EVALUATION OF LIFESKILLS TRAINING IN MINNESOTA

Implementation and Early Impact Findings

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BUILDING KNOWLEDGE TO IMPROVE SOCIAL POLICY

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OVERVIEW

LifeSkills Training is the only program to prevent substance use disorder among adolescents that has evidence of effects on substance use outcomes from multiple randomized controlled trials. Evaluations have shown that the version for middle school students reduces their use of substances in high school, but these studies were conducted in the mid-1980s and early 1990s, when substance use patterns were very different and when interventions with a social and emotional learning (SEL) component were less common.

MDRC's Evaluation of LifeSkills Training in Minnesota aims to examine whether these effects can be replicated with today's adolescents. The study, which began in 2019, is being conducted using a school-level randomized experiment. Interested schools were randomly assigned to a group that was offered LifeSkills Training (the LST group) or to a group that was not offered the program (the non-LST group). Schools assigned to the non-LST group were free to use other prevention strategies or SEL curricula. Students in the study will be followed until the spring of 2027, when they will be nearing the end of high school.

This is the first of two reports for the Minnesota LifeSkills Training evaluation. The purpose of this initial report is to present findings about two factors that influence the measurable effects of the program: (1) whether LifeSkills Training was implemented as intended by schools in the LST group, and (2) whether schools in the non-LST group were using other substance-use-disorder-prevention or SEL-focused programs. Findings include:

- One-fourth of schools in the LST group (25 percent) did not implement the program at all, and only 40 percent implemented all three years of the program. The most cited reason for not implementing the program was staffing challenges related to the COVID-19 pandemic.
- In schools that did implement LifeSkills Training, the curriculum was implemented as intended, but several schools reported that the program was outdated and not engaging for students. Four schools stopped implementing the program because they were dissatisfied with its relevance.
- Most schools in the non-LST group stated that they were providing other classroom-based instruction on the prevention of substance use disorder (70 percent) or the development of social and self-management skills (100 percent).
- As was the case in past studies, LifeSkills Training did not reduce students' substance use at the end of the first year of the program, nor did it improve students' knowledge about substance use or their social and self-management skills. Students in the LST group reported fewer negative mental health outcomes and fewer aggressive behaviors than students in the non-LST group, but these differences are not statistically significant.

Taken together, these results suggest that the impact of LifeSkills Training on students' substance use at the end of high school (to be examined in the next report) could prove smaller in this evaluation than in prior studies of the program. The findings from this study also indicate that the program may have the potential to improve students' mental health and their aggressive behaviors in high school.

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ACKNOWLEDGMENTS

This report is the product of several years of collaboration among multiple organizations and stakeholders, without whom this study would not have been possible.

First and foremost, we are deeply grateful to our partners in Minnesota state agencies who conceived of the project, recruited schools for the study, and helped schools navigate the implementation of LifeSkills through the height of the COVID-19 pandemic. This project is rooted in their desire and commitment to bring evidence-based programming to the state.

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The Authors

INTRODUCTION

Alcohol and tobacco use among high school students in the United States has declined over the last decade, but students' use of other substances, such as vapor products and prescription opioids, has remained persistently stable. There are also large differences in substance use across different groups of students, with higher prevalence rates for female and LGBTQ+ students.[1] These discrepancies underscore the challenge of addressing substance use in a school context and highlight the continuing need for effective substance use disorder prevention for the entire student population.

Identifying strategies to help students make healthier decisions about their use of alcohol, tobacco, and other substances is important for their personal well-being and for society at large. Substance use during adolescence is associated with a higher likelihood of experiencing violence, depression, and suicide risk.[2] Young people who initiate substance use in middle school have higher rates of lifetime substance dependence than those who remain abstinent until adulthood, making it critical to initiate prevention strategies as early as possible.[3] Yet, despite the importance of the task, very few prevention programs for adolescents have been shown to have an effect on students' decisions about substance use. Blueprints, a registry of evidence-based interventions that aim to reduce antisocial behavior and promote youth development, has identified only three prevention programs with evidence of effects on substance use outcomes in at least two high-quality studies (two randomized controlled trials or one randomized controlled trial and one high-quality quasi-experimental evaluation).[4]

One notable program in this field is LifeSkills Training, a classroom-based substance-use-disorder-prevention program that has been used in all U.S. states and territories as well as in 39 other countries. An estimated 3 million students across 10,000 schools have received the program since it was developed starting in the early 1980s.[5] The program is owned and operated by National Health Promotion Associates, Inc. (NHPA), a privately held company founded in 1985. The founder and president of NHPA is Gilbert J. Botvin, PhD, the developer of the program.

1. U.S. Centers for Disease Control and Prevention (2021).
2. Hallfors et al. (2004); Clayton, Lowry, August, and Jones (2016); Clayton et al. (2017); Tapert, Aarons, Sedlar, and Brown (2001); Lowry et al. (1994); Decker et al. (2016).
3. For dependence rates, see Substance Abuse and Mental Health Services Administration (2014). On the need to initiate prevention early, see Grant and Dawson (1997) and Dennis, Babor, Roebuck, and Donaldson (2002).
4. Blueprints for Healthy Youth Development (n.d.), using search terms alcohol, tobacco, violence, early and late adolescence, and universal prevention. In a randomized controlled trial, study enrollees are randomly assigned either to a program group that is eligible to participate in the intervention or to a control group that is not eligible to participate in the intervention. By comparing the outcomes of the two groups, a study can estimate the impact of the intervention. Quasi-experimental research designs use rigorous statistical methods to try to estimate the effects caused by interventions but do not involve random assignment to program and control groups.
5. National Health Promotion Associates (n.d.).

LifeSkills Training applies a two-pronged approach: (1) It provides students with information and tools to help them resist peer and social pressure to use tobacco, alcohol, and other substances; and (2) it helps students develop the social skills and self-management skills they need to make better decisions and navigate difficult situations.[6] Although the program was developed with the primary aim of preventing substance use disorder, its focus on social and self-management skills is expected to benefit students in other ways as well, including improving their mental health and reducing their aggressive behaviors.[7] LifeSkills Training lessons can be integrated into an existing class, such as a health class or other class taken by all students. The program can be used with students of various ages, with versions of LifeSkills Training available for upper elementary school, middle school, and high school.

In addition to being one of only a few prevention programs with evidence of effects on substance use outcomes from multiple studies, LifeSkills Training stands out as the only prevention-focused program for adolescents that has received the highest level of accreditation from multiple reviewers of effective programs.[8] The version for middle school students, which is a three-year intervention that can be taught in grades six through eight or grades seven through nine, has been the most extensively and rigorously evaluated. The two most cited evaluations are randomized controlled trials conducted in both rural and suburban contexts in New York State and Iowa beginning in the mid-1980s and the early 1990s, respectively. These studies found that students exposed to LifeSkills Training in middle school had lower levels of substance use in high school.[9] By the end of twelfth grade, students who had received LifeSkills Training were less likely to report having ever used tobacco (as well as reporting having used it less frequently), having ever used marijuana, and having recently gotten drunk.[10] Subsequent evaluations of LifeSkills Training conducted in New York City demonstrate its potential to be effective in an urban context as well. Students in these later studies were not followed all the way to high school, but by the end of middle school, there were small effects found on rates of cigarette smoking, drunkenness, and use of inhalants.[11]

6. Botvin and Griffin (2004).
7. Aggressive behaviors as defined in this study are property offenses (theft, vandalism, destruction of property), violent behavior (hitting, punching, kicking someone), and bullying and harassment.
8. LifeSkills Training is the only prevention program for adolescents that is rated a "Model Plus Program" by Blueprints, an accreditation reserved for programs that have evidence of effectiveness from at least two high-quality randomized controlled trials, including an independent evaluation. See Blueprints for Healthy Youth Development (n.d.). LifeSkills has also been rated an effective program by CrimeSolutions, a registry of programs operated by the National Institute of Justice. See CrimeSolutions (n.d.). In addition, LifeSkills has been highlighted favorably in meta-analyses of classroom-based middle school programs. (Meta-analyses pool results from multiple published studies to determine the likely effect of a type of intervention.) See Jagers, Harris, and Skoog (2015).
9. Laura and John Arnold Foundation (2019).
10. In the study conducted in rural Iowa, among students who received LifeSkills Training, tobacco initiation was 14 percentage points lower and marijuana initiation was 9 percentage points lower than they were among students who had not received the intervention. See Spoth et al. (2008). In the study conducted in rural and suburban schools in New York State, among students who received LifeSkills Training, the percentage who reported getting drunk in the last month was 6.5 percentage points lower than among those who had not received the intervention. See Botvin et al. (1995).
11. Botvin, Griffin, Diaz, and Ifill-Williams (2001).

These studies of LifeSkills Training, however, were conducted many decades ago. Since that time, cultural and educational changes have emerged that could alter the program's effectiveness. First, patterns of both substance use and media influence have undergone significant shifts. Vaping has increased in popularity as a method of nicotine consumption, and there has been an increase in the use of opioids. Marijuana has been legalized or decriminalized in many states. The last couple of decades have also seen a rise in social media and its influence on students' perceptions and decisions about substance use. Yet the content of the LifeSkills Training curriculum, which was developed over 40 years ago, has remained relatively static. To make the lessons relevant for today's adolescents, LifeSkills instructors must supplement the curriculum with examples based on current issues, which they may or may not have the capacity or willingness to do.

Second, the benefits of social and emotional learning (SEL) — like the social and self-management skills promoted by LifeSkills Training — are now widely recognized as important determinants of students' well-being and academic outcomes.[12] There is an expanding body of evidence showing that school-based interventions that target SEL competencies can lead to reductions in students' emotional distress, conduct problems, and drug use.[13] In the 1980s, when LifeSkills Training was first developed and evaluated, the program's focus on SEL was novel, and the LifeSkills Training approach represented a substantial contribution to the programming that schools would have been offering otherwise. At present, however, administrators have access to a wider selection of programs focused on SEL — and schools have been ramping up their use of programs and services aimed at developing students' social and self-management skills — thereby possibly diminishing the benefits of LifeSkills Training compared with other strategies.[14]

MDRC's evaluation of LifeSkills Training in Minnesota, which began in 2019, aims to examine whether the effects of LifeSkills Training found in previous studies can be replicated in today's context. Two Minnesota state agencies — the Department of Human Services (DHS) and Minnesota Management and Budget (MMB) — were awarded a Moving the Needle grant from Arnold Ventures to implement LifeSkills Training across a diverse group of Minnesota

12. The Collaborative for Academic, Social, and Emotional Learning (CASEL) defines social and emotional learning as the process through which all young people and adults acquire and apply the knowledge, skills, and attitudes to develop healthy identities, manage emotions and achieve personal and collective goals, feel and show empathy for others, establish and maintain supportive relationships, and make responsible and caring decisions. See CASEL (n.d.).

13. Durlak et al. (2011); Taylor, Oberle, Durlack, and Weissberg (2017).

14. A number of SEL-focused interventions have been shown to be effective. In the U.S. Department of Education's What Works Clearinghouse, a registry of educational evaluations, there are 11 middle school and high school SEL interventions with strong (Tier 1) evidence of effectiveness based on a randomized experiment conducted in the last 20 years, and there are an additional 8 programs with moderate (Tier 2) evidence of effectiveness based on a well-designed and well-implemented quasi-experimental study. See Institute of Education Sciences (n.d.), using search terms Middle School, High School, Tier 1: Strong, Tier 2: Moderate, Social Emotional Learning and Behavior, and Since 2005. See Institute of Education Sciences (2022) for details on the review process. In a recent national survey, 83 percent of principals reported that their schools used an SEL curriculum. For complete survey findings, see Skoog-Hoffman et al. (2024).

middle schools.[15] The grant requires that the program's effectiveness be evaluated, which created an opportunity to conduct a rigorous independent study of the program in a contemporary setting. Interested schools were randomly assigned to a group that was offered the LifeSkills Training middle school program (the LST group) or to a group that was not offered the program (the non-LST group). Schools assigned to the non-LST group were free to use any other substance-use-disorder-prevention or SEL program. Students in the study will be followed until the spring of 2027, when they will be in eleventh or twelfth grade.

The primary goal of the study is to examine the effect of LifeSkills Training on students' substance use at the end of high school in order to determine whether the findings from earlier studies can be replicated. The evaluation will also examine the program's effects at the end of high school on two related domains: students' aggressive behaviors and their mental health. Although these additional outcomes are not primary goals of the program, LifeSkills Training has been shown to improve them as well.[16] These outcomes have not been as thoroughly investigated as substance use, so they are considered exploratory in this study, which means that they will not be used to make conclusions about the replicability of the program's effects.

The evaluation was originally intended to be a replication study of the impact of the program in a contemporary setting, but the unexpected onset of the COVID-19 pandemic also makes it an evaluation of LifeSkills Training at a unique moment in time. Students in the study began receiving the program in the 2021-2022 school year (SY 2021-2022), when vaccines had become available but schools in the United States were dealing with staffing shortages and turnover, as well as periodic returns to virtual instruction triggered by outbreaks. The pandemic also made it necessary to provide training for LifeSkills instructors in an asynchronous online format instead of in person, which had previously been the standard.

Although the findings from this study may not represent the effects of LifeSkills Training in a nonpandemic context, the results do provide insights about the program's effectiveness when used in an environment of high teacher turnover, which is an ongoing reality for many U.S. school districts. This evaluation also serves as a test of the program when instructors are trained online, which has become the primary method for delivering that training.

This is the first of two reports for the Minnesota LifeSkills Training evaluation. The purpose of this initial report is to provide context for interpreting the high school follow-up findings that will be presented in the second report. Accordingly, this report examines two factors that influence the measurable effects of the program: (1) how well the program was implemented by schools in the LST group, and (2) whether schools in the non-LST group were offering other comparable substance-use-disorder-prevention or SEL-focused programming

15. The two agencies selected LifeSkills Training because of the strong evidence of effects on substance use.

16. For evidence of improvements in social anxiety, see Botvin et al. (1990). For evidence of reductions in aggressive behaviors (destruction of property, shoplifting, theft), see Botvin et al. (1990) and Botvin, Griffin, and Nichols (2006).

to their students. If the program was implemented as intended, and if the comparison schools were not providing classroom-based prevention or SEL instruction to their students, then LifeSkills Training has a higher likelihood of having an impact on students' outcomes at the end of high school.

This first report also takes advantage of an existing data source (a triennial youth development survey administered routinely by the state of Minnesota) to provide an early look at the impact of LifeSkills Training on substance use and other outcomes at the end of the first year of the program, when students were in sixth or seventh grade. These results should not be used to draw inferences about the replicability of the program's effectiveness because response rates on the survey were low and program effects are not expected after only one year based on prior studies of the program. Nonetheless, these early impact findings are useful for previewing patterns that might emerge more fully during the high school follow-up, using a data source that has policy relevance for the state of Minnesota.[17]

This report is structured as follows. The next section provides an overview of the components of the LifeSkills Training middle school program that was implemented and evaluated in Minnesota. It is followed by an overview of the study's design, which includes a description of the schools and students participating in the evaluation. Next, the report presents findings about the fidelity with which LifeSkills Training was implemented in schools in the LST group, followed by information about whether any prevention or SEL programming was being used by schools in the non-LST group. The report then discusses the effects of LifeSkills Training at the end of the first program year on substance use outcomes, as well as on other outcomes that the program is intended to improve, such as perceptions about the risks of substance use, self-management and social skills, mental health, and aggressive behaviors.

The findings presented in this report are the following:

- **Most study schools did not implement LifeSkills Training for three years as intended, so many students in the LST group did not receive the entire intervention.** One-fourth of schools in the LST group (25 percent) did not implement the program at all, and only 40 percent implemented all three years of the program. The most cited reason for not implementing the program was staffing challenges related to the COVID-19 pandemic.

- **In schools that did implement LifeSkills Training, the curriculum was implemented as intended, but several schools reported that the program was outdated and not engaging for students.** LifeSkills Training was generally implemented as intended (that is, with fidelity to the model). Instructors were trained as intended, they taught most of the LifeSkills lessons in the curriculum, and their delivery of the lessons was of high quality. However, instructors in a third of the schools reported that the lessons were outdated and not sufficiently engaging, and four schools stopped implementing the program because they were dissatisfied with it for these reasons. Only one-fourth (25 percent) of

17. For more information on Minnesota's survey, see Minnesota Department of Education (n.d.).

the schools adapted or changed the program materials and lessons to make them more relevant, suggesting that students may not have received timely and applicable content about adolescent substance use.

- **Most schools in the non-LST group provided students with classroom-based instruction focused on substance use disorder prevention or SEL.** As expected given the increasing use of such programming, most schools in the non-LST group reported that they were providing other types of classroom-based instruction focused on the prevention of substance use disorder (70 percent) or the development of social and self-management skills (100 percent).

- **LifeSkills Training did not have an effect on student outcomes at the end of the first year of the program.** As was the case in prior studies, the knowledge, skills, and levels of substance use of students in the LST group were similar to those of students in the non-LST group after only one year of the program. Students in the LST group reported fewer negative mental health outcomes and fewer aggressive behaviors than students in the non-LST group, but these differences are not statistically significant.

Taken together, these results suggest that the impact of LifeSkills Training on students' substance use at the end of high school (to be examined in the next report) could prove smaller in this study than in prior studies of the program due to several factors, including the COVID-19 pandemic, the limited relevance of the curriculum content, and the increasing availability and use of other prevention and SEL programming. At the same time, the findings from this study also indicate that the program has the potential to improve students' mental health and aggressive behaviors in high school. Although these outcomes are not the primary focus of the LifeSkills Training program or of this study, they are important factors affecting students' development and well-being.

WHAT IS LIFESKILLS TRAINING?

LifeSkills Training is a comprehensive approach to substance-use-disorder prevention that is based on the hypothesis that adolescents who struggle with their personal and social skills are more vulnerable to influences that lead to drug use and more likely to use drugs as a coping mechanism.[18] Thus, the program provides students with training in three types of skills:[19]

- **Drug Resistance Skills:** Students are provided with information to enable them to identify misconceptions about substance use and to develop skills for dealing with peer and media pressure to use alcohol, tobacco, and other substances.[20]

18. Botvin and Griffin (2004).
19. CrimeSolutions (n.d.).
20. Examples of lesson topics are "smoking: myths and realities"; "drug abuse: causes and effects"; and "resisting peer pressure." See Appendix Table A.1.

- **Personal Self-Management Skills:** Students are taught to reflect on their self-image and how it affects their behavior, to set goals for themselves and monitor their progress toward achieving these goals, to identify how their decisions are influenced by others, to analyze situations by weighing the consequences of different solutions before making a decision, to use strategies to reduce stress and anxiety, and to view personal challenges from a positive perspective.[21]

- **Social Skills:** Students are taught how to communicate clearly and avoid misunderstandings, how to start and engage in conversations with others, how to be assertive when making or refusing requests, and how to make choices other than aggression or passivity when encountering a difficult situation.[22]

These skills are taught to students through developmentally appropriate lessons that can be integrated into an existing course taken by all students, such as a health class. Each lesson focuses on a specific topic and goal. The format of the lessons includes explanation and demonstration by instructors, written exercises that encourage students to reflect on different topics and situations, and interactive behavioral rehearsals, or role play. During role play, students practice applying skills based on hypothetical scenarios and receive coaching and critiques from the instructor and other students. Students are also asked to practice using skills outside class as part of behavioral "homework" assignments. In addition to these interactive activities, students receive information about the consequences of substance use and about the ways that media shape perceptions about substance use.

The program can be taught to students of all ages, but the MDRC Evaluation of LifeSkills Training in Minnesota is an evaluation of the three-year middle school version, which, as mentioned earlier, can be offered to students in grades six to eight or grades seven to nine.[23] The program has three levels (one per grade). Level 1 includes 15 lessons that introduce students to a broad set of skills. Level 2 (10 lessons) and Level 3 (9 lessons) are booster trainings for students to continue to develop and practice the skills introduced in Level 1 while learning new skills and gaining additional knowledge about substance use.[24] Each lesson includes 1 or 2 sessions (classes), and each class runs from 30 to 45 minutes. Level 1 provides 13.5 hours of instruction, Level 2 provides 9 hours, and Level 3 provides 6.75 hours (a cumulative total

21. Examples of lesson topics are "self-image and self-improvement," "making decisions," and "coping with anxiety." See Appendix Table A.1.

22. Examples of lesson topics are "communication," "assertiveness," and "resolving conflicts." See Appendix Table A.1.

23. Botvin and Dusenbury (1987).

24. The full middle school program was used for this project, including optional lessons focused on violence prevention. See Appendix Table A.1 for a list of lessons for each level, as well as the number of class periods (sessions) per lesson. The lessons must be taught in the sequence specified by the developers, but the pacing can vary (they can be taught over a school year or in a single semester).

of 29.25 hours of instruction).[25] As a reference point, a core curriculum class — like English Language Arts — represents about 135 hours of instruction per school year.[26]

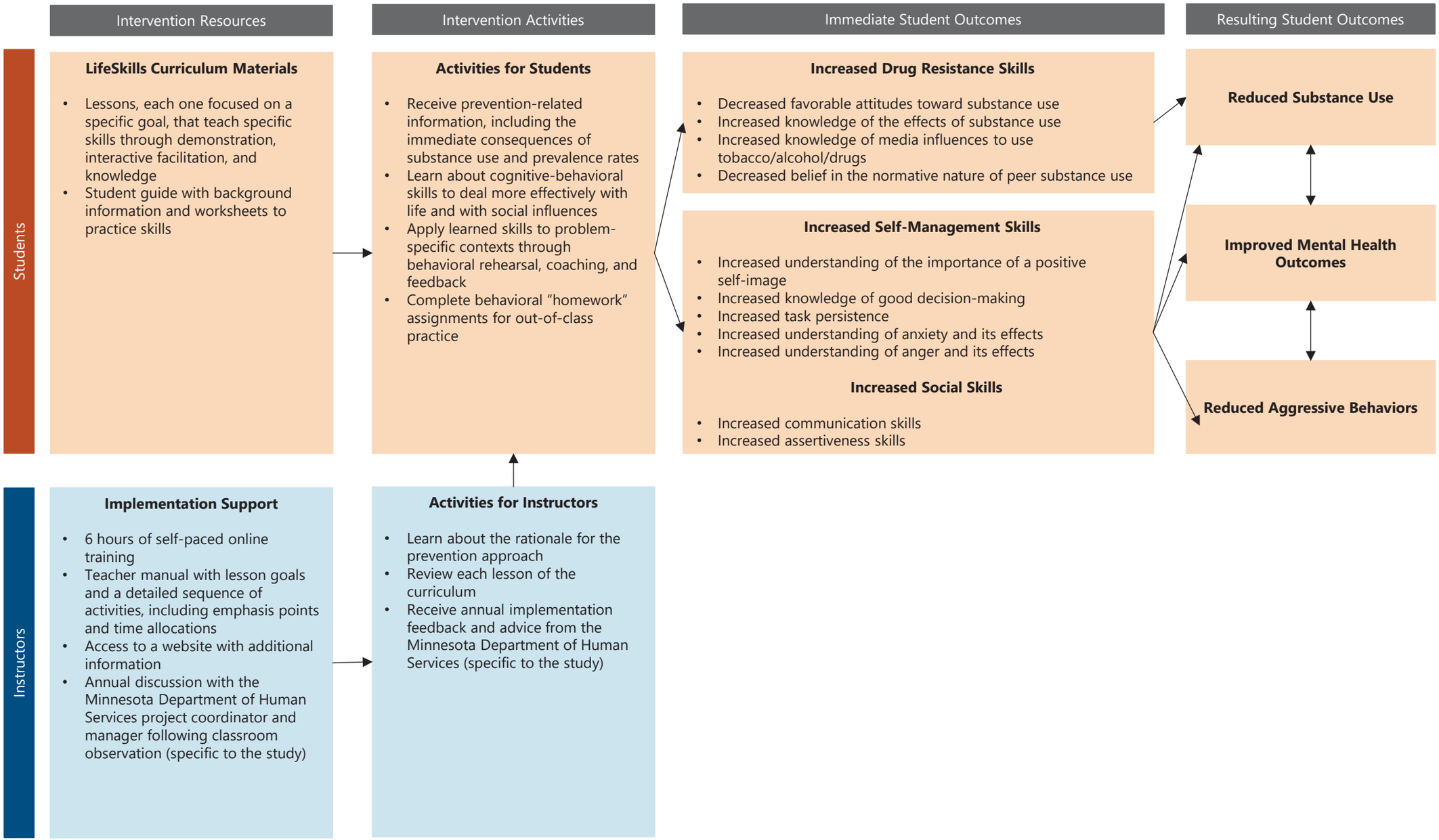
A variety of staff members — teachers, school counselors, prevention specialists, administrators, and other providers — can successfully implement LifeSkills Training. To support their delivery of the LifeSkills Training curriculum, instructors now receive six hours of self-paced online training that provides background on the rationale for the intervention and an overview of each lesson. Prior to the COVID-19 pandemic, training had been offered only in person. The developers of the program created an online version of the training in response to the demands of the pandemic, which is what was used for the schools in this evaluation and has now become the primary mode of delivery for all implementations (even outside the study).[27] Instructors also have access to resources, including a teacher manual with lesson plans with structured activities and a website with additional materials. For the purposes of this study, the Minnesota Department of Human Services provided participating schools with all curriculum materials and instructor training, and on an annual basis, DHS staff visited classrooms and provided in-person guidance to instructors.[28]

The mechanisms through which the LifeSkills Training middle school program is expected to prevent substance use disorder — its theory of change — are illustrated in Figure 1. Initially, participation in the program is expected to strengthen students' drug resistance skills (including their knowledge of and attitudes about substance use, as well as their awareness of media influences), self-management skills, and social skills. In turn, the acquisition of this knowledge and these skills is expected to reduce students' substance use, which is the primary goal of the program. The social and self-management skills that students accrue — such as strategies for coping with anxiety and anger — are also expected to improve their mental health and well-being and to reduce their aggressive behaviors. Students who are more emotionally resilient are less likely to engage in risky substance use behaviors, so the effect of the program on students' substance use is expected to be partly explained by improvements in their mental health.

Prior studies of LifeSkills Training have found evidence of effects along this entire pathway of outcomes, which lends support to the program's theory of change. Effects on students' knowledge about the consequences of substance use and on their attainment of the promoted skills, as well as on their aggressive behaviors, have been found as early as the first year of the program.[29] Effects on substance use outcomes have been found as early as the second

25. This assumes a 45-minute class period.
26. This assumes 45 minutes of instruction per school day and 180 days of instruction per school year.
27. On-site training remains an option for large groups (20 or more).
28. Program materials and trainings were purchased by DHS from Botvin/National Health Promotion Associates (NHPA).
29. Effects have been reported for the following outcomes at the end of seventh grade, the first year of the program in these studies: knowledge about the consequences, prevalence, and acceptability of smoking (Botvin and Tortu, 1991; Botvin et al., 1990; Botvin, Griffin, Diaz, and Ilfill-Williams, 2001); communication and interpersonal skills (Botvin and Tortu, 1991; Botvin et al., 1990); and aggressive behaviors, including destruction of property, shoplifting, and theft (Botvin, Griffin, and Nichols, 2006).

Figure 1. LifeSkills Training Theory of Change



year.[30] Mental health outcomes have not been as thoroughly explored, but one study did report reductions in social anxiety at the end of the program.[31] Using data from that same study, improvements in psychological well-being were found to be associated with reductions in substance use, which supports the hypothesis that the effects of the program on students' substance use are partly achieved by improving their mental health.[32]

HOW IS LIFESKILLS TRAINING BEING EVALUATED?

MDRC's evaluation of LifeSkills Training in Minnesota, like earlier studies of the program, is based on a school-level randomized experiment. More schools applied to receive LifeSkills Training than the grant could support, so a lottery-like process was used to select which schools would be offered the program (the LST group) and which schools would not (the non-LST group). Schools in the LST group were expected to implement the program for three school years. Schools in the non-LST group were free to implement any substance-use-disorder-prevention or SEL program other than LifeSkills Training.[33]

As a result of random assignment, schools in the LST group and the non-LST group (and the students enrolled in these schools) are expected to have similar characteristics before the implementation of LifeSkills Training. This includes both measured and unmeasured characteristics. Thus, any differences in student outcomes between the two groups can be interpreted as causal effects of LifeSkills Training relative to the programs and strategies used by schools in the non-LST group. In practice, program effects are estimated by comparing the outcomes of students enrolled in schools in the LST group (regardless of whether they received the intervention or not) with the outcomes of students enrolled in schools in the non-LST group.[34] Estimated effects that are statistically significant then can be attributed

30. Effects have been reported for the following outcomes at the end of eighth grade, the second year of the program in these studies: cigarette smoking (Botvin et al., 1990); marijuana use (Spoth, Redmond, Trudeau, and Shin, 2002); and smoking, alcohol consumption, and the use of inhalants (Botvin, Griffin, Diaz, and Ilfill-Williams, 2001).

31. The students were in ninth grade. See Botvin et al. (1990).

32. This is based on exploratory analyses of data from an evaluation study of LifeSkills Training. See Griffin, Scheier, Botvin, and Diaz (2001). See also Griffin et al. (2002) for a similar analysis from another evaluation study.

33. Schools in the non-LST group were offered the curriculum materials in the fall of 2023, once the follow-up period for students in the study had concluded. Only two schools took up the offer.

34. These comparisons are conducted using a two-level regression analysis—with students nested in schools—to account for the fact that entire schools were randomly assigned to the research groups. The statistical models also control for the characteristics of students to improve the precision of estimated effects. For the impact analyses presented later in this report, Level 1 of the model (the student level) controls for the following available student and family characteristics: race/ethnicity; biological sex; whether the student has experienced homelessness; whether the student has an individualized education plan; whether a student's parent or guardian has ever been incarcerated, drinks too much, or uses drugs; and whether a student's parent or guardian is depressed or has mental health issues. Level 2 of the model (the school level) includes an indicator for students' research grouping (whether they are enrolled in a school that was assigned to the LST group) and controls for indicators of the random assignment blocks. See Somers (2020) for the full registered preanalysis plan.

with a high degree of confidence to the program rather than to chance alone. Put another way, a statistically significant effect is one that is unlikely to have been the result of a truly ineffective program.[35]

As discussed in the next section, several schools in the LST group did not implement the program. This fact means that the impact findings in this report should be interpreted as the effects on students of being enrolled in a school that had the *opportunity* to implement the program. This type of analysis results in what is known as an "intent to treat" estimate of the effect of a program. This type of estimate — because it is based on random assignment — provides the most accurate information about program effects, and it is also policy-relevant because in many cases schools cannot be compelled to implement an intervention.[36]

The key research questions for the evaluation and the data sources used to answer each of them are summarized in Table 1. Student outcomes in this study are measured at two points in time: at the end of the first year of the program, when students are in middle school (measured using data from a survey routinely administered by the state of Minnesota), and at the end of high school (based on a study survey to be administered in the spring of 2027). To provide background for interpreting the impact findings, the study also looks at whether LifeSkills Training was implemented as intended in schools in the LST group (using program monitoring data collected by the state) and whether other prevention or SEL programs were used in the non-LST schools (based on information from a study survey of school principals). These data sources are discussed in more detail in the relevant sections of this report.

As noted earlier, the study is examining the effects of LifeSkills Training on the student outcomes that the program is hypothesized to improve (see Figure 1). The confirmatory outcome for the study (the one used to make conclusions about the program's effectiveness) will be tobacco initiation by the end of high school. All other outcomes (including students' mental health and aggressive behaviors) will be considered exploratory, meaning that they will be

35. The level of statistical significance is indicated by the p-value, which is the probability of observing the impact estimate (that value or higher) if the *true* impact were zero — that is, if the program had no effect. The statistical significance of estimated effects in this study is evaluated at p-values of 1, 5, and 10 percent. The lower the significance threshold, or p-value, that is met, the more likely it is that the program had a true effect. For example, if the estimated effect is 10 percentage points and the p-value is 0.05, there is a 5 percent probability of observing an impact estimate of 10 percentage points *even if the true impact were zero* — that is, if the program really had no effect at all. If the significance level is set at 5 percent, any value with less than a 5 percent probability of occurring (if the true impact is zero) is deemed a "statistically significant" program effect. So, the lower the p-value, the more certainty there is that the estimated effect is truly a result of the program rather than chance alone.

36. The next report for this LifeSkills Training evaluation will also examine the effects of the program for students enrolled in the subset of middle schools that did implement it. In other words, the next report will provide "intent to treat" estimates of the program's effects at the end of high school, as well as estimates of the "treatment on the treated." See Somers (2020). The latter are not presented in this report because the middle school follow-up findings are not statistically significant. (The p-value for both types of estimates is the same.)

Table 1. Data Sources for the LifeSkills Training Evaluation, by Research Question

Research Question	Data Source	Target Population	Timing
To what extent was the program implemented as intended by schools in the LST group?	• Surveys completed by instructors after each lesson (Web-based) • Classroom observations conducted by local fidelity monitors trained by DHS • Records collected by DHS as part of its technical assistance to schools	Schools in the LST group	SY 2021-2022 SY 2022-2023 SY 2023-2024 (surveys only)
To what extent were schools in the non-LST group also providing classroom-based substance-use-disorder-prevention and social and emotional programming?	• Principals survey (Web-based)	All study schools	Spring 2024
What is the effect of LST on student outcomes at the end of the first year of the program?	• Minnesota Student Survey (Web-based)	All students in the study sample	Spring 2022
What is the effect of LST on student outcomes at the end of high school?[a]	• Student survey (Web-based)	All students in the study sample	Spring 2027

NOTES: DHS = Minnesota Department of Human Services; SY = school year.
[a]The data for this research question have yet to be collected. The high school follow-up findings will be presented in the next report for this evaluation.

used as context for the confirmatory finding and to generate hypotheses for future studies to explore more fully.[37]

Schools in the Study

The recruitment of schools for the evaluation began in the spring of 2019 when Minnesota Management and Budget released an announcement about the opportunity to implement LifeSkills Training and be part of the study, which was sent to school districts and to members of various education, health, and human services networks across the state. All public school districts, private schools, and charter networks with schools serving grades six to eight or grades seven to nine were eligible to apply. Over the summer and early fall of 2019, MMB staff members reviewed applications and conducted short phone interviews with the

37. See Somers (2020) for the full registered preanalysis plan.

applicants to gauge their willingness and capacity to implement the curriculum with fidelity to the LifeSkills Training model (that is, as designed) and to be part of MDRC's evaluation. In the fall of 2019, MMB and DHS staff members then conducted in-person visits to schools to confirm that there was sufficient superintendent, principal, and teacher support to implement the program and to participate in the study's data collection activities. Shortly thereafter, schools were formally notified of their eligibility and, if interested, signed agreements to be part of the evaluation and to implement LifeSkills Training if assigned to the LST group.

Sixty schools from across the state of Minnesota were selected to participate in the study.[38] The study schools are predominantly public schools (95 percent) that are eligible for federal Title I funding because they serve low-income communities (96 percent). Most schools are located in a rural area or a town (82 percent) as opposed to a city or a suburb (18 percent).[39] For SY 2018-2019 (before the start of the study), 44 percent of students in the study's public schools were eligible for free or reduced-price lunch (a proxy for low income), and 7 percent were English learners.[40] As was the case in the earlier evaluations of the LifeSkills Training program in Iowa and New York State, the majority of students in the study schools are White (74 percent). About half the students were proficient on state tests (53 percent for English Language Arts and 44 percent for math). Compared with the average Minnesota public school, the study's public schools are similar with respect to students' demographic characteristics and state test proficiency, but they are more likely to be in a rural area or town and to be Title I eligible (see Table 2).[41]

The random assignment of study schools was conducted in early 2020, before the U.S. response to the COVID-19 pandemic. Of the 60 study schools, a total of 36 were randomly assigned to the LST group, with the remaining 24 assigned to the non-LST group. To notify schools as soon as possible of their group assignment, lotteries were conducted in two separate rounds (by early or late recruitment). Within each round, separate lotteries were also conducted by the grade levels that schools intended to implement the program (grades six to eight or seven to nine) in order to make it possible to identify consistent target populations of students in the LST group and the non-LST group.[42] Of the schools that planned to offer the program, 64 percent planned to offer it in grades six to eight, and 36 percent planned to offer it in grades seven to nine.

38. Seven "schools" in the study are in fact pairs of schools (for example, a middle and a high school with atypical grade configurations) that are working together to offer LifeSkills Training across three grades (sixth through eighth or seventh through ninth). A paired school is considered one school for the purposes of the study.

39. The study schools are located in all regions of the state (northwest, northeast, central, southwest, south central, and southeast, as well as the Twin Cities).

40. The federal government defines an English learner as "an individual who has sufficient difficulty speaking, reading, writing, or understanding the English language to be denied the opportunity to learn successfully in classrooms where the language of instruction is English or to participate fully in the larger U.S. society." See National Center for Education Statistics (n.d.). For applications in the state of Minnesota, see Minnesota Department of Education (2023).

41. Information on school characteristics is only readily available for public schools.

42. This resulted in four random assignment blocks (two rounds by two grade configurations).

Table 2. Characteristics of Public Middle Schools in the United States, Minnesota, and the Study in the 2018-2019 School Year

Characteristic	U.S. Schools[a]	Minnesota Schools[a]	All Study Schools[b]
Title I–eligible school (%)	75	88	96
Alternative school (%)	8	18	5
Location (%)			
City	28	19	11
Suburb	27	23	7
Town	11	19	27
Rural	35	40	55
Enrollment (n)			
Total school enrollment	515	421	301
Students per middle school grade[c]	117	95	53
Student race/ethnicity (%)			
Black	16	11	6
Hispanic	23	9	9
White	51	67	74
Asian	3	4	3
Other	7	9	9
Student biological sex (%)			
Female	48	46	48
Male	52	54	52
Students eligible for free/reduced price lunch (%)	57	44	44
English learners (%)	7	6	7
Students with disabilities (%)	16	25	18
Students proficient on state tests[d] (%)			
Math	39	44	44
English Language Arts	46	54	53
Number of schools	26,323	621	55

(continued)

Table 2 (continued)

SOURCES: National Center for Education Statistics (2019); Office for Civil Rights (2018); U.S. Department of Education (2018).

NOTES: This table is based only on public schools in the United States and in the study because information on the characteristics of private schools is not readily available.

[a]Based on all public schools in the United States and Minnesota that serve students in grades six to eight or seven to nine.

[b]One public charter school in the study is not included in these results because it was not serving middle school students in the 2018-2019 school year, and one public school in the study is not included because it serves students from across several school districts and therefore is not included in the Common Core of Data maintained by the National Center for Education Statistics.

[c]Reported for sixth and seventh grades.

[d]Average proficiency rate on the math or English Language Arts state assessment in sixth and seventh grades in the spring of 2019.

As expected, schools in the LST group and the non-LST group had similar characteristics in SY 2018-2019, the year before the lotteries were conducted, which indicates that the random selection process resulted in two groups of schools that were comparable with each other before LifeSkills Training was implemented.[43]

Students in the Study

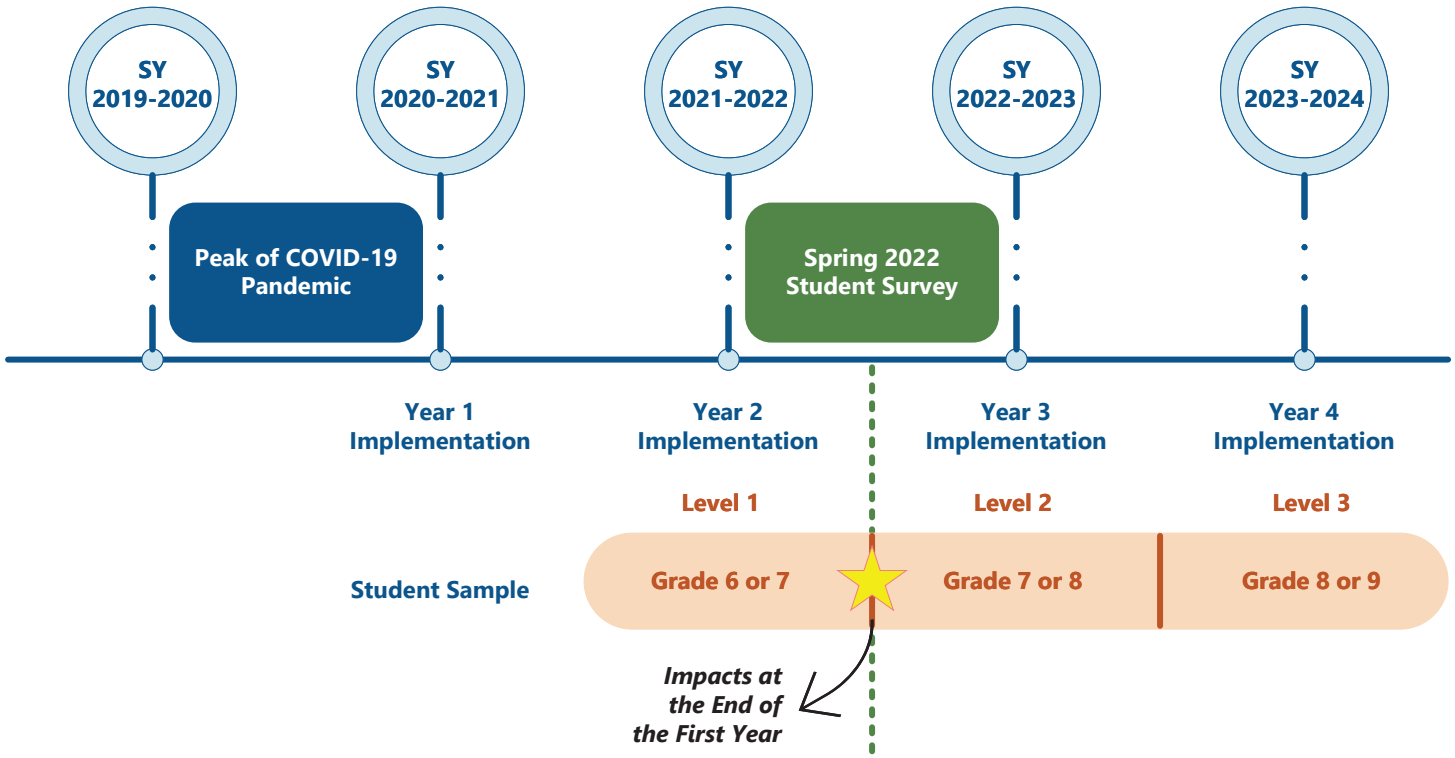
The target population for the study comprises students in the study schools who were in grades eligible to begin receiving Level 1 of LifeSkills Training in SY 2021-2022. As previously noted, schools in the LST group were expected to begin implementing the program in the fall of 2020. However, that was the first full school year of the COVID-19 pandemic, and at the time it was unclear whether schools would be able to implement the program, which is better suited for in-person instruction due to its interactive and role-play elements. For this reason, the study team decided to evaluate the effects of LifeSkills Training for the cohort of students who became eligible to start receiving the program in the fall of 2021 instead, with the expectation (or hope) that in-person instruction would have resumed at that point.[44]

Figure 2 illustrates the expected progression of students in the study through the LifeSkills Training curriculum. Students were expected to receive Level 1 of the program in SY 2021-2022, Level 2 in SY 2022-2023, and Level 3 in SY 2023-24. Students were intended to receive the program lessons in grades six to eight or seven to nine, depending on their school.

43. See Appendix Table B.3 for the characteristics of the study schools by research group.

44. A cohort is a group of participants who join a program at the same time and move through it together.

Figure 2. Intended Student Progression Through LifeSkills Training Levels



NOTE: SY = school year.

WAS LIFESKILLS TRAINING IMPLEMENTED AS INTENDED BY SCHOOLS THAT WERE OFFERED THE PROGRAM?

This section examines the extent to which LifeSkills Training was implemented with fidelity by schools in the LST group during the three school years that students in the study were intended to receive the program (SY 2021-2022, SY 2022-23, and SY 2023-24).

This period, especially the 2021-2022 school year, continued to be deeply affected by the COVID-19 pandemic. Across the country, schools faced staffing shortages and other challenges that limited their capacity to provide even core academic instruction, let alone a new intervention like LifeSkills Training. In Minnesota, chronic absenteeism increased from 14 percent in 2018 to 30 percent in 2022, reducing the amount of time that students were at school to receive in-person instruction.[45]

The study's implementation findings are summarized below. Not all schools in the LST group implemented the program, so the summary begins by looking at the number of schools that did and for how many years. This is followed by a discussion of how LifeSkills Training was implemented in those schools that did deliver the program. The section concludes by examining the amount of instruction provided to students across all schools in the LST group, including schools that did not implement the program. The findings presented in this section are based on surveys completed by instructors after each lesson, annual structured observations of classrooms conducted by local trained fidelity monitors, and records collected by DHS as part of their technical assistance to participating schools.[46]

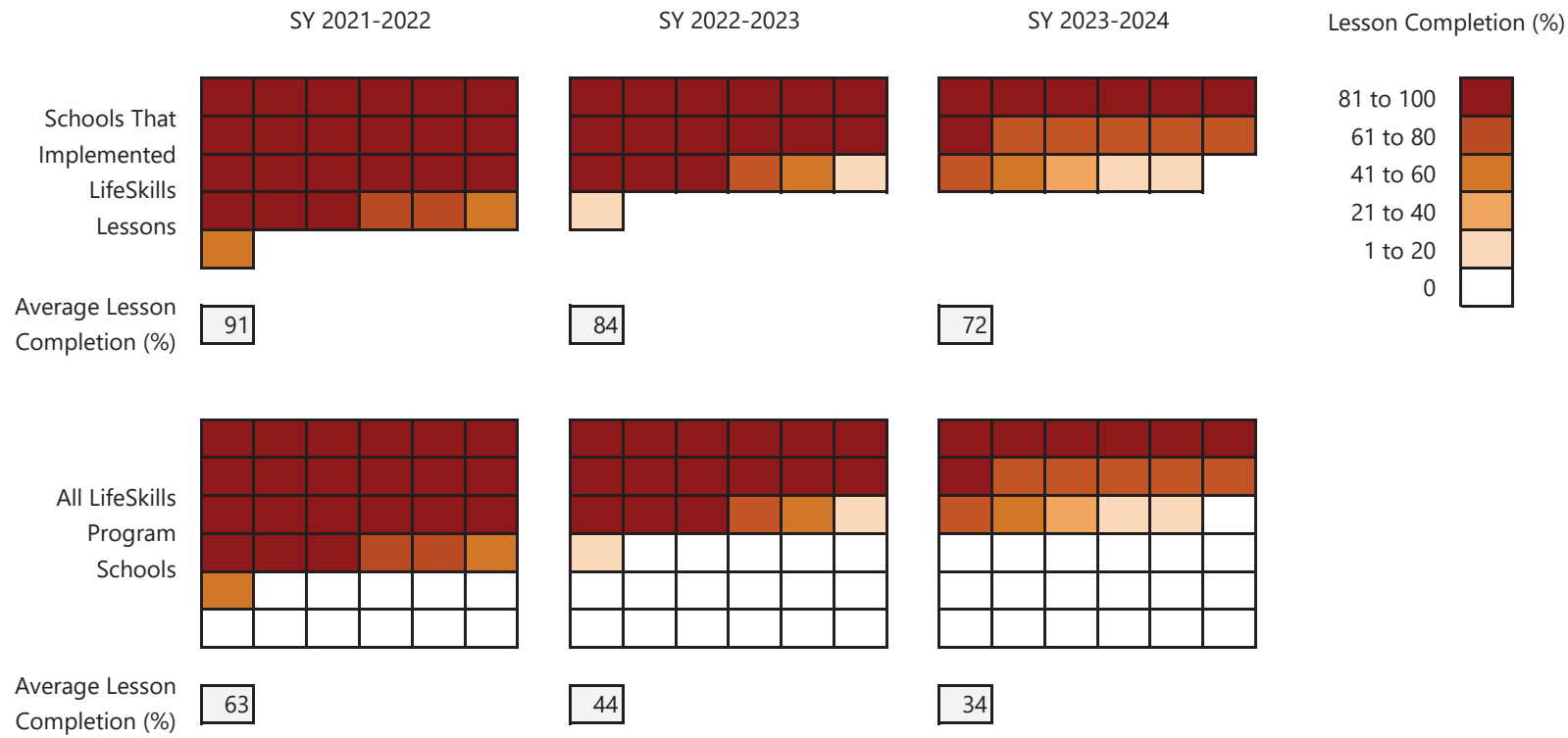
Program Participation Rates

- **A quarter of the schools in the LST group did not implement LifeSkills Training at all, and less than half implemented all three levels of the program.**

A number of schools in the LST group were unable to implement LifeSkills Training, and many were unable to sustain implementation for the entirety of the expected three-year period. Ultimately, 39 percent of schools (n = 14) provided all three levels of the program to students in the study, 17 percent (n = 6) provided the first two levels, 19 percent (n = 7) provided Level 1 only, and 25 percent (n = 9) did not provide the program at all.[47] Over time, there was a decrease in the number of schools in the LST group implementing the program, which is illustrated by the declining number of cells in the upper panel of Figure 3.

45. Return2LearnTracker (2024).
46. See also Appendix Tables C.1 through C.9 for more detailed findings by school year.
47. See Appendix Table C.1.

Figure 3. Proportion of LifeSkills Training Lessons That Schools Delivered on Average, by School Year



NOTE: SY = school year.

Based on email communications with school staff members and exit information collected by DHS, the most cited reason for not implementing the program (or halting implementation) was the challenge of finding staff to teach LifeSkills Training due to turnover related to the pandemic. However, three schools stopped implementing the program because they felt that that the curriculum was outdated and not culturally relevant to their students, and possibly for related reasons, one school stopped implementing LifeSkills Training to replace it with another program.

Implementation in Schools That Delivered the Program

- **In schools implementing LifeSkills Training, instructors were trained as expected.**

In implementing schools, all designated LifeSkills Training instructors completed the 6-hour online training. A total of 98 instructors were trained in advance of the 3 school years of the study, an average of 2 to 3 instructors per school in the LST group. On average across these school years, 73 percent of instructors were regular teachers, 23 percent were school counselors, and 4 percent were staff members in another role.

- **In schools implementing LifeSkills Training, teachers delivered the intended sequence of lesson activities and were rated as delivering the lessons with a high level of quality.**

On average across the study's 3 school years, class time in implementing schools was spent as intended: on a combination of lecture (33 percent), skills demonstration (17 percent), skills practice (17 percent), and discussion (33 percent).[48] For any given lesson, instructors completed 94 percent of the expected activities on average. The overall quality of instructor delivery of the lessons was rated as high by local fidelity monitors (an average score of 4 out of 5). This finding is consistent across a variety of quality dimensions, including knowledge of the content, level of enthusiasm, poise and confidence, rapport with students, ability to answer questions, and lesson clarity.

- **In schools implementing LifeSkills Training, students were present at school to receive the program, even during the school year most affected by the COVID-19 pandemic.**

Information on attendance rates was collected in SY 2021-2022, the school year when students in the study were slated to receive Level 1 of the program and the study year that was most affected by the COVID-19 pandemic. (Information about attendance was not collected for subsequent school years.) Instructors reported that, on average, the daily attendance rate in LifeSkills Training classes was 91 percent in SY 2021-2022, and therefore, chronic absenteeism was not an issue in the average study school. This suggests that in schools that implemented the program, the pandemic did not prevent students from being at school

48. From surveys administered to instructors after each lesson. See Appendix Table C.4 for percentages by school year.

in person to attend the lessons, which as noted earlier, were delivered as intended by the instructors.[49]

- **In schools implementing LifeSkills Training, a number of instructors reported that the program content is outdated and not engaging for students.**

As noted earlier, three schools in the LST group stopped implementing the program because instructors felt that the curriculum was outdated, and one school stopped implementing it to replace it with another intervention. In open-ended responses to surveys completed after each lesson, instructors in 33 percent of implementing schools noted that the lessons were not up-to-date or that the content was not engaging for students or both.[50] Instructors in two additional schools noted that they were unable to use program compact discs (CDs) because they did not have a CD player, a further indication of the outmoded nature of the program's materials. Instructor responses also suggest that the materials were not sufficiently differentiated across levels to keep students interested from one school year to the next.[51] DHS staff members who provided technical assistance to study schools also heard anecdotally from instructors that the materials were not current and that students were distracted by the dated nature of the videos and materials.

- **In schools implementing LifeSkills Training, most instructors did not update or change the lessons to make them more relevant to students.**

The core LifeSkills Training curriculum has remained relatively unchanged over time, so keeping the program relevant requires that instructors supplement or adapt the lessons — especially those related to drug resistance skills — with examples or activities relevant to present-day substance use patterns among adolescents (like vaping and the use of opioids) and to the ways that social media can influence perceptions.

On average across school years, only 23 percent of instructors reported adapting or modifying the lessons. The most common supplements were videos and PowerPoint presentations.[52] This suggests that, in schools implementing the program, the content received by students may not have been updated to reflect current substance use patterns or relevant topics.

During their technical assistance calls and observations, DHS staff members noted that in schools that implemented LifeSkills Training most successfully — and where students seemed

49. LST lessons are intended to be delivered in person to facilitate role playing and group discussion.

50. Out of the 27 schools that implemented the program for at least a year, 9 reported that the program was outdated or not engaging for students or both. On average across schools and school years, student engagement in the LST lessons was rated as 3.6 on a 5-point scale (between medium and high), suggesting that there is room for improvement. See Appendix Table C.7.

51. Instructors in two schools noted that students receiving Level 2 and Level 3 of the program were getting tired of the content. (For any given topic, the Level 2 and Level 3 booster lessons cover the same content as the Level 1 lessons.)

52. See Appendix Table C.8.

the most engaged—instructors had made extensive modifications to the core curriculum. Instructors who had previously taught the program also seemed to find it easier to deliver the lessons because they were able to reuse resources they had added in prior years.

- **In schools implementing LifeSkills Training, instructors completed most of the lessons, but lesson completion was lower for Levels 2 and 3.**

On average across schools, instructors taught most of the program lessons in any given school year, although lesson completion rates declined over time. The upper panel of Figure 3 shows the percentage of lessons completed by schools that implemented LifeSkills Training, by school year.[53] Each cell represents a study school that implemented the program during that school year. In SY 2021-2022, when students were receiving Level 1 of the program, implementing schools delivered 91 percent of the lessons on average. In SY 2022-2023 and SY 2023-2024, when students were intended to receive Level 2 and Level 3 of the program (the booster levels), implementing schools completed 84 percent and 72 percent of the lessons, respectively. In open-ended responses in the surveys completed after each lesson, instructors in two schools reported that students receiving the booster levels of LifeSkills Training were getting tired of the content, which may explain why, on average, instructors did not deliver as many lessons in later school years.

The duration of the LifeSkills Training lessons also decreased over time. In SY 2021-2022, instructors reported that a lesson took them 53 minutes to complete on average, which indicates that they were spending the expected amount of time on each lesson (each lesson includes one or two 45-minute sessions). However, in the subsequent two school years, the average duration of a LifeSkills Training lesson was lower, between 45 minutes and 47 minutes, possibly because instructors were able to move through the content of the booster level lessons more quickly or perhaps because students were less engaged.

In summary, the findings from this study indicate that LifeSkills Training was generally implemented as intended (that is, with fidelity to the model) in schools that delivered the program. Instructors were trained as intended, they taught most of the LifeSkills lessons in the curriculum, the quality of their delivery of the lessons was high, and students were present to experience much of the intended content. However, some instructors reported that the lessons were outdated and not sufficiently engaging, suggesting that there are issues related to the design of the program.

53. The last lesson delivered is determined as the latest lesson for which an instructor completed a survey or was observed teaching. This percentage should be viewed as a lower bound because instructors may have completed a lesson without submitting a survey.

Amount of Instruction Provided Across All Schools in the LST Group

- **Across all schools in the LST group, the average amount of instruction provided to students was less than intended because most schools did not implement the program for the expected three-year period.**

The lower panel of Figure 3 shows the percentage of lessons delivered in all 36 schools in the LST group, by school year, including in schools that did not implement the program. Non-implementing schools delivered zero lessons in the associated school year, and therefore, the average percentage of lessons delivered across all schools in the LST group (lower panel) is lower than among just the implementing schools (upper panel). In the first year of the program (SY 2021-2022), schools in the LST group delivered 63 percent of LifeSkills Training content on average. In later school years, when more schools ceased implementation, schools in the LST group provided less than half the intended content on average (44 percent in SY 2022-2023 and 34 percent in SY 2023-24).

Overall, these findings indicate that schools in the LST group provided less of the program's content than intended. Cumulatively, students in the LST group received an average of 15 hours of instruction across all 3 years of the study, or about half the intended 29 hours of instruction.

WAS COMPARABLE PROGRAMMING PROVIDED IN SCHOOLS THAT WERE NOT OFFERED LIFESKILLS TRAINING?

This section examines the extent to which schools in the non-LST group were using other substance-use-disorder-prevention or SEL programming. This uptake of other programs is important in this study because the effects of the program are being measured relative to the strategies used in non-LST schools. If schools in the non-LST group are also providing classroom-based prevention or SEL instruction, then it becomes more challenging for LifeSkills Training to improve student outcomes above and beyond other available approaches.

Information about the prevention and SEL strategies used by schools was collected through a survey of school principals that was administered online in the spring of 2024, the end of the intended third year of the program for students in the study, with principals asked to report on programming during SY 2023-2024. The survey was administered to principals in all schools in both the non-LST group and the LST group to make it possible to compare programming across the two groups. Only 24 principals (40 percent) completed the survey, however, so the findings reported here may not be representative of the strategies used by

schools in the full study sample.[54] In addition, a higher proportion of principals of schools in the LST group completed the survey compared with principals of schools in the non-LST group (44 percent versus 33 percent), and there are differences in the characteristics of participating schools across the two research groups.[55] Nonetheless, the results provide a useful look at the extent to which schools in the non-LST group were also implementing prevention or SEL programming.

The study's findings, which are based on the subset of school principals who responded to the survey, are summarized below.[56] These findings suggest that — as expected given current trends in school programming — most surveyed schools in the non-LST group were also providing classroom-based prevention or SEL programming to their students, an indication that in this study LifeSkills Training is being compared with other strategies now being provided by schools in this topic area.

- **Most schools in the non-LST group provided classroom-based instruction focused on substance-use-disorder prevention or social and self-management skills.**

Overall, 70 percent of school principal respondents in the non-LST group reported that their school provided students with information about substance use in a classroom-based setting in SY 2023-2024. Similarly, all respondents in the non-LST group (100 percent) reported that their school provided classroom-based instruction focused on helping students develop their self-management skills or their social skills.[57] These results are in line with a recent survey showing that a high proportion of schools in the United States are now offering SEL. In SY 2023-2024 (the same year the survey of school principals was conducted for the study), 83 percent of principals in a national survey reported that their school used an SEL curriculum.[58]

Most schools in the LST group reported offering prevention- or SEL-focused instruction or both. All respondents (100 percent) reported that they provided students with prevention-related information in a classroom-based setting in SY 2023-2024, and 88 percent reported providing classroom-based instruction focused on self-management and social skills.[59] By this point in time, about half the schools in the LST group were no longer implementing

54. Schools whose principals participated in the survey were somewhat more likely to be private schools (see Appendix Table B.2). However, the total number of schools is small.

55. For example, respondents in the LST group are more likely than respondents in the non-LST group to be principals of rural schools, and a higher proportion of their students are proficient on state tests. See Appendix Tables B.1 and B.4.

56. See Appendix Table D.1 for more detailed results.

57. Two schools in the non-LST group were implementing LifeSkills Training, but not with students in the study sample. Schools in the non-LST group were offered the curriculum materials in the fall of 2023, once the follow-up period for students in the study had concluded.

58. Skoog-Hoffman et al. (2024).

59. Compared with schools in the non-LST group, schools in the LST group are statistically more likely to report providing prevention-focused instruction. Differences across the study's two research groups with respect to SEL-focused instruction are not statistically significant. See Appendix Table D.1 for details.

LifeSkills Training, which suggests that these schools may have adopted another intervention or curriculum.[60]

- **Schools in the study used various modes of delivery to provide prevention-related information to students.**

Other than the classroom-based format, schools in the study reported conveying prevention-related information to students through whole-school events or activities (46 percent), small group interventions (46 percent), one-on-one interventions (63 percent), and after-school events (4 percent). The percentage of schools using these strategies was not statistically different across the two research groups.[61]

WHAT WERE THE EFFECTS OF LIFESKILLS TRAINING ON STUDENT OUTCOMES AT THE END OF THE FIRST YEAR OF THE PROGRAM?

This section examines the effects of LifeSkills Training on student outcomes in the spring of 2022 at the end of the first year of the program, when students were in grade six or seven. Effects on student outcomes are not expected after only one year, but the availability of an existing data source, the Minnesota Student Survey, makes it possible to take an early look at emerging patterns.[62]

The Minnesota Student Survey, which is administered every three years by the state, covers several youth development areas.[63] Of relevance to the study, the survey includes items pertaining to the immediate outcomes that LifeSkills Training is intended to change — students' perceptions about the risks of substance use and their peer and social resistance, self-management, and general social skills. The survey also includes items about the primary outcome targeted by the program — substance use — as well as mental health and aggressive behaviors, which, as mentioned previously, the program is also hypothesized to change.[64]

60. The proportion of schools in the school principals survey sample that did not implement the program is similar to the proportion in the full study sample that did not implement it. See Appendix Table B.2.
61. See Appendix Table D.1 for more detailed results.
62. In prior studies, the reported effects of LifeSkills Training after one year have been limited to an increase in knowledge about the consequences of drinking and drunkenness (Botvin, Griffin, Diaz, and Ifill-Williams, 2001) and reductions in delinquency (Botvin, Griffin, and Nicols, 2006).
63. The Minnesota Student Survey is a collaboration between the Minnesota Departments of Education, Health, Human Services, and Public Safety. For more background, see Minnesota Department of Education (n.d.).
64. The survey is anonymous. Parents and guardians can opt their child out of the survey.

The Minnesota Student Survey was most recently administered in the spring of 2022, toward the end of the first program year for students in the study.[65] All schools in Minnesota were provided with information about the survey and invited to participate. To encourage participation by the study schools, MMB and DHS sent several reminders to those schools to administer the survey to students in the study (students in sixth or seventh grade, depending on the school).

Due to the ongoing challenges posed by the COVID-19 pandemic, however, only about half the study schools (28 schools, 47 percent) participated in the 2022 Minnesota Student Survey. The study schools that did participate are all public schools, and they are likely to be in rural areas.[66] Thus, the findings presented here may not be generalizable to the full study sample. Nonetheless, school participation rates were similar across the two research groups (47 percent in LST schools and 46 percent in non-LST schools), and the characteristics of LST schools and non-LST schools that administered the survey are comparable, which indicates that differences in student outcomes across the two groups at the end of the first program year can be reasonably attributed to the effects of the program.[67]

The effects of LifeSkills Training at the end of the first program year were examined for the subset of students in the study who took the survey in 2022 and who provided information on all outcomes of interest.[68] A total of 932 students are included in the analysis, representing 62 percent of all students enrolled in the study grades in schools that participated in the survey.[69]

Important for determining the causal effects of LifeSkills Training, the characteristics of students in the survey sample were similar across the two research groups in the spring of 2022, when the survey was administered.[70] Of note, a little over a quarter of students in the survey sample (28 percent) reported having a long-term mental, behavioral, or emotional problem, and 12 percent reported having a parent who drinks too much or uses drugs. These levels are comparable with statewide averages.[71] About 27 percent of students in the survey

65. Minnesota Student Survey Interagency Team (2022).
66. See Appendix Table B.2 for a comparison.
67. See Appendix Table B.5 for the characteristics of schools in the LST group and the non-LST group that did administer the survey.
68. These outcomes are students' perceptions of substance use risk; their social resistance skills, self-management skills, and general social skills; whether they have ever used tobacco, alcohol, or marijuana; whether they have exhibited an aggressive behavior in the last year; and whether they have experienced a negative mental health outcome in the last year.
69. Response rates were similar across research groups (63 percent in LST schools and 61 percent in non-LST schools). See Appendix Table B.1 for more information about response rates.
70. See Appendix Table B.6 for information on the characteristics of students in the survey sample by research group. It is not possible to compare the characteristics of survey respondents and nonrespondents because information on the characteristics of the latter group is not available.
71. Statewide, 26 percent of middle school students reported having a long-term mental health, behavioral, or emotional problem, and 9 percent reported that a parent drinks too much or uses drugs. See Minnesota Student Survey Interagency Team (2022).

sample reported having a parent or guardian that had ever been incarcerated, which is higher than the statewide average of 17 percent for middle school students.[72]

As discussed earlier, the impact findings in this section should be interpreted as the effect of being enrolled in a school that was *offered the opportunity* to receive LifeSkills Training, as opposed to the effect of being enrolled in a school that actually implemented the program. This is because almost a third (31 percent) of schools in the LST group in the survey sample did not provide Level 1 of the program to their students in SY 2021-2022.[73]

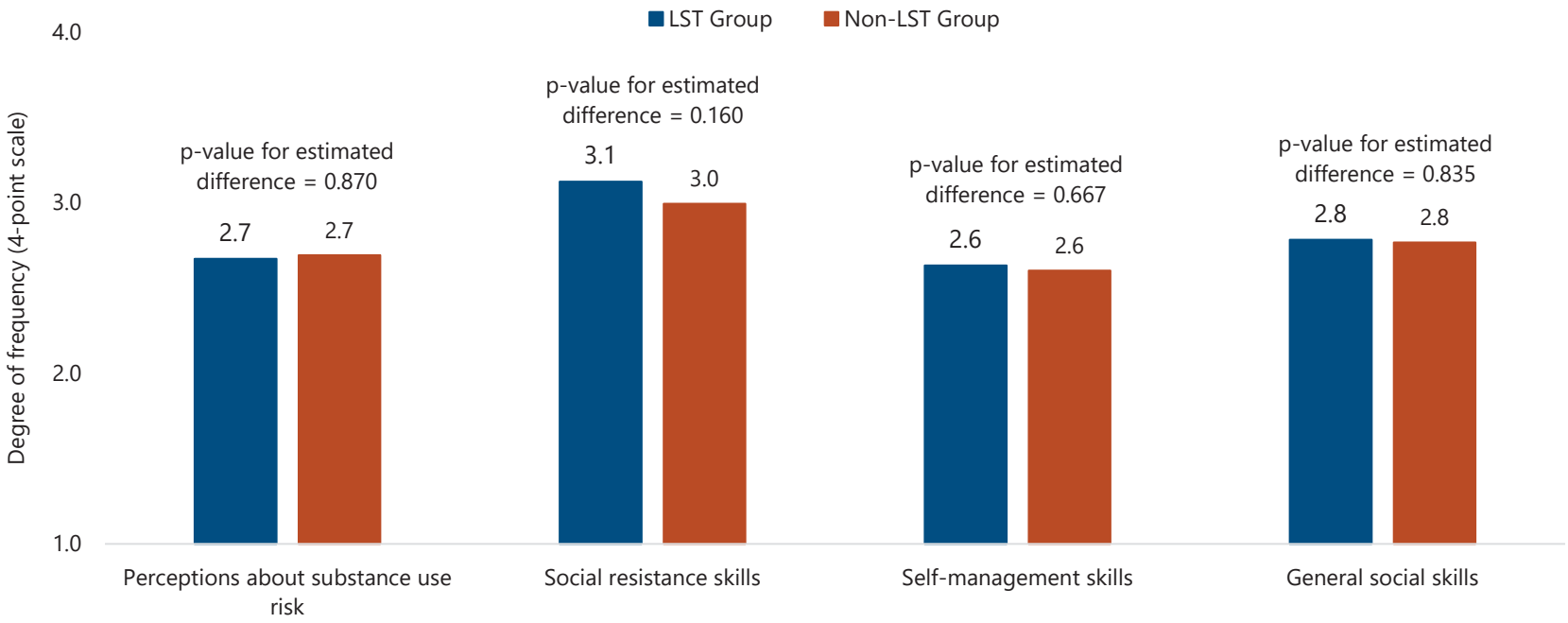
The study's impact findings are summarized below. Overall, no effects of enrolling in a school that was offered LifeSkills Training had materialized at the end of the first year. The differences between the outcomes of students in the LST group and the outcomes of students in the non-LST group — which reflect the program's impacts — are not statistically significant, although patterns were observed with respect to reduced aggressive behaviors and improved mental health.[74] Given low school-level participation in the 2022 Minnesota Student Survey, these findings should be interpreted with caution as they may not be generalizable to all study schools and students.

- **At the end of the first year of the program, the social resistance and social and self-management skills of students in schools in the LST group were similar to those of students in schools in the non-LST group.**

At the end of the first year of the program, the immediate outcomes that LifeSkills Training intends to improve — students' perceptions about substance use risks and students' social resistance, social, and self-management skills — were similar for the two research groups (see Figure 4).[75] On average, students in both groups rated substance use as "slightly" to "moderately" risky (an average score of 2.7 out of 4).[76] Students in both groups rated themselves as able to resist bad influences and risky situations "often" (3 out of 4).[77] Both

72. Minnesota Student Survey Interagency Team (2022)
73. In general, schools that participated in the Minnesota Student Survey were more likely to have implemented the program than schools in the full study sample. See Appendix Table C.2 for more information.
74. The effects of the program were also examined by grade (sixth or seventh grade), by biological sex (male or female), and by race/ethnicity (White only or other). No discernable meaningful and consistent differences across subgroups were found, with the exception that effects on reducing some aggressive behaviors were larger for students in grade seven than for those in grade six.
75. See Appendix Tables E.1 and E.2 for more detailed results.
76. The perceptions score is based on a student's average across five items: How much do you think people risk harming themselves if they... smoke one or more packs of cigarettes a day; drink an alcoholic beverage once or twice a week; use marijuana once or twice a week; use prescription drugs not prescribed for them; vape or use e-cigarettes (1 = no risk, 2 = slight risk, 3 = moderate risk, 4 = great risk).
77. The resistance score is based on a student's average across two items: I stay away from bad influences; I say no to things that are dangerous or unhealthy (1 = not at all or rarely, 2 = sometimes, 3 = often, 4 = almost always).

Figure 4. Students' Perceptions of Substance Use Risk and Their Social and Self-Management Skills at the End of the First Program Year



NOTES: Differences between the LST and non-LST groups are not statistically significant at the 10 percent level.

Perceptions about substance use risk | Student's average score across five items: How much do you think people risk harming themselves if they... smoke one or more packs of cigarettes a day; drink an alcoholic beverage once or twice a week; use marijuana once or twice a week; use prescription drugs not prescribed for them; vape or use e-cigarettes (1 = no risk, 2 = slight risk, 3 = moderate risk, 4 = great risk).

Social resistance skills | Student's average score across two items: I stay away from bad influences; I say no to things that are dangerous or unhealthy (1 = not at all or rarely, 2 = sometimes, 3 = often, 4 = almost always).

Self-management skills | Student's average score across five items: I deal with disappointment without getting too upset; I find ways to deal with things that are hard in my life; I plan ahead and make good choices; I can shape and influence what happens in my life and future; I think about what I want to do with my life when I grow up. (1 = not at all or rarely, 2 = sometimes, 3 = often, 4 = almost always).

General social skills | Student's average score across five items: I build friendships with other people; I resolve conflict without anyone getting hurt; I accept people who are different from me; I am sensitive to the needs and feelings of others; I express feelings in proper ways (1 = not at all or rarely, 2 = sometimes, 3 = often, 4 = almost always).

groups of students reported that they were "somewhat" to "very" able to self-manage their behavior (2.6 out of 4) and to build and maintain relationships with others (2.8 out of 4).[78] The differences in outcomes between students in the LST group and the non-LST group are not statistically significant. Of note, the average outcome levels for students in the sample are comparable with those of middle school students in the state of Minnesota as a whole, indicating that the study sample is in line with state-level trends.[79]

- **At the end of the first year of the program, students in schools in the LST group reported levels of substance use similar to those of students in schools in the non-LST group.**

At the end of the first year of the program, differences in tobacco, alcohol, and marijuana initiation rates between students in the LST group and the non-LST group are small and not statistically significant (see Figure 5). Nor were there any notable differences between the two groups with respect to the frequency or intensity of consumption.[80]

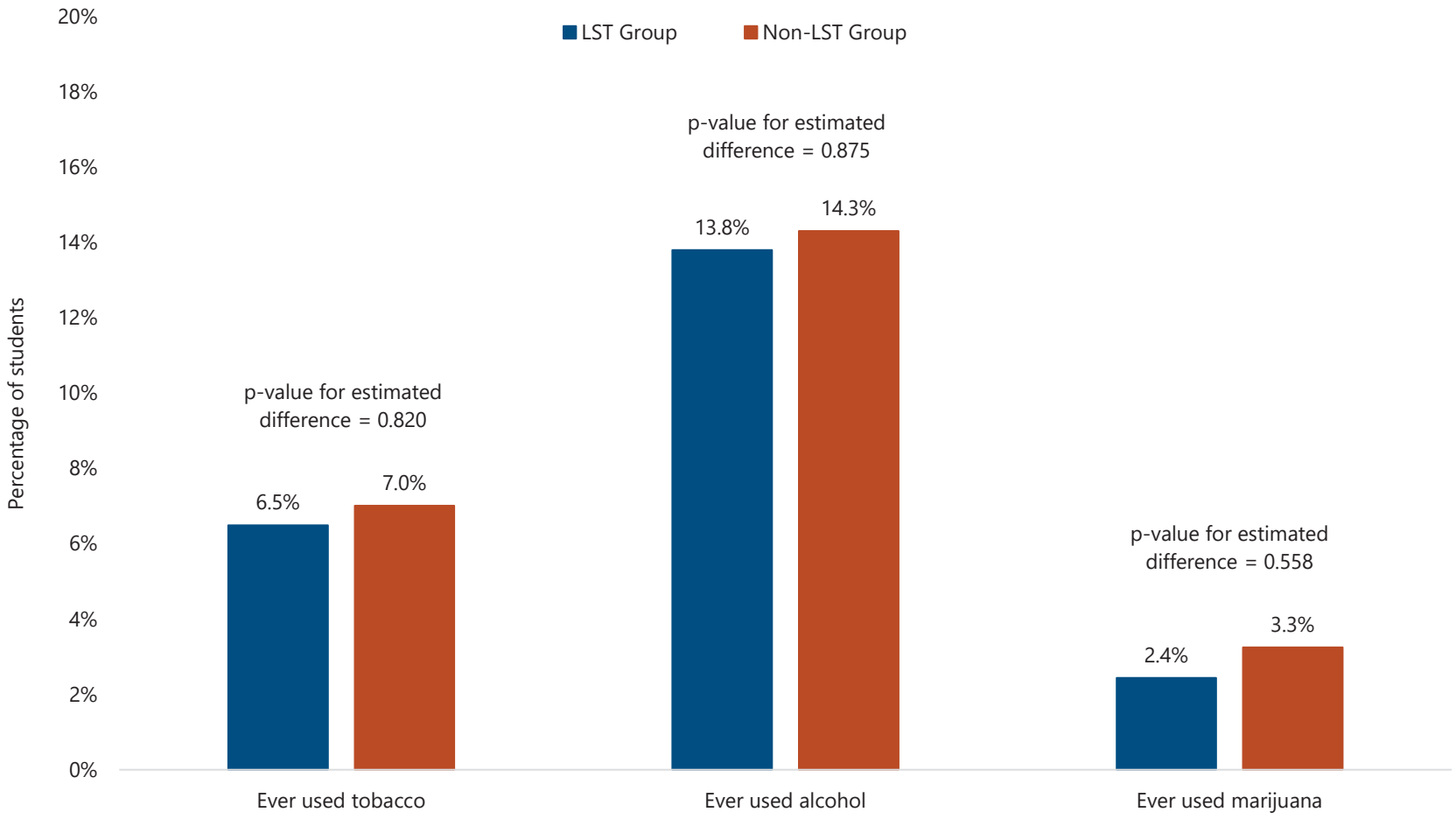
The substance most likely to have been tried by students is alcohol—14 percent of students in both research groups reported having ever consumed alcohol. About 6 percent to 7 percent of students in both groups reported having tried a tobacco product, and 2 percent to 3 percent of students reported having tried marijuana. Students in the sample were less likely to report having ever used these substances than students in Minnesota as a whole. For example, 14 percent of students in the study reported having ever consumed alcohol, compared with 19 percent in the state.[81] This may be due to a difference in age: students in the study are in sixth or seventh grade, whereas most other schools in the state administered the survey to eighth-graders.

- **Students in schools in the LST group reported fewer negative mental health outcomes and fewer aggressive behaviors than students in schools in the non-LST group, but these differences are not statistically significant.**

In general, students in the LST group consistently reported more favorable mental health and behavioral outcomes than students in the non-LST group (see Figure 6).[82] Students in

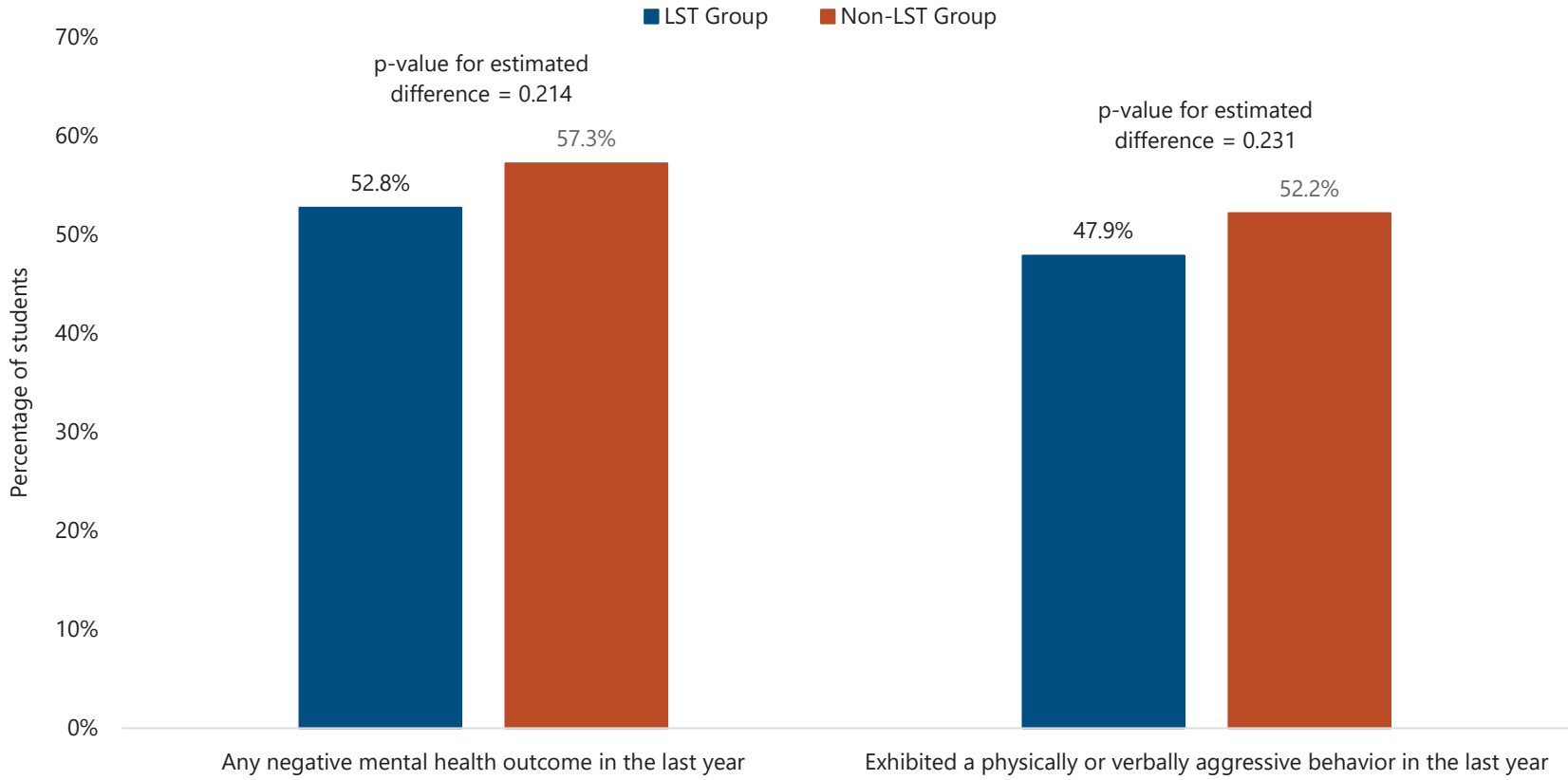
78. The self-management score is based on a student's average across five items: I deal with disappointment without getting too upset; I find ways to deal with things that are hard in my life; I plan ahead and make good choices; I can shape and influence what happens in my life and future; I think about what I want to do with my life when I grow up (1 = not at all or rarely, 2 = sometimes, 3 = often, 4 = almost always). The relationships score is based on a student's average across five items: I build friendships with other people; I resolve conflict without anyone getting hurt; I accept people who are different from me; I am sensitive to the needs and feelings of others; I express feelings in proper ways (1 = not at all or rarely, 2 = sometimes, 3 = often, 4 = almost always).
79. Minnesota Student Survey Interagency Team (2022).
80. See Appendix Tables E.3 through E.7 for more detailed results and additional outcomes.
81. Minnesota Student Survey Interagency Team (2022).
82. As specified in the registered preanalysis plan for this study, to reduce the risk of "false positives" due to multiple hypothesis testing, inferences in this report are based on composite (or summary) measures of mental health and aggressive behaviors. See Somers (2020). Appendix Tables E.8 and E.9 include results for the specific outcomes included in the summary measures.

Figure 5. Substance Use at the End of the First Program Year



NOTE: Differences between the LST group and the non-LST group for suicide ideation are statistically significant at the 10 percent level.

Figure 6. Mental Health and Aggressive Behaviors at the End of the First Program Year



NOTES: Differences between the LST group and the non-LST group are statistically significant at the 10 percent level.

Students are considered to have had a negative mental health outcome if they reported any of the following: self-injury in the last year, suicide ideation in the last year, suicide attempt in the last year, treatment for mental health in the last year, frequent anxiety (seven days or more in the last two weeks), frequent depression (seven days or more in the last two weeks), or infrequent positive perceptions of self and future (never or rarely/sometimes).

Students are considered to have exhibited a physically or verbally aggressive behavior if they reported engaging in at least one of the following behaviors in the last year: hit or punched someone; damaged property or stole; pushed/slapped/kicked someone when they weren't kidding around; threated to beat someone up; spread mean lies or rumors about someone; made sexual jokes or gestures or comments toward someone; excluded someone from friends, other students, or activities.

the LST group were less likely to report a negative mental health outcome in the past year — including frequent anxiety or depression, negative perceptions of self, suicide ideation and attempts, or treatment for a mental health problem — than students in the non-LST group (53 percent compared with 57 percent).[83] Students in the LST group were also less likely to report exhibiting an aggressive behavior in the last year — hitting or punching someone, damaging or stealing property, or verbally bullying or harassing someone — compared with students in the non-LST group (48 percent compared with 52 percent).

The differences between groups on these summary measures are not statistically significant. Nonetheless, the findings suggest that mental health and aggressive behaviors are areas where effects may emerge in the high school follow-up for this study.[84] Effects on these outcomes will be examined again in the next report to determine whether they are real and sustained.

Of note, average mental health outcomes for students in the sample are comparable with those for middle school students in the state of Minnesota as a whole.[85] However, students in the sample were more likely to report an aggressive behavior than the average middle school student in Minnesota.[86]

CONCLUSION

The next report for this evaluation will examine the effects of LifeSkills Training when students are nearing the end of high school — in eleventh or twelfth grade. At that time, students will have entered a stage in their development when they will be more likely to use tobacco, alcohol, and other substances.[87] Studies of LifeSkills Training conducted in the 1980s and 1990s found meaningful reductions in substance use at the end of high school.[88]

83. Students are coded as having a negative mental health outcome if they reported any of the following: frequent anxiety (seven days or more in the last two weeks), frequent depression (seven days or more in the last two weeks), infrequent positive perceptions of self and future (not at all, rarely, somewhat or sometimes), suicide ideation in the last year, suicide attempt in the last year, and treatment for mental health in the last year.
84. Specific outcomes where effects may emerge in high school are anxiety levels, suicide ideation, and reports of theft and property damage. Differences between the LST group and the non-LST group for these outcomes were statistically significant at the 10 percent level. See Appendix Tables E.3 and E.4.
85. Minnesota Student Survey Interagency Team (2022).
86. For example, 18 percent of eighth-grade students in Minnesota reported damaging or stealing property, compared with 26 percent of students in the sample. See Minnesota Student Survey Interagency Team (2022).
87. For example, based on the results of the 2022 Minnesota Student Survey, 36 percent of eleventh-grade students reported consuming alcohol compared with 19 percent of eighth-grade students. See Minnesota Student Survey Interagency Team (2022).
88. As noted in the introduction to this report, more recent studies of LifeSkills Training have not followed students to the end of high school.

Taken together, the findings in this report suggest that the effects of LifeSkills Training on substance use at the end of high school may be smaller in this study than in earlier studies of the program, for several reasons.[89] First, a significant proportion of students in the LST group did not receive the program because a quarter of the LST schools did not implement LifeSkills Training and because most schools did not deliver all three levels of the program.[90] Second, unlike 40 years ago, when LifeSkills training first became available, many schools now offer classroom-based SEL to their students, thereby reducing the extent to which LifeSkills Training can contribute to the changing of students' classroom experiences and their outcomes relative to what they would have experienced otherwise. Third, the content of the LifeSkills Training lessons is widely perceived as outmoded and not sufficiently relevant for today's students, which may dampen students' engagement with the lessons and hinder their ability to apply what they learn. Although the COVID-19 pandemic played a role in preventing some schools from consistently implementing the program, perceptions about the content of the lessons would have been applicable even in a nonpandemic context, suggesting that the program may not be a good fit for all schools. Of note, the Minnesota Department of Human Services will not be continuing with LifeSkills Training in the state for various reasons, including its dated content and the limitation that it is only offered in English.[91]

Thus, this report's findings raise important practical and policy questions about the design of LifeSkills Training and other substance-use-disorder-prevention programs for adolescents. How can educational technology and digital tools be effectively incorporated into the design of programs (for example, as a means of keeping the content up to date across multiple languages and of enabling students to engage with the materials outside school)? What is the optimal approach that would allow teachers to make local modifications to the content to improve its relevance to their students while also maintaining program fidelity and quality? Now that social and emotional learning is more prevalent in schools, should

89. The study is still expected to be able to statistically detect program effects on substance use in high school, as long as they are meaningfully sized. The effect of the program on tobacco initiation in twelfth grade in prior studies was 0.304, expressed as an effect size. The present study can detect an effect size on tobacco initiation, the primary outcome for this study, as small as 0.241, which is smaller than the effects found by prior studies. Effect size is a metric widely used for gauging whether the magnitude of a program's impact is large or small. It is defined as the estimated effect of a program divided by the standard deviation of the outcome of interest. For example, an effect size of 0.20 represents an improvement in outcomes that is equal to 20 percent of the standard deviation distribution for that particular outcome.

90. In earlier studies of LifeSkills Training, all schools implemented the intervention to some extent, so study students received a greater portion of the program on average. For example, in the study conducted in New York State, the average amount of intervention content delivered by the study schools was 68 percent. See Botvin et al. (1990). In the current study, 47 percent of the intended content was delivered by schools in the LST group across school years.

91. Email correspondence with MMB staff members (June 12, 2024, and December 17, 2024). LifeSkills Training was not continued because of feedback from schools that the program is only offered in English and is not aligned with current substance use patterns among adolescents. The state was also seeking a program that has a digital/online component enabling updates to its content. There is now a hybrid version of LifeSkills Training—called "eLST"—that combines digital learning modules with in-person class sessions, but it is unclear whether the content of the modules and in-person sessions has been updated.

substance-abuse-disorder-prevention programs include an SEL component, or can they be paired with existing SEL programs? How can booster lessons be designed to reinforce previously learned content while at the same time providing students with new and engaging information?

The next report for this evaluation will continue to explore these questions and will also examine the effects of LifeSkills Training at the end of high school on students' substance use and on their mental health and aggressive behaviors. These latter outcomes have been examined in prior studies but not at the end of high school, so the next report will contribute to strengthening the body of evidence about this aspect of the program. The first-year effects presented in this report are encouraging in this regard. For the broad U.S. student population, indicators of poor mental health such as feelings of sadness and hopelessness, have shown increases over the last 15 years, making it especially relevant to identify interventions that promote emotional well-being.[92] Because not all schools in the LST group in this study implemented the LifeSkills Training program, the next report will also examine its effects for students enrolled in the subset of middle schools where the program was at least partially implemented.[93]

Although the next report will not be released until 2029, another ongoing study of LifeSkills Training, also funded by Arnold Ventures, is being conducted in Colorado and Ohio, and the findings from that evaluation will be available sooner.[94] That study, also a school-level randomized controlled trial, is evaluating the effect of the high school version of the program.[95] A total of 47 high schools are participating: 26 schools were randomly assigned to implement LifeSkills Training in the first semester of ninth grade (fall 2021), and the remaining 21 schools were assigned to a non-LST control group. Students in the study are being surveyed multiple times up to the fall of eleventh grade (fall 2023). Over the next few years, this study of the high school program in Colorado and Ohio, along with the present study of the middle school program in Minnesota, will contribute to updating the evidence base about the effects of LifeSkills Training in a contemporary context, and by doing so, build knowledge about effective strategies for helping today's students develop the skills they need to make healthier decisions in high school and beyond.

92. U.S. Centers for Disease Control and Prevention (2021).

93. More specifically, it will examine the effects of being enrolled in a school that implemented the program (that is, of the "treatment on the treated"). Treatment-on-the-treated estimates are not presented in this report because the first-year effects of being enrolled in any school in the LST group are not statistically significant (which means that treatment-on-the-treated estimates would also not be statistically significant).

94. See Hill and Steeger (2021).

95. The high school version includes 10 lessons, each running from 40 minutes to 45 minutes, that are intended to be delivered over a single semester.

APPENDIX

A

LifeSkills Training Program Information

Appendix Table A.1. Lessons in the LifeSkills Training Middle School Program, by Level

Lesson Name	Level 1	Level 2	Level 3
Drug resistance skills			
Smoking myths and realities	1		
Smoking and biofeedback	1		
Alcohol myths and realities	1		
Marijuana myths and realities	1		
Advertising	1		
Drug abuse and violence: causes and effects		1	
Drug abuse: causes and effects			1
Media influences		1	1
Violence and the media	1		
Resisting peer pressure		2	1
Personal self-management skills			
Self-image and self-improvement	1		
Coping with anxiety	2	2	1
Coping with anger	1	1	1
Making decisions	2	1	1
Social skills			
Communication skills	1	1	
Social skills A	1		
Social skills B	1		
Social skills		1	1
Assertiveness	2	1	1
Resolving conflicts	1	1	1

NOTES: Shading indicates that the lesson topic is taught in the associated level. The number in each cell represents the number of class periods (sessions) for each lesson. The content of a given lesson is the same across all levels.

APPENDIX

B

Survey Response Rates and the Characteristics of Participating Schools

Appendix Table B.1. Proportions of Study Schools and Students That Participated in the Surveys, by Research Group

Survey Administration	LST Schools	Non-LST Schools	Estimated Difference	P-Value
Minnesota Student Survey				
School participation rate (%)	47.2	45.8	1.4	0.918
Schools that participated (total = 28)	17	11		
Study schools (total = 60)	36	24		
Student response rate in participating schools (%)	62.5	60.9	1.7	0.685
Students in analysis sample (total = 932)	616	316		
Students enrolled in study grades (total = 1,504)	985	519		
Study survey of school principals				
School participation rate (%)	44.4	33.3	11.1	0.398
Schools that participated (total = 24)	16	8		
Study schools (total = 60)	36	24		

SOURCES: Minnesota Student Survey Interagency Team (2022); study survey administered to school principals in the spring of 2024.

NOTE: This table is based only on public schools in the United States and in the study because information on the characteristics of private schools is not readily available.

Appendix Table B.2. Characteristics of Schools in the Study, by Their Participation in Surveys

Characteristic	All Study Schools	Study Schools Participating in the Principals Survey	Study Schools Participating in the Student Survey
School type (%)			
Public	95	88	100
Regular	65	58	79
Charter	30	29	21
Private	5	13	0
Number of schools	60	24	28
Public school characteristics[a]			
Title I–eligible school (%)	96	95	100
Alternative school (%)	5	8	4
Location (%)			
City	11	10	4
Suburb	7	5	4
Town	27	35	18
Rural	55	50	75
Enrollment			
Total school enrollment	301	298	278
Students per middle school grade[b]	53	66	46
Student race/ethnicity (%)			
Black	6	8	2
Hispanic	9	12	10
White	74	67	76
Asian	3	2	1
Other	9	11	11
Student biological sex (%)			
Female	48	48	49
Male	52	52	51
Students eligible for free/reduced lunch (%)	44	46	43
English learners (%)	7	2	3
Students with disabilities (%)	18	21	17
Students proficient on state tests[c] (%)			
Math	44	44	43
English Language Arts	53	52	51
Number of schools	55	20	28

(continued)

Appendix Table B.2 (continued)

SOURCES: Minnesota Student Survey Interagency Team (2022); National Center for Education Statistics (2019); Office for Civil Rights (2018); U.S. Department of Education (2018).

NOTES: This table is based only on public schools in the United States and in the study because information on the characteristics of private schools is not readily available.

[a]These characteristics are reported for public schools only due to data availability. One public charter school in the study is not included in these results because it was not serving middle school students in the 2018-2019 school year, and one public school in the study is not included because it serves students from across several school districts and therefore is not included in the Common Core of Data.

[b]Reported for sixth and seventh grades.

[c]Average proficiency rate on the math or English Language Arts state assessment in sixth and seventh grades in the spring of 2019.

Appendix Table B.3. Baseline Characteristics of All Study Schools, by Research Group

Characteristic	LST Group	Non-LST Group	Estimated Difference	Effect Size	P-Value
School type (%)					
Public	97.2	92.1	5.1	0.23	0.365
Regular	69.4	58.7	10.8	0.22	0.395
Charter	27.8	33.4	-5.6	-0.12	0.653
Private	2.8	7.9	-5.1	-0.23	0.365
Number of schools (total = 60)	36	24			
Public school characteristics[a]					
Title I–eligible school (%)	97.1	94.7	2.3	0.12	0.670
Alternative school (%)	5.6	4.2	1.3	0.06	0.825
Location (%)					
City	11.8	10.9	0.8	0.03	0.926
Suburb	5.9	10.4	-4.5	-0.17	0.529
Town	32.4	19.7	12.6	0.28	0.319
Rural	50.0	58.9	-8.9	-0.17	0.503
Enrollment					
Total school enrollment	307.3	300.6	6.7	0.00	0.893
Students per middle school grade[b]	61.1	41.9	19.2	0.39	0.214
Student race/ethnicity (%)					
Black	4.8	8.2	-3.3	-0.14	0.535
Hispanic	10.4	6.1	4.3	0.15	0.325
White	71.1	77.4	-6.3	-0.14	0.366
Asian	3.5	1.6	1.9	0.12	0.574
Other	10.1	6.7	3.4	0.12	0.287
Student biological sex (%)					
Female	47.3	49.2	-1.9	-0.04	0.105
Male	52.7	50.8	1.9	0.04	0.105
Students eligible for free/reduced lunch (%)	45.7	40.6	5.2	0.10	0.391
English learners (%)	10.2	1.7	8.5 *	0.34	0.098
Students with disabilities (%)	15.9	22.7	-6.8	-0.17	0.147
Students proficient on state tests[c] (%)					
Math	44.4	43.0	1.4	0.03	0.791
English Language Arts	51.8	54.0	-2.1	-0.04	0.670
Number of schools (total = 55)	34	21			

(continued)

Appendix Table B.3 (continued)

SOURCES: National Center for Education Statistics (2019); Office for Civil Rights (2018); U.S. Department of Education (2018).

NOTES: Estimated differences are regression-adjusted using an ordinary least squared model, controlling for the blocking of random assignment. The LST schools value is the unadjusted mean for schools randomly assigned to the LST group. The non-LST schools value is calculated as the difference between the LST schools value and the estimated difference.

A two-tailed t-test was applied to estimated differences. The statistical significance is indicated as follows: *** = 1 percent; ** = 5 percent; * = 10 percent.

Rounding may cause slight discrepancies in calculating sums and differences.

[a]These characteristics are reported for public schools only due to data availability. One public charter school is not included because it was not serving middle school students in the 2018-2019 school year, and one public school is not included because it serves students from across several school districts and therefore is not included in the Common Core of Data.

[b]Reported for sixth and seventh grades.

[c]Average proficiency rate on the math or English Language Arts state assessment in sixth and seventh grades in the spring of 2019.

Appendix Table B.4. Baseline Characteristics of the Study Schools that Participated in the Principals Survey, by Research Group

Characteristic	LST Group	Non-LST Group	Estimated Difference	Effect Size	P-Value
School type (%)					
Public	93.8	83.7	10.0	0.29	0.478
Regular	75.0	29.2	45.8 **	0.98	0.043
Charter	18.8	54.5	-35.7	-0.77	0.108
Private	6.3	16.3	-10.0	-0.29	0.478
Number of schools (total = 24)	16	8			
Public school characteristics[a]					
Title I–eligible school (%)	100.0	83.3	16.7	0.74	0.130
Alternative school (%)	6.3	12.3	-6.0	-0.20	0.654
Location (%)					
City	0.0	33.3	-33.3	-1.17	0.022
Suburb	7.1	0.0	7.1	0.30	0.527
Town	35.7	33.3	2.4	0.05	0.924
Rural	57.1	33.3	23.8	0.44	0.355
Enrollment					
Total school enrollment	340.4	187.7	152.6	n/a	0.112
Students per middle school grade[b]	85.0	16.1	68.9	1.78	0.033
Student race/ethnicity (%)					
Black	1.9	21.2	-19.3	-0.75	0.097
Hispanic	12.7	10.4	2.2	0.06	0.757
White	69.7	61.9	7.8	0.16	0.554
Asian	1.9	2.2	-0.3	-0.02	0.867
Other	13.8	4.2	9.6	0.30	0.290
Student biological sex (%)					
Female	46.9	51.4	-4.4 **	-0.09	0.014
Male	53.1	48.6	4.4 **	0.09	0.014
Students eligible for free/reduced lunch (%)	42.7	51.9	-9.2	-0.18	0.400
English learners (%)	3.2	0.0	3.3	0.21	0.105
Students with disabilities (%)	12.3	37.9	-25.6 **	-0.64	0.022
Students proficient on state testsc (%)					
Math	50.5	30.7	19.8 **	0.39	0.030
English Language Arts	56.8	41.0	15.7 **	0.30	0.033
Number of schools (total = 20)	14	6			

(continued)

Appendix Table B.4 (continued)

SOURCES: National Center for Education Statistics (2019); Office for Civil Rights (2018); U.S. Department of Education (2018).

NOTES: Estimated differences are regression-adjusted using an ordinary least squared model. The LST schools value is the unadjusted mean for schools randomly assigned to the LST group. The non-LST schools value is calculated as the difference between the LST schools value and the estimated difference.

A two-tailed t-test was applied to estimated differences. The statistical significance is indicated as follows: *** = 1 percent; ** = 5 percent; * = 10 percent.

Rounding may cause slight discrepancies in calculating sums and differences.

[a]These characteristics are reported for public schools only due to data availability. One public charter school is not included because it was not serving middle school students in the 2018-2019 school year, and one public school is not included because it serves students from across several school districts and therefore is not included in the Common Core of Data.

[b]Reported for sixth and seventh grades.

[c]Average proficiency rate on the math or English Language Arts state assessment in sixth and seventh grades in the spring of 2019.

Appendix Table B.5. Baseline Characteristics of the Study Schools That Participated in the Minnesota Student Survey, by Research Group

Characteristic	LST Group	Non-LST Group	Estimated Difference	Effect Size	P-Value
School type (%)					
Public	100.0	100.0	0.0	0.00	0.397
Regular	76.5	83.1	-6.7	-0.15	0.702
Charter	23.5	16.9	6.7	0.15	0.702
Private	0.0	0.0	0.0	n/a	n/a
Number of schools (total = 28)	17	11			
Public school characteristics[a]					
Title I–eligible school (%)	100.0	100.0	0.0	0.00	0.551
Alternative school (%)	5.9	0.0	5.9	0.30	0.448
Location (%)					
City	5.9	-0.4	6.3	0.32	0.397
Suburb	5.9	-0.4	6.3	0.32	0.397
Town	23.5	5.9	17.6	0.44	0.250
Rural	64.7	94.9	-30.2	-0.68	0.056
Enrollment					
Total school enrollment	286.5	262.6	23.9	0.00	0.667
Students per middle school grade[b]	46.8	41.7	5.0	0.10	0.749
Student race/ethnicity (%)					
Black	2.0	1.2	0.8	0.06	0.475
Hispanic	12.5	5.4	7.2	0.24	0.351
White	70.6	84.7	-14.2	-0.33	0.091
Asian	1.4	0.6	0.8	0.08	0.410
Other	13.5	8.1	5.4	0.17	0.323
Student biological sex (%)					
Female	48.2	49.2	-1.0	-0.02	0.561
Male	51.8	50.8	1.0	0.02	0.561
Students eligible for free/reduced lunch (%)	46.3	39.1	7.2	0.14	0.326
English learners (%)	5.5	0.2	5.3	0.28	0.244
Students with disabilities (%)	15.2	19.2	-4.0	-0.10	0.352
Students proficient on state testsc (%)					
Math	42.5	43.8	-1.3	-0.03	0.830
English Language Arts	48.8	55.2	-6.4	-0.12	0.358
Number of schools (total = 28)	17	11			

(continued)

Appendix Table B.5 (continued)

SOURCES: National Center for Education Statistics (2019); Office for Civil Rights (2018); U.S. Department of Education (2018).

NOTES: Estimated differences are regression-adjusted using an ordinary least squared model, controlling for the blocking of random assignment. The LST schools value is the unadjusted mean for schools randomly assigned to the LST group. The non-LST schools value is calculated as the difference between the LST schools value and the estimated difference.

A two-tailed t-test was applied to estimated differences. The statistical significance is indicated as follows: *** = 1 percent; ** = 5 percent; * = 10 percent.

Rounding may cause slight discrepancies in calculating sums and differences.

[a]These characteristics are reported for public schools only due to data availability. One public charter school is not included because it was not serving middle school students in the 2018-2019 school year, and one public school is not included because it serves students from across several school districts and therefore is not included in the Common Core of Data.

[b]Reported for sixth and seventh grades.

[c]Average proficiency rate on the math or English Language Arts state assessment in sixth and seventh grades in the spring of 2019.

Appendix Table B.6. Characteristics of Students in the Middle School Survey Analysis Sample, by Research Group

Student Characteristics	LST Group	Non-LST Group	Estimated Difference	Effect Size	P-Value
Age	12.1	12.1	0.0	-0.005	0.955
Grade (%)					
Grade 6	62.8	62.8	0.0	0.000	1.000
Grade 7	37.2	37.2	0.0	0.000	1.000
Biological sex (%)					
Female	51.8	50.1	1.6	0.032	0.746
Male	48.2	49.9	-1.6	-0.032	0.746
Gender identity (%)					
Cisgender	85.0	88.6	-3.5	-0.100	0.243
Not cisgender[a]	15.0	11.4	3.5	0.100	0.243
Racial/ethnic group (%)					
White	68.7	80.9	-12.3	-0.275	0.171
Non-White/multiple	31.3	19.1	12.3	0.275	0.171
Has an individualized education plan (%)	10.6	12.9	-2.3	-0.069	0.513
Long-term mental, behavioral, or emotional problem (%)	27.0	29.5	-2.4	-0.052	0.618
Home learning resources (%)					
One or more bookcase(s) of books	68.6	71.1	-2.5	-0.052	0.719
Internet at home	97.4	97.8	-0.4	-0.022	0.772
Access to a computer	90.4	85.3	5.1	0.154	0.321
Access to a tablet	63.1	62.5	0.6	0.011	0.907
Access to a smartphone	88.3	89.6	-1.4	-0.042	0.538
Socioeconomic characteristics (%)					
Does not have their own bedroom	14.3	16.0	-1.6	-0.045	0.689
Skipped meals (last 30 days)	2.8	6.7	-4.0 *	-0.202	0.057
Homeless/in shelter (last 12 months)	7.1	7.1	-0.1	-0.002	0.984
Parent/guardian characteristics (%)					
Ever incarcerated	25.5	24.9	0.6	0.012	0.921
Drinks too much or uses drugs	12.7	8.9	3.8	0.115	0.148
Depressed/mental health issues	24.7	28.0	-3.4	-0.074	0.457
Number of students (total = 932)	616	316			
Number of schools (total = 28)	17	11			

SOURCE: Minnesota Student Survey Interagency Team (2022).

