**InGRID Expert workshop: New skills new jobs: Tools for harmonising the**

**measurement of occupations’**

**Title: Assessment tools for transversal cognitive skills in individual occupational careers of the 21st century**

*Jakob Mainert*

**Handout**

The role of Complex Problem Solving (CPS) in lifelong learning at the workplace is the topic of my publication-based doctoral thesis. CPS is essential for lifelong learning (OECD, 2010). It is assessed in complex simulations (Funke, 2001) which allow for dynamic interactions between examinees and task situations (Raven, 2000). While the application of CPS in education is already established (Greiff & Fischer, 2013), we introduce CPS to the workplace. Thus, the overall goal is the translation of CPS into the fields of Industrial Organizational (I/O) Psychology. My doctoral project is embedded in the Large Scale Assessment (LSA) project LLLight´In´Europe (2010), which offers a continuously growing database. We have been conducting computer-based assessments, measuring CPS and socioeconomic backgrounds of approximately 4000 individuals in 60 European companies, which allow for analyses on the relations of CPS to income, lifelong learning behaviors and innovation.

Successfully understanding and predicting occupational histories of individuals is the major research goal of the empirical study at hand. Do transversal cognitive skills like CPS influence career developments beyond classical cognitive skills? Comprehensive research has shown that general intelligence is one of the best predictors of occupational success and occupational training and development (e.g. Schmidt & Hunter, 1998). However, recent empirical findings support the value of CPS beyond general intelligence in education (e.g., Greiff, Wüstenberg, & Funke, 2012). Certainly, learning and education continue over the entire lifespan. Thus, CPS plays a role in career developments, but research on this role for learning and education later in life is scarce (Greiff et al., 2013). Exceptions are Danner et al. (2011), who related a computer-based simulation of leading a fictional company over time (The Tailorshop, see e.g. Wittmann und Hattrup, 2004), requiring the active exploration and control of a complex dynamic systems, to real-life job performance ratings by supervisors. Performance in this simulation predicted supervisory ratings. Results on this scenario operationalizing CPS point toward the practical value of CPS measures for determining professional success (Danner et al., 2011).

The aim of this study is therefore to shed further light on the relation between lifelong education and cognitive skills in secondary and tertiary education with a focus on CPS. By means of an assessment with 245 employees at the Daimler AG, we examined the role of CPS and general intelligence as individual characteristics at specific transition points of individual educational paths: After finishing school, after obtaining a vocational training qualification or university degree, and when taking a particular job position. Based on our theoretical considerations and previous studies we expected positive correlations this selection career parameters, CPS and general intelligence.

We applied latent correlations, confirmatory factor analysis (CFA) and structural equation modeling (SEM). CPS and intelligence showed similarly substantial correlations (between .13 and .51, with p<.01) to career parameters. Our research models showed good fits and detected CPS to explain variance in two of three career parameters beyond intelligence (β=.15 and β=.38, with p<.01).We attempted to reveal the relevance of CPS for careers and give answers whether CPS is a precursor, result or aggregate indicator of lifelong learning.

**References**

Danner, D., Hagemann, D., Holt, D. V., Hager, M., Schankin, A., Wüstenberg, S., & Funke, J.

(2011). Measuring Performance in Dynamic Decision Making. *Journal of Individual Differences*, *32*(4), 225–233.

Funke, J. (2001). Dynamic systems as tools for analysing human judgement. Thinking and

Reasoning, 7, 69–89.

[Greiff, S, & Fischer, A. (2013). Der Nutzen einer Komplexen Problemlösekompetenz:](http://hdl.handle.net/10993/3169)

[Theoretische Überlegungen und empirische Befunde. Zeitschrift für Pädagogische Psychologie, 27, 1-13.](http://hdl.handle.net/10993/3169)

Greiff, S., Wüstenberg, S., Molnár, G., Fischer, A., Funke, J., & Csapó, B. (2013). Complex

Problem Solving in Educational Contexts—Something Beyond g: Concept, Assess- ment, Measurement Invariance, and Construct Validity. Journal of Educational Psy- chology, 105(2), 364–379.

Greiff, S., Wüstenberg, S., & Funke, J. (2012). Dynamic Problem Solving: A New Assessment

Perspective. Applied Psychological Measurement, 36, 189–213.

LLLight´in´Europe (2010). Concept and objectives, progress beyond state-of-the-art, S/T

methodology and work plan. Accessed at: <http://www.lllightineurope.com/home/>

Shane, S., & Venkataraman, S. (2000). The Promise of Enterpreneurship as a Field of Re-

search. The Academy of Management Review, 25(1), 217-226.

OECD. (2010). PISA 2012 Problem Solving Framework. Paris: OECD. Retrieved from

<http://www.oecd.org/dataoecd/8/42/46962005.pdf>.

Raven, J. (2000). Psychometrics, cognitive ability, and occupational per- formance. Review of

Psychology, 7, 51–74.

Schmidt, F. & Hunter, J. (1998). The validity and utility of selection methods in personnel psy-

chology: Practical and Theoretical Implications of 85 years of research findings.

Psychological Bulletin, 124(2), 262-274.