Healthy Marriage and Relationship Education for High School Students: The Longer-Term Impacts of *Relationship Smarts PLUS* in Georgia

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Healthy Marriage and Relationship Education for High School Students: The Longer-Term Impacts of *Relationship Smarts PLUS* in Georgia

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Introduction

Healthy marriage and relationship education (HMRE) programs provide high school students education on relationships through structured, classroom-based curricula. These programs fill a common gap in what students learn about relationships in school by teaching them about the social and emotional aspects of relationships, such as communicating effectively, managing conflict, and avoiding dating violence.

Although earlier studies have provided evidence on the immediate and shorter-term effectiveness of HMRE programs on students' relationship skills, knowledge, and attitudes, questions remain about programs' longer-term impact on students' relationship experiences and the quality of their relationships. As students get older and are more likely to have romantic relationships, they may have more opportunities to practice the skills learned in HMRE programs and apply these skills to their dating relationships. Additionally, for programs delivered in schools, it can be difficult for providers to secure the class time necessary for a meaningful amount of programming. As a result, providers may shorten or drop lessons from the curriculum to fit within the allotted time. There is currently no rigorous evidence on whether shortening an HMRE curriculum can interfere with its intended effects on students' relationship experiences.

Primary research questions

The present study sought to address two interrelated research questions:

1. What is the longer-term impact of offering HMRE programming as part of the regular school curriculum on high school students' relationship experiences, quality, and skills?
2. How does shortening an HMRE program influence its longer-term impact on students' relationship experiences, quality, and skills?

Purpose

This report is the third in a series on the implementation and impacts of an HMRE program delivered to students in two Atlanta-area high schools. For the study, trained facilitators from More than Conquerors Inc., a nonprofit social service agency near Atlanta, delivered the *Relationships Smarts PLUS* (*RQ+*) Version 3.0 curriculum in health classes for primarily 9th grade students. The impact study compared groups of students who were offered two different versions of the curriculum—the full 12-lesson, 18 hour version and a shortened 8-lesson, 12 hour version developed for this study—against a control group of students who were not offered any HMRE programming.

This report documents the study methods and presents program impacts based on follow-up data collected around three years after students enrolled in the study. Earlier reports document program impacts one year after study enrollment and provide detailed information on the program's design and implementation. This study was conducted by Mathematica and Public Strategies as part of the Strengthening Relationship Education and Marriage Services (STREAMS) evaluation for the Administration of Children and Families in the U.S. Department of Health and Human Services.

What we learned

- Three years after study enrollment, students offered the full *RQ*+ curriculum and students in the control group reported similar levels on seven outcomes related to their relationship experiences, quality, and skills. However, we were unable to precisely measure program impacts for two additional outcomes related to relationship quality—students' happiness with their current relationship and their satisfaction with their current relationship—because these outcomes were available for only a small and select portion of the full sample. In addition, in checking the robustness of our findings, we found some evidence suggesting that the program had impacts three years later for girls, but not boys.
- Three years after study enrollment, we found only one statistically significant impact when comparing students offered the full, 12-lesson version of *RQ*+ to students offered the shortened, 8-lesson version of *RQ*+. Specifically, students offered the full curriculum were less likely than students offered the shortened curriculum to report having sex without using a condom in the last three months. However, this impact did not remain statistically significant when we used other estimation strategies or when we adjusted for the total number of significance tests conducted across the study's three research groups.

Methods

During two consecutive school years, 1,862 students from 61 health classes in two high schools received permission from a parent or guardian to participate. The study team randomly assigned each health class to one of three research groups: (1) a group that was offered the full 12-lesson, 18 hour *RQ*+ curriculum, (2) a group that was offered the shortened 8-lesson, 12 hour *RQ*+ curriculum, and (3) a control group that was not offered any HMRE programming. For the impact analysis presented in this report, we used data from a three-year follow-up survey administered to students in all three research groups to compare students on seven outcomes related to their relationship experiences, quality, and skills.

Considerations for HMRE programs and research

This study contributes to a growing research literature on the impacts of HMRE programs for high school students and provides guidance for providers seeking to increase the likelihood that programs have consistent, sustained impacts for all students. The results of this study suggest that current program models may not be intensive enough to have a lasting impact on outcomes for all students. Therefore, providers may need to devote more time to HMRE programming or sustain programming over a longer period. In addition, providers should reflect on the characteristics and motivations of youth served by their programs and consider tailoring their programs to better address the needs, questions, and experiences of their intended population.

Future research studies should consider the right time to measure the impacts of HMRE programs for high school students. Although measuring impacts late in high school may be appropriate for outcomes that are relevant for all or most students in the study, such as their relationship skills, attitudes, or certain behaviors, studies may require a much longer follow-up period to assess impacts on the quality of students' romantic relationships.

Future studies should also assess the longer-term impacts of a wider variety of HMRE programs delivered to diverse groups of youth. Even though the present study examined a widely-used HMRE curriculum implemented in a typical high school setting, the findings are not necessarily generalizable to all school-based HMRE programs. HMRE programs for youth use a variety of curricula and service delivery

approaches to serve youth with diverse backgrounds, beliefs, and identities. More research is needed—including smaller formative studies and larger impact studies—to understand the most effective ways to design and implement programs for different groups of youth.

Introduction

Healthy marriage and relationship education (HMRE) programs provide high school students education on relationships through structured, classroom-based curricula. These programs fill a common gap in what students learn about relationships in school by teaching them about the social and emotional aspects of relationships, such as communicating effectively, managing conflict, and avoiding dating violence (Administration for Children and Families 2020; Kerpelman 2007). Since the mid-2000s, the federal government has funded HMRE programs for youth through the competitive healthy marriage grant program administered by the Office of Family Assistance (OFA) in the Administration for Children and Families (ACF), U.S. Department of Health and Human Services. To date, the state and local organizations funded by these grants have provided HMRE programming to more than 80,000 youth around the country (Avellar et al. 2020; Scott et al. 2017).

Although earlier studies have provided evidence on the immediate and shorter-term effectiveness of HMRE programs, questions remain about their longer-term impacts on high school students (Alamillo and Goesling 2021; Alamillo et al. 2021; Simpson et al. 2018). As students get older and are more likely to have romantic relationships, the lessons from HMRE programs may become more relevant to their daily experiences. Another consideration for programs delivered in schools is that providers can find it hard to secure the class time necessary for a meaningful amount of programming. As a result, they drop or shorten lessons from the full curriculum to fit it within the available time. There is currently no rigorous evidence on whether shortening an HMRE curriculum for youth can interfere with its intended effects on students' relationship experiences.

To expand available evidence on HMRE programs for high school students, ACF's Office of Planning, Research, and Evaluation, with funding from OFA, contracted with Mathematica and its partner, Public Strategies, to conduct a random assignment impact study and an accompanying implementation study of an HMRE program for high school students. This study was part of a larger evaluation called Strengthening Relationship Education and Marriage Services (STREAMS; Box 1 has more information on the STREAMS evaluation). To conduct this study, Mathematica and Public Strategies collaborated with More than Conquerors Inc. (MTCI), a nonprofit social service agency located near Atlanta, Georgia. MTCI received a federal grant from OFA in 2015 to deliver *Relationship Smarts PLUS* Version 3.0 to youth in high school. *Relationship Smarts PLUS*—which is often referred to by its nickname, *RQ+,* to reflect its emphasis on improving relationship intelligence or IQ—is a widely implemented HMRE curriculum for youth. For STREAMS, MTCI delivered *RQ+* to youth in two high schools as part of a semester-long class for primarily 9th grade students. The impact study compared students who were offered two different versions of the curriculum—the full 12-lesson version and a shortened 8-lesson version—with a control group of students who were not offered any HMRE programming.

Box 1. About the STREAMS evaluation

Since the early 2000s, the Administration for Children and Families (ACF) in the U.S. Department of Health and Human Services has led a sustained effort to expand available evidence on healthy marriage and relationship education (HMRE) programs. In 2015, ACF contracted with Mathematica and its partner, Public Strategies, to conduct the Strengthening Relationship Education and Marriage Services (STREAMS) evaluation to help identify strategies for improving the delivery and effectiveness of HMRE programs. The evaluation has a particular emphasis on understudied populations and program approaches not covered in ACF's prior federal evaluations. STREAMS includes in-depth process studies, random assignment impact studies, a rapid-cycle evaluation of text message reminders to improve attendance at HMRE group workshops, a formative evaluation of a facilitation training curriculum for HMRE programs for high school students, and predictive analytic modeling of attendance at HMRE group workshops. Learn more about the evaluation at https://www.acf.hhs.gov/opre/research/project/strengthening-relationship-education-and-marriage-services-streams.

This report uses data from a follow-up survey collected about three years after study enrollment to examine the longer-term (that is, several years after the program) impacts of HMRE programming on students' relationship outcomes. The study also was designed to examine whether reducing the dosage of HMRE programming might lessen impacts on these outcomes. Specifically, the report addresses the following two research questions:

1. What is the longer-term impact of offering HMRE programming as part of the regular school curriculum on high school students' relationship experiences, quality, and skills?
2. How does shortening an HMRE program influence its longer-term impact on students' relationship experiences, quality, and skills?

Exploratory analyses described in the Appendix also examine impacts on related outcomes, including students' relationship attitudes, knowledge, and expectations for the future.

This report is the third in a series on the implementation and impacts of *RQ+* as delivered by MTCI. The first report in the series provided detailed information on the program's design and implementation during the first year of the impact study (Baumgartner and Zaveri 2018). It found that the program was implemented well and facilitators delivered both versions of the curriculum as intended. The second report in the series examined the impact of MTCI's delivery of *RQ+* on students' relationship skills, attitudes, and knowledge as measured about one year after study enrollment (Alamillo and Goesling 2021). It found limited impacts on these outcomes at the time of the one-year follow-up survey, although exploratory analyses uncovered small, positive impacts on students' relationship attitudes immediately after the program ended. This third report builds on these studies to explore whether impacts emerged on students' relationship experiences, quality, and skills about three years after study enrollment, when most students were seniors in high school.

Prior research on HMRE programs for high school students

HMRE programs for high school students aim to improve students' understanding of romantic relationships and prepare them to have healthy romantic relationships in adulthood (ACF 2020). In the short run, the goals of these programs are to help students improve their relationship skills, recognize the difference between healthy and unhealthy relationships, and adopt attitudes and expectations that will increase their chances of having stable, high quality relationships. In the longer run, these programs aim to help youth continue to practice positive relationship skills, avoid dating violence and other negative relationship outcomes, and form and maintain high quality relationships in both adolescence and adulthood (Kerpelman 2007; Simpson et al. 2008). To achieve these objectives, HMRE programs for high school students provide classroom-based instruction on topics such as identifying personal values and goals, understanding the characteristics of healthy and unhealthy relationships, and developing effective communication and conflict management skills. Some but not all curricula also include instruction on reducing risky sexual behavior and avoiding teenage pregnancy (Scott et al. 2017; Scott and Huz 2020). Programs are often offered in schools as part of an existing class such as health or family and consumer sciences.