(continued)

Appendix Table B.6 (continued)

NOTES: Estimated differences between students in schools assigned to the LST group and the non-LST group are regression-adjusted using a two-level model (students nested in schools), controlling for the blocking of random assignment. The LST group value is the unadjusted mean for the students in schools randomly assigned to the LST group. The non-LST group value is calculated as the difference between the LST group value and the estimated difference.

Rounding may cause slight discrepancies in calculating sums and differences.

The effect size is calculated as the estimated difference divided by the pooled within-group standard deviation for that characteristic, with a small sample size correction for students and schools (Hedges' g). A two-tailed t-test was applied to estimated differences.

The statistical significance is indicated as follows: *** = 1 percent; ** = 5 percent; * = 10 percent.

The sample sizes reported here are for the full middle school survey sample. Due to missing values, the number of students included varies by characteristic. The percentage of students with missing data ranges from 0 percent to 3 percent for all characteristics except having an individualized education plan (data are missing for 28 percent of students).

[a]Transgender, gender-fluid, nonbinary, agender, unsure.

APPENDIX

C

Program Participation and Implementation Fidelity

Appendix Table C.1. LifeSkills Training Levels Provided to Students in the Study Sample by School Year, Schools in the LST Group

Level(s) Provided	School Year LST Was Implemented			Number of Schools (% of LST Group)
	SY 2021-2022	SY 2022-2023	SY 2023-2024	
Schools that provided Levels 1, 2, and 3	Level 1	Level 2	Level 3	14 (39%)
Schools that provided Levels 1 and 2	Level 1	Level 2		3 (8%)
	Level 1		Level 2[a]	2 (6%)
		Level 1[b]	Level 2[a]	1 (3%)
Schools that provided Level 1 only	Level 1			6 (17%)
		Level 1[b]		1 (3%)
Schools that did not implement				9 (25%)
Number of schools implementing LST (% of LST Group)	25 (69%)	19 (53%)	17 (47%)	36

NOTES: [a]Students in these schools received Level 2 a grade level later than intended.
[b]Students in these schools received Level 1 a grade level later than intended.

Appendix Table C.2. Distribution of Schools in the LST Group by Number of Years of LifeSkills Training Provided, for the Full Study Sample and the Survey Samples

LST Program Implementation (% schools)	All Schools in the LST Group	Schools in the Principals Survey	Schools in the Middle School Follow-Up	Schools in the High School Follow-Up
Implemented all 3 levels	39	38	59	54
Implemented Levels 1 and 2	17	25	6	21
Implemented Level 1 only	19	19	18	21
Did not implement any level	25	19	18	4
Number of schools	36	16	17	24

SOURCE: Monitoring records from the Minnesota Department of Human Services.

Appendix Table C.3. LifeSkills Training Instructor Characteristics

Implementation Feature	SY 2021-2022	SY 2022-2023	SY 2023-2024
Instructor role (surveys) (%)			
Regular teacher	79.5	81.8	66.7
Counselor	20.2	18.2	25.0
Principal	0.0	0.0	0.0
Substitute	0.0	0.0	0.0
Other	0.3	0.0	8.3
Number of schools with lesson surveys	22	16	12
Number of lesson surveys completed	371	139	86

SOURCE: Study surveys administered to instructors after each lesson.

NOTES: SY = school year.

Due to delays in the start of program implementation, not all schools implemented Level 2 in SY 2022-2023 and Level 3 in SY 2023-2024. Findings for each school year are therefore based on the LifeSkills Training level that students received at their school in a given year. In SY 2021-2022, all schools offered Level 1 of the curriculum to students in the study. In SY 2022-2023, 12 percent of schools with implementation data offered Level 1 to students in the study, and 88 percent offered Level 2. In SY 2022-2023, 25 percent of schools with implementation data offered Level 2 to students in the study, and 75 percent offered Level 3.

Appendix Table C.4. LifeSkills Training Class Size and Instructional Format

Implementation Feature	SY 2021-2022	SY 2022-2023	SY 2023-2024
Class size (from observations)	21.5	19.3	n/a
Percentage of time by instructional format (from surveys)			
Lecture	33.0	35.9	29.7
Discussion	33.2	33.2	31.4
Demonstration	17.0	15.7	19.6
Practice	16.7	15.1	19.4
Percentage of time by instructional format (from observations)			
Lecture	34.9	34.9	n/a
Discussion	33.2	36.5	n/a
Demonstration	14.5	14.0	n/a
Practice	17.5	14.7	n/a
Number of schools with lesson surveys	22	16	12
Number of lesson surveys completed	371	139	86
Number of schools observed	20	14	n/a
Number of classes observed	94	41	n/a

SOURCES: Study surveys administered to instructors after each lesson; classroom observations conducted by fidelity observers. Observations were not conducted in SY 2023-2024.

NOTES: SY = school year; n/a = not available.

Due to delays in the start of implementation, not all schools implemented Level 2 in SY 2022-2023 and Level 3 in SY 2023-2024. Findings for each school year are therefore based on the LifeSkills level that students received at their school in a given year. In SY 2021-2022, all schools offered Level 1 of the curriculum to students in the study. In SY 2022-2023, 12 percent of schools with implementation data offered Level 1 to students in the study, and 88 percent offered Level 2. In SY 2022-2023, 25 percent of schools with implementation data offered Level 2 to students in the study, and 75 percent offered Level 3.

Appendix Table C.5. Quality Ratings of LifeSkills Training Lesson Delivery

Implementation Feature	SY 2021-2022	SY 2022-2023	SY 2023-2024
Rating of lesson quality (1-5)			
Knowledge of program lesson/content	4.3	4.4	n/a
Level of enthusiasm	4.1	4.3	n/a
Poise and confidence	4.3	4.5	n/a
Rapport and communication with students	4.2	4.3	n/a
Classroom management	4.1	4.3	n/a
Effectively addressed questions/concerns	4.1	4.3	n/a
Overall quality of the program session	4.1	4.3	n/a
Lesson clarity	4.3	4.6	n/a
Number of schools observed	20	14	n/a
Number of classes observed	94	41	n/a

SOURCE: Classroom observations conducted by fidelity observers. Observations were not conducted in SY 2023-2024.

NOTES: SY = school year; n/a = not available.

Due to delays in the start of program implementation, not all schools implemented Level 2 in SY 2022-2023 and Level 3 in SY 2023-2024. Findings for each school year are therefore based on the LifeSkills level that students received at their school in a given year. In SY 2021-2022, all schools offered Level 1 of the curriculum to students in the study. In SY 2022-2023, 12 percent of schools with implementation data offered Level 1 to students in the study, and 88 percent offered Level 2. In SY 2022-2023, 25 percent of schools with implementation data offered Level 2 to students in the study, and 75 percent offered Level 3.

Appendix Table C.6. LifeSkills Training Lessons Taught and Dosage

Implementation Feature	SY 2021-2022	SY 2022-2023	SY 2023-2024
Length of lessons (minutes)			
From lesson surveys	59.6	47.4	46.4
From classroom observations	41.1	45.2	n/a
Number of lessons taught (surveys and observations)			
Lessons covered (%)	91.3	83.7	72.2
Final lesson in the level was surveyed or observed (%)	47.8	47.1	50.0
Instructional hours delivered	12.3	8.0	5.4
Pacing during each lesson (observations)			
Rating of whether lesson kept on time (1-5)	4.4	4.4	n/a
Expected activities completed in a given lesson (%)	93.7	95.5	n/a
Student attendance rate during lessons (surveys) (%)	91.2	n/a	n/a
Amount of instruction received by students (%)			
Curriculum received by students[a]	79.2	n/a	n/a
Hours of instruction received by students[b]	8.7	n/a	n/a
Number of schools with lesson surveys	22	16	12
Number of lesson surveys completed	371	139	86
Number of schools observed	20	14	n/a
Number of classrooms observed	94	41	n/a

SOURCES: Study surveys administered to instructors after each lesson; classroom observations conducted by fidelity observers. Observations were not conducted in SY 2023-2024.

NOTES: SY = school year; n/a = not available.

Due to delays in the start of program implementation, not all schools implemented Level 2 in SY 2022-2023 and Level 3 in SY 2023-2024. Findings for each school year are therefore based on the LifeSkills level that students received at their school in a given year. In SY 2021-2022, all schools offered Level 1 of the curriculum to students in the study. In SY 2022-2023, 12 percent of schools with implementation data offered Level 1 to students in the study, and 88 percent offered Level 2. In SY 2022-2023, 25 percent of schools with implementation data offered Level 2 to students in the study, and 75 percent offered Level 3.

[a]Calculated by multiplying the student attendance rate for each school by the percentage of lessons taught at each school.

[b]Calculated by multiplying the student attendance rate for each school by the number of lessons taught at each school and the average lesson length at each school.

Appendix Table C.7. Student Engagement During LifeSkills Training Lessons

Implementation Feature	SY 2021-2022	SY 2022-2023	SY 2023-2024
From lesson surveys			
Level of students actively participating (1-4)	3.1	3.4	3.4
Level of student engagement (1-5)	3.8	3.4	n/a
From classroom observations			
Student responsiveness (1-5)	3.9	4.1	n/a
Student participation (1-5)	3.9	3.8	n/a
Student understanding (1-5)	4.0	3.8	n/a
Number of schools with lesson surveys	22	16	n/a
Number of lesson surveys completed	371	139	n/a
Number of schools observed	20	14	n/a
Number of classes observed	94	41	n/a

SOURCES: Surveys administered to instructors after each lesson; classroom observations conducted by fidelity observers. Observations were not conducted in SY 2023-2024.

NOTES: SY = school year; n/a = not available.

Due to delays in when schools started program implementation, not all schools implemented Level 2 in SY 2022-2023 and Level 3 in SY 2023-2024. Findings for each school year are therefore based on the LifeSkills level that students received at their school in a given year. In SY 2021-2022, all schools offered Level 1 of the curriculum to students in the study. In SY 2022-2023, 12 percent of schools with implementation data offered Level 1 to students in the study, and 88 percent offered Level 2. In SY 2022-2023, 25 percent of schools with implementation data offered Level 2 to students in the study, and 75 percent offered Level 3.

Appendix Table C.8. LifeSkills Training Lesson Modifications and Supplements

Implementation Feature (%)	SY 2021-2022	SY 2022-2023	SY 2023-2024
Lesson was adapted or changed (surveys)	21.7	30.4	17.6
Supplements used (observations)			
PowerPoint presentations	37.9	10.2	n/a
Videos	19.3	5.4	n/a
Quizzes	1.3	3.6	n/a
Non-LST handouts	4.3	3.6	n/a
Other textbook information	7.4	1.0	n/a
Activities created or obtained from other sources	14.4	8.9	n/a
Guest speakers/testimonials	1.0	0.0	n/a
Teacher omitted LST activities	3.6	3.6	n/a
Other supplement	0.4	1.0	n/a
No supplements used	49.7	66.1	n/a
Number of schools with lesson surveys	22	16	12
Number of lesson surveys completed	371	139	86
Number of schools observed	20	14	n/a
Number of classes observed	94	41	n/a

SOURCES: Study surveys administered to instructors after each lesson; classroom observations conducted by fidelity observers. Observations were not conducted in SY 2023-2024.

NOTES: SY = school year; n/a = not available.

Due to delays in the start of program implementation, not all schools implemented Level 2 in SY 2022-2023 and Level 3 in SY 2023-2024. Findings for each school year are therefore based on the LifeSkills level that students received at their school in a given year. In SY 2021-2022, all schools offered Level 1 of the curriculum to students in the study. In SY 2022-2023, 12 percent of schools with implementation data offered Level 1 to students in the study, and 88 percent offered Level 2. In SY 2022-2023, 25 percent of schools with implementation data offered Level 2 to students in the study, and 75 percent offered Level 3.

Appendix Table C.9. Challenges Encountered During LifeSkills Training Lesson Delivery

Implementation Feature (%)	SY 2021-2022	SY 2022-2023	SY 2023-2024
From lesson surveys			
Missing materials	3.1	1.7	4.2
Not enough time	15.2	6.9	0.0
Classroom management/student misbehavior	30.3	12.9	0.6
Confusing content	9.8	0.0	0.0
Technical issues	0.6	0.0	0.6
Other	8.6	8.8	23.6
None reported	54.8	68.6	71.0
From classroom observations			
Lack of materials	0.0	0.0	n/a
Shortage of time	10.0	5.1	n/a
Student misbehavior	11.9	3.6	n/a
Inadequate classroom facility	0.0	0.0	n/a
Other problems	1.7	3.6	n/a
None observed	77.5	87.8	n/a
Number of schools with lesson surveys	22	16	12
Number of lesson surveys completed	371	139	86
Number of schools observed	20	14	n/a
Number of classes observed	94	41	n/a

SOURCES: Study surveys administered to instructors after each lesson; classroom observations conducted by fidelity observers. Observations were not conducted in SY 2023-2024.

NOTES: SY = school year; n/a = not available.

Due to delays in the start of program implementation, not all schools implemented Level 2 in SY 2022-2023 and Level 3 in SY 2023-2024. Findings for each school year are therefore based on the LifeSkills level that students received at their school in a given year. In SY 2021-2022, all schools offered Level 1 of the curriculum to students in the study. In SY 2022-2023, 12 percent of schools with implementation data offered Level 1 to students in the study, and 88 percent offered Level 2. In SY 2022-2023, 25 percent of schools with implementation data offered Level 2 to students in the study, and 75 percent offered Level 3.

APPENDIX

D

Programming for Substance Use Disorder Prevention and Social and Emotional Learning in the Study Schools

Appendix Table D.1. Programming for Substance Use Disorder Prevention and Social and Emotional Learning in the Study Schools, by Research Group

Programming in SY 2023-24	LST Group	Non-LST Group	Estimated Difference	P-Value
Substance use disorder prevention				
School provided prevention-related information about substance use	100.0	85.7	14.3	0.125
Delivery format				
Classroom-based instruction	100.0	69.6	30.4 **	0.014
Whole-school events or activities	56.3	21.0	35.3	0.152
Small group counseling or interventions	56.3	20.2	36.0	0.134
One-on-one counseling or interventions	68.8	43.8	25.0	0.296
After-school events or activities	6.3	0.5	5.7	0.550
Social and emotional learning				
School provided classroom-based instruction on self-management and social skills	87.5	100.0	-12.5	0.248
Number of schools (total = 24)	16	8		

SOURCE: Study survey of school principals, spring of 2024.

NOTES: SY = school year.

Estimated differences are regression-adjusted using an ordinary least squared model, controlling for the blocking of random assignment. The LST group value is the unadjusted mean for schools randomly assigned to the LST group. The non-LST group value is calculated as the difference between the LST schools value and the estimated difference.

A two-tailed t-test was applied to estimated differences. The statistical significance is indicated as follows: *** = 1 percent; ** = 5 percent; * = 10 percent.

Rounding may cause slight discrepancies in calculating sums and differences.

APPENDIX

E

Student Outcomes at the End of the First Year of the Program

Appendix Table E.1. Students' Perceptions of Substance Use Risk and Their Social Resistance Skills, by Research Group

Student Outcome	LST Group	Non-LST Group	Estimated Difference	Effect Size	P-Value
Perceptions about substance use risk (4-point scale)[a]					
Student's perceptions	2.7	2.7	0.0	-0.018	0.870
Student's friends (as judged by student)	3.4	3.5	0.0	-0.052	0.549
Student's parents (as judged by student)	3.5	3.6	-0.1	-0.063	0.401
Perceptions about alcohol risk for youth (5-point scale)[b]					
Student's perceptions	4.4	4.6	-0.1 *	-0.134	0.066
Students at school (as judged by student)	4.2	4.1	0.0	0.033	0.723
Social resistance skills (4-point scale)[c]	3.1	3.0	0.1	0.158	0.160
Number of students (total = 932)	616	316			
Number of schools (total = 28)	17	11			

SOURCE: Minnesota Student Survey Interagency Team (2022).

NOTES: Estimated differences between students in schools assigned to the LST group and the non-LST group are regression-adjusted using a two-level model (students nested in schools), controlling for the blocking of random assignment. The LST group value is the unadjusted mean for the students in schools randomly assigned to the LST group. The non-LST group value is calculated as the difference between the LST group value and the estimated difference.

Rounding may cause slight discrepancies in calculating sums and differences.

The effect size is calculated as the estimated difference divided by the pooled within-group standard deviation for that characteristic, with a small sample size correction for students and schools (Hedges' g). A two-tailed t-test was applied to estimated differences. The statistical significance is indicated as follows: *** = 1 percent; ** = 5 percent; * = 10 percent.

The sample sizes reported here are for the full middle school survey sample. Due to missing values, the number of students included varies by outcome. The percentage of students with missing data ranges from 0 percent to 2 percent.

