ABSTRACT
In a study of mathematics achievement growth of 92,045 students with and without disabilities over Grades 3-7, we examined growth for students with disabilities (SWDs) in seven exceptionality categories. Students in all subgroups showed significant growth that decelerated over grades. Race/ethnicity, gender, parental education, free lunch status, and language proficiency were also significant predictors of achievement. We also examined effect size (ES) estimates as a means for interpretation of growth. Students showed substantial year-to-year growth ES that decreased over grades. In comparison to students without disabilities (SWoDs), students in specific exceptionality categories showed sizeable achievement gaps that did not vary appreciably over grades. We advocate for greater attention to the growth of exceptional children as well as the study of growth for students in specific exceptionality categories.

Using multilevel, longitudinal models, we examined the mathematics achievement growth of the statewide sample of 92,045 students taking the North Carolina achievement test in Grades 3-7 in the years 2001-2005. Foundational skills in mathematics are considered to be essential for the development of proficiencies that lead to later achievement and success in school and career and are central to the examination of proficiency under the No Child Left Behind Act. Despite an emphasis in NCLB on the performance of disaggregated student subgroups, we know little about the mathematics growth of SWDs and even less about the growth of students in specific exceptionality categories.

Few studies have examined achievement growth for SWDs and most commonly these studies have used a dichotomous categorization of SWDs vs. SWoDs. A number of other investigators have examined one or two specific exceptionalities–most commonly speech-language impairment and/or specific learning disabilities. The rare examinations of achievement growth in multiple disability categories have observed considerable heterogeneity in intercept and/or slope of growth trajectories for student subgroups. Wei, Lenz, & Blackorby (2013) found that, in comparison to a national norming sample, students in 11 disability categories had lower math achievement levels and showed slower mathematics achievement growth during elementary school.

In studying the North Carolina cohort, we found that students in all subgroups showed significant growth that decelerated over grades as well as significant variability in achievement by student subgroup both at the initial assessment in Grade 3 and in rates of growth over time. Figure 1 shows student growth trajectories by student subgroup. Note that while there are some notable differences in rate of growth by group, the largest differences in trajectory are in the initial level of performance in Grade 3. We also found that race/ethnicity, gender, parental education, free lunch status, and language proficiency were significant predictors of student achievement growth. In order to provide additional context for the interpretation of growth we computed year-to-year growth effect sizes and effect sizes for the achievement gap between students without disabilities (SWoDs) and students in specific exceptionality categories. As can be seen in Figure 2, year-to-year growth ES was substantial in early grades but decreased over time. Figure 3
system (Grade 3) must attain greater rates of growth to meet expectations for proficiency and close the achievement gap. However, there is little evidence that exceptional children are closing achievement gaps or learning at more rapid rates than their general education peers. Thus commonly expressed expectations for student achievement and “growth targets” that result in universal proficiency or complete reduction of achievement gaps may not be realistic.

Our findings extend a very small literature that examines achievement growth for multiple student exceptionality groups. We believe it is important that additional research is conducted that examines mathematics growth for specific exceptionality groups based on state assessment data used for NCLB accountability reporting. This research is important as a basis for educational program planning, decision-making, and policy development.

A feature of federal policy is that student subgroups that perform significantly lower in achievement on entrance into the accountability system (Grade 3) must attain greater rates of growth to meet expectations for proficiency and close the achievement gap. However, there is little evidence that exceptional children are closing achievement gaps or learning at more rapid rates than their general education peers. Thus commonly expressed expectations for student achievement and “growth targets” that result in universal proficiency or complete reduction of achievement gaps may not be realistic.

Figure 1. Mean mathematics achievement by grade and exceptionality category.

Figure 2. Mathematics achievement growth effect size at each grade transition by exceptionality category.
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References


Figure 3. Achievement gap effect sizes between all non-SWD students and each exceptionality group by grade.