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Scientific Proficiency in the framework of Medical University Admission Tests

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Introduction

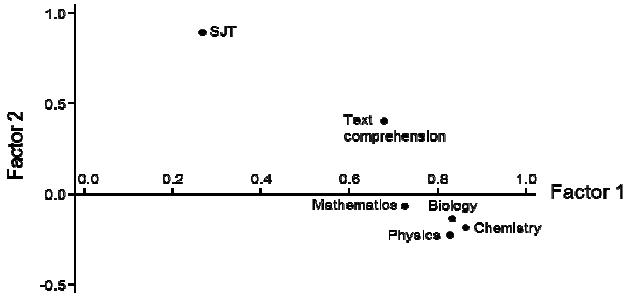
The *Graz Admission Test* was developed based on secondary school knowledge in natural science disciplines and has been applied since the academic year 2006/2007 at the Medical University of Graz, Austria (1). The validity of the *Graz Admission Test* was demonstrated by a significant improvement of study success and a significant reduction of dropout rate (2). The purpose of this study was a detailed analysis of the internal correlation structure of the various components of the *Graz Admission Test* over three academic years. In particular the question was investigated whether or not the various test parts constitute a suitable construct (a latent variable) which might be designated as "Scientific Proficiency".

Methods

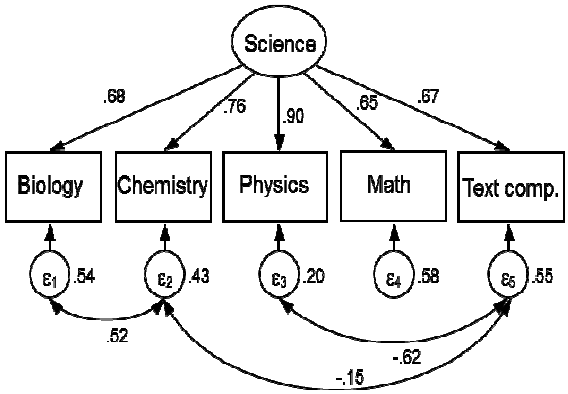
This study is an observational investigation, analyzing the results of the *Graz Admission Test* for the study of human medicine and dentistry, obtained in the academic years 2010/11, 2011/12 and 2012/13. 4741 applicants were included in the analysis. Principal component factor analysis (PCFA), specifically confirmatory factor analysis (CFA), as well as techniques from structural equation modeling (SEM) were employed to detect potential underlying latent variables governing the behavior of the measured variables (3).

Results

PCFA showed good clustering of the science test parts, including also text comprehension. A putative latent variable "Scientific Proficiency", investigated by CFA, was shown indeed to govern the response behavior of the applicants in biology, chemistry, physics, and mathematics as well as text comprehension.



The analysis of the correlation structure of the various test parts confirmed that the science test parts together with text comprehension constitute a satisfactory instrument for measuring a latent construct variable "Scientific Proficiency".



χ^2 (2) = 11.65
P = 0.0030
RSMEA = 0.032
CFI = 0.999
N = 4741

Discussion

The present results suggest the fundamental importance of basic science knowledge for results obtained in the framework of the admission process for medical universities.

References
1. Reibnegger G, Caluba HC, Ithaler D, Manhal S, Neges HM, Smolle J. Progress of medical students after open admission or admission based on knowledge tests. Medical Education. 2010;44(2):205-14.
2. Reibnegger G, Caluba HC, Ithaler D, Manhal S, Neges HM, Smolle J. Dropout rates in medical students at one school before and after the installation of admission tests in Austria. Academic Medicine. 2011;86(8):1040-8.
3. Acock Ac. Discovering Structural Equation Modeling Using Stata, Revised Edition. Texas: Stata Press; 2013