

Study of Training in Multi-Tiered Systems of Support for Behavior: Impacts on Elementary School Students' Outcomes

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Study of Training in Multi-Tiered Systems of Support for Behavior: Impacts on Elementary School Students' Outcomes

July 2022

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Students' early problem behaviors in school can be disruptive and even hinder their learning and long-term success. To prevent and address these problem behaviors, schools across the country report adopting *multi-tiered systems of support for behavior* (MTSS-B). The MTSS-B approach seeks to change the school learning environment by consistently teaching and reinforcing good behavior for all students, and then identifying and providing supplemental support to students who need it. Given the reported widespread use of MTSS-B but limited evidence of effective programs, this study evaluated a promising, intensive program of MTSS-B training and technical assistance. About 90 elementary schools in six states were randomly assigned either to participate in the program or to continue with their usual strategies for supporting student behavior. Comparing student and teacher experiences in the two sets of schools measures the effectiveness of the program.

Key Findings

- ***The program was no better than schools' usual strategies at improving overall student behavior or achievement, though it did have positive effects on teachers' classroom management, classroom functioning, and some aspects of school climate.*** These intermediate effects may result from the greater use of MTSS-B practices in participating versus non-participating schools, even though principals and MTSS-B team leaders in participating schools indicated that there were challenges with some aspects of implementation.
- ***For the 15 percent of students initially identified as struggling the most with behavior, the program had positive effects on disruptive behavior and reading achievement while the program lasted.*** But the effect on reading achievement was not sustained in the year afterward.

Research highlights the negative consequences of students' problematic behaviors in school. On average, students with behavioral challenges have lower levels of academic achievement.¹ Those with persistent behavioral challenges are nearly 20 percent less likely to complete high school and are more likely to be arrested.² The disruptive behaviors of a few students can also compromise the learning environment and have long-term negative effects on their peers.³

For at least a decade, the U.S. Department of Education and many states have encouraged schools to provide supports for students that proactively address problematic behavior and promote a positive school climate. These efforts to use multi-tiered systems of support for behavior (MTSS-B) have been expected to benefit all students by improving their classroom experience through classroom practice and school-wide supports (Tier I) and additional supports (Tier II) for struggling students who need more help.⁴ MTSS-B may be particularly helpful for students with disabilities, to the extent that it reduces the use of special education services for those who do not need it and results in more informed, earlier identification for services for those who do. Perhaps as a result, by 2018 more than 25,000 schools reported adopting some kind of MTSS-B approach.⁵

Even with this attention, teachers generally express concerns about student behavior and a desire for more training and support to prevent and address student behavior challenges in the classroom.⁶ Yet, there is little information educators can draw on about which strategies work and for whom; only a few MTSS-B programs have been rigorously evaluated, and none on a national scale.⁷

Given the widespread use of—but limited evidence about—particular approaches, this study examines the effectiveness of a promising MTSS-B training and technical assistance program building on those that have been shown to be effective in smaller-scale studies.⁸ A panel of experts selected the Center for Social Behavior Support (CSBS) to deliver the program based on prior evidence of the effectiveness of the organization’s approach to MTSS-B and the quality of its proposed intervention and training plan, corporate and staff capabilities, and management plan.⁹ CSBS and the study team helped districts and schools get ready to implement the program and then over two years CSBS provided technical assistance and more than 60 hours of training for each district coach and school behavior team, as described in Exhibit 1.

Exhibit 1. Training and Technical Assistance Program

- **Readiness guidance (before each program year):** Advise districts in identifying behavior coaches and schools in selecting a behavior team, and installing and learning a data system.
- **In-person training (before each program year):** Teach school teams and coaches the core practices of the approach and help them to develop school-specific implementation plans that include teaching and supporting all school staff in using the practices.
- **Virtual training (throughout Program Year 1):** Teach school team leaders and coaches the program’s core classroom management practices and how to train and support all classroom teachers in their use.
- **Virtual and in-person technical assistance (throughout Program Years 1 and 2):** Provide support to coaches and school teams on how to monitor and enhance implementation progress. Troubleshoot with individual schools as needed.
- **Resources:** District-based behavior coaches to support each school one day per week; student behavior and progress monitoring data system.

Based on this training and technical assistance, each school’s team and coach trained and supported all school staff in carrying out school-wide behavior support practices for all students in the first and second program years (Tier I) and supplemental support for students needing additional assistance in the second program year (Tier II).¹⁰ Tier I included teaching and reinforcing behavior expectations, addressing infractions consistently, and applying classroom management strategies. Tier II included a supplemental support intervention that involved reteaching expectations each morning, giving increased feedback throughout the day, and rewarding or reteaching expectations at the day’s end. See Appendix A for a more detailed description of the MTSS-B program and how it was expected to lead to strong implementation of Tiers I and II as well as the logic of how the program is intended to work.

The program is primarily intended to improve staff practices and school climate to help prevent and address students’ disruptive behavior and ultimately improve academic achievement. The study was designed to assess whether that happened when the program was introduced in a large set of elementary schools. The study examined student achievement both during the program and after the training and technical assistance ended, to see if the expected effects on behavior, practices, and climate also led to improved learning that persisted. Exhibit 2 provides an overview of the study design, with more detail in Appendix B.

Exhibit 2. Study Design

Who was in the study?

- The study included 89 elementary schools that were not already systematically using MTSS-B practices (see Appendix B for more detail on eligibility criteria).¹¹ The schools came from nine school districts in six states.
- Compared with elementary schools nationally, the study schools were more likely to be large and located in urban areas. They also served significantly higher proportions of students from families with low incomes, Hispanic students, and students with limited English proficiency (see Appendix Exhibit B.2).

How was the study conducted?

- Within each district, study schools were randomly assigned either to participate in the MTSS-B training and technical assistance program (hereafter referred to as “participating” schools) or not to participate and follow their usual strategy for improving student behavior (hereafter referred to as “non-participating” schools).¹² Because the two groups had similar characteristics when they were randomly assigned (see Appendix Exhibit B.3), any later differences in outcome levels are reliable measures of the program’s effects. All differences cited in the text as resulting from the program are statistically significant, indicating they are unlikely to be due to chance variation.
- Primary Impact Analysis: The study compared the following primary outcomes for all students between participating and non-participating schools: (1) student disruptive behavior and achievement levels after one and two years of program participation, and (2) student academic achievement levels the year after the study’s training and technical assistance ended.¹³ The study also compared these outcomes between participating and non-participating schools for a subgroup of students identified at the outset of the first program year to be those who struggled the most with disruptive behavior.¹⁴ Defining this subgroup as the 15 percent of students with the highest levels of disruptive behavior at the start of the program is consistent with prior evidence about the proportion of students expected to need supplemental supports.¹⁵ To ensure an appropriate comparison group of students struggling the most with disruptive behavior, the subgroup was defined at the onset of the program and was not redefined at the start of year 2, when supplemental supports were added.
- Exploratory Impact Analysis: To see if the strategy improved other behavioral outcomes, the study explored the program’s effect on pro-social behavior, attention to schoolwork, dysregulation, and internalizing behavior for all students and the subgroup of students defined above. To inform whether the program worked similarly or not for specific types of students, the study examined the impacts on student behavior by student gender, grade span, individualized education program status, and English language learner status. It also examined impacts on measures of classroom experiences and school climate.

(continued)

Exhibit 2 (continued)

Which data were used and what was measured?