Although still in its early stages, research on the effectiveness of HMRE programs for high school students has grown in recent years (Alamillo et al. 2021). Prior studies suggest that HMRE programs can improve students' relationship skills, knowledge, and attitudes as measured around the time the program ends (Alamillo et al. 2021; Simpson et al. 2018), but that these impacts are likely to diminish over time. For example, an impact evaluation of an older version of the *RQ+* among high school students in Alabama found that, immediately after the program ended, students who were offered the program expressed more disagreement with unrealistic relationship beliefs and had higher conflict management skills than students in the control group, but these effects attenuated considerably by the time of the one- and two-year follow-up surveys (Kerpelman et al. 2009). Similarly, for the STREAMS evaluation, an earlier report on MTCI's delivery of *RQ+* found that the program had the expected immediate impacts on some outcomes at the end of the program, but these impacts had faded one year after the program ended (Alamillo and Goesling 2021). After one year, students in the treatment group reported levels of relationship skills, knowledge, and attitudes that were similar to those of students in the control group for 9 out of 10 outcome measures (Alamillo and Goesling 2021).

Less information exists about the impacts of HMRE programming on students' relationship experiences and the quality of their relationships. A recent review of the impact literature on HMRE programs for youth (Alamillo et al. 2021) only identified three studies that examined outcomes related to students' relationship experiences and the quality of their relationships a year or more after the program ended (Alamillo and Goesling 2021; Gardner and Boellard 2007; Hutson et al. 2021). These studies did not uncover any significant impacts on these outcomes.

One possible reason why few studies have assessed impacts on students' relationship experiences and the quality of their relationships may be that studies have typically measured outcomes early in high school, when students are in 9th or 10th grade (Alamillo et al. 2021). Students are less likely to have experience with dating relationships early in high school than later (Eickmeyer et al. 2020). Because of the low prevalence of dating relationships early in high school, researchers may choose to focus on alternative outcomes that are relevant for all students, such as students' relationship skills, knowledge, and attitudes.

However, even studies that have examined students' relationship experiences and the quality of their relationships have not uncovered impacts on these outcomes. This may be because it is difficult for

studies to identify program impacts on an outcome when the prevalence of that outcome in the sample is low. For example, the first STREAMS impact study of *RQ+* assessed impacts on students' likelihood of being in a relationship and likelihood of ever having sex as part of its exploratory analyses (Alamillo and Goesling 2021). This study found no impacts on these outcomes, perhaps because only about a third of the sample was in a dating relationship and less than a quarter of the sample reported having sexual intercourse by the time of the one-year follow-up survey. In addition, regardless of students' age or dating experience, more time may need to pass for HMRE programs to yield impacts on students' relationship experiences and quality. For example, students may need more time to absorb the information and practice the skills learned in the program and apply them to their dating relationships. For both these reasons, to provide a better test of the impact of HMRE programs on students' relationship experiences and quality, it may be necessary to collect follow-up data when more time has passed since the end of the program and students are more likely to be in dating relationships.

The *Relationship Smarts PLUS* curriculum and its implementation in Georgia

Students in the present study received lessons from *RQ+,* a widely used HMRE curriculum for youth ages 13 to 18 distributed by the Dibble Institute (Dibble Institute 2021). The present study focuses on Version 3.0 of the curriculum, which was the version available in 2016 when the study started. The full *RQ+* Version 3.0 curriculum includes 12 lessons, each lasting about 90 minutes. The curriculum covers a broad range of topics (Table 1), with lessons taught sequentially to build on each other. See Alamillo and Goesling (2021) for more information on the *RQ+* curriculum.

Table 1. Summary of *RQ+* lessons

Lesson name	Lesson overview
1. Who am I, and where am I going?	Youth learn more about themselves, their development, and what is important to them, and they identify future goals.
2. Maturity issues and what I value	Youth discuss what maturity looks like from physical, mental, emotional, and social perspectives; prioritize values that are important to them; and discuss character traits they value in others.
3. Attraction and infatuation	Youth think about the foundational elements of healthy relationships and how they develop, and they learn about the brain chemistry of attraction to understand the importance of taking a new relationship slowly.
4. Principles of smart relationships	Youth learn seven research-based principles to use when starting a romantic or peer relationship, and they learn about the concept of mature, balanced love.
5. Is it a healthy relationship?	Youth learn how to tell if a relationship is healthy or unhealthy, and why people sometimes find themselves in unhealthy relationships.
6. Decide, don't slide	Youth learn and apply the concept of sliding versus deciding, or making clear and active decisions related to life, relationships, and the timing of family formation.
7. Dating violence and breaking up	Youth learn about why people break up, how to tell when it's time to break up, and healthy ways to break up. They also learn to recognize early signs of dating violence and how to get help if they or someone they know are victims of dating violence.

Lesson name	Lesson overview
8. Communication and healthy relationships	Youth examine communication patterns they experienced growing up and become aware of patterns that damage relationships. They also learn communication skills, such as taking a time-out and the speaker-listener technique.
9. Communication challenges and more skills	Youth further build communication skills and learn to recognize hidden issues in arguments and to solve problems with their partner.
10. Sexual decision making	Youth apply the concept of sliding versus deciding to choices about sex; begin to understand the dimensions of intimacy and the social and emotional sides of sex; identify sexual boundaries; get medically accurate information on pregnancy and sexually transmitted infections; and role-play how to say "no" in risky situations.
11. Unplanned pregnancy through the eyes of a child	Youth consider the social, emotional, and financial benefits of parents' healthy relationships to the child and discuss what it means to be a good parent.
12. Teens, technology, and social media	Youth reflect on the role of technology and social media in their lives and the risks, discuss how they influence honesty and social-emotional skills, and develop a personal success plan.

RQ+ = Relationship Smarts Plus.

In the present study, the *RQ+* curriculum was delivered by MTCI, a nonprofit social service provider in suburban Atlanta with a long history of providing HMRE programming. In fall 2015, we contacted MTCI about participating as a site in the STREAMS evaluation because of its history of successfully delivering HMRE programming in prior rounds of OFA grant funding. The STREAMS study team collaborated with staff from MTCI and a local county health department (Gwinnet, Newton, and Rockdale County Health) to develop a plan for program implementation that would support a random assignment impact study. For the study, MTCI had interest in both (1) assessing the overall impact of its program and (2) learning whether and how program impacts varied according to the number of instructional hours students received. Like other HMRE providers, MTCI had found it challenging to fit its in-school programming into the limited available class time.

The design of the study called for MTCI facilitators to deliver two different versions of *RQ+* as part of their semester-long health classes: (1) the full 12-lesson version of the curriculum and (2) a shortened 8-lesson version. To create the shortened 8-lesson version of *RQ+*, the STREAMS study team and MTCI worked with the curriculum developer and distributor. Together, the group decided to exclude the standard lessons on communication and conflict management skills (Lessons 8 and 9), sexual decision making (Lesson 10), and unplanned pregnancy (Lesson 11) from the shorter version, believing that removing these later lessons would be less disruptive to students' comprehension than removing any of the earlier lessons. Concepts introduced in earlier lessons are revisited later in the curriculum, so leaving those lessons out would impact comprehension of the later lessons. In addition, the decision to remove 4 full lessons from the curriculum rather than deliver condensed versions of all 12 lessons meant that students who received the shortened curriculum would cover selected topics with the same depth as students who received the full curriculum. The two versions of the curriculum were identical in all respects except for the 4 lessons excluded from the 8-lesson version (Table 2). For both versions, each lesson was planned to include 90 minutes of material, which meant that the planned instructional time for the full curriculum totaled 18 hours, and the planned instructional time for the shortened curriculum totaled 12 hours. MTCI facilitators delivered lessons once or twice per week over the course of one semester.

Table 2. Lessons included in the full and shortened versions of *RQ+*

Lesson name	Full version	Shortened version
1. Who am I, and where am I going?	✓	✓
2. Maturity issues and what I value	✓	✓
3. Attraction and infatuation	✓	✓
4. Principles of smart relationships	✓	✓
5. Is it a healthy relationship?	✓	✓
6. Decide, don't slide	✓	✓
7. Dating violence and breaking up	✓	✓
8. Communication and healthy relationships	✓	
9. Communication challenges and more skills	✓	
10. Sexual decision making	✓	
11. Unplanned pregnancy through the eyes of a child	✓	
12. Teens, technology, and social media	✓	✓

RQ+ = Relationship Smarts Plus.

Findings from the first impact report (Alamillo and Goesling 2021) indicate that the program was implemented with fidelity and that students received the intended curriculum in line with the study design. In more than 90 percent of classes, facilitators reported using all intended curriculum materials and following all instructional guidance in the manual. See Alamillo and Goesling (2021) for more information on implementing *RQ+* in Georgia for the STREAMS impact study.

Study design

The impact study used a random assignment design that compared the outcomes of students across three research groups. Students in one group were offered the full 12-lesson *RQ+* curriculum. Students in a second group were offered the shortened 8-lesson version of *RQ+*. Students in a third research group were not offered any HMRE programming. Next, we briefly describe the study design; additional details can be found in the first impact report (Alamillo and Goesling 2021).

Sample intake

For two consecutive school years (2016–2017 and 2017–2018), we enrolled students from health classes in two public high schools in Gwinnett County, Georgia, northeast of Atlanta. In both schools, we invited students from 61 health classes to participate. The classes served primarily 9th grade students, but also included some older students who had not taken health class before. The classes were each one semester long. Across the two schools, a total of 1,836 students received permission from their parent or guardian to participate in the study, representing about 92 percent of all eligible students.

Random assignment

The study team randomly assigned the participating health classes to one of three research groups: (1) a treatment group in which MTCI delivered the full, 12-lesson *RQ+* curriculum, (2) a treatment group in which MTCI delivered a shortened, 8-lesson version of *RQ+*, or (3) a control group in which MTCI did not deliver any HMRE programming. The team conducted random assignment near the start of each semester after the schools had set their class schedules, for a total of four times during the study. To have an even mix of classes from the two study schools in each of the three research groups, the study team

randomly assigned classes separately by school. This approach to random assignment resulted in a blocked evaluation design, with each combination of school and semester defined as a separate block. During the two-year sample intake period, the study team randomly assigned 21 classes to the group that was offered the full curriculum, 20 classes to the group that was offered the shortened curriculum, and 20 classes to the control group that was not offered any HMRE programming.

For classes assigned to either the control group or the group that was offered the shortened curriculum, MTCI staff delivered supplementary lessons from a job readiness curriculum called *12 Pluses for Work Readiness and Career Success*. The lessons covered such topics as career planning, resume writing, planning for a job search, appropriate workplace attire, and interview skills. For classes assigned to the control group, MTCI facilitators delivered 12, 90-minute lessons of the *12 Pluses* curriculum an average of once or twice per week over the course of the semester. For classrooms offered the shortened version of the *RQ+* curriculum, MTCI facilitators delivered 4, 90-minute lessons of the *12 Pluses* curriculum after the class completed the 8 *RQ+* lessons. With this design, students in all study classes received the same total amount of instruction, but the content of the instruction differed across the study's three research groups. This design helped isolate the effects of the *RQ+* curriculum by making other aspects of the classroom environment as similar as possible across the treatment and control groups.

Data collection

For the impact analysis discussed in this report, we relied primarily on data from two surveys, which were administered to students in all three research groups:

1. **Baseline survey.** Near the start of the semester, before the MTCI facilitators had delivered any lessons, the members of the STREAMS study team administered a baseline survey to students in class. The survey collected information on the students' demographics, family backgrounds, attitudes, perceived skills, and relationship experiences. Of the 1,862 students who received permission for the study, 1,836 completed the baseline survey, for a response rate of 99 percent. The Appendix to this report has more details on the survey administration procedures and response rates.
2. **Three-year follow-up survey.** About three years after the baseline survey, the study team contacted students in all three research groups to ask them to complete a longer-term follow-up survey. Although this survey was initially designed to be administered during the 2019–2020 school year when students were in 11th or 12th grade, data collection for some students extended into summer and fall 2020 because of disruptions associated with the COVID-19 pandemic. Consequently, most students (57 percent) completed the study when they were in 12th grade. In comparison, 28 percent of survey respondents were in 11th grade, and 14 percent were in college or no longer enrolled in school. Because of the COVID-19 pandemic, data from the survey were primarily collected online or by telephone, rather than in person. The survey collected information on students' attitudes, perceived skills, and relationship experiences three years after they finished the program. The survey had an overall response rate of 71 percent (73 percent for the full group, 69 percent for the shortened group, and 72 percent for the control group). The average amount of time between students' completion of the baseline survey and the three-year follow-up survey was 34.3 months (34.0 months for the full group, 34.5 months for the shortened group, and 34.4 months for the control group).

In addition to these two surveys, the study team also administered a shorter-term program exit survey at the end of each semester, as well as a one-year follow-up survey about one year after the baseline survey. These surveys are described in more detail in the first impact report (Alamillo and Goesling 2021).

Analysis

MTCI's implementation of *RQ+* sought to address a broad range of outcomes, including students' relationship experiences; the quality of their relationships; and their skills, knowledge, and attitudes about relationships. Although including a breadth of outcomes in the impact study is important for a comprehensive assessment of the program, from a statistical perspective, focusing on a broad range of outcomes increases the chances of falsely identifying an impact of a program when no true impact exists (Schochet 2009). The more outcomes we examine, the more likely it is that at least one test will find a statistically significant but spurious impact.

To balance these factors, we conducted both a confirmatory analysis and an exploratory analysis. We used the confirmatory analysis to answer the study's two research questions about (1) the longer-term impact of offering HMRE programming as part of the regular school curriculum on high school students' relationship experiences, quality, and skills and (2) how shortening an HMRE program influences the longer-term impact on these outcomes. We used the exploratory analysis to assess the longer-term impact of the program on measures of students' relationship attitudes, knowledge, and expectations that were included in the first impact study.

For the confirmatory analysis, we used data from the three-year follow-up survey to measure program impacts on students' outcomes across three domains: (1) relationship experiences, (2) relationship quality, and (3) relationship skills (Table 3). We selected these outcomes because they align with the intended longer-term goals of HMRE programming for youth. For each outcome, we measured program impacts by comparing students' average outcomes across the three research groups (full *RQ+* curriculum, shortened *RQ+* curriculum, and control group). We specified both the outcomes and methods before examining the data to prevent any perception that we decided which findings to report after seeing the results. For the main impact findings presented in this report, we estimated impacts for the full sample using analysis methods that account for the clustered random assignment design and adjust for survey nonresponse and a limited number of baseline characteristics (grade level, gender, language spoken at home, and the baseline value of the outcome measure [when available]). We also examined the robustness and of the impact findings to make sure our results were not overly sensitive to specific analytic decisions. In addition, recognizing that the program served a diverse group of students and might resonate with some students more than others, we also checked the consistency of impacts across subgroups of students. We used students' gender and primary language spoken at home for these consistency checks; we did not have a prior hypothesis about the expected direction of these tests. Details of our analytic approach are in the Appendix.

Table 3. Confirmatory outcome measures

Outcome	Measure
Relationship experiences	
Currently in an unhealthy relationship	Binary variable: Equals 1 if students reported currently being in a romantic relationship and having experienced any of the following: • Their partner has tried to keep them from seeing friends. • Their partner has made them feel stupid. • They have felt their partner might hurt them. Equals 0 if student reported not currently being in a relationship or currently being in a romantic relationship without any of these experiences. This measure was adapted from questions used on the Supporting Healthy Marriage 12-month survey (Hsueh et al. 2012).

Outcome	Measure
Ever had sex	Binary variable: Equals 1 if student reported ever having sexual intercourse; equals 0 if student reported never having sexual intercourse.
Had sex without using a condom in the last three months	Binary variable: Equals 1 if student reported having sex without using a condom in last three months; equals 0 if student reported using a condom consistently, or reported not having sexual intercourse in last three months.
Relationship quality	
Relationship quality with parents	Continuous scale variable: Average of responses to the following three statements included on the survey: 1. In the past month, how often did you feel like you could count on at least one of your parents to be there when you needed them? 2. In the past month, how often did you feel like you could talk with your parent(s) about things that really matter? 3. In the past month, how often did you feel like you could share your thoughts and feelings with your parent(s)? For each statement, the survey asked students to respond on a 4-point scale ranging from none of the time to all of the time. These questions were drawn from the Parent-Adolescent Relationship Inventory (Lippman et al. 2014).
Relationship quality with friends	Continuous scale variable: Average of responses to the following three statements included on the survey: 1. In the past month, how often did you feel like you could count on your friends to be there when you needed them? 2. In the past month, how often did you feel like you could talk with your friends about things that really matter? 3. In the past month, how often did you feel like you could share your thoughts and feelings with your friends? For each statement, the survey asked students to respond on a 4-point scale ranging from none of the time to all of the time. We adapted these questions from the Parent-Adolescent Relationship Inventory (Lippman et al. 2014).
Relationship skills	
Perceived general relationship skills	Continuous scale variable: Average of responses to six survey questions; each question asked students to report their level of agreement with a statement such as, "I believe I will be able to effectively deal with conflicts that arise in my relationship," or "I have the skills needed for a lasting, stable romantic relationship."; Questions are a subset of items from the Relationship Deciding Scale (Vennum and Fincham 2011); scale values range from 1 to 4, with higher values indicating greater perceived relationship skills.
Perceived conflict management skills	Continuous scale variable: Average of responses to five survey questions; each question asked students to report their perceived ability to perform certain conflict management skills, such as listening to another person's opinion during a disagreement or working through problems without arguing; adapted from the Conflict Management Subscale of the Interpersonal Competence Scale (Buhrmester et al. 1988). Scale values range from 1 to 4, with higher values indicating greater perceived skills.

We originally planned to include two additional measures of relationship quality as confirmatory outcomes: students' happiness with their current relationship, and their satisfaction with their current relationship. However, unlike the measures of relationship quality with parents and relationship quality with friends[1], these measures were only available for students who were in a relationship at the time of the three-year follow-up survey. In looking at our data, we found that only about one-third of students reported being in a relationship at the three-year survey and consequently responded to these items. In

[1] Relationship quality with friends does not include romantic relationships.

addition, in this subsample of students, we found differences in some key baseline characteristics including students' primary language, living arrangements, whether they attended a class in the prior year on romantic relationships or dating violence, and whether they ever had sexual intercourse. (The Appendix has additional details on the baseline equivalence of this subsample.) These differences indicate that the program may have affected which students were in a relationship at the time of the follow-up survey, which could lead to biased estimates of the program's effectiveness on their reported happiness and satisfaction with their current relationship. As a result, we decided to consider these outcomes exploratory rather than confirmatory. We present findings for these outcomes in the Appendix.

For the exploratory analysis, we also examined impacts on several other outcomes, including students' relationship status, their attitudes and knowledge about relationships, and their expectations for the future. Even though the program did not have a goal of making students more or less likely to have a relationship, it could have an impact on their relationship status— for example, by making them more interested in relationships or making them more cautious or deliberate about starting a relationship. The program could also have an impact on students' relationship attitudes, knowledge, and expectations for the future when more time has elapsed since they participated in the program. Even though we examined these outcomes as part of the one-year impact study and largely found no impacts, as students gain experience with romantic relationships, these experiences could reinforce lessons they learned in the HMRE program related to attitudes, knowledge, or expectations about relationships. The Appendix to this report describes the methods and findings for the exploratory analysis.

Characteristics of the sample

The baseline characteristics of students who responded to the three-year follow-up survey, shown in Table 4, generally matched the characteristics of those who participated in the study as a whole. More than half of the students in the study sample identified as Hispanic (58 percent) and about one-quarter identified as Black (24 percent). Forty-five percent of students said they primarily spoke Spanish at home, whereas 10 percent reported speaking more than one language or a language other than English or Spanish. Just over half (55 percent) reported that their biological parents were married. At baseline, 27 percent of students who completed the three-year follow-up survey reported being in a dating relationship, whereas 12 percent reported ever having had sexual intercourse. The Appendix has more information on how the study sample compares to the full randomly assigned sample.

Table 4. Demographic characteristics of the study sample at baseline

Measure	Percentage
Grade in school	
9th grade	89
10th grade or higher	11
Female	49
Race and ethnicity	
Hispanic	58
Black, non-Hispanic	24
White, non-Hispanic	4
Other	14
Born outside of U.S.	18
Primary language spoken at home	
English	45
Spanish	45

Measure	Percentage
Other or more than one language	10
Biological parents are married	55
In a dating relationship	27
Ever had sexual intercourse	12
Sample size	**1,314**

Source: Baseline survey conducted by Mathematica.

As expected, in the three years after study enrollment, students, gained more education, employment, and relationship experience. Table 5 shows the characteristics of the students in the study sample at the time of the three-year follow-up survey. Although most (86 percent) were still enrolled in high school, some were in college (6 percent) or no longer in school (8 percent). Just under half reported having either a full-time job (9 percent) or a part-time job (36 percent). Students in the study also had more experience with dating relationships and sexual intercourse by the time of the three-year follow-up survey than they had at the baseline survey. At the three-year follow-up, 37 percent were currently in a dating relationship, compared with 27 percent at baseline. Forty-one percent had ever had sexual intercourse at the three-year follow-up, compared with 12 percent at baseline. Twenty-five percent of students reported having sexual intercourse in the three months before the three-year follow-up survey. These findings are consistent with data from national surveys indicating the percentage of high school students who report experience with dating and sexual activity increases with age (Abama and Martinez 2017; Eickmeyer et al. 2020).

Table 5. Characteristics of the study sample at the three-year follow-up survey

Measure	Percentage
Education status	
Enrolled in high school	86
Enrolled in college	6
No longer enrolled in school	8
Employment status	
Employed full-time	9
Employed part-time	36
Unemployed	55
Relationship experiences	
Currently in a dating relationship	37
Ever in a dating relationship	74
Ever had sexual intercourse	41
Had sexual intercourse in the last three months	25
Sample size	**1,314**

Source: Three-year follow-up survey conducted by Mathematica.

Longer-term program impacts

We focus the presentation of program impacts on the study's two main research questions. First, to assess the longer-term impact of HMRE programming on high school students' experience with relationships, the quality of their relationships, and their relationship skills, we compare students offered the full, 12-lesson version of *RQ+* with students in the control group who were not offered any HMRE programming. We also discuss findings from our tests of the robustness and consistency of the impact findings. Second, to assess the effects of shortening the curriculum, we compare students offered the full version of *RQ+* with students offered the shortened, 8-lesson version of the curriculum designed for this study.

Longer-term impacts on relationship experiences, skills, and quality

Overall, we found no evidence of longer-term impacts on students' relationship experiences, quality, and skills (Table 6). At the three-year follow-up, a similar percentage of students in the full *RQ+* group and in the control group reported they were currently in an unhealthy relationship (9 percent in the full *RQ+* group versus 10 percent in the control group). Likewise, a similar percentage of students in both groups reported ever having sex (40 percent in the full *RQ+* group versus 44 percent in the control group) and having sex without using a condom in the last three months (12 percent in the full *RQ+* group versus 16 percent in the control group). For our two confirmatory measures of relationship quality, students in both research groups reported similar levels of quality when describing their relationships with their parents and friends. On scales ranging from 1 to 4, with higher values indicating better relationship quality, students reported an average relationship quality of about 3.2 with their parents, and an average relationship quality of about 2.9 with their friends. As noted in the earlier section on the study design, we originally planned to include two other measures of relationship quality in our confirmatory analysis (relationship happiness and relationship satisfaction) but had to exclude them because they were available only for a small portion of the overall study sample. In addition, students in the full *RQ+* group and students in the control group reported similar levels of relationship skills. For the measure of general relationship skills, students in both groups averaged about 3.2, and for the measure of conflict management skills, students in both groups averaged about 2.8. Both scales ranged from 1 to 4, with higher values indicating greater perceived skills.

Table 6. Longer-term impacts on students' relationship experiences, quality, and skills

Measure	Full *RQ+* group	Control group	Impact	Effect size
Relationship experiences				
Currently in an unhealthy relationship	9	10	-1	-0.04
Ever had sex	40	44	-4	-0.08
Had sex without using a condom in the last three months	12	16	-4	-0.11
Relationship quality				
Relationship quality with parents (range: 1 to 4)	3.18	3.17	0.01	0.01
Relationship quality with friends (range: 1 to 4)	2.88	2.90	-0.02	-0.03
Relationship skills				
Perceived general relationship skills (range: 1 to 4)	3.19	3.22	-0.02	-0.05
Perceived conflict management skills (range: 1 to 4)	2.79	2.78	0.01	0.02
Sample size	**435**	**425**		

Source: Baseline and three-year follow-up surveys conducted by Mathematica.

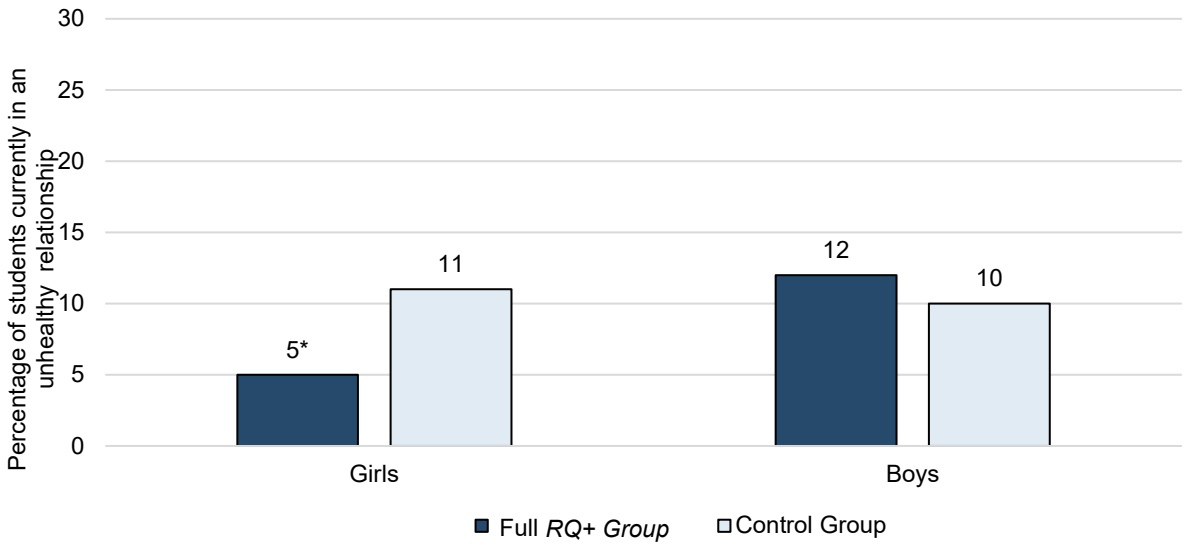
Note: The numbers in the table are regression-adjusted means on the three-year follow-up survey for each study group.

***/**/* Impact estimates are statistically significant from zero at the .01/.05/.10 level, respectively, two-tailed test.

RQ+ = Relationship Smarts PLUS.

In checking the robustness and consistency of these findings, we found some evidence to suggest the program had different impacts on girls than on boys. Specifically, for three of the seven confirmatory outcomes examined, we found a statistically significant difference in impacts for girls and boys. First, 11 percent of girls in the control group reported being in an unhealthy relationship at the time of the three-year follow-up, compared with 5 percent of girls in the full *RQ*+ group (Figure 1). This difference was statistically significant at the 0.10 level and corresponds to an effect size of 0.20 standard deviations. Among boys, there was no difference between research groups in the likelihood of being in an unhealthy relationship. Second, 21 percent of girls in the control group reported having sex without using a condom in the last three months, compared with 12 percent of girls in the full *RQ*+ group (Figure 2). This difference was statistically significant at the 0.01 level and corresponds to an effect size of 0.31 standard deviations. Among boys, there was no difference between research groups in the likelihood of having sex without using a condom in the past three months. Third, compared with girls in the control group, girls in the *RQ*+ group reported lower average scores on a measure of the quality of their relationships with friends. On average, girls in the control group reported a score of 2.94 on this measure (on a scale ranging from 1 to 4), whereas girls in the full *RQ*+ group reported a score of 2.77 (Figure 3) This difference was statistically significant at the 0.10 level and corresponds to an effect size of 0.20 standard deviations. Among boys, there was no difference between research groups on this measure. Our other robustness and consistency checks revealed no meaningful differences in findings based on the analytic methods used to estimate program impacts, or for subgroups defined by students' primary language (English versus Spanish or other language). The Appendix describes the full set of consistency and robustness checks.

Figure 1. Longer-term impacts on students' likelihood of being in an unhealthy relationship, by gender



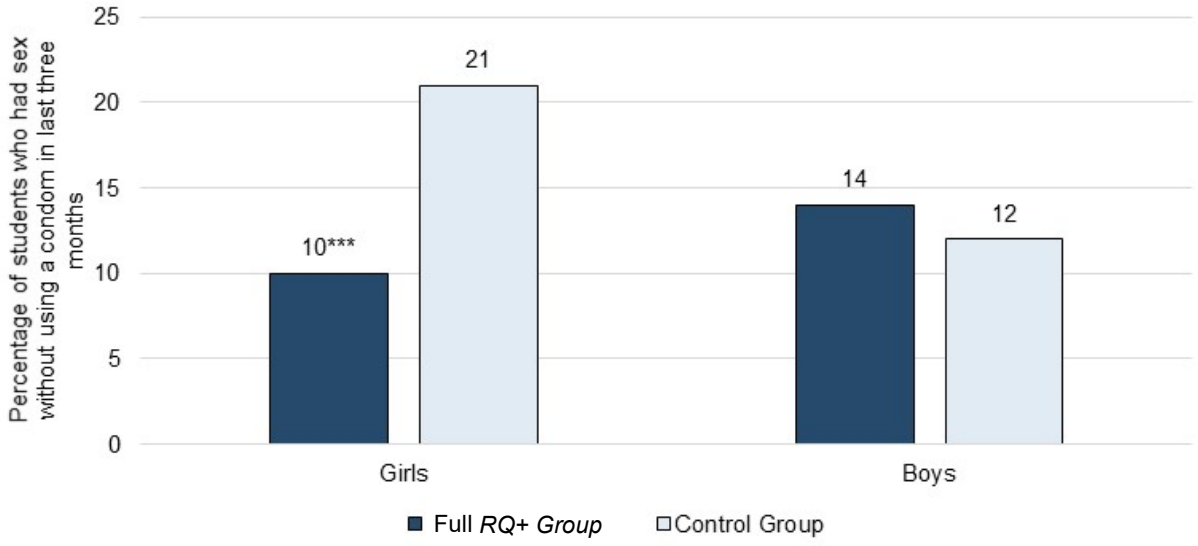
Source: Baseline and three-year follow-up surveys conducted by Mathematica.

Note: The numbers for the full *RQ*+ group and the control group are regression-adjusted predicted values of outcomes. Appendix Table A.10 details the subgroup analyses. The difference in impacts between girls and boys was statistically significant at the 0.10 level.

***/**/* Impact estimates are statistically significant from zero at the .01/.05/.10 level, respectively, two-tailed test.

RQ+ = *Relationship Smarts PLUS*.

Figure 2. Longer-term impacts on students' likelihood of having sex without using a condom in last three months, by gender



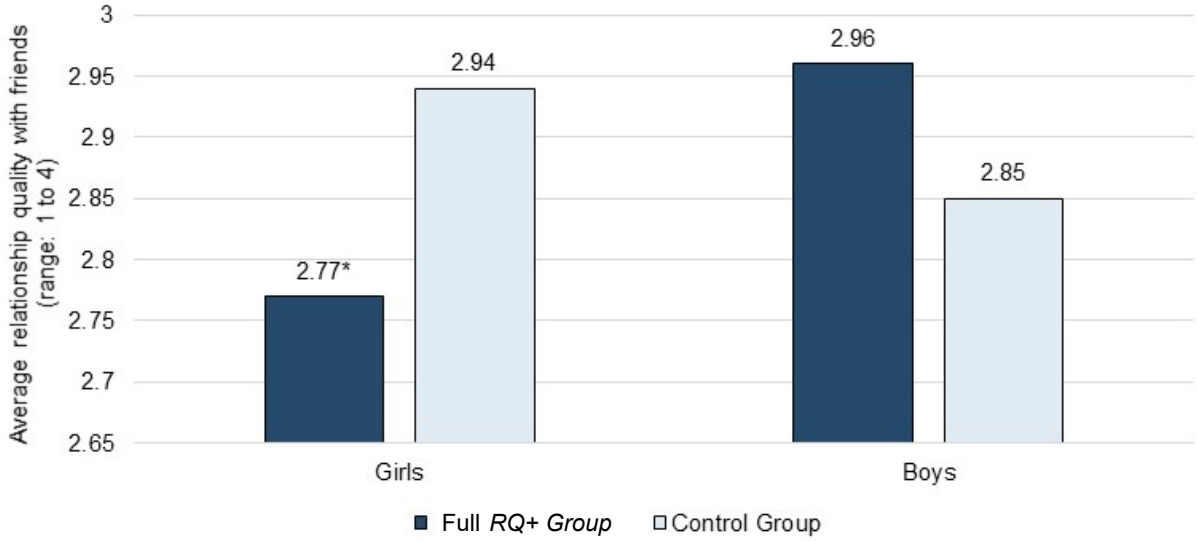
Source: Baseline and three-year follow-up surveys conducted by Mathematica.

Note: The numbers for the full *RQ*+ group and the control group are regression-adjusted predicted values of outcomes. Appendix Table A.10 details the subgroup analyses. The difference in impacts between girls and boys was statistically significant at the 0.05 level.

