

MindPrint Research Brief

Early results on the efficacy of the BOOST Yourself course on student academic growth

By Dr. Gregory King & Susan Beshel



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Overview

Preliminary results of MindPrint Learning's National Science Foundation sponsored research (NSF-213397) found that sixth grade students who actively participated in MindPrint's Assessment and BOOST Yourself Course showed improvement in both math and reading scores on nationally normed achievement tests. The BOOST Yourself course is designed to improve student study skills, self-awareness and self-efficacy. Active participation in the course led to an increase in the percent of students meeting or exceeding growth goals on the NWEA MAP Growth assessment during the Fall '22 - Winter '23 term. The percent of students meeting or exceeding their growth goals maintained through the next term (Winter '23 - Spring' 23). While these results are preliminary, they are promising given the small sample size. What is even more positive is the nature of the intervention given its relatively low touch and potential to improve academic outcomes for students across a broad academic performance range. These promising results of the study, alongside the research design, meet tier three of the Evidence for ESSA requirements. More rigorous research is expected in Phase IIB NSF-funded research grant to fully understand the impact MindPrint's assessment and BOOST Yourself course may have on student growth and achievement across a broader sample size and age range.

Methodology

Students in the adjusted treatment¹ group participated in 11, 30 minute lessons delivered during students' scheduled Extended Academics (a homeroom/study skills class) during the regular school day from Fall-to-Winter 2022-2023. During the BOOST Course students learned about brain neuroplasticity and received a personalized profile highlighting their cognitive strengths and needs based on their performance on the MindPrint Cognitive Assessment. Each lesson taught students to use personalized strategies based on their cognitive strengths to build learner efficacy in a different context (e.g. how to memorize, homework efficiency, test-taking, etc.). Students in the comparison group also took the MindPrint Cognitive Assessment and participated in an Extended Academics class. All students took NWEA MAP Growth Assessments in September 2022, February 2023 and May

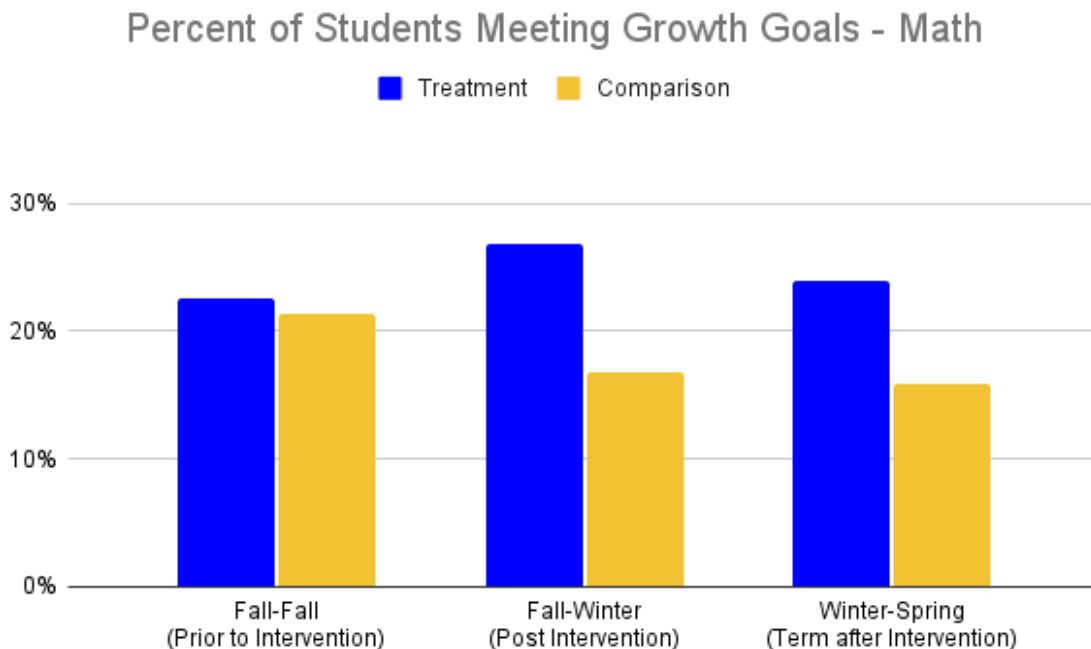
¹ This study employs a Treatment-on-Treated (TOT) or a descriptive approach to the Effect of Treatment on Treated (ETT) methodology (Geneletti & Dawid, 2009). TOT is intended to show the impact of an intervention under ideal conditions. Treatment and comparison groups were adjusted due to implementation issues. The original design had four classes broken evenly into treatment and comparison groups. However, the lack of implementation fidelity in one portion of a two-portion treatment group has the potential to mask any results from the treatment group, especially when one group received the treatment with full fidelity. For the purposes of this preliminary research this is treated as a non-randomized study and includes only the group provided with treatment at an acceptable level of fidelity, all other groups are treated as comparison groups having not received the treatment with purpose. As such this is a descriptive study, results should be taken with caution.

