

## CROSS-CULTURAL MEASUREMENT OF ACADEMIC SKILLS

S-1

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From a practitioner's perspective, measuring academic skills as diagnostics is very useful to structure and design instruction. From a researcher's perspective, measurement as investigation offers a great opportunity to observe and compare the development of academic skills particularly in different cultures.

Such cross-cultural research requires certain prerequisites which are focused on in this symposium. On the one hand, translating and adapting tests do not only compare learners' performances, but also validate theories on learning developments in different cultures. Examples for the successful transfer of theoretical frameworks are given in the first two talks. On the other hand, efficient measurement tools are needed to apply tests in different cultures reliably. The last two talks present an impressively diversely useable measurement tool and its application in different countries.

1) In the first talk, a developmental model of early arithmetic concepts is presented. The hierarchical structure of five conceptual levels was validated in Germany in a longitudinal study with N=26 children in pre-school and grade 1. The individual trajectories show that the model describes learners' individual conceptual development.

The model was translated and adapted in four South African languages (English, Afrikaans, SeSotho, isiZulu). In a study with N=602 South African first-graders, the level hierarchy as described in the model was validated in one-dimensional Rasch-analysis.

2) Based on the developmental model of arithmetic concepts, a study with German and Turkish speaking children was run. Arithmetic concepts of N=91 bilingual children in pre-school and first grade were assessed in both languages. In a Rasch-analysis, the model structure was underpinned in general. More interestingly, items in both languages did not differ in their difficulty, suggesting that bilingual learners can use arithmetic concepts in both languages.

3) The second part of the symposium starts with a description of an online assessment tool (eDia) that allows large-scale assessment of a huge variety of academic skills. Initially designed as a diagnostic device, the online platform offers interesting research opportunities. This talk describes the development and evolution of the assessment platform as well as successful applications in research projects in several countries on three continents. Particular focus is laid on how eDia increases the efficacy, reliability and validity of research as well as how certain measurements are made possible just by technology.

4) The last talk presents a successful application of eDia. In a cross-cultural study involving N=187 Chinese and N=835 Hungarian learners aged 12, performances and strategies in problem-solving tasks were investigated. The online platform allowed comparing the log-data of both groups, revealing better performances and more effective strategies in Chinese learners. A latent class analysis underpins these results.