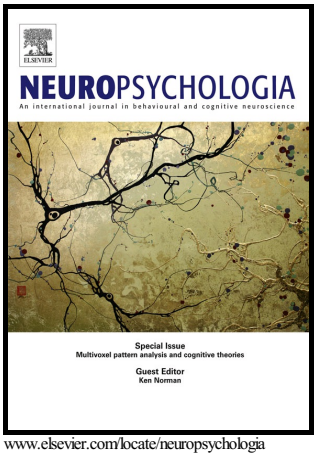

www.elsevier.com/locate/neuropsychologia

DEVELOPMENT OF MOTOR COORDINATION DURING JOINT ACTION IN MID-CHILDHOOD

E. Satta, S. Ferrari-Toniolo, F. Visco-Comandini, R. Caminiti, A. Battaglia-Mayer

PII: S0028-3932(17)30156-2
DOI: http://dx.doi.org/10.1016/j.neuropsychologia.2017.04.027
Reference: NSY6341

To appear in: *Neuropsychologia*

Received date: 22 September 2016
Revised date: 21 April 2017
Accepted date: 22 April 2017

Cite this article as: E. Satta, S. Ferrari-Toniolo, F. Visco-Comandini, R. Caminit and A. Battaglia-Mayer, DEVELOPMENT OF MOTOR COORDINATION DURING JOINT ACTION IN MID-CHILDHOOD, *Neuropsychologia* http://dx.doi.org/10.1016/j.neuropsychologia.2017.04.027

DEVELOPMENT OF MOTOR COORDINATION DURING JOINT ACTION IN MID-CHILDHOOD

Satta E[1], Ferrari-Toniolo S[1], Visco-Comandini F[1], Caminiti R[1,2], Battaglia-Mayer A[1*]

[1]Department of Physiology and Pharmacology, University of Rome SAPIENZA, P.le A. Moro 5, 00185 Rome, Italy

[2]Department of Anatomy, Histology, Forensic Medicine and Orthopedics, University of Rome SAPIENZA, via Borrelli 50, 00185, Rome, Italy

[*]Corresponding Author: Prof. Alexandra Battaglia-Mayer, Dipartimento di Fisiologia e Farmacologia, SAPIENZA - Università di Roma, ph: +39 06 49910632.

alexandra.battagliamayer@uniroma1.it

Abstract

The ability to act jointly with others is a hallmark of primate evolution and is fundamental for human development. In recent years, the study of coordination strategies between individuals performing joint actions has received growing attention. However, when, in the course of post-natal development, this cognitive-motor function emerges is still unknown. Here, we studied dyads of peers aged 6 to 9 years, as well as adult subjects, while they performed a task where the same action, namely, exerting hand force on an isometric joystick to move a visual cursor from a central toward a peripheral target, was performed in a "solo" and in a social "cooperative" context. The results revealed that during joint action planning, an attempt to synchronize one's own action with that of a partner emerges at 7 years of age, together with a reduction in the duration and variability of the reaction-times. A critical time is 8 years, when "solo" performance reaches a high level of accuracy. From this age, another coordination strategy, based on the online monitoring of the peer's behavior, seems to be implemented during the execution of joint action. The motor and cognitive development occurring during childhood are discussed as possible mechanisms mediating, respectively, the capability and the propensity to take into account the peer's behavior for implementing a common action plan.