THE ROLE OF TIME-ON-TASK IN EXPLAINING STUDENTS' PERFORMANCE IN INDUCTIVE REASONING: FOLLOW-UP FROM GRADE 7 TO GRADE 9

T-11

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The present study is part of a wider project aiming at building a view of the development of students' inductive reasoning through 11 years of Finnish education through a multi-cohort follow-up. The study followed 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 focus of this presentation is the two middle cohorts with three measurement points in three years.

The 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 learning, but also in students' engagement and attainment in various assessment tasks. The role of time on task (TOT), afforded by computer-based assessment, has proven a valuable indicator for effort in addition to, or instead of, a questionnaire (Goldhammer et al., 2014; Kupiainen et al., 2014; Wise & Kong, 2005). The present study continues the earlier two time-point study on the role of time on task on students' test performance with the addition of the third time point (Kupiainen & Hotulainen, 2018a).

The data comprises two cohorts of approximately 230 students through three measurement points (grades 4→6 and grades 7→9, mean age 10.5/12.5 and 13.5/15.5). The measurements in the analysis cover Inductive reasoning (IR) with four different tasks and a test for Visuo-Spatial Memory (VM). In the final model (SEM), IR at Time 3 is predicted on IR, VM and TOT (added stepwise to the model in this order) at Times 1 and 2.

In the preliminary analysis for grades 7→9, the models suffer from poor fit at all stages (IR; IR+VM; IR+VM+TOT) except for RMSEA (<.056–.44). Yet, TOT increased the final model's explanative power from 50 to 78 percent. TOT also proved to be almost as strong a predictor for students' performance in the IR test at Time 3 as their performance in the same test a year earlier (Time 2) and VM at Time 3 together (β=.60 vs. β=.32 and β=.33). The correlation between TOT and task performance was strongest in the most difficult Number Series task and increased during the three time points from r=.433 to r=.592 while the mean performance stayed the same at 47 percentage and TOT decreased from 5.72 to 3.63 minutes.

In the presentation, we will compare the results of the older and younger students, and explore possible explanations (e.g., for the stagnant mean performance) and possible methodological solutions to the above reported poor fit of the models.

Despite the statistical shortcomings, the results seem to confirm the critical role of TOT on students' test performance even if their achievement also rested strongly on their earlier reasoning skills and working memory (c.f., Demetriou & Spanoudis, 2017). The results also shed light on the key role students' attitudes have on tests performance through time spent on a task.