- Student behavior: Teachers' ratings of individual students' behaviors were collected at the beginning of the first year of the program and at the end of each of the two program years in Grades 1 through 5.^{16,17}
- Student achievement: State assessment test scores in math and reading were collected for students in Grades 3 through 5 for the two years of the program and the year afterward. Because the study's districts were in states that use different tests, the scores were transformed so they could be combined and used in the analysis (see Appendix B for details).
- School climate: Surveys of teachers and other staff members were conducted at the end of the second year of the program.¹⁸
- Classroom experiences: Classroom observations were conducted in Grades 1 through 5 at the end of the second year of the program.¹⁹
- School behavior policies and practices: Schools were observed; school team leaders, principals, and other school staff members were interviewed; and school behavior policy documents were reviewed during each of the two program years and the year afterward.²⁰
- Implementation of the training and technical assistance program: All training was observed, attendance and other program data were collected, and staff members were interviewed about their experiences during the two years of the program.²¹

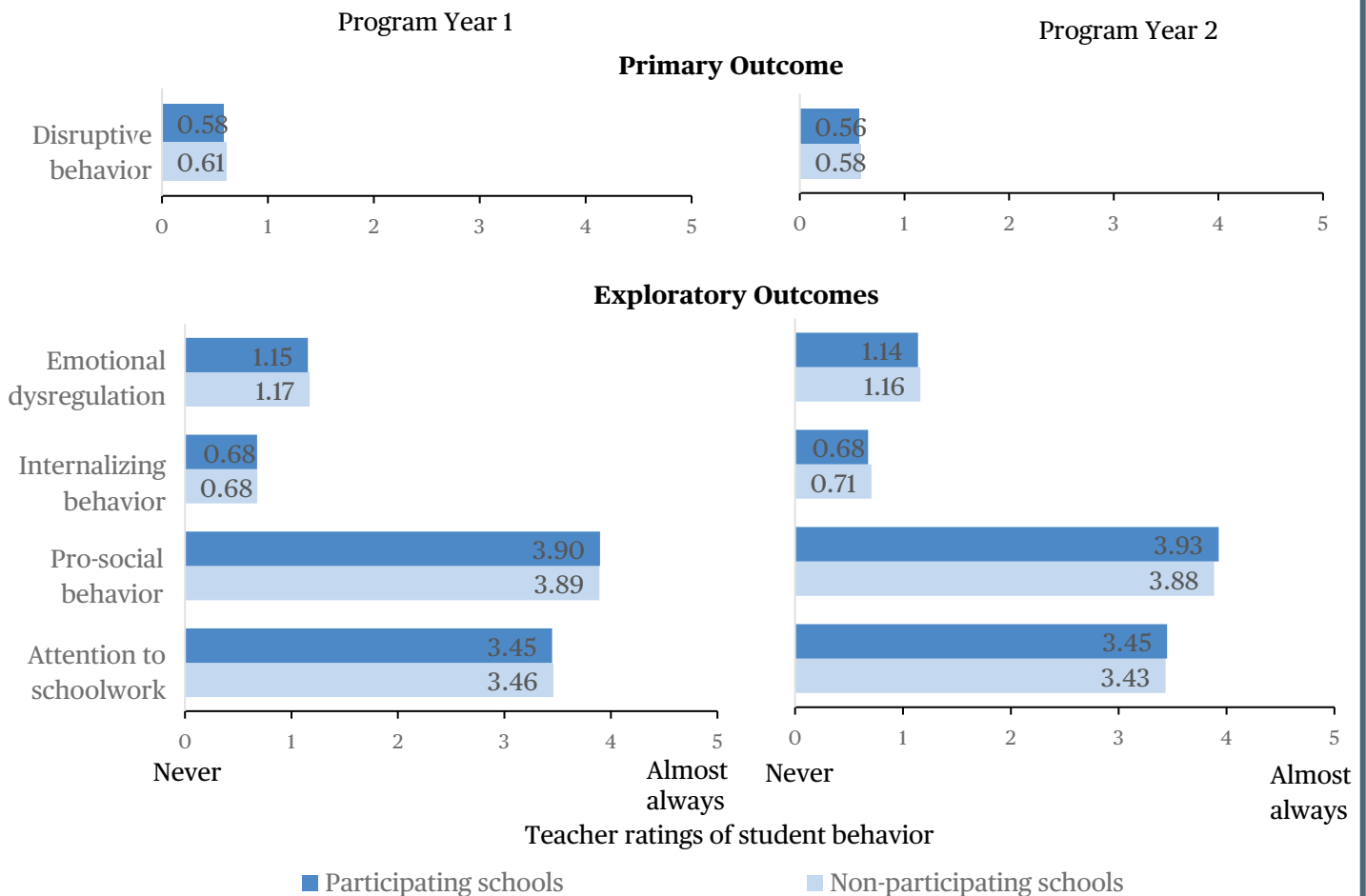
THE PROGRAM WAS NO BETTER THAN SCHOOLS' USUAL STRATEGY FOR STUDENTS OVERALL

The MTSS-B program encourages school-wide consistency in behavioral expectations for students in the classroom and throughout the school day. These expectations are primarily conveyed by having teachers both instruct students in how to behave appropriately and having all school staff consistently recognize appropriate behavior in simple ways (Tier I in the MTSS-B approach). For example, when a child remains quiet while others are talking, the teacher may positively acknowledge the specific behavioral expectation that the child is meeting by giving a “thumbs up” and saying something like, “That’s great that you waited your turn to speak!” Or teachers can give on-the-spot reminders that a particular behavior is expected. For example, before speaking a teacher could remind the class, “While I’m speaking, everyone should listen quietly.” The program also helps teachers establish systems to positively reinforce students for desired behavior in tangible ways that have meaning to them, for example by awarding points that can be exchanged for more recess time or time for independent reading. Additionally, the program supports teachers in the use of classroom management practices designed to maximize time focused on learning. For example, teachers are trained in how to develop and teach efficient routines and procedures in the classroom to help students move quickly through transition periods. Finally, the program includes training on supplemental supports (Tier II), described later, in the second program year for students still struggling with problematic behavior. Together, these program components are

intended to improve how students conduct themselves, reduce classroom disruptions, and increase learning (see Appendix A for more details on the version of MTSS-B fielded in this study).

- The program had no effect on the disruptive behavior of students overall, or on any other student behaviors.** At the end of two program years, students' disruptive behavior (for example, being aggressive) was similar in schools participating in the program and those that were not, as shown in Exhibit 3. Consistent with this lack of improvement in disruptive behavior, the program also did not improve other aspects of student behavior that the study explored, including pro-social behavior (for example, displaying positive behavior with peers), attention to schoolwork, emotional dysregulation (for example, becoming easily upset), and internalizing behavior (for example, acting withdrawn and sad).²² All aspects of student behavior were measured by teachers' ratings on a commonly used 0- to 5-point scale, with higher values reflecting more frequent displays of the behavior. Importantly, despite participating schools' interest in implementing

Exhibit 3. Impacts of the MTSS-B Program on Student Behavior



SOURCE: Teacher ratings of student behavior.

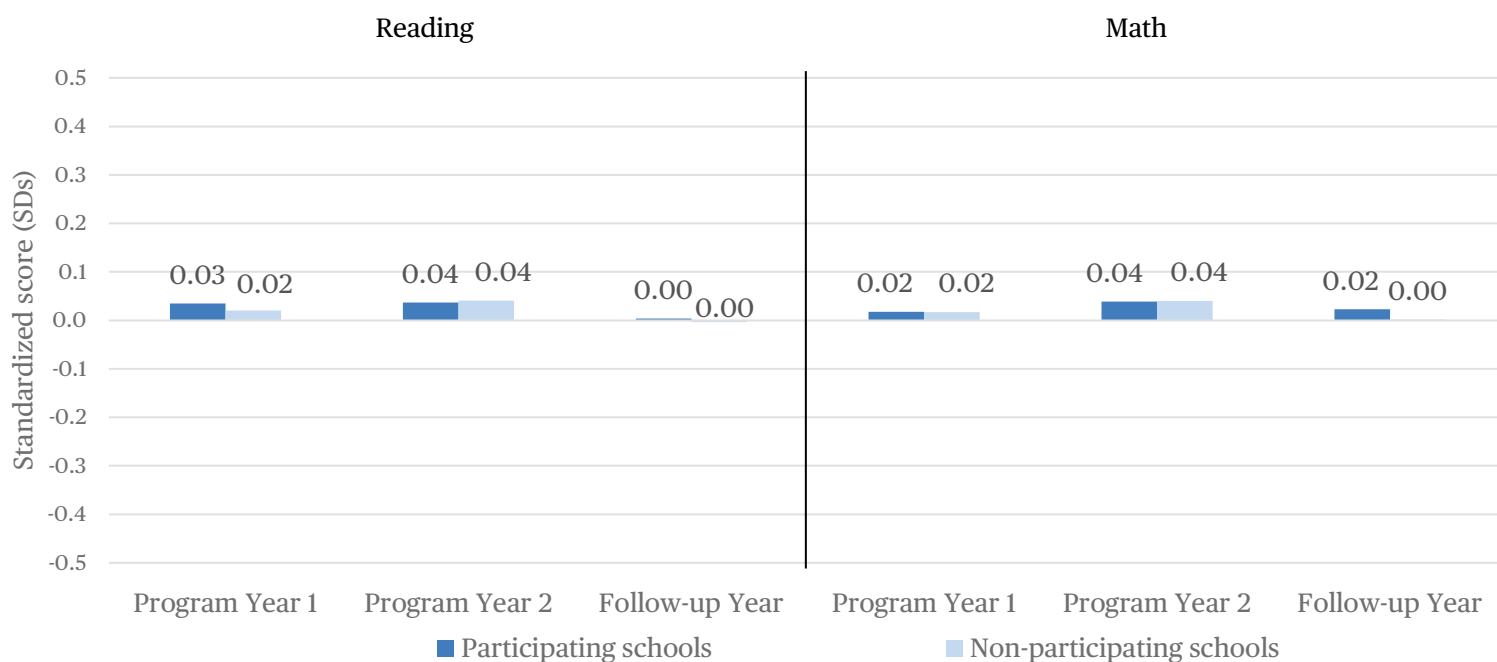
NOTES: Sample size = 89 schools. It includes 25,391 Grade 1-5 students in Program Year 1 and 24,842 Grade 1-5 students in Program Year 2.

