Contribution ID: **184** Type: **Posterpräsentation**

Oscillatory Electroencephalographic Patterns of Arithmetic Problem Solving in Fourth Graders

Tuesday, 6 September 2022 13:00 (1 hour)

Oscillatory electroencephalographic (EEG) patterns associated with arithmetic solution strategies have been found in numerous studies with adults. Fact retrieval is associated with left-hemispheric theta ERS (event-related synchronization), whereas procedural strategies are accompanied by bilateral alpha ERD (event-related desynchronization). It is currently not clear if these findings generalize to children.

Our study assessed ERD/ERS correlates of 31 children in fourth grade during arithmetic problem solving. They solved multiplication and subtraction problems with either fact retrieval or a procedure.

We found similar strategy-related patterns to those reported in studies with adults. Retrieval problems elicited stronger left-hemispheric theta ERS and weaker alpha ERD as compared to procedural problems. Although there were no behavioral differences, we observed operation-specific neurophysiological patterns between multiplications and subtractions within retrieval problems. This finding could indicate that retrieval of multiplication and subtraction facts are distinct processes, and/or that multiplications are more frequently retrieved than subtractions in this age group.

Primary author: VOGEL, Stephan E. (Institut für Psychologie, Universität Graz)

Co-authors: BRUNNER, Clemens (University of Graz); KOREN, Nikolaus A. (University of Graz); SCHEUCHER, Judith (University of Graz); MOSBACHER, Jochen A. (University of Graz); DE SMEDT, Bert (KU Leuven); GRABNER, Roland (University of Graz, Institute of Psychology)

Presenters: VOGEL, Stephan E. (Institut für Psychologie, Universität Graz); BRUNNER, Clemens (University of Graz); KOREN, Nikolaus A. (University of Graz); SCHEUCHER, Judith (University of Graz); MOSBACHER, Jochen A. (University of Graz); DE SMEDT, Bert (KU Leuven); GRABNER, Roland (University of Graz, Institute of Psychology)

Session Classification: Postersession 2