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The Mechanisms of Peer-Effects in Education: A Frame-Factor Analysis of Instruction

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Abstract : In the educational literature on peer effects, attention has been brought to the fact that the mechanisms creating peer effects are still to a large extent hidden in obscurity. The hypothesis in this study is that the Frame Factor Theory can be used to explain these mechanisms. At heart of the theory is the concept of “time needed” for students to learn a certain curricula unit. The relations between class-aggregated time needed and the actual time available, steers and hinders the actions possible for the teacher. Further, the theory predicts that the timing and pacing of the teachers’ instruction is governed by a “criterion steering group” (CSG), namely the pupils in the 10th-25th percentile of the aptitude distribution in class. The class composition hereby set the possibilities and limitations for instruction, creating peer effects on individual outcomes. To test if the theory can be applied to the issue of peer effects, the study employs multilevel structural equation modelling (M-SEM) on Swedish TIMSS 2015-data (Trends in International Mathematics and Science Study; students N=4090, teachers N=200). Using confirmatory factor analysis (CFA) in the SEM-framework in MPLUS, latent variables are specified according to the theory, such as “limitations of instruction” from TIMSS survey items. The results indicate a good model fit to data of the measurement model. Research is still in progress, but preliminary results from initial M-SEM-models verify a strong relation between the mean level of the CSG and the latent variable of limitations on instruction, a variable which in turn have a great impact on individual students’ test results. Further analysis is required, but so far the analysis indicates a confirmation of the predictions derived from the frame factor theory and reveals that one of the important mechanisms creating peer effects in student outcomes is the effect the class composition has upon the teachers’ instruction in class.

Keywords : compositional effects, frame factor theory, peer effects, structural equation modelling
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