None of the differences between participating schools and non-participating schools is statistically significant at the 0.05 level.

the program to reduce problematic student behaviors, schools had low levels of these behaviors at the start of the first study year; this may limit room for the program to improve student behaviors (see Appendix Exhibits B.13a and B.14a).²³

- The program also did not improve overall student achievement.** There were no differences in average reading or math achievement state test scores between the two groups of schools in either program year or in the third (“follow up”) year after the program support ended (see Exhibit 4).²⁴ While the program was not explicitly directed at increasing academic achievement, it was hypothesized to have that effect through improvements in student behavior or classroom or school environment. Because the program did not result in improved behavior in either program year for students overall, it is perhaps not surprising that there were no effects on achievement. The relationship between achievement and the other factors that could have influenced learning, classroom functioning, and school environment, are explored later.

Exhibit 4. Impacts of the MTSS-B Program on Reading and Math Achievement



SOURCE: Standardized state test scores for Program Year 1, Program Year 2, and the Follow-up Year were collected from district records data.

NOTES: Sample included 89 schools in the two program years and 80 schools in the follow-up year. It included 24,381 Grade 3-5 students in the first program year, 23,616 Grade 3-5 students in the second program year, and 22,186 Grade 3-5 students in the follow-up year.

The standardized score value represents how many standard deviations (SDs) the raw score is from the mean of non-participating schools. For example, a positive standardized score with a value of 1 indicates the raw score is one standard deviation above the mean. Section III in Appendix B provides detailed explanations on how the mean outcome levels for the participating and non-participating schools were constructed.

None of the differences between participating schools and non-participating schools is statistically significant at the 0.05 level.

BUT THE PROGRAM DID HAVE BOTH BEHAVIORAL AND ACADEMIC BENEFITS FOR STUDENTS INITIALLY IDENTIFIED AS STRUGGLING WITH BEHAVIOR

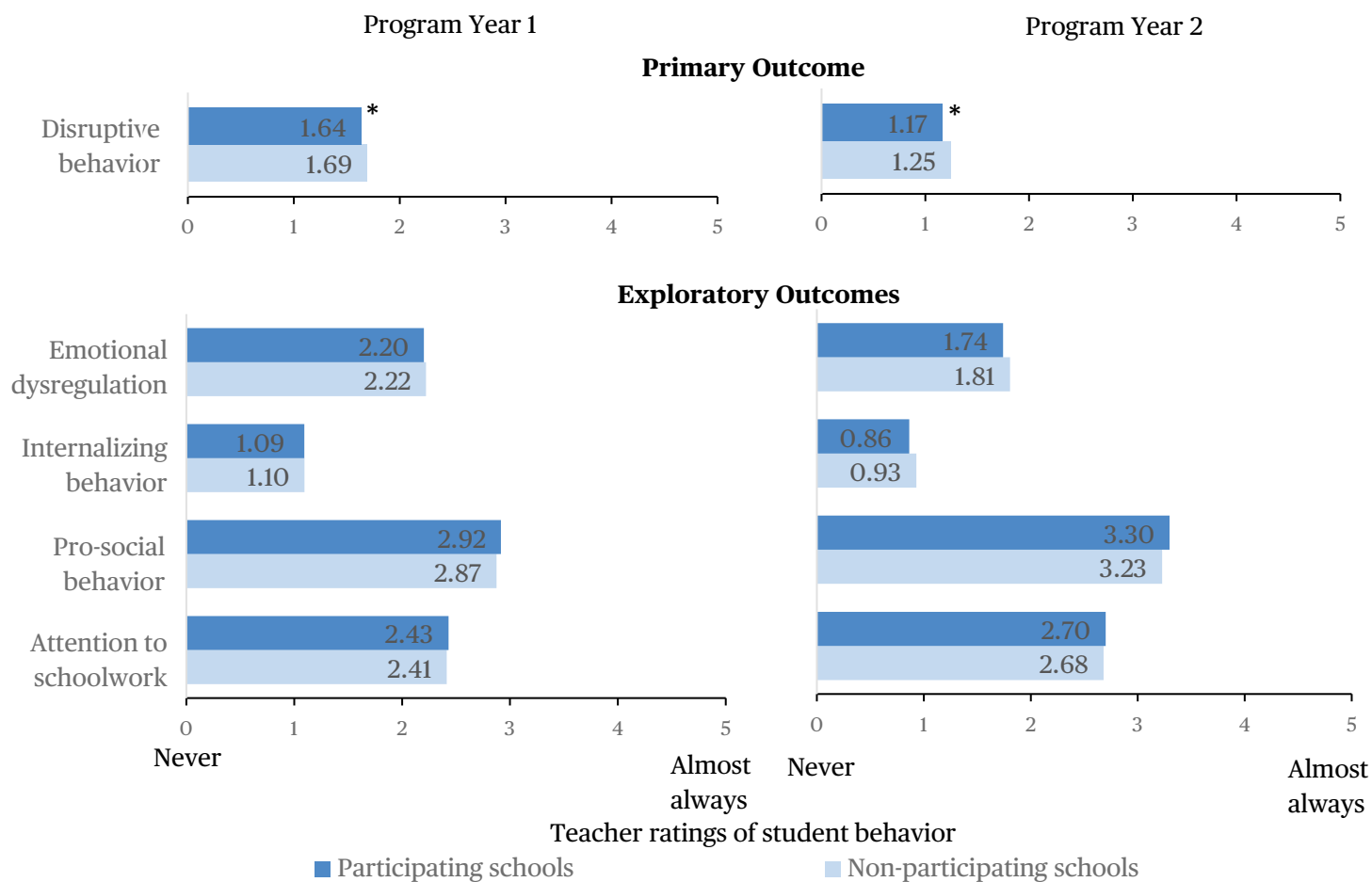
The MTSS-B school-wide practices could be especially important for students already exhibiting disruptive behavior.²⁵ These students may have greater challenges understanding behavior expectations and meeting them, resulting in negative interactions with their teacher. As a result, this study also explored the impact of the program on students who were identified as struggling with behavior at its outset.

Within an MTSS-B model, it is expected that some students will need more support for behavior than is provided in the school-wide program (Tier I). To address this need, the program included procedures to identify and refer those students who were struggling in year 2 for additional support. School staff were trained in a Tier II strategy called Check In Check Out (CICO) for implementation in the program's second year along with the school-wide practices that were already in place (see Appendix A for more detail on CICO).²⁶ Schools chose a CICO facilitator who was expected to meet individually with referred students at the start of the school day to set daily behavioral goals ("check in"). Throughout the day, teachers and other school staff were expected to provide individualized feedback on whether the student attained those goals. At the end of the day, the student again was expected to meet with the facilitator, for acknowledgement of the student's good behavior or to offer reteaching as needed ("check out"). This additional teaching in behavior expectations, positive reinforcement, and corrective responses was expected to improve the behaviors of students receiving supplemental supports, which could increase their opportunities for learning.

