Motor imagery for walking and drawing in children

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Various studies have demonstrated that MI ability is reduced in 6-year-old children but considerably improved between 7 and 10 years as a result of the refinement of internal models of action (Molina, Tijus & Jouen, 2008; Caeyenberghs, Tsoupas, Wilson, & Smits-Engelsman, 2009).

The aim of the present study was to evaluate motor-imagery skills for walking and for drawing in 6-year-old (age 6.5 ± .76; N= 22), 8-year-old (age 8.7 ± 1.4; N = 22) and 10-year-old (age 10.5 ± 1.3; N = 22).

A Mental chronometry paradigm was used according to which durations for executed (E) and imagined (I) actions were compared for a walking task (box 1) and a drawing task (box 2).

Box 1: The walking task
Children were asked to walk and to imagine themselves walking on two different distances (4 m and 8 m).

Box 2: The drawing task
Children were asked to draw loops and to imagine themselves drawing loops on a graphic tablet. They performed each condition on two different distances (13 cm and 26 cm).

Fig. 1: Experimental setup for the walking task: 3 m for the short distance and 6 m for the long distance.

Fig. 2: Experimental setup for the drawing task: 13 cm for the short distance and 26 cm for the long distance. The starting point and the arrival points were indicated.

Fig. 3: Executed-Imagined (E-I) correlation for drawing at each age (6, 8, and 10).

Fig. 4: Executed-Imagined (E-I) correlation for walking at each age (6, 8, and 10).

Fig. 5: Cumulative distribution of the E/I ratios in each age group, by task (walking or drawing).

Conclusion:
- Time invariance is observed on both tasks in 6-, 8-, and 10-year-old children.
- A time lag between walking and drawing tasks exists in 6- and 8-year-old children.
- By the age of 10 years, time invariance is similar between the two tasks.

References: