

Workshop on Education

Tue Oct 27, 2020
100 pm until 220 pm

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Longitudinally Adaptive Assessment and Instruction Increase Numerical Skills of Preschool Children

ABSTRACT Social inequality in mathematical skill is apparent at kindergarten entry and persists during elementary school. To level the playing field, we trained teachers to assess children's numerical and spatial skills every 10 weeks. Each assessment provided teachers with information about a child's growth trajectory on each skill, information designed to help them evaluate their students' progress, reflect on past instruction, and strategize for the next phase of instruction. A key constraint is that teachers have limited time to assess individual students. To maximize the information provided by an assessment, we adapted the difficulty of each assessment based on each child's age and accumulated evidence about the child's skills. Children in classrooms of 24 trained teachers scored 0.29 SD higher on numerical skills at posttest than children in 25 randomly assigned control classrooms ($p=.005$). We observed no effect on spatial skills. The intervention also positively influenced children's verbal comprehension skills (0.28 SD higher at posttest, $p<.001$), but did not affect their print-literacy skills. We consider the potential contribution of this approach, in combination with similar regimes of assessment and instruction in elementary schools, to the reduction of social inequality in numerical skill, and discuss possible explanations for the absence of an effect on spatial skills.

BIO: Stephen W. Raudenbush is the Lewis-Sebring Distinguished Service Professor in the Department of Sociology, the College and the Harris School of Public Policy and Chair of the Committee on Education at the University of Chicago. He is interested in statistical models for child and youth development within social settings such as classrooms, schools, and neighborhoods. He is best known for his work developing hierarchical linear models, with broad applications in the design and analysis of longitudinal and multilevel research. He is currently studying the development of literacy and math skills in early childhood with implications for instruction; methods for assessing school and classroom quality; and methods for heterogeneous effects of interventions. Stephen Raudenbush is a member of the National Academy of Sciences, the American Academy of Arts and Sciences, the National Academy of Education, and a recipient of the American Educational Research Association award for Distinguished Contributions to Educational Research.

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