- ***The program had positive effects on initially struggling students' disruptive behavior.*** At the end of the first program year, when only the school-wide Tier I MTSS-B practices were under way, these students in participating schools showed less disruptive behavior (1.64) than their counterparts in non-participating schools (1.69; see Exhibit 5).^{27,28} The finding of less-disruptive behavior among this group of students represents a reduction of approximately one-third in the rate of increase in disruptive behavior that schools typically experience from the start to the end of a school year on this measure.²⁹ This effect persisted into the second program year (1.17 versus 1.25). Also, the program did not have an effect on the four other exploratory behavior outcomes in either year (as shown in Exhibit 5). Because behavior was not measured after the study's training and assistance ended, the effect of the program on student behaviors is not known for the follow-up year.

The effect on students' disruptive behavior did not statistically differ between the two years for those initially identified as struggling the most with behavior. There are several potential reasons why this might be the case. First, this group of students was identified at the outset of the study and may not have been identified as needing supplemental supports when they were implemented by the second year.³⁰ Second, the measure used by the study to identify students for this subgroup, teacher ratings, differed from the program measure used to identify students for Tier II supports, and office and other referrals. In fact, only about a fifth of students initially identified as struggling the most with behavior in participating schools did receive supplemental behavior supports.³¹ Finally, principals and team leaders reported challenges with aspects of Tier II implementation, noted later, which may have limited the effects of the supports.

Exhibit 5. Impacts of the MTSS-B Program on Student Behavior, for Students Initially Identified as Struggling with Behavior



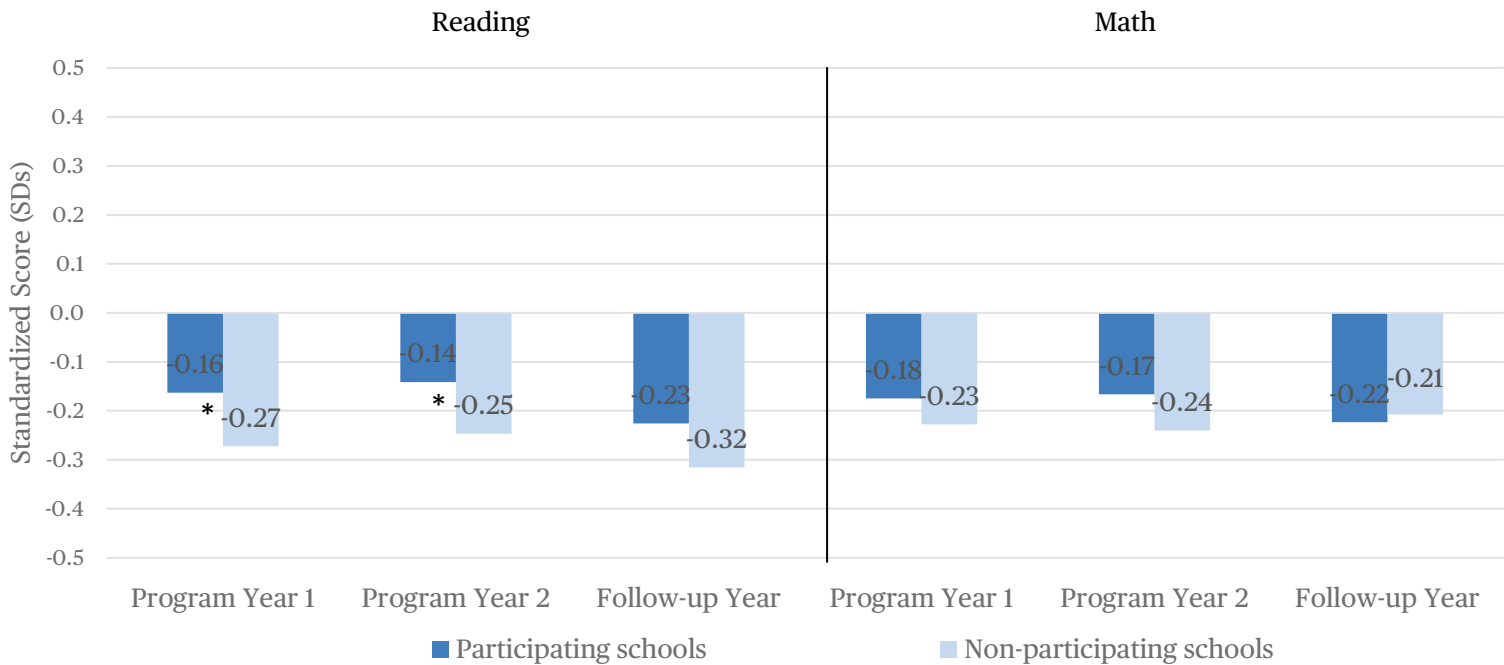
SOURCE: Teacher ratings of student behavior.

NOTES: The sample included 89 schools. In the first year of the program, it included 2,949 Grade 1-5 students initially identified as struggling with behavior in the fall of that year. In the second year of the program, it included 1,847 Grade 2-5 students initially identified as struggling with behavior in the fall of the first program year.

*Indicates a statistically significant difference at the 0.05 level between participating schools and non-participating schools.

- The program had positive effects on these students' reading achievement during the two program years, but not in the year afterward.** At the end of the first program year, initially struggling students in participating schools scored higher, on average, on state reading tests than their counterparts in non-participating schools (see Exhibit 6). The -0.16 estimate of Year 1 reading scores for initially struggling students enrolled in participating schools indicates that these students scored 0.16 standard deviations below the average reading scores for students, overall, in non-participating schools. The difference in student scores in participating and non-participating schools represented 2.4 months of *extra* learning or about one-fourth of the typical annual gain in reading skills.³² Students initially identified as struggling with behavior tended to have lower-than-average reading achievement, as indicated by the negative scores. The program led to higher reading achievement than would have been the case in the program's absence, bringing those students' achievement closer to, but still below, the average. This effect on reading achievement was

Exhibit 6. Impacts of MTSS-B Program on Reading and Math Achievement, for Students Initially Identified as Struggling with Behavior



SOURCE: Standardized state test scores for Program Year 1, Program Year 2, and the Follow-Up Year were collected from district records data.

NOTES: Sample included 89 schools in the two program years and 80 schools in the follow-up year. In each year the sample included Grade 3-5 students initially identified as struggling with behavior in the fall of year 1. In year 1 it included 1,879 students, in year 2 it included 1,595 students, and in the follow-up year it included 1,323 students.

The standardized score value represents how many standard deviations (SDs) the raw score is from the mean of the non-participating schools. For example, a positive standardized score with a value of 1 indicates the raw score is one standard deviation above the mean.

* Indicates a statistically significant difference at the 0.05 level between participating schools and non-participating schools.

sustained but did not increase for those students in the second year of the program. There were no effects on math test scores during the two program years. Even though the third year allowed staff and their students to gain more experience with the MTSS-B approach, there was no effect on reading or math test scores in the year after the study's training and support had ended.³³

In addition to looking at the impacts on this primary subgroup of initially struggling students, the study explored the program's effects on student behavior for subgroups of students defined by gender, grade span, individualized education program status, and English language learner status, and found few significant impacts (see Section V in Appendix D for more details).

