Why Do Children Have Difficulty Learning Fractions?: Findings From a Three-Year Longitudinal Study

Although the importance of fraction knowledge for understanding of most aspects of mathematics is clear, little is known about why some children master fractions quickly but others struggle even as adults. In this presentation, key findings from the IES funded Center for Improving Learning of Fractions will be presented. To date, approximately 400 children were followed longitudinally from third through fifth grades. The goal was to pinpoint predictors of potential learning problems early so that students’ difficulties with fractions can be addressed before they become entrenched. The results showed that although there was considerable shared variance among predictors, both general cognitive and number-related competencies were uniquely important for explaining why some children struggle with fractions. Early understanding of numerical magnitudes, as indicated by accuracy of number line estimations, was an especially strong early predictor of fraction concepts and procedures at the end of fifth grade. Other unique predictors included attention, proportional reasoning, and whole number fluency. Implications for intervention will be discussed.