2023. Student performance relative to normed growth goals were used to account for variations in students' starting NWEA MAP scores (e.g. students starting in the 90th percentile wouldn't expect to grow the same number of absolute growth percentile points as students in the 50th percentile).

Study Results

As shown in Figure 1, prior to the study, 23% of students in the treatment group (n=71) and 21% of students in the comparison group (n=198) were meeting normed math growth goals established by NWEA MAP. After the intervention period, the treatment group increased to 27% of students meeting growth targets while the comparison group declined to 17%. Most of the growth, and the differential between groups, was sustained into the next term.

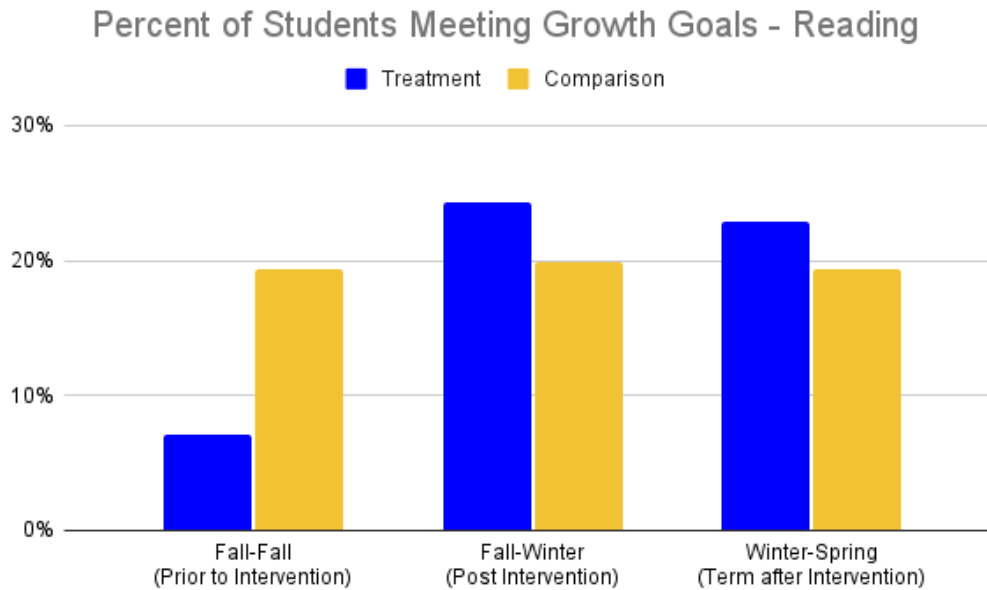
Figure 1:



As shown in Figure 2, beginning reading growth scores in the comparison group (n=201) were consistent with math at 19% of students meeting targets and remained at the same level throughout the year. In contrast, students in the treatment group (n=71) started at a much lower 7% meeting growth targets. Unlike the comparison group, the treatment group more than tripled performance and 24% of students met

MAP Growth targets in Winter 2023. The percent of students meeting growth sustained into Spring 2023. The large differential in starting reading growth scores, unlike math, was unexpected and consideration should be taken in future studies to normalize these groups.

