

The Impact of the Montessori Program on Achievement and College Readiness

EXECUTIVE SUMMARY

Prince George's County School District (PGCPS) opened three Montessori programs in 1986 and in 2002, which established two dedicated Montessori sites at John Hanson Montessori and Robert Goddard Montessori. Having been an established program for quite some time now, PGCPS decision-makers are interested in the impact of attending a Montessori school. The district established a third Montessori school; however, the current study will focus on these two schools. Placement in a Montessori program is through a lottery process and students can only be placed in a Montessori school starting at 3 or 4 years old. The current study will focus on the impact of attending a Montessori school at Grade 3, Grade 5, Grade 8, and Grade 11. While examining the effect of Montessori education while students are enrolled in the program is important because it provides a better understanding on the added value of a child attending Montessori versus attending another type of school; examining the long-term effect of Montessori in Grade 11 will provide insight on whether the impact of Montessori sustains throughout high school.

The following research questions guided this study: 1) Do third, fifth, and eighth grade students who are enrolled in Montessori have better English Language Arts (ELA), math, and science scores compared to similar students with other schooling experiences?; 2) Are eleventh graders who completed Montessori education more likely to be ready for college and career than eleventh graders of the same high school who attended non-Montessori schools?; 2a) After accounting for academic achievement in elementary and middle grades, are eleventh graders who completed Montessori education more likely to be ready for college and career than eleventh graders of the same high school who attended non-Montessori schools?

To address the research questions, we used SY15-SY16 enrollment data to create the analytical samples and Montessori lottery participation data across several years, starting in SY05, as a proxy for parental motivation. The outcomes of interest for this study were ELA and math proficiency in Grades 3, 5, 8 and 11; whether a student takes advanced math in Grade 8; science proficiency in Grades 5 and 8; and whether a student is considered college ready in ELA and math in Grade 11. PARCC ELA and math data, MSA science data, and Maryland State's College and Career Readiness (CCR) report data were used for the outcomes. The samples were restricted to students who attended the same elementary schools (i.e. K-5 and K-3 for the Grade 3 analysis) and had available achievement data for the respective analysis. Each Montessori student in the sample was then matched with a demographically identical student. To estimate the impacts of Montessori experience on PARCC proficiency rate for each grade, we used the Average Treatment Effect on the Treated (ATET) model.

The Impact of Montessori Education in Elementary and Middle School

The findings from the Grade 3, Grade 5, and Grade 8 treatment effect analysis show a consistent pattern of impact of Montessori enrollment across grade levels in ELA, mathematics, and science. The results demonstrate that the size of the impact progressively increased as students moved through elementary and middle school. In ELA, impact estimates range from 15 percent in Grade 3 to about 24 percent in Grade 8. In mathematics, Montessori students outperform their peers by eight percent to 30 percent, depending on grade level, and in science, they outperform by 14 percent to 27 percent. Thus, the impact of Montessori generally increases by grade level. This is consistent with previous findings that found the achievement advantage for Montessori students increases with the number of years in Montessori education and concluded that the effect of Montessori education is cumulative, which is realized with sustained time in a Montessori classroom (Mallet and Schroeder, 2015). The study also explored the role of parental motivation in moderating the impact of Montessori. After controlling for parental motivation, findings further suggest that there were positive and statistically significant impacts in ELA, mathematics, and science at each observed grade level, but in mathematics for Grade 3.

Long-term Effect of Montessori Education in Grade 11

The findings from the treatment effect for Grade 11 analysis show that high school students who had attended Montessori program demonstrated higher rates of readiness for college and career in reading and they were as prepared as their peers for college and career in mathematics. That is, despite a very different educational experience through the 8th grade, Montessori students performed as well as their matched high school peers on PARCC ELA, Algebra II and CCR Math, and they were better prepared for college than their matched peers in CCR ELA. Moreover, the overall higher performance of students who attended Montessori schools on the 11th grade reading outcome is due primarily to the higher academic performance in reading they achieved during the elementary and middle grades. However, we cannot confidently say that there was a significant long-term effect of Montessori enrollment on achievement in math. Thus, the study confirmed that the impact of Montessori in reading sustained long after the students graduated from the program, but there is no evidence to suggest that was the case for mathematics. Nevertheless, Montessori educated students were as prepared in mathematics as their peers, and this is a sign that they adjusted very well to high school mathematics instruction in spite of the different instructional method in mathematics that they received until the 8th grade.