements may not be explained with the novelty effects based on infants’ visual experience.

However, the number of the subjects was not enough in the present study. We need to collect the data with more subjects to clarify our questions.

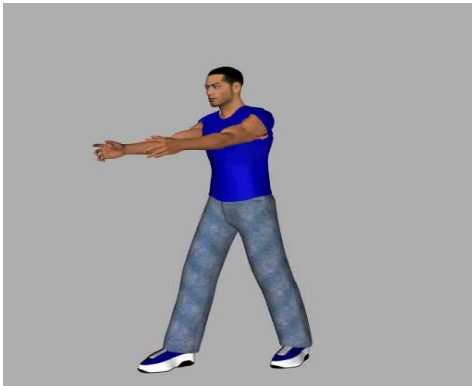


Figure 1: Sample of stimulus of human agent.

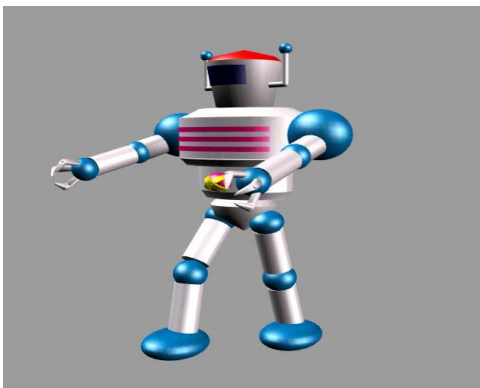


Figure 2: Sample of stimulus of robot agent.

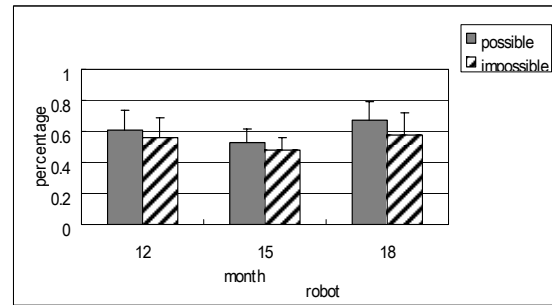


Figure 4: The result in robot version.

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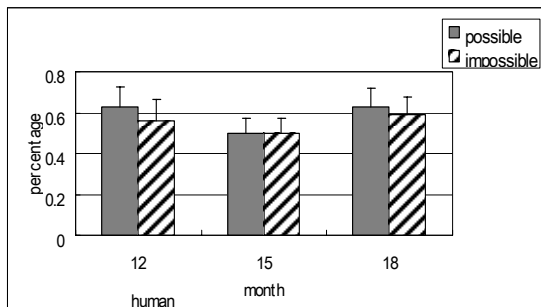


Figure 3: The result in human version.