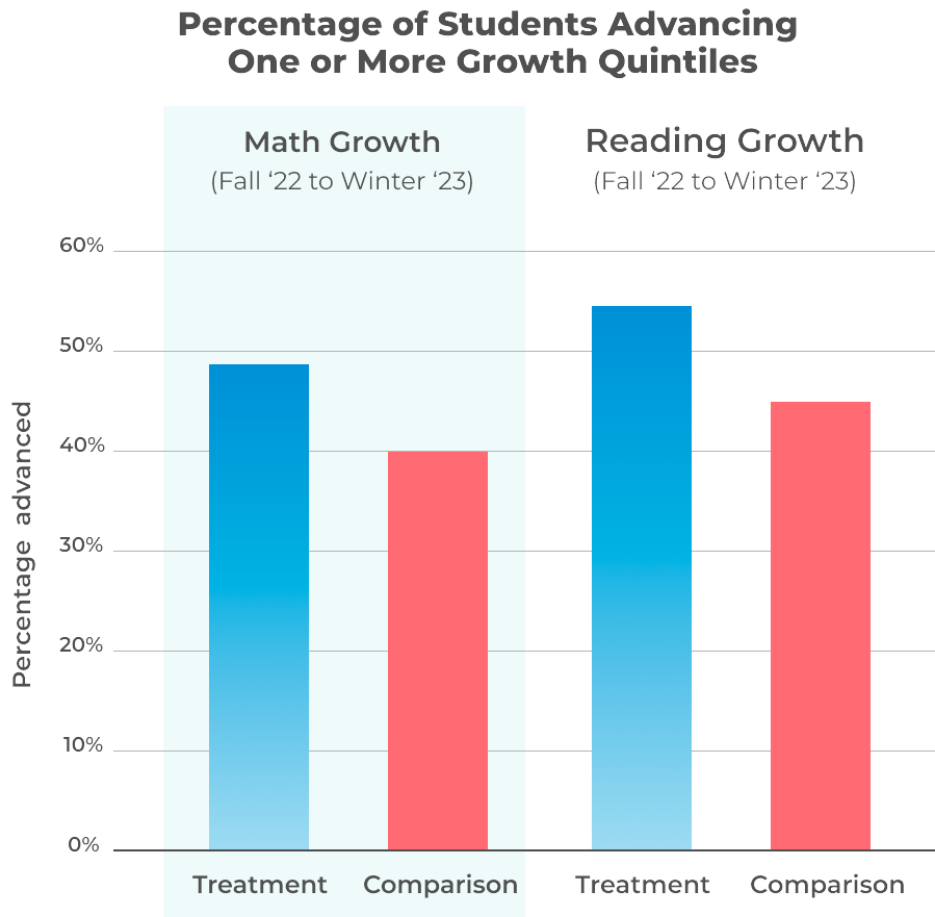
Figure 2:



Further analysis showed that not only were a greater percentage of students showing growth in the treatment group but that students were growing by an overall larger amount.

Figure 3 shows that in math nearly 50% of students in the treatment group grew one or more quintiles compared to only 40% in the comparison group. In reading, 54% of students grew one or more quintiles compared to only 45% in the comparison group.

Figure 3.



Students in the BOOST Yourself course (treatment group) versus Comparison Group

A third analysis, shown in Figures 4 through 7, focused on a longitudinal cohort model. In this model growth is measured using NWEA MAP Growth’s Conditional Growth Index (CGI), a measure that represents the standard deviation units of expected growth compared to actual growth. In CGI terms, a 0.00 would mean the student achieved expected, or average, growth, while a negative number (e.g. -0.2) would indicate the student experienced two-tenths of a standard deviation below expected growth. A student with positive growth of (0.2) would indicate two-tenths of a standard deviation unit above expected growth.

In math, students in the treated group saw above expected CGI during the Winter-to-Spring 2023 term relative to the comparison group (0.16 CGI for treated group, -0.08 CGI for the comparison group). While students in the treated group saw higher than expected growth, the results were not significantly different from the comparison group which saw slightly below-expected growth. Figure 4 highlights the Mathematics trends of each class in the study, showing that students experienced a decline in math growth in the Fall-to-Winter 2022-2023 term upon entering 6th grade. The class receiving the BOOST Yourself course and one of the comparison classes experienced growth rebounds beyond students in other classes in the Winter-to-Spring 2023 term.