***/**/* Impact estimates are statistically significant from zero at the .01/.05/.10 level, respectively, two-tailed test.

RQ+ = *Relationship Smarts PLUS*.

Figure 3. Longer-term impacts on students' relationship quality with friends, by gender



Source: Baseline and three-year follow-up surveys conducted by Mathematica.

Note: The numbers for the full *RQ*+ group and the control group are regression-adjusted predicted values of outcomes. Appendix Table A.10 details the subgroup analyses. The difference in impacts between girls and boys was statistically significant at the 0.05 level.

***/**/* Impact estimates are statistically significant from zero at the .01/.05/.10 level, respectively, two-tailed test.

RQ+ = *Relationship Smarts PLUS*.

Longer-term impacts of shortening the HMRE program

We found that students offered the shortened *RQ+* curriculum had outcomes similar to those of students offered the full *RQ+* curriculum (Table 7). Compared with students in the full *RQ+* group, students in the shortened *RQ+* group reported similar relationship experiences and similar levels of relationship quality and skills for six of the seven confirmatory outcome measures. We did find a marginally statistically significant impact for one of our three measures of relationship experiences. Specifically, 12 percent of students offered the full *RQ+* curriculum reported having sex without using a condom in the last three months, compared with 16 percent of students offered the shortened *RQ+* curriculum. This impact was significant at the 0.10 level. The difference in scores corresponds to an effect size of 0.11 standard deviations. However, as discussed in the Appendix to this report, this impact did not remain statistically significant when we used other estimation strategies or when we adjusted for the total number of significance tests conducted across the study's three research groups.

Table 7. Longer-term impacts of shortening the HMRE program on students' relationship experiences, quality, and skills

Measure	Full *RQ+* group	Shortened *RQ+* group	Impact	Effect size
Relationship experiences				
Currently in an unhealthy relationship	9	10	-2	-0.06
Ever had sex	40	39	1	0.02
Had sex without using a condom in the last three months	12	16	-4*	-0.11
Relationship quality				
Relationship quality with parents (range: 1 to 4)	3.18	3.20	-0.01	-0.01
Relationship quality with friends (range: 1 to 4)	2.88	2.92	-0.03	-0.04
Relationship skills				
Perceived general relationship skills (range: 1 to 4)	3.19	3.22	-0.02	-0.05
Perceived conflict management skills (range: 1 to 4)	2.79	2.78	0.01	0.03
Sample size	**435**	**450**		

Source: Baseline and three-year follow-up surveys conducted by Mathematica.

Note: The numbers presented in the table are regression-adjusted means on the three-year follow-up survey for each study group.

***/**/* Impact estimates are statistically significant from zero at the .01/.05/.10 level, respectively, two-tailed test.

RQ+ = Relationship Smarts PLUS.

Discussion and lessons learned

In this study, we sought to expand available evidence on the longer-term impacts of HMRE programs for high school students. Existing studies have primarily examined impacts on students immediately after a program ended or within a year of the program ending (Alamillo et al. 2021). To provide evidence on the longer-term impacts of these programs, we partnered with MTCI, an organization experienced in providing HMRE programming to high school students, to deliver two versions of the *RQ*+ curriculum to high school students in the Atlanta area. Most students participated in the program when they were in 9th grade.

We collected data from students about three years after they enrolled in the HMRE program, when most were seniors in high school. The decision to conduct a three-year follow-up survey was meant to give students more time to engage in the kind of relationship behavior that HMRE programs ultimately are designed to improve, and in turn, offer a better test of program impacts on students' relationship experiences, quality, and skills. In addition, the decision to implement the full, 12-lesson version of *RQ*+ and a shortened, 8-lesson version of *RQ*+ allowed us to examine whether shortening the curriculum influenced the longer-term impacts of the program.

Key findings

The first research question we examined was whether HMRE programming for high school students has longer-term impacts on their relationship experiences, quality, and skills. To answer that question, we compared the outcomes of students offered the full, 12-lesson version of *RQ*+ with the outcomes of students in the control group. Based on this comparison, we found that the program did not impact any of our confirmatory outcomes for the full sample of youth. For all seven confirmatory outcomes we examined, students offered the full, 12-lesson of *RQ*+ and students in the control group had similar outcomes at the time of the three-year follow-up survey. However, we were unable to precisely measure program impacts for two additional measures of relationship quality—students' happiness with their current relationship and their satisfaction with their current relationship—because these measures were available for only a small and select portion of the full sample. In addition, in checking the robustness and consistency of our confirmatory impact findings, we found some evidence suggesting that program had different impacts for girls and boys. For three of the seven confirmatory outcomes we examined, we found a statistically significant impact for girls but not for boys. The impacts on two of these outcomes were in the expected direction; girls who were offered the full version of *RQ*+ were less likely than girls in the control group to report being in an unhealthy relationship or having sex without using a condom in the last three months. However, contrary to expectations, girls who were offered the full version of *RQ*+ reported significantly lower relationship quality with their friends than girls in the control group.

Why might the program have had different impacts for girls than for boys? We did not design the study predicting a difference in impacts by gender, and the curriculum did not provide different content for girls and boys. Rather, we tested for gender differences to check the consistency of our impact findings and account for the general possibility that HMRE programming might resonate with some students more than others, especially when offered to a diversity of students in a public-school setting. In investigating possible reasons for the observed gender difference, we found prior research showing that adolescent girls and boys report different attitudes toward and experiences with relationships. For example, research has uncovered gender differences in teens' attitudes toward adolescent sexual behavior, dating violence, marriage, and parenthood (Goesling and Alamillo 2018; Forrester et al. 2022; Wood et al. 2008). Studies have also found gender differences in teens' reports of certain relationship experiences, such as being in

love, having sex with a different-sex partner, having sex with a same-sex partner, and using condoms (Regan et al. 2004; Lindberg et al. 2021). Given these differences, it is possible that girls in our study were more responsive to the information provided by the HMRE program than boys. For example, it is possible that receiving information on the characteristics of healthy relationships led girls to have higher standards for their relationships, which could explain both the program's favorable impact in reducing unhealthy relationships and unprotected sex and the program's unexpected impact in lowering girls' perceived relationship quality with their friends.

The second research question we examined was whether shortening an HMRE curriculum could interfere with its intended, longer-term effects on students' relationship experiences, quality, and skills. To answer that question, we compared the outcomes of students offered the full, 12-lesson version of *RQ*+ with the outcomes of students offered the shortened, 8-lesson version of *RQ*+ designed for this study.[2] For six of the seven confirmatory outcomes we examined, we found that students offered the full 12-lesson *RQ*+ curriculum reported similar relationship experiences, and similar levels of relationship quality and skills, as youth offered the shortened 8-lesson *RQ*+ curriculum. For the one exception, we found that students offered the full *RQ*+ curriculum were less likely than students offered the shortened curriculum to report having sex without using a condom in the last three months. This impact was significant at the 0.10 level, but did not remain statistically significant when we used other estimation strategies or when we adjusted for the total number of significance tests conducted across the study's three research groups. Overall, then, we found limited evidence of differences in impacts between the full and shortened curriculum.

Our findings contribute to an emerging research literature on the impacts of HMRE programs for high school students. Prior studies suggest these programs can positively affect students' relationship skills, attitudes, and knowledge around the time the program ends, but that these impacts fade after the program ends (Alamillo et al. 2021). For instance, in the one-year impact study of *RQ*+ conducted as part of STREAMS, we found evidence of small, positive impacts on students' relationship attitudes immediately after the program, but we found no evidence of impacts on students' relationships attitudes, skills, or knowledge one year after the program (Alamillo and Goesling 2021). Similarly, in the present study, we found no evidence of impacts on students' relationship experiences, quality, and skills three years after the program for the full sample of students. However, we did find some evidence of some longer-term program impacts for girls. In addition, our assessment of impacts on students' relationship quality was limited by the fact that relatively few students were in a relationship at the time of the three-year follow-up survey, and consequently most of them did not respond to items about the quality of their romantic relationships.

Considerations for HMRE programs

To increase a program's chances of showing evidence of consistent, sustained impacts for all students, HMRE program providers might need to consider alternative approaches to program design or implementation. For example, it is possible that current program models are not intensive enough to have a lasting impact on students' outcomes. Providers could consider devoting more than 18 hours to HMRE programming, or sustaining programming over a longer period, to achieve the intended effects over a longer term. Providing a sequence of programming across multiple grade levels—such as an introductory class in 9th grade and a follow-up class later in high school—would allow providers to introduce

[2] Because our second research question is about the impacts of shortening *RQ*+ from 12 lessons to 8 lessons, we focus our comparisons on the full and shortened research groups. The differences in outcomes between students in the shortened group and students in the control group can be found in the Appendix.

important program content before most students start dating, and to revisit the content with students as they embark on dating relationships.

Providers should also consider the characteristics and motivations of youth served by their programs. Many HMRE programs for youth, including the one we evaluated in the present study, take a universal prevention approach, offering all students a chance to participate in services, typically early in high school, regardless of their current relationship status or interest in receiving the information (Wadsworth and Markman 2012). This approach has the advantage of reaching a larger number of students and potentially preventing negative relationship outcomes when students eventually begin dating. However, the findings from this study suggest the approach of trying to reach a large number of students early in high school may not yield longer-term program impacts. As an alternative or supplement to universal prevention, providers may want to tailor their programs to a more select group of youth. For example, a recent meta-analysis of teen pregnancy prevention programs found that programs delivered exclusively to girls had larger impacts than programs delivered to all genders (Juras et al. 2019). A more tailored approach to programming could allow providers to better address the needs, questions, and experiences of their intended population. However, offering a program to certain groups of youth and not others may raise issues related to equity and inclusion. Providers should carefully consider these issues when determining who to serve in their programs.

Considerations for research

The results of this study can also inform future research on HMRE programs. Future studies should consider the right time to measure the impacts of HMRE programs for high school students. In our sample, which was mostly made up of 12th-graders, only about one-third of students reported they were currently in a relationship. The low prevalence of dating relationships made it challenging to address whether the program had an impact on the quality of students' relationships. Although measuring outcomes later in high school may be appropriate to assess program impacts on outcomes that are relevant for all students in the study, such as their relationship skills, attitudes, and certain behaviors, studies may need a much longer follow-up period to assess whether programs are having their intended impacts on the quality of students' romantic relationships.

Future studies should also assess the longer-term impacts of a wider variety of HMRE programs delivered to diverse groups of youth. Even though the present study examined a widely implemented HMRE curriculum in a setting that aligns with how many other organizations deliver HMRE programming, the findings are not necessarily generalizable to all school-based HMRE programs. HMRE programs for youth use a variety of curricula and service delivery approaches to serve youth with diverse backgrounds, beliefs, and identities. More research is needed—including smaller formative studies and larger impact studies—to understand the most effective ways to design and implement programs for different groups of youth.

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Technical Appendix

This Technical Appendix supplements the longer-term impact study of a healthy marriage and relationship education (HMRE) program for high school students. Mathematica and Public Strategies conducted the study as part of the Strengthening Relationship Education and Marriage Services (STREAMS) evaluation. The first section of the Appendix provides additional detail on the random assignment procedures for the impact study. The second section describes the survey administration procedures and the approach to dealing with survey nonresponse. The third section provides additional detail on the study's confirmatory analyses. Finally, the fourth section presents findings from the study's exploratory analyses.

