Archives Jean Piaget

40, boulevard du Pont d'Arve
1205 Genève │Suisse

18th Advanced Course

Cognitive Development, Mechanisms and Constraints

3 – 5 July 2008

Saturday morning, July 5, 2008

10h00 **Andreas Demetriou**, University of Cyprus
Processing Efficiency, Representational Capacity, and Reasoning : Modelling their Dynamic Interactions through the Life-Span?

Abstract:
This address will first outline a general model of the structure and development of the human mind. The model integrates the traditions of Piagetian, the psychometric, and the information processing tradition. The model claims that the mind involves general purpose processes underlying processing efficiency and representational capacity, general inferential processes underlying information management, general executive and self-awareness processes underlying self-understanding and self-regulation, and domain-specific processes underlying understanding and problem solving in different domains.
We will then summarize on a series of studies which aimed to highlight the development and dynamic relations between these processes during development. These studies involved participants from 4 to 60 years of age who were examined by tasks addressed to various aspects of processing efficiency (i.e., speed of processing, perceptual discrimination, perceptual control, and conceptual control), working memory, reasoning in different domains, and self-awareness. Using structural equation modelling we show that these processes are organized hierarchically so that simpler and more general processes are embedded in more complex processes. There are four main levels of organization: (1) processing efficiency, including general efficiency reflected by speed and more specialized executive processes reflected by control; (2) representational processes, involving sheer storage and organizational processes underlying information storage and recall; (3) reasoning, involving general inferential mechanisms; (4) domain-specific processes. Processes within organizational levels are hierarchically organized so that speed influences control, storage influences executive working memory, and general inferential processes influence reasoning in different domains. In addition, each of these levels involves processes germane to itself. The three levels are also hierarchically structured as general processing efficiency predicts working memory later in time and this, in turn, predicts general reasoning and domain-specific reasoning even latter. The weaving of these processes into stage-like ensembles of reasoning and problem solving is also explicated. The implications for the general theory of intelligence and intellectual development are discussed.