INFANTS' MATCHING OF PRETEEN VERSUS PRESCHOOL CHILDREN'S FACES AND VOICES

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ABSTRACT

In two experiments, we assessed the roles of motion versus featural information in infants' intermodal matching of faces and voices of preteen versus preschool children. In Experiment 1, when featural information was preserved, infants matched dynamic but not static faces to the voices, even when voice-lip synchrony was eliminated. In Experiment 2, when featural information was eliminated but motion patterns were preserved, infants no longer matched the faces and voices. These findings demonstrate that infants are adept perceivers of intermodal relations uniting faces and voices. They can discriminate and match the faces and voices of preschool and preteen children on the basis of audio-visual information specifying age. By 7-months of age, facial motion appears to be necessary for intermodal matching of faces and voices. In addition, featural information must be present to support face-voice perception.

INTRODUCTION

Research indicates that 7-month-old infants match the dynamic faces of adults versus preteen children with their voices when gender and voice-lip synchrony are controlled (Bahrick, Netto, & Hernandez-Reif, 1998). Matching is based on intermodal information specifying age. For example, children's facial movements and vocalizations are more labile, less controlled, and show a higher degree of intensity and amplitude change than adults. Children also have smaller heads, their faces are less angular, have smaller features, and more filled out cheeks, and their voices have a higher pitch. In the present study, we further explored the basis for this matching and asked whether 7-month-olds could make even finer distinctions. In two experiments, we assessed the roles of motion versus featural information in infants' intermodal matching of faces and voices of preteen versus preschool children.

EXPERIMENT 1

In this experiment we investigated whether motion was necessary for matching the faces and voices when the facial features were preserved.

Method

Stimuli. Color videos were created depicting two male and two female preschoolers (3-5 years) and two male and two female preteen children (9 years) reciting a nursery rhyme, "This Old Man". Natural, undistorted faces were presented (see Figure 1).

Participants. Sixteen healthy 7-month-old infants (M = 219 days, SD = 8.84), 7 males and 9 females, participated.

Procedure. Infants received two blocks of 6 test trials each, one of moving displays and the other of static displays, counterbalanced for order. Each block depicted one same-sex preschool-preteen pair (counterbalanced). To familiarize infants to the lateral positions of the displays on each block, they first received a 20-s trial of a preschool and a preteen child side-by-side. This was immediately followed by the two blocks of six test trials. Because the vocal and facial expressions of preschoolers are more labile than those of preteen children we eliminated voice-lip synchrony as a basis for matching by presenting successive trials consisting of voices and faces. Thus, on each trial, infants heard the voice of a child for 10s, followed immediately by two side by side videos of the same-sex faces of a preschool and a preteen child for 20s. One or two trained observers, who were unaware of the lateral positions of the video displays, monitored infants' visual fixations to the left and right monitors. Inter-observer reliability, expressed as a Pearson product moment correlation between the looking proportions of the primary and secondary observer for 4 of 16 subjects (25 %) averaged .85 (SD = .11). If infants could match the faces and voices on the basis of age, they were expected to look longer to the face whose voice was just heard. We expected better matching on the moving than static trials because motion makes intermodal relations available.

Results

The proportions of total looking time (PTLT) to the voice-matched films were calculated for moving and static blocks of trials. For each trial, the total time infants looked to the face that matched the voice (played 10 s earlier) was divided by the total looking time to both displays on that trial. These proportions were averaged across trial blocks to obtain a PTLT for each block. T-tests were conducted on the PTLTs for each block against the chance value of .5. They revealed that infants looked significantly longer to the voice-matched films on the moving [t (15) = 2.26, p = .039] but not the static block of test trials [t (15) = .11, p > .1; Figure 2]. These results supported our prediction and indicated intermodal matching when the faces were dynamic but not when they were static (p < .05).

EXPERIMENT 2

In this experiment, we investigated whether motion alone was sufficient for matching the faces and voices or whether the facial features were also necessary.

