THE ROLE OF TIME ON TASK IN A TEST ON INDUCTIVE REASONING: A FOLLOW-UP FROM GRADE 1 TO GRADE 2

S-1

Kupiainen, Sirkku *, Hotulainen, Risto *, Pásztor Attila **
** University of Helsinki, Centre for Educational Assessment*
*** MTA-SZTE Research Group on the Development of Competencies*

Keywords: computer-based assessment; time-on-task; inductive reasoning

The roots for differences in student achievement at secondary school are mostly there already before children ever enter formal education (Grodsky, Huangfu, Miesner & Packard, 2017). The differences stem from students' home background, gender, early learning opportunities, and maybe temperament as well (Keltikangas-Järvinen, 2007). The current presentation is part of a wider project aiming at building a view of the development of students' inductive reasoning through 11 years of Finnish education. The study follows four separate cohorts of students: from grade 1 to grade 3, from grade 4 to grade 6, from grade 7 to grade 9 and from grade 10 to grade 11, within the space of three years. The test for the youngest cohort, the focus of this presentation, differs from the others due to implementation at grades 1 and 2 through headphones, and comprising only figurative tasks. The current study incorporates two strands of educational research and theory: inductive reasoning as a key factor for all learning at school and beyond (Tomic & Klauer, 2002), and Carroll's (1963) learning model regarding the role of time in students' learning but also in their engagement and attainment in various assessment tasks. The role of time on task, af-forded by CBA, has proven a valuable indicator for effort in addition to or instead of a questionnaire (Goldhammer et al., 2014; Wise & Kong, 2005). This is especially salient for young students whose ability of self-reflection is still developing (Demetriou & Kazi, 2006; Harter, 1999). The data comprises 240 students (51% boys) who took part in the assessment in grade 1 and in grade 2 (mean age 7.5/8.5). The measurements in the analysis cover inductive reasoning (IR) with two different tasks (Figure Series and Figure Analogies, α=.866–.893) and a test for visuo-spatial memory (VM). In addition, the modelling (SEM) incorporates the time the students spent on the two IR tasks (TOT). Students' achievement in the IR tasks increased significantly from grade 1 to grade 2 (50→73% and 50→75%, respectively) while variation between students decreased somewhat (30→27% and 28→23%). Despite the increase in achievement, the time students spent on the tasks decreased slightly (6.6→5.5 min and 4.7→4.4 min). The relation of students' performance in the two tasks stayed the same (r =.66 vs. r=.67) but the impact of VM increased from IR1 to IR2 (r=.27 vs. r=.39) as did that of TOT (r=.23 vs. r=.45). The built model showed adequate to good fit (TLI=.956, CFI=.979, RMSEA=.040, χ^2=35.219, p=.27). Only IR1 had a direct positive impact on IR2, while the impact of TOT2 was negative (β=-.34). However, the addition of TOT1 and TOT2 in the model increased its explanative power from 50 to 64%. The results confirm the understanding of the role of time on task on students' performance but also show that the mere time spent on task is not adequate with achievement based strongly on students' earlier skills or reasoning power (see Demetriou & Spanoudis, 2017).

Attila Pásztor was supported by a „For the Young Talents of the Nation" scholarship (NTP-NFTÖ-17-B-0586).