UNIVERSITÄT SALZBURG

Fachbereich Psychologie & Salzburger Gesellschaft für Psychologie
Kolloquiumsreihe

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The role of working memory in the development of mathematics

Dr. Evelyn Kroesbergen

Utrecht University

About five to ten percent of the children have serious difficulties in learning mathematics. One of the most important explanations may be found in the underlying cognitive factors such as working memory and executive functions. Recent findings indeed show that executive functions are important predictors for individual differences in the development of early mathematics. Within the concept of executive functions, a distinction can be made between inhibition, shifting, updating, and possibly even more different cognitive processes. The role of the different executive functions in the development of mathematics will be discussed and illustrated by empirical findings. These findings show that of all explaining factors, updating is the most important one. Since this factor seems to be closely related to the central executive component in Baddeley's multiple-component model of working memory, the role of executive functions in math development will also be discussed in terms of this working memory model. Although the model seems to provide a good framework for studying the development of mathematical cognition, it has also been criticized recently, mainly because of the growing complexity of the central executive component. The focus will be on the value of the model for the understanding of individual differences in mathematical development in general and of mathematical disabilities in specific. Implications for interventions will also be discussed.