Figure 5 demonstrates the longitudinal trends between the treatment and comparison groups only. Both treatment and comparison groups increased growth during the Winter-to-Spring 2023 term. The treatment group had slightly higher, albeit non-significant change in growth compared to everyone in the comparison group. These results are encouraging but require further validation.

Figure 4

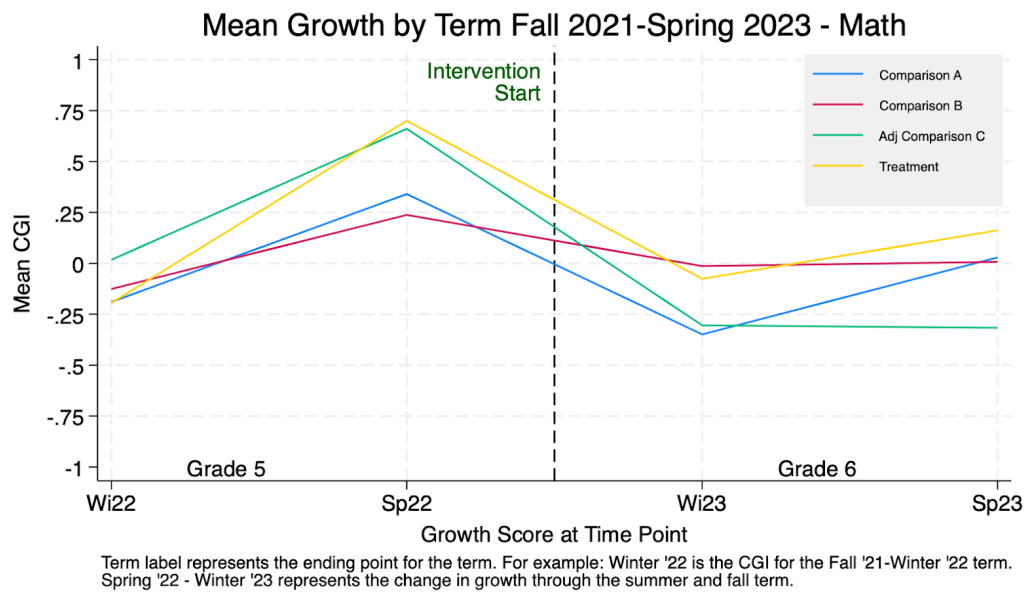
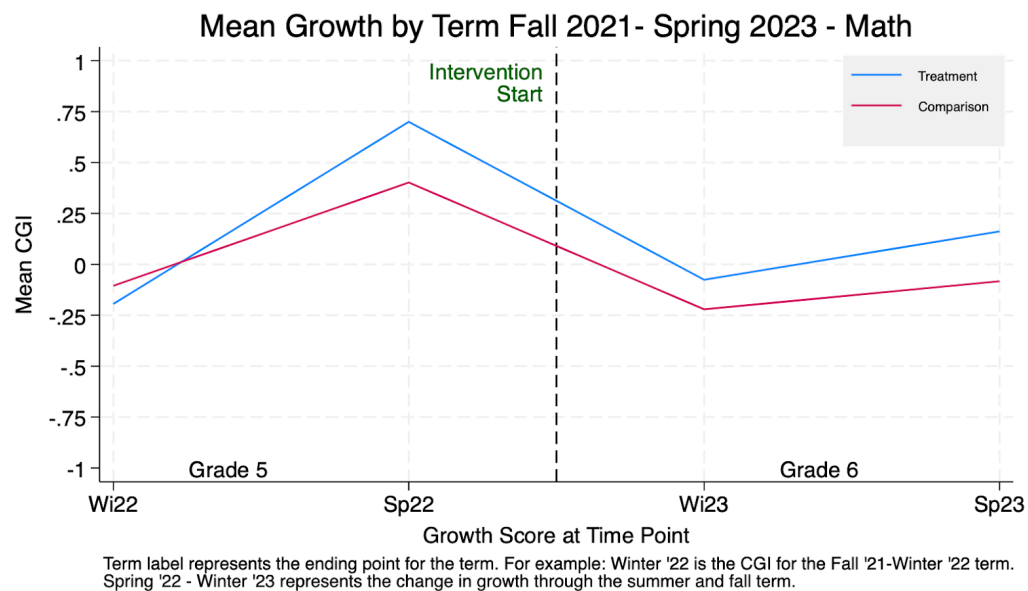
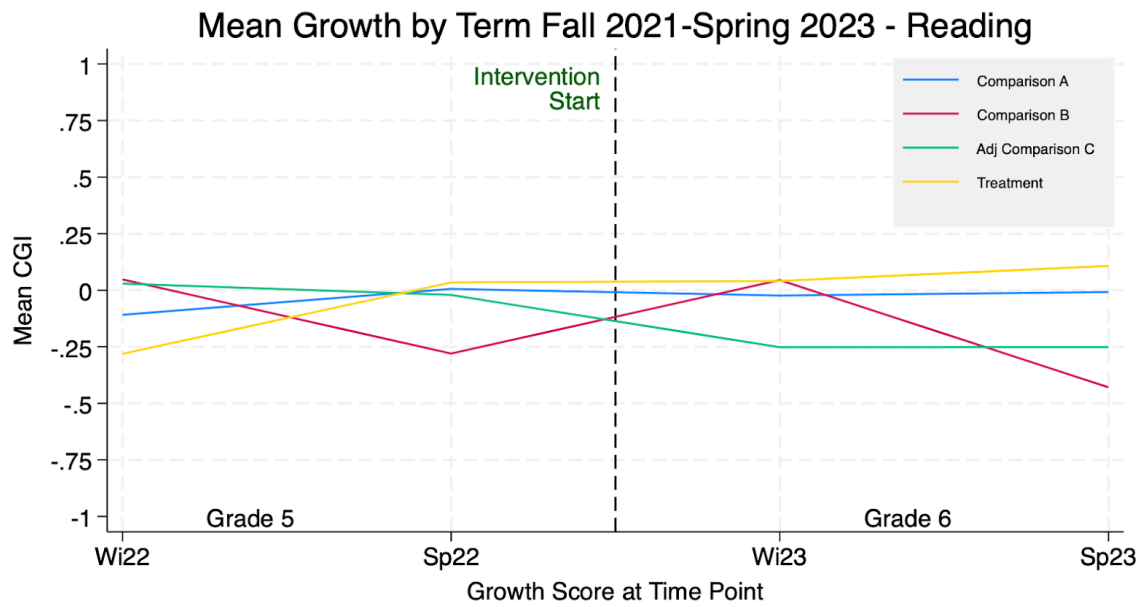