[a]Based on a student's average score across five items: How much do YOU/YOUR FRIENDS/YOUR PARENTS think people risk harming themselves if they... smoke one or more packs of cigarettes a day; drink an alcoholic beverage once or twice a week; use marijuana once or twice a week; use prescription drugs not prescribed for them; vape or use e-cigarettes (1 = no risk, 2 = slight risk, 3 = moderate risk, 4 = great risk). Cronbach's alpha is 0.96 for all three constructs. Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. It is considered to be a measure of scale reliability. The closer Cronbach's alpha is to 1, the higher the internal consistency.

[b]Based on the following two questions: How much do YOU/MOST STUDENTS AT YOUR SCHOOL feel about the following statement: Drinking alcohol is never a good thing for someone my age to do (1 = strongly disagree, 2 = disagree, 3 = neither agree or disagree, 4 = agree, 5 = strongly agree).

[c]Based on a student's average score across two items: I stay away from bad influences; I say no to things that are dangerous or unhealthy (1 = not at all or rarely, 2 = sometimes, 3 = often, 4 = almost always). Cronbach's alpha is 0.64.

Appendix Table E.2. Students' Self-Management and General Social Skills, by Research Group

Student Outcome	LST Group	Non-LST Group	Estimated Difference	Effect Size	P-Value
Self-management skills (4-point scale)[a]	2.6	2.6	0.0	0.047	0.667
Coping skills[b]	2.5	2.4	0.0	0.050	0.570
Decision-making skills[c]	2.7	2.7	0.0	0.047	0.674
General social skills (4-point scale)[d]	2.8	2.8	0.0	0.026	0.835
Number of students (total = 932)	616	316			
Number of schools (total = 28)	17	11			

SOURCE: Minnesota Student Survey Interagency Team (2022).

NOTES: Estimated differences between students in schools assigned to the LST group and the non-LST group are regression-adjusted using a two-level model (students nested in schools), controlling for the blocking of random assignment. The LST group value is the unadjusted mean for the students in schools randomly assigned to the LST group. The non-LST group value is calculated as the difference between the LST group value and the estimated difference.

Rounding may cause slight discrepancies in calculating sums and differences.

The effect size is calculated as the estimated difference divided by the pooled within-group standard deviation for that characteristic, with a small sample size correction for students and schools (Hedges' g). A two-tailed t-test was applied to estimated differences. The statistical significance is indicated as follows: *** = 1 percent; ** = 5 percent; * = 10 percent.

The sample sizes reported here are for the full middle school survey sample. Due to missing values, the number of students included varies by outcome. The percentage of students with missing data ranges from 0 percent to 1 percent.

[a]Based on a student's average score across the five items included in the coping subscale and decision-making subscale (1 = not at all or rarely, 2 = sometimes, 3 = often, 4 = almost always). Cronbach's alpha is 0.72. Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. It is considered to be a measure of scale reliability. The closer Cronbach's alpha is to 1, the higher the internal consistency.

[b]Student's average score across two items: I deal with disappointment without getting too upset; I find ways to deal with things that are hard in my life. Cronbach's alpha is 0.68.

[c]Student's average score across three items: I plan ahead and make good choices; I can shape and influence what happens in my life and future; I think about what I want to do with my life when I grow up. Cronbach's alpha is 0.57.

[d]Based on a student's average score across five items: I build friendships with other people; I resolve conflict without anyone getting hurt; I accept people who are different from me; I am sensitive to the needs and feelings of others; I express feelings in proper ways (1 = not at all or rarely, 2 = sometimes, 3 = often, 4 = almost always). Cronbach's alpha is 0.69.

Appendix Table E.3. Students' Tobacco Use, by Research Group

Student Outcome	LST Group	Non-LST Group	Estimated Difference	Effect Size	P-Value
Ever used tobacco (initiation) (%)	6.5	7.0	-0.5	-0.020	0.820
Used tobacco in the last 30 days (%)	4.4	4.0	0.4	0.017	0.875
Frequency of tobacco use in the last 30 days (number of days)					
Cigarettes	0.1	0.0	0.0	0.021	0.777
Cigars	0.1	0.1	-0.1	-0.044	0.625
Chewing tobacco/snuff/dip	0.1	0.1	0.0	-0.013	0.871
E-cigarettes	0.2	0.1	0.1	0.054	0.552
Hookah/waterpipe	0.1	0.0	0.1	0.066	0.409
Number of students (total = 932)	616	316			
Number of schools (total = 28)	17	11			

SOURCE: Minnesota Student Survey Interagency Team (2022).

NOTES: Estimated differences between students in schools assigned to the LST group and the non-LST group are regression-adjusted using a two-level model (students nested in schools), controlling for the blocking of random assignment. The LST group value is the unadjusted mean for the students in schools randomly assigned to the LST group. The non-LST group value is calculated as the difference between the LST group value and the estimated difference. Rounding may cause slight discrepancies in calculating sums and differences.

The effect size is calculated as the estimated difference divided by the pooled within-group standard deviation for that characteristic, with a small sample size correction for students and schools (Hedges' g). A two-tailed t-test was applied to estimated differences. The statistical significance is indicated as follows: *** = 1 percent; ** = 5 percent; * = 10 percent.

The sample sizes reported here are for the full middle school survey sample. Due to missing values, the number of students included varies by outcome. The percentage of students with missing data ranges from 0 percent to 1 percent.

Appendix Table E.4. Students' Alcohol Use, by Research Group

Student Outcome	LST Group	Non-LST Group	Estimated Difference	Effect Size	P-Value
Ever consumed alcohol (initiation) (%)	13.8	14.3	-0.5	-0.014	0.875
Alcohol use in the last 12 months					
Consumed any alcohol (%)	6.9	6.8	0.1	0.004	0.956
Number of times alcohol consumed	0.3	0.4	-0.1	-0.039	0.577
Alcohol use in the last 30 days					
Consumed any alcohol (%)	3.7	3.8	-0.1	-0.005	0.946
Number of days alcohol consumed	0.2	0.1	0.1	0.052	0.506
Any binge drinking in the last 30 days[a] (%)	1.1	0.4	0.7	0.074	0.386
Number of students (total = 932)	616	316			
Number of schools (total = 28)	17	11			

SOURCE: Minnesota Student Survey Interagency Team (2022).

NOTES: Estimated differences between students in schools assigned to the LST group and the non-LST group are regression-adjusted using a two-level model (students nested in schools), controlling for the blocking of random assignment. The LST group value is the unadjusted mean for the students in schools randomly assigned to the LST group. The non-LST group value is calculated as the difference between the LST group value and the estimated difference. Rounding may cause slight discrepancies in calculating sums and differences.

The effect size is calculated as the estimated difference divided by the pooled within-group standard deviation for that characteristic, with a small sample size correction for students and schools (Hedges' g). A two-tailed t-test was applied to estimated differences. The statistical significance is indicated as follows: *** = 1 percent; ** = 5 percent; * = 10 percent.

The sample sizes reported here are for the full middle school survey sample. Due to missing values, the number of students included varies by outcome. The percentage of students with missing data ranges from 0 percent to 1 percent.

[a]Binge drinking is defined as 4 (female) or 5 (male) drinks in a row within a couple of hours. Frequent binge drinking is defined as binge drinking on 10 or more occasions.

Appendix Table E.5. Students' Marijuana Use, by Research Group

Student Outcome	LST Group	Non-LST Group	Estimated Difference	Effect Size	P-Value
Ever used marijuana (initiation) (%)	2.4	3.3	-0.8	-0.049	0.558
Marijuana use in the last 12 months					
Used any marijuana (%)	1.5	1.8	-0.3	-0.023	0.812
Number of times marijuana used	0.2	0.1	0.1	0.036	0.602
Marijuana use in the last 30 days					
Used any marijuana (%)	1.5	1.6	-0.2	-0.013	0.859
Number of days marijuana used	0.1	0.2	0.0	-0.011	0.899
Regular marijuana use[a] (%)	1.0	1.2	-0.2	-0.022	0.813
Number of students (total = 932)	616	316			
Number of schools (total = 28)	17	11			

SOURCE: Minnesota Student Survey Interagency Team (2022).

NOTES: Estimated differences between students in schools assigned to the LST group and the non-LST group are regression-adjusted using a two-level model (students nested in schools), controlling for the blocking of random assignment. The LST group value is the unadjusted mean for the students in schools randomly assigned to the LST group. The non-LST group value is calculated as the difference between the LST group value and the estimated difference. Rounding may cause slight discrepancies in calculating sums and differences.

The effect size is calculated as the estimated difference divided by the pooled within-group standard deviation for that characteristic, with a small sample size correction for students and schools (Hedges' g). A two-tailed t-test was applied to estimated differences. The statistical significance is indicated as follows: *** = 1 percent; ** = 5 percent; * = 10 percent.

The sample sizes reported here are for the full middle school survey sample. Due to missing values, the number of students included varies by outcome. The percentage of students with missing data ranges from 0 percent to 1 percent.

[a]Regular consumption is defined as 4 days in the last 30 days (1 day per week).

Appendix Table E.6. Students' Use of Opioids and Other Substances, by Research Group

Student Outcome (%)	LST Group	Non-LST Group	Estimated Difference	Effect Size	P-Value
Used in the last 12 months to get high					
Opioid (illicit or prescription opioid)	5.4	5.2	0.1	0.006	0.937
Inhalant (for example, glue or aerosol)	2.6	1.1	1.5	0.098	0.199
Over-the-counter drug (for example, cough syrup)	3.1	0.7	2.4	0.151	0.127
Non-opioid prescription drug	4.7	5.4	-0.7	-0.030	0.687
Illicit drug (for example, cocaine or a psychedelic)	2.1	0.6	1.6	0.120	0.161
Used a prescription drug without a prescription in the last 30 days	2.5	2.2	0.2	0.016	0.833
Number of students (total = 932)	616	316			
Number of schools (total = 28)	17	11			

SOURCE: Minnesota Student Survey Interagency Team (2022).

NOTES: Estimated differences between students in schools assigned to the LST group and the non-LST group are regression-adjusted using a two-level model (students nested in schools), controlling for the blocking of random assignment. The LST group value is the unadjusted mean for the students in schools randomly assigned to the LST group. The non-LST group value is calculated as the difference between the LST group value and the estimated difference. Rounding may cause slight discrepancies in calculating sums and differences.

The effect size is calculated as the estimated difference divided by the pooled within-group standard deviation for that characteristic, with a small sample size correction for students and schools (Hedges' g). A two-tailed t-test was applied to estimated differences. The statistical significance is indicated as follows: *** = 1 percent; ** = 5 percent; * = 10 percent.

The sample sizes reported here are for the full middle school survey sample. Due to missing values, the number of students included varies by outcome. The percentage of students with missing data ranges from 0 percent to 1 percent.

Appendix Table E.7. Estimated Effects of LifeSkills Training on Addictive Behaviors at the End of the First Intervention Year

Student Outcome	LST Group	Non-LST Group	Estimated Difference	Effect Size	P-Value
Number of addictive behaviors in the last 12 months[a]	0.1	0.2	0.0	0.022	0.791
Exhibited at least one addictive behavior in the last 12 months[a] (%)	5.7	4.5	1.2	0.052	0.584
Treated for an alcohol or drug problem in the last 12 months (%)	0.8	0.0	0.8	0.106	0.146
Number of students (total = 932)	616	316			
Number of schools (total = 28)	17	11			

SOURCE: Minnesota Student Survey Interagency Team (2022).

NOTES: Estimated differences between students in schools assigned to the LST group and the non-LST group are regression-adjusted using a two-level model (students nested in schools), controlling for the blocking of random assignment. The LST group value is the unadjusted mean for the students in schools randomly assigned to the LST group. The non-LST group value is calculated as the difference between the LST group value and the estimated difference. Rounding may cause slight discrepancies in calculating sums and differences.

The effect size is calculated as the estimated difference divided by the pooled within-group standard deviation for that characteristic, with a small sample size correction for students and schools (Hedges' g). A two-tailed t-test was applied to estimated differences. The statistical significance is indicated as follows: *** = 1 percent; ** = 5 percent; * = 10 percent.

The sample sizes reported here are for the full middle school survey sample. Due to missing values, the number of students included varies by outcome. The percentage of students with missing data ranges from 1 percent to 2 percent.

[a]Students were asked whether they had experienced any of the following 11 addictive behaviors in the last 12 months: had to use a lot more alcohol/drugs to get the same effect; tried to cut down on alcohol/drug use but couldn't; continued to use drugs/alcohol even if hurting their relationships with friends; spent all or most of the day using drugs/alcohol or getting over their effects; gave up important activities to use or get over the effects of alcohol/drugs; missed work/school or neglected responsibilities to use alcohol/drugs or get over their effects; hit someone or became violent while using alcohol/drugs; not able to remember what happened while under the influence; used more alcohol/drugs than intended; had an urge so strong for alcohol/drugs that they couldn't resist it; felt depressed, agitated, paranoid, or unable to concentrate from using drugs/alcohol.

Appendix Table E.8. Estimated Effects of LifeSkills Training on Mental Health at the End of the First Intervention Year

Student Outcome	LST Group	Non-LST Group	Estimated Difference	Effect Size	P-Value
Positive perceptions of self and future (4-point scale)[a]	2.7	2.7	0.1	0.062	0.511
Feelings of depression in the past 2 weeks (number of days)[b]	1.8	1.9	-0.1	-0.113	0.133
Feelings of anxiety in the past 2 weeks (number of days)[c]	1.9	2.0	-0.1 *	-0.122	0.060
Self-inflicted injury in the last year (%)	27.9	32.2	-4.3	-0.092	0.327
Seriously considered suicide in the last year (%)	12.3	18.2	-5.9 *	-0.167	0.060
Suicide attempt in the last year (%)	5.1	9.2	-4.1	-0.177	0.231
Treated for a mental, behavioral, or emotional problem in the last year (%)	12.7	14.4	-1.7	-0.049	0.538
Any negative mental health outcome in the last year[d] (%)	52.8	57.3	-4.5	-0.088	0.214
Number of students (total = 932)	616	316			
Number of schools (total = 28)	17	11			

SOURCE: Minnesota Student Survey Interagency Team (2022).

NOTES: Estimated differences between students in schools assigned to the LST group and the non-LST group are regression-adjusted using a two-level model (students nested in schools), controlling for the blocking of random assignment. The LST group value is the unadjusted mean for the students in schools randomly assigned to the LST group. The non-LST group value is calculated as the difference between the LST group value and the estimated difference. Rounding may cause slight discrepancies in calculating sums and differences.

The effect size is calculated as the estimated difference divided by the pooled within-group standard deviation for that characteristic, with a small sample size correction for students and schools (Hedges' g). A two-tailed t-test was applied to estimated differences. The statistical significance is indicated as follows: *** = 1 percent; ** = 5 percent; * = 10 percent.

The sample sizes reported here are for the full middle school survey sample. Due to missing values, the number of students included varies by outcome. The percentage of students with missing data ranges from 0 percent to 1 percent.

[a]Based on a student's average score across three items: I feel good about my future; I feel good about myself; I feel valued and appreciated by others (1 = not at all or rarely, 2 = sometimes, 3 = often, 4 = almost always). Cronbach's alpha is 0.81. Cronbach's alpha is a measure of internal consistency, that is, how closely related a set of items are as a group. It is considered to be a measure of scale reliability. The closer Cronbach's alpha is to 1, the higher the internal consistency.

[b]Based on the average number of days that the student experienced (two items): little interest/pleasure in doing things; feeling down, depressed, or hopeless. Cronbach's alpha is 0.48.

[c]Based on the average number of days that the student experienced (two items): feeling nervous, anxious, or on edge; not able to stop/control worrying. Cronbach's alpha is 0.78.

[d]Coded as 1 if a student reported any of the following: self-injury in the last year, suicide ideation in the last year, suicide attempt in the last year, treatment for mental health in the last year, frequent anxiety (seven days or more in the last two weeks), frequent depression (seven days or more in the last two weeks), or infrequent positive perceptions of self and future (score of 1 or 2).

Appendix Table E.9. Estimated Effects of LifeSkills Training on Aggressive Behaviors at the End of the First Intervention Year

Student Outcome (%)	LST Group	Non-LST Group	Estimated Difference	Effect Size	P-Value
In the last 12 months...					
Hit or punched someone	22.1	23.0	-0.8	-0.019	0.817
Damaged property or stole	23.7	29.7	-5.9 *	-0.132	0.051
In the last 30 days...					
Verbally bullied/harassed someone	33.7	34.2	-0.4	-0.009	0.926
Has exhibited aggressive behavior(s)[a]	47.9	52.2	-4.3	-0.084	0.231
Number of students (total = 932)	616	316			
Number of schools (total = 28)	17	11			

SOURCE: Minnesota Student Survey Interagency Team (2022).

NOTES: Estimated differences between students in schools assigned to the LST group and the non-LST group are regression-adjusted using a two-level model (students nested in schools), controlling for the blocking of random assignment. The LST group value is the unadjusted mean for the students in schools randomly assigned to the LST group. The non-LST group value is calculated as the difference between the LST group value and the estimated difference. Rounding may cause slight discrepancies in calculating sums and differences.

The effect size is calculated as the estimated difference divided by the pooled within-group standard deviation for that characteristic, with a small sample size correction for students and schools (Hedges' g). A two-tailed t-test was applied to estimated differences. The statistical significance is indicated as follows: *** = 1 percent; ** = 5 percent; * = 10 percent.

The sample sizes reported here are for the full middle school survey sample.

[a]Whether students reported engaging in at least one of the following behaviors in the last 30 days: pushed/slapped/kicked someone when they weren't kidding around; threated to beat someone up; spread mean lies or rumors about someone; made sexual jokes or gestures or comments toward someone; excluded someone from friends, other students, or activities.

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