Abstract

This thesis focuses on to word problems and elementary school pupils. Research on mathematical word problems suggests that differences in success are not only due to different levels of pupils' cognitive abilities but that their motivation plays a role, too. Therefore, in this study, I focused on the context of word problem as a potential source of situational interest, which may affect the quality of pupils' cognitive function in the short term or permanently. I used my participation in a broader quantitatively oriented research on variables influencing the difficulty of word problems and using its methodology, I investigated the influence of different types of contexts on pupils' success in solving the problems. The examined aspect of context was attractiveness – the question was whether pupils would be more successful in solving word problems with elements of fairy tale, science fiction or humour than in similar problems with the same structure but with a neutral context. Pupils of the 3rd to 6th grades of primary school ($n = 2\,092$) were divided into two groups of a comparable ability and each was presented with one of the variants – attractive or neutral. To evaluate the results quantitatively, the Item Response Theory was used allowed us to determine the difficulty of the problem depending on the latent abilities of pupils and the problems discrimination. The data was processed also on qualitative level and complemented by interviews with pupils, which aimed to explore the origin of differences in the success rate of pupils and get insight into the mechanics of situational interest. I verified the attractiveness rate of word problem context via interviews and a questionnaire. The aggregated results of quantitative and qualitative parts of the study show that the context type influenced on solving process, although this influence is not statistically significant, and that under certain conditions, the context type can lead to a slight increase in pupil's success rate of older pupils (5th grade). The tendency of success rate was the opposite for younger pupils (3rd grade). This thesis brings numerous evidence of more or less known difficulties (mathematical and linguistical) which I noticed when evaluating pupils' solutions. The thesis also shows that when varying the context, it is difficult to keep the other parameters of the problem without changes, which might influence the complexity of the situational model, and points out inconsistencies in some previous research results.

Keywords

mathematical word problem; attractiveness of context; situational interest; performance; solving process; error; humour in maths; fairy tales in maths; sci-fi in maths