Figure 5



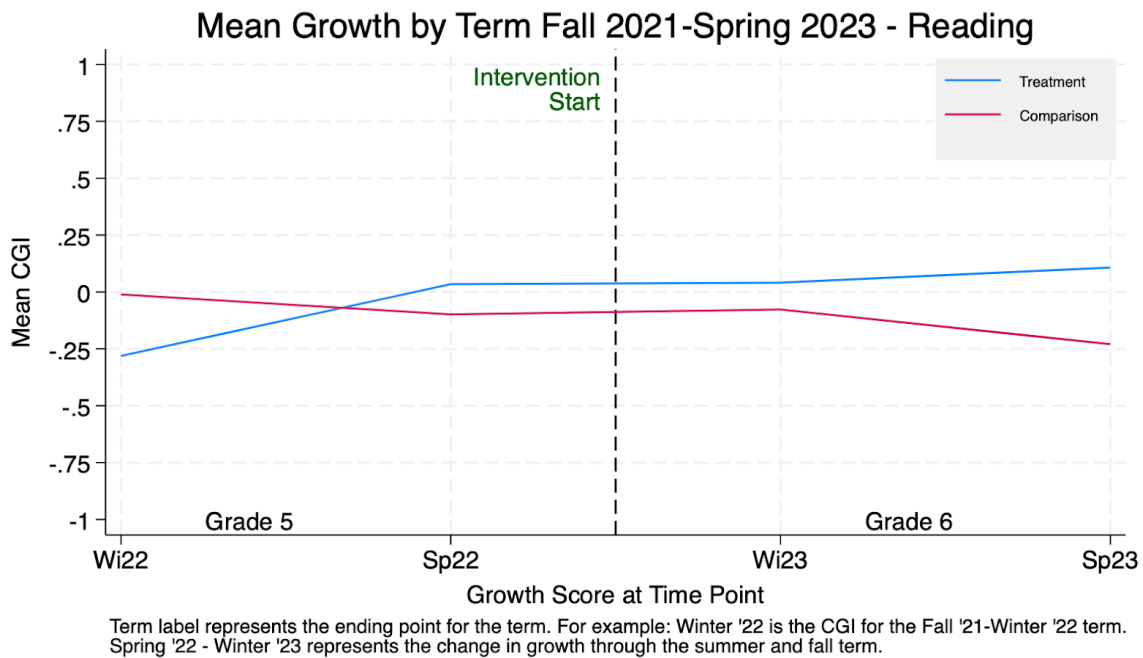
The impact of the BOOST course was significant and more pronounced in NWEA's MAP Growth Reading/ELA assessment. Figures 6 and 7 highlight the trends for students in the treatment and comparison groups. Students in the treatment group experienced a statistically significant increase in the amount of growth, as measured by NWEA's CGI, during the Winter-to-Spring 2023 terms (0.1). Students in the comparison group experienced a decline in Winter-to-Spring 2023 CGI by a fifth of a standard deviation (-0.2), effectively losing academic ground. This is a positive and robust change for the treated group. This result is especially important considering that prior studies have found that higher reading achievement is associated with increased math achievement (Grimm, 2008; Larwin, 2010).