Method

Stimuli. Videos of the faces of Experiment 1 were distorted (using a mosaic transformation) so that the features were no longer discernible, but the motion patterns were preserved.

Participants. Sixteen healthy 7-month-olds (M = 215 days, SD = 5.82), 10 males and 6 females participated.

Procedure. All procedures and analyses were identical to those of Experiment 1.

Results

T-tests on the PTLTs against chance (50%) revealed no significant looking to the voice-matched films on the moving [t (15) = .73, p > .1] or static [t (15) = .65, p > .1; Fig. 2] blocks of trials. Thus, when the featural information was distorted but motion patterns were preserved, infants no longer matched the faces and voices.

CONCLUSIONS

These findings demonstrate that infants are adept perceivers of intermodal relations uniting faces and voices. They can discriminate and match the faces and voices of preschool and preteen children on the basis of intermodal audio-visual information specifying age, even when voice-lip synchrony is eliminated. Matching is observed when the faces are dynamic but not when they are static, and when the features are visible, but not when they are distorted. By 7-months of age, facial motion appears to be necessary for intermodal matching of faces and voices. In addition, featural information must be present to support face-voice perception.

Figure 1

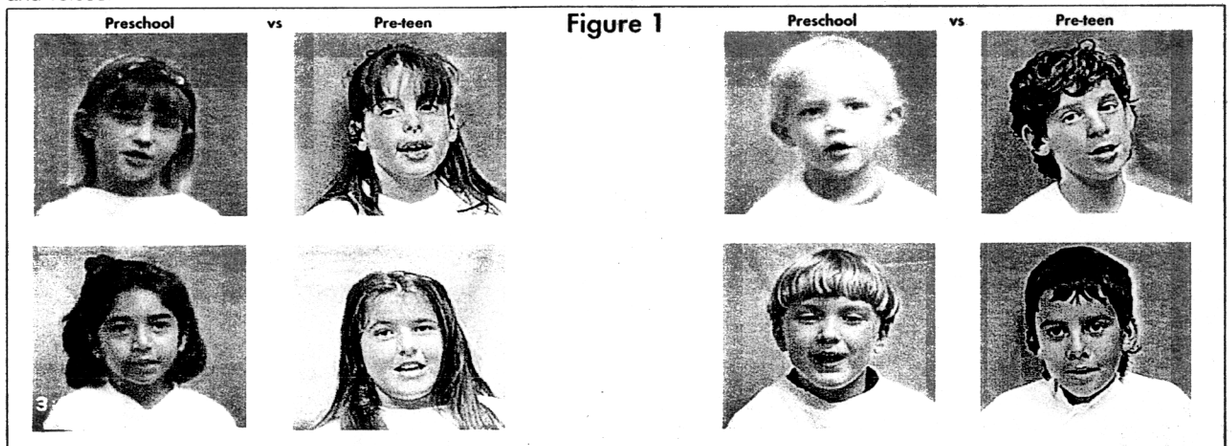
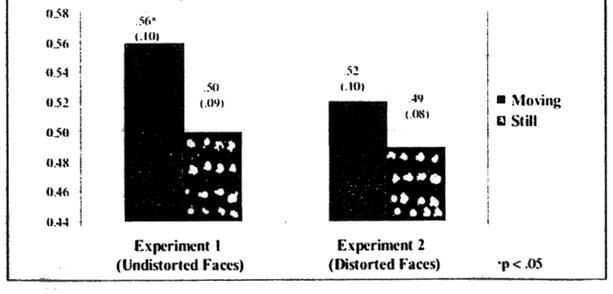


Figure 2

Seven-month-old infants' proportion of total looking time (PTLTs and SDs) to the matching face and voice of preteen versus preschool children.



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1. Bahrick, L.E., Netto, D., & Hernandez-Reif, M. (1998). Intermodal perception of adult and child faces and voices by infants. Child Development, 69 (5), 1263-1275.

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