Random assignment

The impact study used a classroom-level random assignment design with three research groups. Classes assigned to one of the three research groups offered students the full 12-lesson version of the *Relationship Smarts PLUS* (*RQ+*) curriculum. Classes assigned to a second research group offered students a shortened 8-lesson version of the *RQ+* curriculum that was designed specifically for the impact study. Classes assigned to a third research group did not offer students any HMRE programming. We used classrooms, not individual students, as the unit of random assignment mainly because of the practical constraints of conducting an impact study in schools.

For classes assigned to either the control group or the group offered the shortened eight-lesson version of the curriculum, More than Conquerors Inc. (MTCI) staff delivered supplementary lessons from a job-readiness curriculum called *12 Pluses for Work Readiness and Career Success*. The lessons covered topics such as career planning, resume writing, planning for a job search, appropriate workplace attire, and interview skills. For classes assigned to the control group, MTCI educators delivered 12 90-minute lessons of the *12 Pluses* curriculum on average once or twice per week during the semester. For classrooms offered the shortened version of the *RQ+* curriculum, MTCI educators delivered four 90-minute lessons of the *12 Pluses* curriculum after the class completed the *RQ+* lessons. With this design, students in all classes in the study received the same total amount of instruction from the MTCI facilitators, but the content of the instruction differed across the study's three research groups.

Over the course of the 2016–2017 and 2017–2018 school years, we enrolled 1,862 students from 61 health classes at two high schools to participate in the study. We conducted random assignment near the start of each semester after the schools had set their class schedules for the semester, for a total of four times during the study. To ensure that each of the three research groups had an even mix of classes from the two schools in the study, we randomly assigned classes separately by school. This approach to random assignment resulted in a blocked evaluation design, with each combination of school and semester defined as a separate block.

Data from the baseline student survey (Table A.1) showed that the random assignment process yielded groups of students that were similar at baseline in terms of grade level and all measured demographics. The share of students who reported previous attendance in a class about romantic relationships or dating, dating violence, teen pregnancy or sexually transmitted infections (STIs), or marriage was also similar. A similar percentage of students was currently in a dating relationship, had ever had sexual intercourse, or reported having sex without using a condom in the last three months. In addition, the students reported similar perceptions of their general relationship skills and relationship quality.

Table A.1. Baseline characteristics for the full sample, by study group

Measure	Full *RQ*+ group	Summary *RQ*+ group	Control group
Demographics			
Grade in school (%)			
9th grade	85	88	87
10th grade or higher	15	12	13
Female (%)	47	47	47
Race and ethnicity (%)			
Hispanic	54	56	57
Black, non-Hispanic	28	25	26
White, non-Hispanic	5	6	5
Other	13	14	12
Born outside of U.S. (%)	19	19	16
Primary language spoken at home (%)			
English	47	52	48
Spanish	42	40	42
Other or multiple languages	11	8	10
Living arrangements (%)			
Lives with both biological parents	49	50	52
Lives with biological mom only	41	40	38
Lives with biological dad only	4	5	4
Lives with neither biological parent	6	5	6
Biological parents are currently married (%)	44	43	47
Relationship information, experiences, and behaviors			
Attended a class in the prior year on: (%)			
Romantic relationships or dating	23	23	25
Dating violence	10	10	13
Teen pregnancy or STIs	29	28	30
Marriage	8	8	7
Currently in a dating relationship (%)	30	29	31
Ever had sexual intercourse (%)	16	16	13
Had sex without using a condom in the last three months (%)	4	4	5
Relationship skills			
Perceived general relationship skills (range: 1 to 4)	3.0	3.0	3.0
Perceived conflict management skills (range: 1 to 4)[b]	2.6	2.5	2.6
Relationship quality			
Relationship quality with parents (range: 1 to 4)	2.8	2.9	3.0
Relationship quality with friends (range: 1 to 4)	2.7	2.7	2.7
Sample size	**596**	**647**	**593**

Source: Baseline survey conducted by Mathematica.

[a] Differences between full *RQ*+ group and control group are statistically significant at the .05 level, two-tailed test.

[b] Differences between shortened *RQ*+ group and control group are statistically significant at the .05 level, two-tailed test.

[c] Differences between full and shortened *RQ*+ groups are statistically significant at the .05 level, two-tailed test.

RQ+ = *Relationship Smarts PLUS*.

One potential limitation of classroom-level random assignment is the risk of contamination or spillover effects when students from all three research groups within the same schools make up the sample (Goesling 2019). Such effects could arise, for example, if the MTCI facilitators presented information from the *RQ+* curriculum to all three research groups, if changes in students' schedules meant that some students had to switch health classrooms during the semester, or if friendships or social interactions between students assigned to different research groups led to the informal discussion of curriculum content. We undertook several efforts to mitigate this risk, and our analysis of contamination or spillover effects showed little evidence of such effects. Alamillo and Goesling (2021) present more information on these efforts and the analysis of exposure to program information at the one-year follow-up.

Survey administration, nonresponse, and baseline equivalence

For students who received permission from a parent or guardian to respond to the study surveys, we administered (1) a baseline survey in class near the start of the semester before the MTCI facilitators had delivered any lessons; (2) a one-year follow-up survey about 12 months after the baseline survey, either in school or outside of school by telephone; and (3) a longer-term follow-up survey about three years after the baseline survey, either online or by telephone. We designed the surveys to capture a broad range of demographic and personal characteristics, including students' attitudes about relationships and their relationship experiences. The first section of the surveys captured information on students' backgrounds, including demographic information and future education and career goals. The second section asked questions about students' family and friends. Later sections of the surveys gauged students' opinions on their relationship skills, including understanding others' feelings, showing respect to others, and working through problems without arguing. The final section of the surveys asked about current relationships, including current dating status and satisfaction if currently dating. As required by MTCI's grant, we also administered a program exit survey in class near the end of the semester after the MTCI facilitators had completed all the lessons. The program exit survey included a standardized set of survey questions whose answers all grantees had to collect as a condition of grant funding. Some but not all of the questions overlapped in content with the questions included on the STREAMS one-year follow-up survey.

The longer-term follow-up survey collected outcome data from students about three years after study enrollment, when most students were seniors in high school. Survey administration took place primarily online or by telephone. The three-year follow-up survey was designed for administration during the 2019–2020 school year when students in the study were in grade 11 or 12. However, the COVID-19 pandemic and associated disruptions necessitated the extension of data collection into summer and fall 2020. As a result, most respondents (57 percent) were in grade 12 when they completed the survey, with 28 percent of survey respondents in grade 11 and 14 percent in college or no longer enrolled in school.

The survey procedures yielded high consent and survey response rates (Table A.2). The baseline survey had an overall response rate of 99 percent for consented students. As expected, given students' absences, changes in class schedules, and school transfers, the program exit survey and one-year follow-up survey both had a lower overall response rate (84 and 85 percent for consented students, respectively). Response rates for the three-year follow-up survey were lower than for the program exit and one-year follow-up surveys partly because of difficulties in data collection associated with the COVID-19 pandemic. The three-year follow-up survey had an overall response rate of 71 percent (72 percent for the full group, 69 percent for the shortened group, and 71 percent for the control group). For all surveys, response rates were within 5 percentage points across the three research groups.

Table A.2. Survey response rates

	Full *RQ+* group	Shortened *RQ+* group	Control group	All students
Number of students				
Eligible for study	656	700	646	2,002
Returned consent form	628	674	618	1,920
Received consent	604	658	600	1,862
Completed baseline survey	596	647	593	1,836
Completed exit survey	527	539	505	1,571
Completed one-year follow-up survey	513	552	517	1,582
Completed three-year follow-up survey	435	451	428	1,314
Consent rate				
Returned consent form	96%	96%	96%	96%
Received consent				
All eligible students	92%	94%	93%	93%
Students who returned consent form	96%	98%	97%	97%
Baseline survey response rate				
All eligible students	91%	92%	92%	92%
Consented students	99%	98%	99%	99%
Exit survey response rate				
All eligible students	80%	77%	78%	78%
Consented students	87%	82%	84%	84%
One-year follow-up survey response rate				
All eligible students	78%	79%	80%	79%
Consented students	85%	84%	86%	85%
Three-year follow-up survey response rate				
All eligible students	66%	64%	66%	66%
Consented students	72%	69%	71%	71%

Source: Baseline survey, exit survey, one-year follow-up survey, and three-year follow-up survey conducted by Mathematica.

RQ+ = Relationship Smarts PLUS.

Nonresponse to the three-year follow-up survey had little material effect on the similarity of students in the treatment and control groups (Table A.3). When examining baseline characteristics for only those students who completed the three-year follow-up survey, we found that students in all three research groups were similar on most demographic characteristics. The one exception was students' primary language spoken at home. Compared to students in the shortened *RQ+* group, a smaller percentage of students in the full *RQ+* group reported primarily speaking English at home, and a larger percentage reported primarily speaking a language other than just English or Spanish at home. We also found that a similar percentage of students across all three research groups reported previous attendance in classes related to HMRE programming and currently being in a dating relationship, ever having sexual intercourse, and having sex without a condom in the last three months. In addition, students reported similar perceptions of their general relationship skills and relationship quality.

Table A.3. Baseline characteristics for the analytic sample, by study group

Measure	Full *RQ*+ group	Shortened *RQ*+ group	Control group
Demographics			
Grade in school (%)			
9th grade	87	91	89
10th grade or higher	13	9	11
Female (%)	48	49	50
Race and ethnicity (%)			
Hispanic	57	58	60
Black, non-Hispanic	24	24	23
White, non-Hispanic	5	5	4
Other	14	14	14
Born outside of United States (%)	19	19	16
Primary language spoken at home (%)			
English[c]	42	50	44
Spanish	46	42	47
Other or multiple languages[c]	13	9	10
Living arrangements (%)			
Lives with both biological parents	55	55	58
Lives with biological mother only	37	37	33
Lives with biological father only	3	4	4
Lives with neither biological parent	5	4	5
Biological parents are currently married (%)	54	54	56
Relationship information, experiences, and behaviors			
Attended a class in the prior year on: (%)			
Romantic relationships or dating	20	21	23
Dating violence	9	9	12
Teen pregnancy or STIs	27	28	29
Marriage	7	7	6
Currently in a dating relationship (%)	27	26	28
Ever had sexual intercourse (%)	12	13	10
Had sex without using a condom in the last three months (%)	3	3	4
Relationship skills			
Perceived general relationship skills (range: 1 to 4)	3.0	3.0	3.0
Perceived conflict management skills (range: 1 to 4)[b]	2.6	2.5	2.6
Relationship quality			
Relationship quality with parents (range: 1 to 4)	2.8	2.9	2.9
Relationship quality with friends (range: 1 to 4)	2.7	2.7	2.7
Sample size	**435**	**451**	**428**

Source: Baseline survey conducted by Mathematica.

Note: Percentages may not sum to 100 due to rounding

[a] Differences between the full *RQ*+ group and the control group are statistically significant at the .05 level, two-tailed test.

[b] Differences between the shortened *RQ*+ group and the control group are statistically significant at the .05 level, two-tailed test.

[c] Differences between the full and shortened *RQ*+ groups are statistically significant at the .05 level, two-tailed test.

