

Asymmetries in Intermanual Transfer of Visual-Motor Learning in Four-year-olds

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Intermanual transfer was investigated in children in this study, because the way of visual-motor learning in children and its relation to the maturity of brain might be suggested. Our previous study has indicated that four years of age might be critical for the development of memory (Uehara & Shimojo, 1996). Thus the experiments examined in four-year-olds, five-year-olds, and adults.

Experiment 1

Methods

Subjects 18 right-handed four-year-olds (mean:3.8y), 18 right-handed five-year-olds (mean:5.0y), and 4 right-handed adults (mean:24.5y)

Apparatus & Stimuli A pressing-button game made by Prof. Hikosaka. 2 of 16 LED buttons ("set") were illuminated simultaneously, and the subject had to press them in a predetermined order that the subject had to find. When the subject succeeded in 5 sets ("hyperset") that were presented successively in a fixed order, a trial was performed.

Procedure The task consisted of three phases. The identical hyperset was used in the three phases. To finish one phase, the subject had to perform three trials. The subject pressed buttons with the right hand in the first and the second phases, while with the left hand in the third phase.

Results

Four-year-olds showed little transfer from the right to the left hand, while five-year-olds and adult showed much transfer (Figure 1). In order to examine whether four-year-olds show little transfer in both directions or asymmetrical transfer between hands, the transfer from the left to the right hand was also examined (Exp.2).

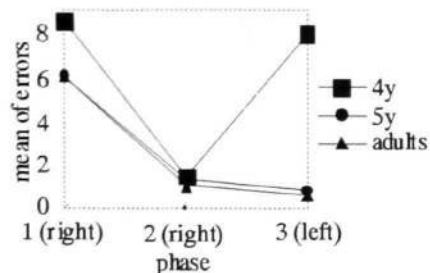


Figure 1: Mean number of errors as a function of phases.

Experiment 2

Methods

Subjects 15 right-handed four-year-olds (12 subjects participated in Exp1. mean:4.0y), 16 right-handed five-year-olds (15 subjects participated in Exp1. mean:5.1y), 4 right-handed adults (All participated in Exp1. mean:24.5y)

Procedure The same game as Exp1. The subject performed with the left hand in the first and the second phases, while with the right hand in the third phase.

Results

All the subjects, regardless of age, showed great transfer from the left to the right hand (Figure 2).

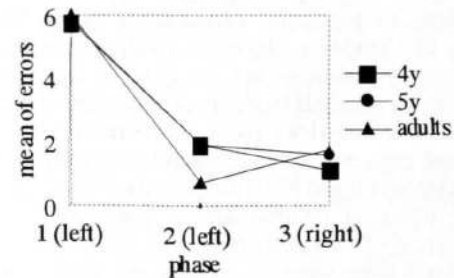


Figure 2: Mean number of errors as a function of phases.

General Discussion

The little transfer from the right to the left hand in four-year-olds might be due to the way of learning different from that of older subjects. Four-year-olds might learn in a more procedural level rather than in a higher cognitive level. In addition, observed asymmetries in four-year-olds might have something to do with the critical dissociation in four-year-olds in our memory tests (Uehara & Shimojo, 1996).

References

Uehara, I., & Shimojo, S. (1996). Two types of memory dissociated by recognition and preference in four-year-olds. Presented at the XXXI International Congress of Psychology, in August, 1996. Abstract in *International Journal of Psychology*, (pp342).