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

11h15 **Anik de Ribaupierre**, University of Geneva
Working memory capacity and its role in cognitive development : Are age differences driven by the same processes across the lifespan?

Abstract:
Anik de Ribaupierre, Thierry Lecerf, & Manuel Tettamanti

Strikingly similar hypotheses were advanced, in the last two decades, in different fields of developmental psychology to explain age differences in working memory capacity, and more generally, in cognitive resources, whether in childhood or in older adulthood. They all refer to the influence of a few general mechanisms such as activation (or speed of processing), and/or inhibition: An increase (decrease) in the quantity of information that can be activated and in the efficiency in inhibiting irrelevant information is thus considered to account for the increase (decrease) in working memory capacity with age. For instance, Pascual-Leone's model proposes that developmental change in attentional capacity consists in an increase both in mental power for activating information and in inhibition. As concerns cognitive aging, Hasher and Zacks suggested that less efficient inhibitory processes account for a lower WM capacity in older adults, while processing speed is considered by Salthouse to explain a large part of age-related variance in WM span tasks. Moreover, working memory is considered both by child developmentalists and by cognitive aging researchers to account for age differences in other cognitive tasks, leading to the hypothesis that most of cognitive development, or of cognitive aging, is accounted for by changes in working memory capacity. Yet, few studies have attempted to compare developmental differences across the lifespan, using the same tasks; this is the main goal of this presentation

Three sets of studies will be briefly presented. First, a large multivariate study, in which working memory, inhibition and processing speed tasks were administered to children, young and older adults, showed that inhibition and speed of processing accounted together for a large part of age differences in working memory capacity; however, inhibition played a larger role to explain age differences between young and older adults whereas speed of processing accounted for more age differences between children and young adults. A second study showed that working memory capacity explained a very large part of age-related variance in the Piagetian Balance task, in children. Finally, a third study demonstrated that working memory and speed of processing accounted for most age differences in the Raven's task, both in children and in adults. Altogether, our data indicated that the same processes underlie age differences in working memory capacity across the lifespan, but vary in their relative contribution. Also, working memory capacity accounts for age differences in other cognitive tasks both in children and in adults, but to a different extent.