



September 28, 2015

CREDO Response to Maul Rejoinder

Days of Learning

In his critique of CREDO's reports, Dr. Maul states his concern that the conversion of effect sizes to "days of learning" is too simplistic to provide useful information. We disagree with that assessment. While this transformation is still young and will benefit from further refinement, even in its current form it provides a useful analogy to help lay readers attach meaning to effect sizes. We do agree that the relationship between effect sizes and "days of learning" is likely not linear at the extremes. As such, we are currently evaluating findings on the most recent set of NAEP data as well as reviewing other work on translating education intervention effect sizes to a more understandable metric. We plan to continue refining our translation of effect sizes to "days of learning" in future reports.

Triviality of Effect Sizes

In his recent rejoinder to CREDO's response, Dr. Maul's says, "My biggest concern with the CREDO studies is that reported effect sizes are so small in magnitude that they may be regarded as trivial." Now that Dr. Maul has provided an explanation for his argument, we would like to address it properly.

The argument as presented in the rejoinder is that the effect size for charter attendance explains only .0008 (.08%) of the total variance of growth within the data set. Likewise by Dr. Maul's comparison to the entire variance, being a student in poverty accounts for only .0018 (.18%) of the total variance and being a Black student only accounts for .0072 (.72%) of the total variance. Yet we as a society acknowledge that being in poverty or being a minority student comes with challenges which have huge impacts on the academic outcomes of a child. If the comparison of interest in CREDO's studies was in fact comparing the charter effect to the entirety of variation in academic growth, then Dr. Maul's critique would be correct.

So how do we explain these seemingly small numbers for characteristics our society believes to be key drivers of educational outcomes? The explanation lies in making the correct comparison. The comparison of interest is not how much of the total variation of the model is explained as suggested by Dr. Maul. Rather, the correct comparison is how the effect of attending a charter school relates to the typical student's average one-year growth. Based on



NAEP data, the average one-year growth was estimated by Hanushek, Peterson, and Woessmann (2012) as 0.25 standard deviations per year.

In CREDO's Urban Study, the typical student in poverty has math growth of -0.10 sd. As explained above, -0.10 sd equates to 72 fewer days of learning per year than the non-poverty student using our translation from sd to "days of learning". This means on average the typical student in poverty experiences 40 percent less growth than the average non-poverty, white, TPS student. It is correct to say that a 0.055 sd charter effect size in math is not large enough to fully offset the -0.10 sd poverty effect size in math. But the charter effect is enough to make a considerable dent in the difference. When put in this context CREDO's finding of 0.055 sd for attending a charter school would be equal to a student regaining 22 percent of a year's growth. That is not a trivial amount.

Hanushek, E.A, Peterson, P.E., and Woessmann, L. (2012) Is the US Catching Up? International and State Trends in Student Achievement. *Education Next*, Vol. 12, No. 4. Fall 2012. Retrieved 10 July, 2015 from: <http://educationnext.org/is-the-us-catching-up/>