GENERALLY GOOD IMPLEMENTATION LED TO IMPROVEMENTS IN SOME ASPECTS OF SCHOOL CLIMATE AND CLASSROOMS BUT DID NOT SEEM TO BE SUFFICIENT TO PRODUCE IMPACTS ON STUDENTS OVERALL

If carried out well, the program is expected to improve student behavior and academic outcomes by helping schools develop a positive climate and teachers improve how they run their classrooms. Whole-school involvement and a collaborative way of doing this work is thought to be critical in creating a positive school-wide environment in which staff are familiar with and are more likely to buy into the school's behavior policy at the outset. Additional one-on-one coaching for teachers is designed to improve the classroom environment by supporting those classrooms that experience the greatest behavioral issues. Both set a positive and collaborative environment to support student behavior, in and out of the classroom, and these improvements in student behaviors are expected to increase the extent of instructional time and student engagement in this instruction to facilitate improvements in achievement. Examining the extent to which these aspects of the approach are realized and whether they are associated with the intended behavior and academic outcomes can shed light on ways to strengthen this program and potentially ones like it.^{34,35}

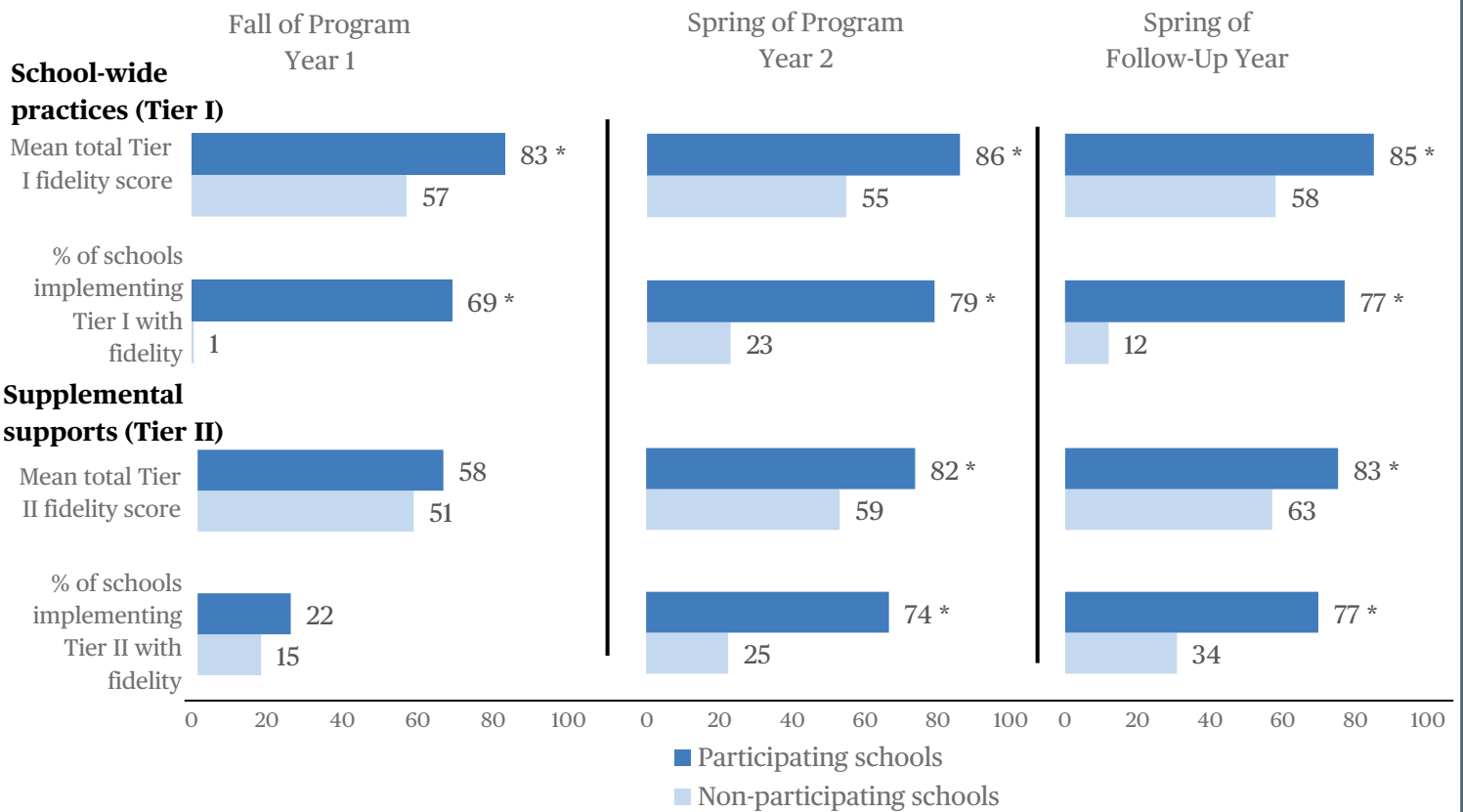
- ***The program's approach was carried out reasonably well in most participating schools and led to more frequent use of many key MTSS-B practices compared to non-participating schools—necessary conditions to expect effects on classrooms and climate.***

In the fall of Program Year 1, about 70 percent of schools that received the program's training and technical assistance met pre-established criteria for fully implementing the school-wide practices (Tier I), with only one school receiving a score substantially below that of full implementation.³⁶ The percentage of participating schools fully implementing Tier I increased to about 80 percent in Program Year 2 (see Exhibit 7). In addition, about three-quarters met the criteria for implementing the supplemental supports (Tier II) in Program Year 2, when those were intended to be added. These ratings were based on study researchers' systematic site visits or 'walk throughs' in schools that included observations, document reviews, and questioning administrators, teachers, and students about key MTSS-B practices.

In contrast, schools that didn't receive the program's training and technical assistance implemented many MTSS-B practices, at least to some extent. However, their average fidelity scores and the percentage of these schools fully implementing either Tiers I or II were significantly below that of participating schools. The one exception was with Tier II implementation, which was limited and similar in the first year, when neither group received training or technical assistance to implement it (see Exhibit 7).

Even though most participating schools were able to implement MTSS-B fairly well, interviews with school principals and MTSS-B team leaders indicated that there were some challenges. Across the two program years, the most common challenge in implementing Tier I activities, reported by about two-fifths of the respondents, was a lack of alignment between the beliefs of teachers and staff and the philosophy of carrying out MTSS-B. Research indicates that such buy-in is important for successful implementation.³⁷ Additionally, about a quarter of the interview respondents across the two program years indicated that there was an incomplete understanding of the program and/or staff were overwhelmed by the time and demands of the program. Interviewed principals and Tier II team leaders also reported challenges with implementing Tier II activities in Program Year 2, with a majority of them indicating that inconsistent student participation and limited staff participation or commitment was problematic (see Appendix Exhibits C.31 and C.32 for detailed findings from these interviews).

Exhibit 7. Implementation Fidelity of MTSS-B Program and Contrasts with Non-Participating Schools



SOURCES: MTSS-B School-wide Evaluation Tool (SET) and Individual Student Systems Evaluation Tool (I-SSET) fielded in the fall of 2015, the spring of 2017, and the spring of 2018.

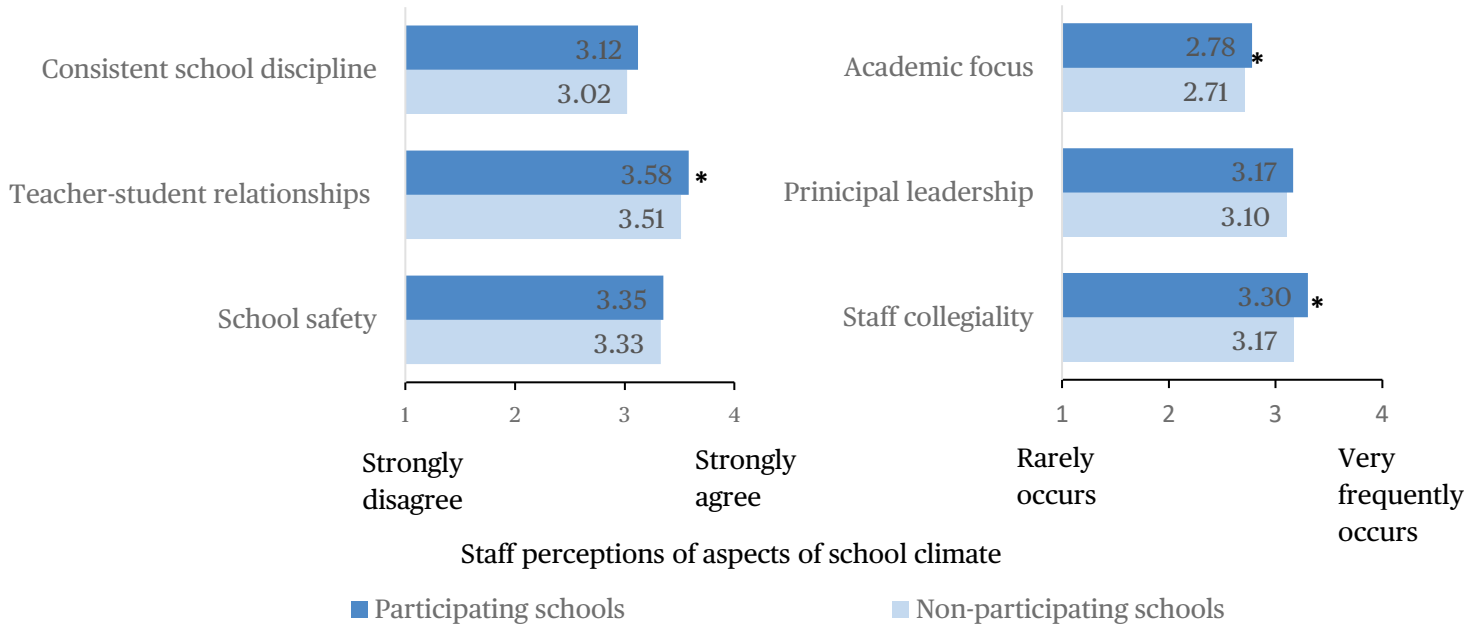
NOTES: For Program Year 1 and Program Year 2, the sample includes 58 participating schools and 31 non-participating schools. In the follow-up year, one district dropped out of the study, therefore the sample includes 51 participating and 28 non-participating schools.

