

archives

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18th Advanced Course

## Cognitive Development, Mechanisms and Constraints

3 – 5 July 2008

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15h30

Graham Hitch, University of York

***Developmental differences in children's use of visual and phonological representations in working memory***

### Abstract:

According to Baddeley & Hitch (1974) working memory consists of a set of limited capacity interacting subsystems and control processes for altering the flow of information and plays a central role in cognition. The original model specified two limited capacity temporary stores - a phonological loop and a visuo-spatial sketchpad specialised for storing verbal and visuo-spatial material respectively. A third component, a limited capacity central executive directs the way the stores are used. This model was offered as a broad, simplistic account of working memory in mature adults. Although it said nothing about developmental change, the model has nevertheless generated some interesting insights into developmental differences that constrain accounts of development. In turn, studies of working memory in children have generated theoretical implications for the adult model. These themes are illustrated by considering children's performance in standard short-term memory (STM) tasks and long-term learning that involve the storage of visual and verbal materials.

It has long been recognised that use of subvocal rehearsal in STM tasks is absent in early childhood. According to the Baddeley & Hitch (1974) model, rehearsal is a function of the phonological loop and access to the phonological loop is automatic for auditory-verbal stimuli but depends on active subvocalization for nameable visual stimuli. Consistent with this account, older (rehearsing) children show evidence of using the phonological loop in STM regardless of whether stimuli are spoken words or nameable pictures. In contrast, younger (non-rehearsing) children show evidence of using the phonological loop in STM for spoken words but use the visuo-spatial sketchpad for nameable pictures. Older children also show good transfer of long-term sequence learning when the stimuli are switched from spoken words to corresponding pictures or from pictures to words. In contrast, younger children show little or no such transfer. Taken together these observations are consistent with the multi-component model and have implications for the interface with long-term memory and for the detailed operation of the temporary stores. The results may also have broader practical implications for young children's ability to generalise learning in educational settings.