RQ+ = *Relationship Smarts PLUS*.

To account for students who did not complete the three-year follow-up survey, we constructed survey nonresponse weights for use in the impact analysis. These weights adjust the data to represent all sample members, not just those who completed the survey. We estimated a logistic regression model that predicted survey response—that is, whether a student was located for, agreed to, and responded to the three-year follow-up survey—as a function of baseline characteristics.[3] We calculated weights as the inverse of the probability of nonresponse, as predicted by the logistic regression model. We truncated weights at the 99th percentile to avoid extreme outliers that could skew the results.

In addition to examining baseline equivalence among the sample of students who completed the three-year follow-up survey, we explored baseline equivalence among the truncated sample of students in a relationship at the time of the three-year follow-up survey (Table A.4). Two of our measures of relationship quality—happiness with current relationship and satisfaction with current relationship—were truncated, meaning that they were available only for the subset of the sample that was in a relationship at the time of the survey. If the HMRE program affected students' likelihood of being in a relationship at the time of the three-year follow-up survey, then the three research groups might not be equivalent among this subsample of students. The lack of equivalence could lead to biased estimates of program effectiveness for the outcomes of happiness and satisfaction. Researchers sometimes refer to this possibility as a truncation problem because the outcome is unavailable or undefined for some sample members (McConnell et al. 2008).

Table A.4. Baseline characteristics for the truncated sample, by study group

Measure	Full *RQ+* group	Shortened *RQ+* group	Control group
Demographics			
Grade in school (%)			
9th grade	89	88	88
10th grade or higher	11	12	12
Female (%)	48	54	56
Race and ethnicity (%)			
Hispanic	58	63	61
Black, non-Hispanic	26	25	24
White, non-Hispanic	5	4	4
Other	11	9	11
Born outside of United States (%)	17	21	16
Primary language spoken at home (%)			
English[c]	41	50	44
Spanish	48	46	46
Other or multiple languages[c,d]	11	4	10
Living arrangements (%)			
Lives with both biological parents	52	49	52
Lives with biological mother only	36	43	38
Lives with biological father only[d]	5	4	3
Lives with neither biological parent[d]	7	4	8

[3] We dropped two students' missing baseline data from all impact analyses, as we were unable to construct weights for these cases.

Measure	Full *RQ*+ group	Shortened *RQ*+ group	Control group
Biological parents are currently married (%)	52	49	52
Relationship information, experiences, and behaviors			
Attended a class in the prior year on: (%)			
Romantic relationships or dating[d]	22	25	34
Dating violence[d]	9	9	15
Teen pregnancy or STIs	27	26	27
Marriage	7	8	8
Currently in a dating relationship (%)	39	37	42
Ever had sexual intercourse (%)[d]	20	21	14
Had sex without using a condom in the last three months (%)	7	7	6
Relationship skills			
Perceived general relationship skills (range: 1 to 4)	3.0	3.0	3.1
Perceived conflict management skills (range: 1 to 4)[b]	2.6	2.6	2.6
Relationship quality			
Relationship quality with parents (range: 1 to 4)	2.9	2.9	2.8
Relationship quality with friends (range: 1 to 4)	2.7	2.7	2.9
Sample size	**150**	**161**	**160**

Source: Baseline survey conducted by Mathematica.

Note: Percentages may not sum to 100 due to rounding

[a] Differences between the full *RQ*+ group and the control group are statistically significant at the .05 level, two-tailed test.

[b] Differences between the shortened *RQ*+ group and the control group are statistically significant at the .05 level, two-tailed test.

[c] Differences between the full and shortened *RQ*+ groups are statistically significant at the .05 level, two-tailed test.

[d] Difference between the research groups exceeds an effect size of .25.

RQ+ = *Relationship Smarts PLUS*.

To assess the potential risk of bias in the estimates of program effects on the two relationship quality measures of happiness and satisfaction, we followed a two-step procedure that several other impact studies used for adults in HMRE programs (Moore et al. 2012; Moore et al. 2018; Wu et al. 2021) and that the U.S. Department of Education's What Works Clearinghouse (WWC) (U.S. Department of Education 2020) initially developed. The first step in the procedure compares overall and differential attrition in each analytic sample to WWC's conservative attrition standard. If attrition meets WWC's standard, then the risk of bias because of truncation is deemed low by WWC evidence standards. If attrition does not meet the standard, then the second step compares students in the three research groups in the analysis sample for equivalence on key observable characteristics. To meet the equivalence standard, the effect size of the difference in characteristics must not exceed .25. Analytic samples that meet neither the attrition nor equivalence standard are deemed capable of producing impact estimates with substantial risk of bias. Therefore, readers would be cautioned to interpret these findings more carefully than other experimental impact estimates.

Table A.5 shows the results from our analyses, indicating that the truncated sample failed to meet both the attrition and equivalence standards. Overall, about three-quarters of students who responded to the baseline survey did not respond to the two relationship quality measures in the three-year follow-up

survey, resulting in high attrition per WWC standards. We then tested equivalence on observable demographic characteristics and found that several baseline characteristics did not meet baseline equivalence standards. The differences in effect sizes between research groups was greater than .25. These characteristics included students' primary language spoken at home, students' living arrangements, whether students attended a class in the previous year on romantic relationships or dating and dating violence, and whether students reported ever having sexual intercourse. Thus, we concluded that the risk of bias was too high to consider the outcomes happiness with current relationship and satisfaction with current relationship as confirmatory. We instead estimated impacts on these truncated outcomes as part of our exploratory analyses. (A section on details of exploratory analyses is in the Appendix.)

Table A.5. Results of assessments of risk of bias for truncated samples

Sample description	Overall attrition (%)	Differential attrition, full *RQ+* versus control (%)	Differential attrition, shortened *RQ+* versus control (%)	Differential attrition, full versus shortened *RQ+* (%)	High or low attrition	Equivalent at baseline?
Happiness with current relationship	74.8	1.5	1.7	0.2	High	No
Satisfaction with current relationship	74.9	1.5	2.0	0.5	High	No

Source: MTCI baseline and three-year follow-up surveys conducted by Mathematica.

RQ+ = Relationship Smarts PLUS.

Details of confirmatory analysis

Before conducting the impact analysis, we specified the outcomes and analytic methods we planned to use for answering the study's main research questions. Specifying this confirmatory analysis in advance prevents focusing the assessment of program impacts on outcomes that happen to emerge as statistically significant or the perception that this might have been the case (Schochet 2009). We publicly documented the outcomes selected for the confirmatory analysis as part of the study's registry on the website clinicaltrials.gov (identifier: NCT02832856).

Confirmatory outcome measures

In selecting outcomes for the confirmatory analysis, we sought to balance the need for a comprehensive assessment of the program against the equally important need to limit the number of statistical tests we conducted. HMRE programs for high school students can potentially affect a broad range of relationship skills, attitudes, knowledge, and behaviors (Simpson et al. 2018). However, from a statistical perspective, the more outcomes that we examined, the more likely that at least one test would find a statistically significant but spurious impact. In other words, selecting too many outcomes for the confirmatory analysis increases the chances of falsely identifying a program impact when no true impact exists (Schochet 2009). To balance these factors, we focused the confirmatory analysis for this report on nine measures of students' relationship experiences, quality, and skills.

As discussed later, five of the outcomes that we selected for the confirmatory analysis were scales constructed by combining students' responses to several survey questions. For consistency, we followed a uniform approach in constructing the scales by averaging students' responses across survey questions. For example, for the scale of students' perceived general relationship skills, we calculated scale scores by averaging students' responses across the six survey questions corresponding to that scale. To maximize

the sample size available for the analysis, we calculated a scale score for any student who responded to at least two-thirds of the questions making up the scale. For example, for a scale with six questions, we calculated a scale score for any students who responded to at least four of the six questions. We coded students as missing on the scale if they responded to fewer than two-thirds of the questions. We did not have enough information to calculate a score for these students.

Relationship experiences

We measured students' relationship experiences through three binary variables.

We adapted our measure of whether a student is *currently in an unhealthy relationship* from questions in the Supporting Healthy Marriage 12-month survey (Hsueh et al. 2012). The variable equals 1 if students reported currently being in a romantic relationship and having experienced any of the following:

- Partner tried to keep them from seeing friends
- Partner made them feel stupid
- Felt their partner might hurt them

We measured whether a student has *ever had sex*. The variable equals 1 if the student reported ever having sexual intercourse and equals 0 if the student reported never having sexual intercourse.

Finally, we measured whether a student has *had sex without using a condom in the last three months*. The variable equals 1 if the student reported having sex without using a condom in the last three months and equals 0 if the student reported using a condom consistently or reported not having sexual intercourse in the last three months.

Relationship quality

We used two continuous variables to measure the quality of students' relationships.

We drew our measure of *relationship quality with parents* from the Parent-Adolescent Relationship Inventory Lippman (et al. 2014). The measure is an average of responses to the following questions:

- In the past month, how often did you feel like you could count on at least one of your parents to be there when you needed them?
- In the past month, how often did you feel like you could talk with your parent(s) about things that really matter?
- In the past month, how often did you feel like you could share your thoughts and feelings with your parent(s)?

For each statement, the survey asked students to respond on a 4-point scale ranging from none of the time to all of the time. For students who responded to at least two of the three questions, we calculated a scale score by taking the average value of the student's responses across the different questions. The resulting scale ranged from 1 to 4, with higher values indicating better relationship quality with parents.

We drew our measure of *relationship quality with friends* from the Parent-Adolescent Relationship Inventory (Lippman et al. 2014). The measure is an average of responses to the following questions:

- In the past month, how often did you feel like you could count on at least one of your friends to be there when you needed them?

- In the past month, how often did you feel like you could talk with your friend(s) about things that really matter?
- In the past month, how often did you feel like you could share your thoughts and feelings with your friend(s)?

For each statement, the survey asked students to respond on a 4-point scale ranging from none of the time to all of the time. For students who responded to at least two of the three questions, we calculated a scale score by taking the average value of the student's responses across the different questions. The resulting scale ranged from 1 to 4, with higher values indicating better relationship quality with friends.

Relationship skills

We measured students' *perceived general relationship skills* with a subset of items from the Relationship Deciding Scale, which was developed with a sample of college-age students (Vennum and Fincham 2011). For these items, the survey asked students to report their level of agreement with each of the following statements:

- I believe I will be able to effectively deal with conflicts that arise in my relationship.
- I feel good about my ability to make a romantic relationship last.
- I am very confident when I think of having a stable, long-term relationship.
- I have the skills needed for a lasting, stable romantic relationship.
- I am able to recognize the warning signs of a bad relationship.
- I know what to do when I recognize the warning signs of a bad relationship.

For each statement, the survey asked students to report their level of agreement on a 4-point scale, ranging from strongly agree to strongly disagree. For students who responded to at least four of the six statements, we calculated a scale score by taking the average value of the student's responses across the different statements. The resulting scale ranged from 1 to 4, with higher values indicating greater perceived relationship skills.

