

Testing Measurement Invariance for a Second-Order Factor. A Cross-National Test of the Alienation Scale

Maksim Rudnev¹, Ekaterina Lytkina¹, Eldad Davidov², Peter Schmidt³ & Andreas Zick⁴

¹ *National Research University Higher School of Economics,*

² *University of Cologne and University of Zurich,*

³ *University of Giessen, ⁴ University of Bielefeld*

Abstract

Multiple group confirmatory factor analysis has become the most common technique for assessing measurement invariance. However, higher-order factor modeling is less frequently discussed in this context. In particular, the literature provides only very general guidelines for testing measurement invariance of second-order factor models, which is a prerequisite for conducting meaningful comparative research using higher-order factors. The current paper attempts to fill this gap. First, we explicate the constraints required for identification of the invariance levels in a multiple group second-order factor model. Second, in addition to the conventional interpretation of the results of this assessment, we suggest an alternative view on the invariance properties of a second-order factor as evidence of structural rather than measurement invariance. Third, we present an empirical application of the test which builds on Seeman's alienation scale and utilizes data from eight countries collected in 2008-2009. We found empirical support for metric invariance of both the first- and second-order factors, but no support for scalar invariance of the first- and second-order factors. However, we find pairs of countries where scalar invariance for both the first- and second-order factors is supported by the data. We finalize with a discussion of the results and their interpretation.

Keywords: higher-order factors, measurement invariance, multiple group confirmatory factor analysis, anomie, Seeman's alienation scale