* Indicates a statistically significant difference at the 0.05 level between the participating and non-participating schools.

- The program did improve some aspects of the school-wide climate, but not some aspects that are closely linked to MTSS-B, such as perceived school discipline.*** Staff members in participating schools rated teacher-student relationships, academic focus among students, and staff collegiality more favorably than those in non-participating schools (see Exhibit 8). There were no improvements on the other measures of school climate. Aspects of school climate were measured by staff responses on a 1- to 4-point scale where higher values reflect more positive perceptions, either greater agreement or more frequent desired activities.

The program's lack of improvement in perceived school discipline, including fairness of policies and equal application of school rules, is noteworthy because it is key to the logic of how MTSS-B should work to benefit schools and students. Effects on school safety and principal leadership were measured because MTSS-B is hypothesized to influence these outcomes. While the program in this study did not produce impacts on

Exhibit 8. Impacts of MTSS-B Program on Aspects of School Climate



SOURCE: Staff survey in Program Year 2.

NOTES: Sample included 4,280 instructional and non-instructional school staff from 89 schools.

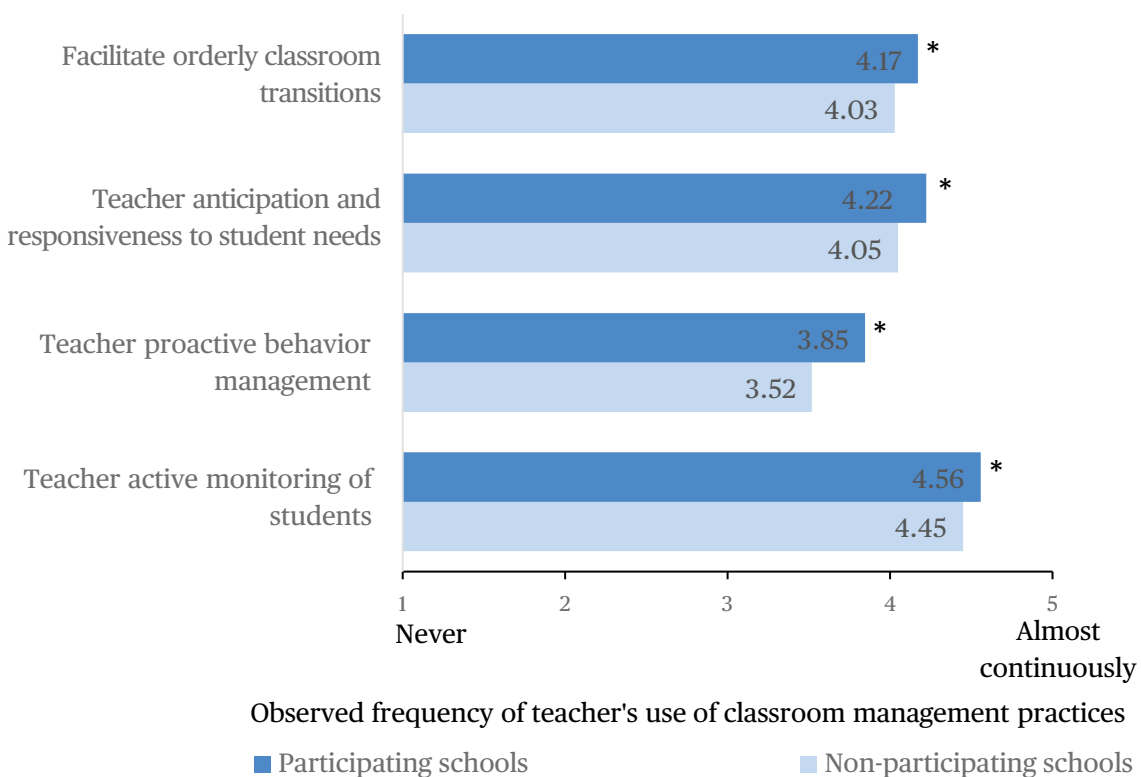
* Indicates a statistically significant difference at the 0.05 level between participating and non-participating schools.

safety, earlier studies of similar MTSS-B approaches did find improvements on this dimension.³⁸ Finally, the program did not include a major emphasis on the role of the principal, which may contribute to the lack of impacts on perceptions of principal leadership; this finding is consistent with other studies.³⁹

- The program also improved how teachers managed their classrooms and how their classrooms functioned.** The program led to more use in the participating schools of all four of the intended teacher classroom practices measured by the study than was the case in the non-participating schools (see Exhibit 9). These practices included facilitation of orderly classroom transitions from one activity to the next, the teacher’s anticipation of and responsiveness to students’ needs, the teacher’s proactive behavior management, and the teacher’s active monitoring of students, all measured based on observations on a 1-5 scale, with 5 being the strongest.

Consistent with these positive effects on teacher practices, teachers in the participating schools demonstrated better control of the classroom and their students were less disruptive and more engaged and cooperative in class compared to those in the non-participating schools according to ratings based on observations of their classrooms (see Exhibit 10).⁴⁰ Classroom disruptions were less frequently observed in participating schools.⁴¹ Specifically, classroom disruptions were reduced by nearly two instances within a 15-minute observation period. Greater access to coaching as a result of the program and/or the greater effectiveness of MTSS-B classroom management practices may have played a role in this improvement: about 60 percent of the teachers in participating schools reported that they had received coaching on classroom management or student behavior, compared with about one-third of teachers in non-participating schools (see Appendix Exhibit C.11).

