A re-analysis of TIMSS data using Statistical Implicative Analysis

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Abstract. An often noted difference between teachers' experience and empirical research concerns the dimensionality of mathematical proficiency. Several large scale studies (PISA, TIMMS) as well as smaller studies found that the one-dimensional Rasch model is appropriate to model students' performance. On the other hand, teachers' experience is that several mathematical sub-domains are only weakly coupled. The dimensionality of a construct may be assessed by various models. This paper concentrates on Statistical Implicative Analysis and finds a structure within mathematical proficiency that is largely compatible with an intuitive classification.