A Meta-Analysis of Regression Discontinuity Studies Examining the Effects of Placement into Postsecondary Developmental Education

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Background and Intervention
Broadly speaking, the term “developmental education” connotes a set of policies and practices designed for students who are underprepared to do college level work in a given area. The goal of this experience is to give students the knowledge, skills, and habits that will help them be successful in the college level version of the course. The growing use of developmental education reflects an increasingly normative transition from high school to college, which while predicated on completion of secondary schooling does not necessarily imply adequate preparation for what is deemed “post-secondary” work.

Almost two in five beginning college students are placed in developmental education. And, there are high personal and societal costs to developmental education. As a result the effectiveness of developmental education has become an important public policy question that has spurred both research and reform efforts. Most simple comparisons of students assigned to developmental education relative to those not assigned suggest that assignment to developmental education is associated with several negative outcomes, not least of which is a much lower likelihood of postsecondary attainment (i.e., graduation or certification).

Some of the observed differences in outcomes between students placed into developmental education in at least one subject and students not placed into developmental education are real in the sense that they reflect different levels of academic opportunities, preparation, and motivation. However, the raw statistics do little to untangle the causal effects of being placed into developmental education. There are two aspects to this problem. One is the distinction between enrollment and assignment (some students assigned to developmental education never take a developmental education course). The second part of the problem is untangling the causal relationships. To test the effect of assignment to developmental education, researchers could identify a group of students for whom an institution’s policy suggests developmental education is needed, and randomly recommend students for placement into either the developmental course or into the college level course in the subject in which remediation is needed. While there are a very small number of RCTs that investigate the effects of placement into developmental education, much more common are non-randomized experiments that adopt a similar approach of conditioning, in one way or another, on success in the developmental course. Given the scarcity of randomized trials in this area, it seems likely that institutions are reluctant to randomly assign students to developmental education or not. But because students are typically assigned to developmental education on the basis of a test score, regression discontinuity is a viable option for studying the effects of assignment to developmental education.
Methods
To investigate the effects of placement into developmental education, we report on one of the first meta-analyses of regression discontinuity designs, and also provide the first discussion about the conditions under which it makes sense to carry out such a synthesis. We implemented a robust search for studies using RD to investigate the effects of placement into developmental education. We ran electronic database searches (e.g., PsycInfo and ERIC), searched the websites of relevant governmental, non-profit, and research agencies that might fund or conduct these studies, and hand searched select journals. Studies were coded by two investigators working independently, and discrepancies were resolved through discussion.

Many studies provided several estimates based on the same set of students on the same outcome. To increase comparability of the effect sizes across studies, when we had a choice we selected the model with (a) the largest number of control variables, (b) the narrowest bandwidth around the estimate, and also selected (c) results that were as close to three years from the time of assignment as possible (except for attainment, for which we selected the longest follow up point). We used traditional inverse variance weighting meta-analysis to analyze the data, employing both fixed and random effects models (though we place interpretative priority on the random effects estimates).

Results
The literature search uncovered 11 reports, with 21 independent samples, that met our inclusion criteria. Results suggest that placement into developmental education is associated with effects that are negative, statistically significant, and substantively large for three outcomes: (a) the probability of passing the college level course in which remediation was needed, (b) college credits earned, and (c) attainment. Relative to their peers who are also on the margins of college readiness but who were placed into college level courses, students placed into developmental education earned fewer college credits after about 3 years (our estimates ranged from about 2 to 3 credit hours, depending on model specification), were about 8 percentage points less likely to eventually pass the college level course in which remediation was needed, and were about 1.5 percentage points less likely to earn a certificate or degree. Several sensitivity analyses suggest these results are not a function of particular stylized studies, or the choices made in assembling the meta-analytic database. Two exploratory moderator analyses suggest that the negative effects of placement into developmental education are stronger for university students than for community college students, and worse for students placed in reading or writing than in math.

Conclusions
If the causal inferences are correct and our effect sizes are reasonably accurately estimated, the meta-analyses of studies using regression discontinuity to investigate the effects of placement into developmental education suggest that placement into developmental education results in statistically significant and substantively sizable negative impacts. Further, even if our logic about the suitability of these data for meta-analysis is unpersuasive, it is hard to use these studies to argue that placement into developmental helps students, as over 75% of the estimates in our meta-analytic database are negative. Our hope is that this work will inform
debate and research on postsecondary policies and on alternative mechanisms for ensuring that college students have the skills needed to meet their goals.