Exhibit 9. Impacts of MTSS-B Program on Classroom Management Practices



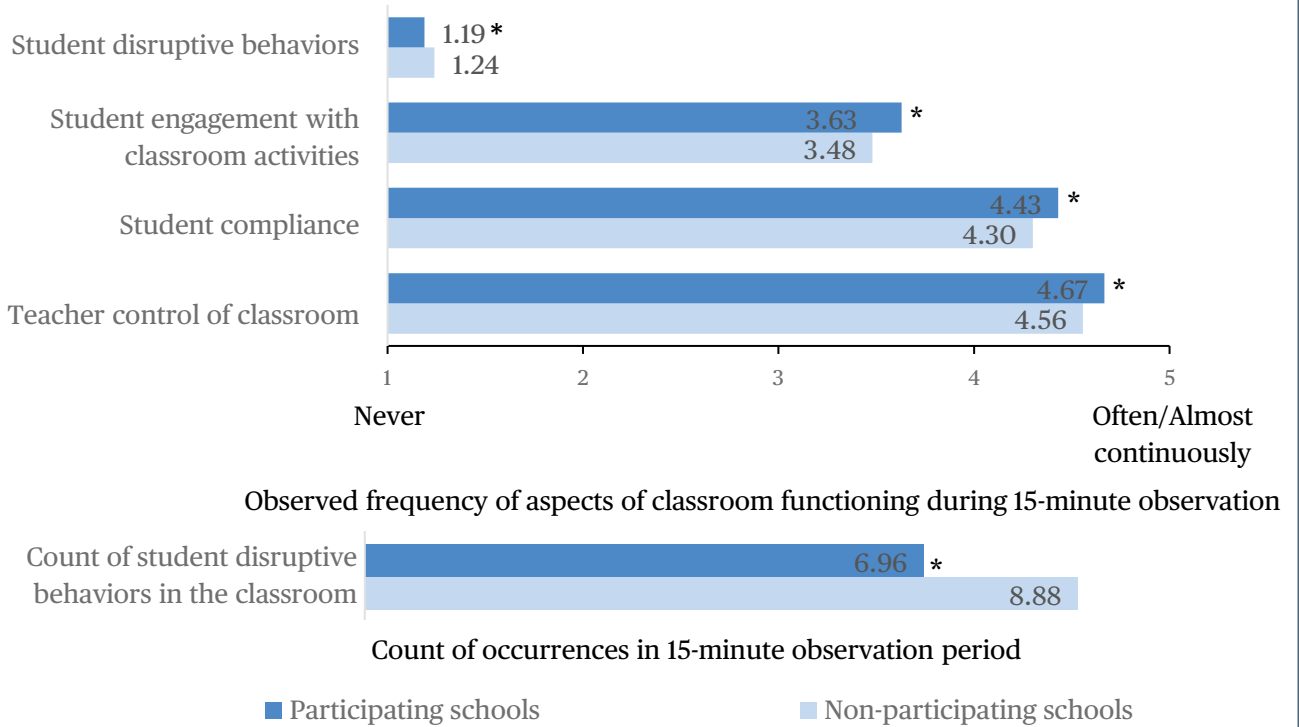
SOURCE: Classroom observations in Program Year 2.

NOTES: Sample included 1,791 classrooms in Grades 1-5 in 88 study schools.

* Indicates a statistically significant difference at the 0.05 level between participating schools and non-participating schools.

- However, the positive impacts on school and classroom outcomes did not consistently translate into improvements in student behavior or achievement outcomes.** Additional analyses were conducted to explore the relationship between school-wide or classroom effects and effects on student behavior or achievement (see Appendix C and Exhibits C.16 and C.17). These analyses provide opportunities to better understand how this MTSS-B approach did and did not work, which may suggest ways to strengthen the program. For students overall, improvements in the management of their classroom and the climate of their schools were unrelated to how much their behavior and, subsequently, achievement improved. For the group of students initially struggling with disruptive behavior, improvements on some aspects of classroom management and school climate were linked to improvements in their disruptive behavior—the primary focus of the program. However, these classroom and school improvements did not seem to be related to improvements in reading achievement. Instead, if anything, effects on less emphasized aspects of the program, such as students’ attention to schoolwork, were related to effects on reading achievement and therefore may be more productive in improving this learning outcome.

Exhibit 10. Impacts of MTSS-B Program on Classroom Functioning



SOURCE: Classroom observations in Program Year 2.

NOTES: Sample includes 1,791 classrooms in Grades 1-5 in 88 study schools.

* Indicates a statistically significant difference at the 0.05 level between participating schools and non-participating schools.

HOW THIS STUDY EXPANDS THE EVIDENCE ON MTSS-B

This study's findings underscore both the potential and the limitations of multi-tiered systems of behavior support as a way to help students and schools. This broad approach is being widely promoted and adopted, but evidence of its effectiveness is limited, as is guidance about which types of schools are likely to benefit.⁴² It is therefore important to extend the learning from this study so that those making decisions to refine or adopt MTSS-B strategies have more to draw on.

In particular, program developers and schools might want to consider these key aspects of the approach:

- **Aligning program adoption where needs are greatest.** The study findings suggest that the extent of effort to adopt and implement this MTSS-B program may not be warranted in all schools. This study, in combination with earlier studies, suggests that this type of program may be more beneficial where student behavior is a significant challenge. In contrast to earlier studies, schools in this evaluation did not have significant behavioral problems to begin with, according to teacher ratings. District and school leadership may have believed there to be widespread behavioral issues based on general impressions, leading them to volunteer the schools to participate in the study. But the educators who worked with students on a daily basis seemed to have a different perspective. This may have limited the potential for improving student behavior. Schools and providers may want to consider ways to assess behavior issues and students' needs before significant investments in adopting MTSS-B strategies are made.
- **Improving mechanisms to enact the strategy and to identify and support students in need of supplemental support.** While study observers found MTSS-B systems and practices to largely be in place in the participating schools, principals and MTSS-B team leaders reported challenges with: (1) fully understanding the strategy, and (2) meeting the demands and time needed to implement the strategy. This could mean that the program needs to improve training or provide tools to make implementing the strategy more feasible.
- **Strengthening connections between program components and academic improvement.** The program's primary focus on addressing students' disruptive behavior in the classroom and offering supplemental supports when needed may not be sufficient to improve academic achievement, either for students with behavior issues or for that of their peers. To boost these program effects, program developers and educators might consider enhancements to MTSS-B that take advantage of a smoother functioning classroom and more directly target behaviors affecting academic instruction and learning.

Supporting improvements in student behavior will continue to be important. Experimentation with and studying different strategies are critical to expanding the evidence base.

ENDNOTES

¹Breslau et al. (2009); McClelland, Acock, and Morrison (2006).

²Duncan and Magnuson (2011).

³Carrell, Hoekstra, and Kuka (2018).

⁴This study uses the term ‘multi-tiered systems of support for behavior’ to describe the program because it is the umbrella term used in the field although the selected training provider’s program is also aligned with the more specific school-wide positive behavioral interventions and supports framework.

⁵In 2018, 26,424 schools were identified as using Positive Behavior Interventions and Supports (Sugai and Horner, 2020), which is also referred to as Multi-Tiered Systems of Support for Behavior (MTSS-B).

⁶Reinke et al. (2011); Ingersoll (2001).

⁷See Lee and Gage (2020) for a review of the existing research.

⁸Bradshaw, Mitchell, and Leaf (2010); Bradshaw, Waasdorp, and Leaf (2012); Horner et al. (2009).

⁹The Center for Social Behavior Support was a collaboration between the Illinois-Midwest Positive Behavior Interventions and Supports (PBIS) Network at the School Association for Special Education in DuPage, Illinois, and the PBIS Regional Training and Technical Assistance Center at Sheppard Pratt in Maryland. The training materials used for the study have been archived (see Center for Social Behavior Support), and the Midwest PBIS Network regularly updates these materials. See the Midwest PBIS Network’s website for the most recent versions of training materials.

¹⁰Many MTSS-B programs include supports for students not improving after they are provided Tier II supplemental supports (sometimes referred to as Tier III), but the program fielded here did not train schools to implement this tier or to conduct universal screening by fielding periodic brief assessments of all students to identify students who may be struggling. Additionally, in order to focus on areas with the most evidence from prior studies, limit the burden on school staff, and avoid activities that could spill over to the non-participating schools, some features of MTSS-B were either not included or were not a focus of the current program. Specifically, the program tested here did not include activities prior to the adoption of MTSS-B to build teacher support for the program (because schools were randomly assigned to participate), there was limited support for involving district staff, and there was no support for involving external stakeholders. See Appendix A for more details on this.

¹¹Eighty of these schools continued with the year of follow-up data collection after the training and support program had ended.

¹²For districts where the proportion of students from families with low incomes varied widely among study schools, schools with similar proportions of such students were clustered together and random assignment was conducted within each cluster. Within each district or cluster, two-thirds of study schools were assigned to receive the program and one-third were assigned to continue with usual practices.

¹³This analysis is also called confirmatory analysis in the research literature and is distinct from exploratory analysis, which is discussed in the next bullet. See Appendix B for the distinction between these two types of analysis.

¹⁴This group of students was identified based on teacher ratings of student behavior in the fall of the first program year. See Appendix B for more information about how this subgroup was identified. Also see Appendix D for an analysis demonstrating that the findings are not sensitive to this subgroup definition.