Figure 6



Term label represents the ending point for the term. For example: Winter '22 is the CGI for the Fall '21-Winter '22 term. Spring '22 - Winter '23 represents the change in growth through the summer and fall term.

Figure 7



While more research is needed and planned for in the coming months, initial descriptive results are positive showing a change in growth trajectories for students who received the BOOST Yourself course with fidelity. The impact of the BOOST Course could be seen in student math and reading academic growth measures in the intervention term and maintained through the term after the intervention. Importantly, the group of students who received the treatment is the only group to see positive growth in both Math and ELA subjects. The BOOST Yourself Course being subject agnostic provides further evidence of the value in providing learner centered, strength-based strategies that can help address learner variability.

Summary

The 11 week intervention of the MindPrint Assessment and BOOST Course showed immediate and sustained improvement in Math and Reading scores relative to a comparison group. Because of the small size of the sample and lack of fidelity of implementation in one group to the treatment, results were analyzed in three different ways to ensure the results were not overstated. Using three different methodologies, students in the treatment group showed meaningful gains in both math and reading scores, gains that were sustained a full trimester after treatment was completed.

References

Geneletti, S., & Dawid, A. P. (2011). *Defining and identifying the effect of treatment on the treated* (pp. 728-49). na.

Grimm, K.J. (2008) Longitudinal Associations Between Reading and Mathematics Achievement, *Developmental Neuropsychology*, 33:3, 410-426, DOI: [10.1080/87565640801982486](https://doi.org/10.1080/87565640801982486)

Larwin, K. H. (2010). Reading is Fundamental in Predicting Math Achievement in 10th Graders?. *International Electronic Journal of Mathematics Education*, 5(3), 131-145.

About the Authors



Susan Beshel is a 20 year math educator, data and curriculum specialist dedicated to creating classroom environments that encourage all students to see themselves as mathematicians and capable learners. She began her career as a teacher, math coach and data specialist in an award winning NYC public school. She later spent 7 years as the math and curriculum specialist at an independent school in NJ before joining MindPrint Learning 3 years ago. At MindPrint she helps school leaders understand and use their students' cognitive data to improve student outcomes. She has a Master's in Teaching and is pursuing her Educational Doctorate in Curriculum and Instruction.



Dr. Gregory King has spent over 15 years working as a practitioner, educator, and researcher working to bridge the gap between K-12, higher education, and workforce development. He began his career teaching life skills courses while working with at-risk students, before shifting his focus to developing the policies and practices that would increase opportunities for the students he served. This journey led him to work for nationally recognized organizations focusing on research that impacts policies and improves teaching and learning. Dr. King is dedicated to empowering educators and students in strength-based ways through the use of connected and coherent information. Greg has a Master's in education and a Doctorate in Educational Research and Policy Analysis.