FACTORS AFFECTING BILINGUAL PRIMARY SCHOOL CHILDREN’S PROBLEM SOLVING PROCESS IN MATHEMATICAL WORD PROBLEMS

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THEORETICAL BACKGROUND AND RESEARCH QUESTIONS

Word problems
- Important part in the primary school mathematics (Verschaffel, Corte & Lasure, 1994)
- Effective on pupils’ problem solving competence (Rasch, 2001) representations are important for the problem solving process in mathematics and an adequate representation promote to find the solution (Schnotz & Bannert, 2003)
- Research outcomes show conflicting views about the learning of mathematics in second language at all levels of education (Barwell, 2003).

Research Questions
1) Does the language make a difference for the solutions? (representations & answers)
2) Do gender, grade & skill level moderate these effects?

METHOD

Sample
- 5 primary schools in Landau & Mannheim
- 202 students from 2nd, 3rd and 4th grade
  107 German-Turkish bilinguals
  95 German monolinguals

Measures
- Quantitative: BVAT, ELFE, HRT, CPM, Attitude (TOMRA), Motivation
- SES (e.g. number of books at home)
- Qualitative: Interview, Video records
  (Rasch, 2001)

Dependent variable: word problems

Analysis
- Descriptive
- Rating scale for video (score 0-2)
- Multilevel Analysis of variance
- Multiple Regression Analyses

RESULTS

- Instruction language was performed better on word problems when presented in German than in Turkish
- Frequency of language use % 57 German for (DE- TR) bilinguals
- Number of books at home max 11-25 books ( % 39,2) for DE-TR bilingual students, more than 200 books (% 32.6 ) for German monolinguals
  - ELFE bilingual M= 43.9  SD=10,9 / monolingual M= 47,7 SD=11,9
  - HRT  bilingual M= 46  SD=10,2 / monolingual M=53   SD=41,1

DISCUSSION

- Are word problems too early for the Grade 2 bilingual students?
- Language switching (DE-TR / TR-DE ) is much more successful among the Grade 4 students
- Proficiency at least in one language is important for students’ understanding and success
- Importance of family literacy level in child language development and success at school
- Social, cultural and daily experience aspect in word problems & representation (e.g. Different symbol for division in TR and DE /How can I help the snail? / We are shopping for ice-cream only in a box not in a cornet)

REFERENCES