¹⁵Horner and Sugai, 2015.

¹⁶This survey was adapted from the Teacher Observation of Adaptation-Checklist. See Koth, Bradshaw, and Leaf (2009) and Bradshaw and Kush (2020). Teachers could only rate the 70 percent of students whose families consented to this activity. Several analyses examined the potential for bias in the student rating sample due to non-consent and some subsequent teacher non-response. These analyses are summarized in Appendix D. As a result of some significant differences in the background characteristics of respondents and non-respondents (see Appendix Exhibit D.3), the study applied weights to account for potential non-response bias, and the analysis demonstrates that the findings are not sensitive to these adjustments (see Appendix Exhibits D.9 and D.10).

¹⁷Kindergarteners were excluded from data collection and analyses partially out of concerns about the reliability and validity of the behavior measures when used for very young children as they first enter the school environment. The decision was also affected by the budget constraints. As a result, findings from this study cannot be generalized to kindergarten students.

¹⁸The study adapted scales from the Organizational Health Inventory (Hoy and Tarter, 1997), Delaware's school climate survey (Bear, Gaskins, Blank, and Chen, 2011; Bear, Yang, Pell, and Gaskins, 2014) and the U.S. Department of Education's School Climate Survey (National Center on Safe Supportive Learning Environments).

¹⁹Classroom observations were conducted using an adapted version of the Assessing School Settings: Interactions of Students and Teachers (ASSIST) protocol as the data-collection tool (Rusby, Crowley, Sprague, and Biglan, 2011).

²⁰The study used the School-wide Evaluation Tool data-collection tool to assess the extent to which the school-wide MTSS-B infrastructure and practices were implemented in both groups of schools. See Horner et al. (2004). To assess the provision of the supplemental support practices, the study team used an adaptation of a similar protocol called the Individual Student Systems Evaluation Tool. See Anderson et al. (2007); Debnam, Pas, and Bradshaw (2012).

²¹Program data include web-based meeting minutes recorded by the school team, behavior-monitoring data from the web-based data system used by the program schools, and logs of daily activities recorded by MTSS-B coaches.

²²Appendix D presents findings for the sample of students for whom both achievement and behavior outcome data are available for both program years. Importantly, achievement test scores are only available for students in grades 3 through 5. Findings for this consistent sample largely corroborate the findings presented in the report (see Exhibit D.12).

²³While the sample of students in this study had a high proportion of Hispanic students, the tested MTSS-B approach was expected to be broadly applicable across a range of settings including districts and schools that are predominately Hispanic. The impacts in districts that are predominately Hispanic were similar to other districts in the study, supporting this expectation. See Appendix Exhibit D.18.

²⁴This finding is based on annual state achievement tests administered to students in grades 3 to 5. The student sample for this analysis of academic achievement is different from that used for the analysis of student behavior, where teacher ratings are available for grades 1 through 5. Appendix B provides more details about the samples and Appendix D presents findings for the sample of students for whom both achievement and behavior outcome data are available. The findings for that sample are similar to those in the main text (see Appendix Exhibits D.12 and D.13).

²⁵Prior studies evaluating the effects of behavior support programs delivered to *all* students have shown they can produce the greatest benefits for those students struggling most with behavior. See Chuang, Reinke, and Herman (2020); Kellam et al. (2008); Bradshaw, Waasdorp, and Leaf (2015).

²⁶Crone, Hawken and Horner (2010); Hawken et al. (2015).

²⁷The study examined whether this effect varied based on the manner of defining the subgroup of students experiencing the most challenging behavior. The study team defined an alternative subgroup according to whether or not students had received an office disciplinary referral in the fall of the first year of the program and found a positive impact on these students' disruptive behavior indicating that the results are robust to how the subgroup was defined. (See Appendix Exhibit D.5.) The study also did sensitivity tests using the subgroup definition in the text, examining whether the effect varied based on the threshold used to identify this group of students. Specifically, the study looked at impacts for this group as the threshold moved from 5 percent of students with the highest levels of disruptive behaviors at the start of the program to 30 percent. As expected, in Program Year 2 in particular, effect sizes are greater when the threshold is lower, suggesting that effects are greatest for those students struggling the most with behavior (see Appendix Exhibits D.6a and D.6b).

²⁸The subgroup of students initially struggling the most with disruptive behavior, in this study, displayed similar or less disruptive behavior than the average student in schools participating in previously published studies of MTSS-B. See Bradshaw, Waasdorp, and Leaf (2012).

²⁹Table 3 in Dong et al. (2016) shows that the rating for disruptive behavior tends to increase within a school year (Fall to Spring) for children across all grades in elementary school.

³⁰The subgroup of students struggling the most with disruptive behavior was defined at the onset of the program and was not redefined at the start of Year 2 when supplemental supports were added in order to maintain an appropriate comparison student subgroup in the schools that did not participate in the program.

³¹Exhibit C.7 shows that among the initially identified struggling students in the participating schools, 19 percent were reported by their teachers as having received supplemental behavior support in Year 2.

³²This "average student's gain" is based on the annual gain in reading for nationally representative samples reported in Table 1 of Hill, Bloom, Black, and Lipsey (2008).

³³The study conducted exploratory analyses to examine the possibility of the findings for the follow-up year being caused by a change in the student sample (e.g., one district dropped out of the study in Year 3) and does not see evidence that this change explains the diminished effects on achievement.

³⁴Reflecting this connection between school climate and academic outcomes, the U.S. Department of Education has funded School Climate Transformation Grants to local educational agencies since 2014. For details, see the U.S. Department of Education School Climate Transformation Grants website.

³⁵Due to the timing of the program rollout and budget constraints, it was not feasible to collect school climate, classroom management practices, and classroom functioning information prior to the random assignment. However, the study team was able to assess whether the participating and the non-participating groups were similar on school characteristics (Exhibits B.3 and B.17), staff background characteristics (Exhibit B.16), and classroom information (Exhibit B.15) that are likely to be related to classroom experience or school climate outcomes. In general, the team found no substantial differences between these two groups.

³⁶Schools attaining a score of 80 percent or above are considered to be fully implementing core MTSS-B components according to the instrument developers. In Program Year 1, in addition to the 70 percent of schools that scored above the 80 percent full implementation score threshold, another 28 percent of schools scored above 60 percent, and only 1 school (2 percent) scored below 60 percent.

³⁷Research shows that staff buy-in is important for the successful adoption, full implementation, and sustainability of any school-based initiative (Fixsen et al., 2005). The latest PBIS team handbook also emphasizes the importance of teacher buy-in (Ryan and Baker, 2020).

³⁸Horner et al. (2009).

³⁹Bradshaw et al. (2008).

⁴⁰*Teacher control* of the classroom is demonstrated by students following classroom routines; the teacher influencing student behavior without expressing annoyance, irritability, or sarcasm; and teachers and students appearing comfortable with each other. *Student and teacher meaningful participation* is demonstrated by students sharing ideas and opinions, making choices, working together cooperatively by helping each other and sharing ideas, and responding to teachers' questions or volunteering responses. *Student compliance* is demonstrated by consistently following rules appropriate to the setting, cooperating, being focused and engaged, and treating their peers with respect (i.e., listening with others are talking). For details on this measurement, see Appendix B on the ASSIST observation instrument.

⁴¹While the finding of a reduction in disruptive behavior is consistent across teacher ratings and classroom observations, the study uses the teachers' ratings of student behavior as the primary outcome because it measures an individual student's behavior over an extended period of time and in multiple instructional contexts versus the classroom observations that measure the extent of disruptive behavior in a classroom at a given point in time without attributing the behavior to an individual student. The latter is intended to gauge how well a classroom is functioning versus how well individual students are behaving. These uses are consistent with prior studies of MTSS-B.

⁴²A recent meta-analysis finds that MTSS-B leads to significant reductions in school disciplinary incidences and increased academic achievement though effect sizes were small to medium (Lee and Gage, 2020). Of the 32 studies included in the analysis, only five were experimental studies conducted in multiple U.S. districts. See Appendix C Section IV for a comparison of the findings from this study with other research on MTSS-B.

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