We measured students' *perceived conflict management skills* with a subset of items adapted from the Conflict Management Subscale of the Interpersonal Competence Scale (Buhrmester et al. 1988). An earlier evaluation of *RQ+* for high school students used the same items (Kerpelman et al. 2009; Kerpelman et al. 2010). For these items, the survey asked students to report their level of perceived skill for each of the following five conflict management skills:

- Admitting that you might be wrong during a disagreement
- Avoiding saying things that could turn a disagreement into a big fight
- Accepting another person's point of view even if you don't agree with it
- Listening to another person's opinion during a disagreement
- Working through problems without arguing

For each item, the survey asked students to report their level of perceived skill based on the following four response options: (1) I am extremely good at this, (2) I am good at this, (3) I am ok at this, or (4) I am bad at this. For students who responded to at least four of the five items, we calculated a scale score

by taking the average value of the student's responses across the items. The resulting scale ranged from 1 to 4, with higher values indicating greater perceived communication skills.

Confirmatory analysis methods

For each confirmatory outcome, we estimated program impacts by using *RCT-YES*, a publicly available statistical software tool (https://www.rct-yes.com/). *RCT-YES* uses estimation methods designed specifically for estimating program impacts with data from randomized controlled trials. For the present study, we used the estimation methods for what *RCT-YES* describes as Design 4: the clustered, blocked design. These methods account for the fact that we randomly assigned students in clusters (health classes) and used a blocked design by conducting random assignment separately for each school and in each of four consecutive semesters (fall 2016, spring 2017, fall 2017, and spring 2018).

For designs with three or more research groups, *RCT-YES* estimates impacts by comparing each possible pair of groups. For the present study, this approach resulted in three comparisons for each outcome: (1) full versus control, (2) shortened versus control, and (3) full versus shortened. For each comparison, the software calculated the impact estimate as a regression-based weighted average across blocks of differences in outcomes for students in each pair of research groups. In the *RCT-YES* software, we specified the model by assuming a finite population (SUPER_POP = 0), including fixed effects for random assignment blocks (BLOCK_FE = 1), and weighting for individual nonresponse.

We used data from the baseline survey to include covariates for students' grade level, gender, language spoken at home, and baseline value of the outcome measure (when available). We included gender and spoken language as covariates partly because we used these variables for subgroup analyses (described later in this section). We included the baseline value of the outcome measure as a covariate (when available) in an effort to improve the precision of the impact estimates (Orr 1999). For missing data, we used the default *RCT-YES* options of mean imputation for missing baseline covariates (based on the average value of the covariate for all non-missing respondents) and case deletion for missing outcome data (meaning that the impact estimates for a particular outcome excluded any students with missing data for that outcome). For all three research groups, fewer than 5 percent of students were missing outcome data for any one confirmatory outcome.

We deemed impact estimates as statistically significant if the associated *p*-value of the estimate fell below 10 percent based on a two-tailed hypothesis test. We further distinguished *p*-values that fell between 5 and 10 percent, between 1 and 5 percent, and below 1 percent. Because the estimation approach in RCT-YES involves making three comparisons for each outcome, the software reports both the unadjusted *p*-value for each test and, for any statistically significant impacts, whether the impact estimate remains statistically significant after adjusting for the total number of tests per outcome. The software uses the Benjamini-Hochberg procedure (Schochet 2016) to make this adjustment for several tests per outcome. To help interpret the magnitude of impact estimates, we reported estimates of the standardized mean difference in outcomes (effect sizes) as calculated by *RCT-YES*.

Details of impacts on confirmatory outcomes

For the confirmatory outcomes related to students' relationship experiences, we found that students in all three research groups were about equally likely to be in an unhealthy relationship or to have ever had sex at the three-year follow-up survey (Table A.6). Students offered the full *RQ+* curriculum were less likely to report having sex without using a condom in the past three months than students offered the shortened *RQ+* curriculum or students in the control group. An estimated 12 percent of students in the full *RQ+*

group reported having sex without condoms in the past three months compared to 16 percent of students in the other two research groups. This impact was not statistically significant when comparing the full and control groups, but it was statistically significant at the .10 level when comparing the full and shortened groups. However, even when comparing the full and shortened groups, the impact did not remain statistically significant after adjusting for the increased number of statistical tests that resulted from comparing outcomes across all three research groups. For the confirmatory outcomes related to students' relationship quality and skills, we found that students in all three research groups had similar average outcomes at the three-year follow-up survey (Table A.6). Observed effect sizes for these outcomes were no greater than 0.05.

Table A.6. Impacts on confirmatory outcomes

Measure	Outcomes by study group			Full *RQ*+ versus control group			Shortened *RQ*+ versus control group			Full *RQ*+ versus shortened *RQ*+		
	Full *RQ*+ group	Shortened *RQ*+ group	Control group	Impact	Effect size	*p*-value	Impact	Effect size	*p*-value	Impact	Effect size	*p*-value
Relationship experiences												
Currently in an unhealthy relationship	9	10	10	-1	-0.04	0.55	0	0.01	0.88	-2	-0.06	0.49
Ever had sex	40	39	44	-4	-0.08	0.31	-5	-0.09	0.25	1	0.02	0.80
Had sex without using a condom in the last three months	12	16	16	-4	-0.11	0.11	-0.20	-0.01	0.94	-4[*]	-0.11	0.07
Relationship quality												
Relationship quality with parents (range: 1 to 4)	3.18	3.20	3.17	0.01	0.01	0.88	0.02	0.03	0.71	-0.01	-0.01	0.87
Relationship quality with friends (range: 1 to 4)	2.88	2.92	2.90	-0.02	-0.03	0.75	0.01	0.01	0.88	-0.03	-0.04	0.67
Relationship skills												
Perceived general relationship skills (range: 1 to 4)	3.19	3.22	3.22	-0.02	-0.05	0.56	0.01	0.01	0.89	-0.02	-0.05	0.51
Perceived conflict management skills (range: 1 to 4)	2.79	2.78	2.78	0.01	0.02	0.75	-0.00	-0.00	0.96	0.01	0.03	0.74
Sample size	**435**	**451**	**428**									

Source: Baseline and three-year follow-up surveys conducted by Mathematica.

Note: The numbers in the three "Outcomes by study group" columns are regression-adjusted predicted values.

***/**/* Impact estimates are statistically significant at the .01/.05/.10 levels, respectively, two-tailed test.

[a] Difference remains statistically significant at the .10 level, two-tailed test, after applying the Benjamini-Hochberg correction for multiple hypothesis testing for pairwise contrasts across the research groups.

RQ+ = *Relationship Smarts PLUS*.

Robustness checks

As described earlier, we specified our confirmatory impact model in RCT-YES to weight for individual student nonresponse and to include covariates for students' grade level, gender, and language spoken at home as well as the baseline value of the outcome measure (when available). To verify that the findings from our confirmatory analysis are not overly sensitive to specific analytic decisions that we made, we performed robustness checks by rerunning the confirmatory analyses with different specifications. Specifically, we repeated the confirmatory analysis when (1) excluding covariates from the model (Table A.7), (2) weighting students equally rather than including nonresponse weights (Table A.8), and (3) weighting each cluster (classroom) equally rather than including nonresponse weights or weighting students equally (Table A.9). In the models excluding covariates and the models weighting clusters equally, we found that the impact on the outcome of having sex without using a condom in the last three months for students in the full *RQ+* group compared to students in the shortened *RQ+* group was no longer statistically significant. In the models weighting students equally, this impact did remain statistically significant at the .10 level for students in the full *RQ+* group compared to students in the control group. In addition, in the models weighting students equally, the impact on having sex without using a condom in the last three months was statistically significant at the .10 level for students in the full *RQ+* group compared to students in the control group. However, neither of these impacts remained statistically significant after adjusting for multiple comparisons. The impact findings for all other outcomes and model specifications were otherwise similar to those of our confirmatory analysis.

Table A.7. Impacts on confirmatory outcomes: Models without covariates

Measure	Outcomes by study group			Full *RQ*+ versus control group			Shortened *RQ*+ versus control group			Full *RQ*+ versus shortened *RQ*+		
	Full *RQ*+ group	Shortened *RQ*+ group	Control group	Impact	Effect size	*p*-value	Impact	Effect size	*p*-value	Impact	Effect size	*p*-value
Relationship experiences												
Currently in an unhealthy relationship	9	10	10	-1	-0.04	0.54	1	0.02	0.80	-2	-0.06	0.45
Ever had sex	41	40	44	-3	-0.05	0.48	-3	-0.07	0.42	1	0.01	0.86
Had sex without using a condom in the last three months	12	15	16	-4	-0.11	0.11	-1.08	-0.3	0.68	-3	-0.09	0.23
Relationship quality												
Relationship quality with parents (range: 1 to 4)	3.13	3.20	3.17	-0.03	-0.04	0.65	0.02	0.02	0.77	-0.05	-0.06	-0.42
Relationship quality with friends (range: 1 to 4)	2.86	2.93	2.90	-0.04	-0.05	0.56	0.02	0.02	0.78	-0.06	-0.07	0.38
Relationship skills												
Perceived general relationship skills (range: 1 to 4)	3.19	3.22	3.22	-0.03	-0.06	0.40	0.01	0.02	0.81	-0.04	-0.08	0.26
Perceived conflict management skills (range: 1 to 4)	2.78	2.76	2.78	-0.00	-0.00	0.96	-0.03	-0.05	0.56	0.02	0.04	0.60
Sample size	**435**	**451**	**428**									

Source: Baseline and three-year follow-up surveys conducted by Mathematica.

Note: The numbers in the three "Outcomes by study group" columns are regression-adjusted predicted values.

***/**/* Impact estimates are statistically significant at the .01/.05/.10 levels, respectively, two-tailed test.

[a] Difference remains statistically significant at the .10 level, two-tailed test, after applying the Benjamini-Hochberg correction for multiple hypothesis testing for pairwise contrasts across the research groups.

RQ+ = *Relationship Smarts PLUS*.

Table A.8. Impacts on confirmatory outcomes: Students weighted equally

Measure	Outcomes by study group			Full *RQ+* versus control group			Shortened *RQ+* versus control group			Full *RQ+* versus shortened *RQ+*		
	Full *RQ+* group	Shortened *RQ+* group	Control group	Impact	Effect size	*p*-value	Impact	Effect size	*p*-value	Impact	Effect size	*p*-value
Relationship experiences												
Currently in an unhealthy relationship	8	9	10	-2	-0.05	-0.39	-0	-0.01	0.84	-1	-0.05	0.50
Ever had sex	40	39	4	-3	-0.06	0.40	-4	-0.08	0.26	1	0.02	0.71
Had sex without using a condom in the last three months	12	16	16	-4*	-0.12	0.08	-0.67	-0.02	0.79	-4[a]	-0.10	0.08
Relationship quality												
Relationship quality with parents (range: 1 to 4)	3.16	3.20	3.16	-0.00	-0.00	0.96	0.03	0.03	0.65	-0.03	-0.03	0.63
Relationship quality with friends (range: 1 to 4)	-2.87	2.90	2.91	-0.04	-0.04	0.59	-0.02	-0.02	0.81	-0.02	-0.02	0.81
Relationship skills												
Perceived general relationship skills (range: 1 to 4)	3.19	3.21	3.21	-0.02	-0.03	0.64	-0.00	-0.01	0.93	-0.01	-0.02	0.77
Perceived conflict management skills (range: 1 to 4)	2.80	2.76	2.79	0.01	0.01	0.80	-0.02	-0.04	0.62	0.03	0.05	0.51
Sample size	**435**	**451**	**428**									

Source: Baseline and three-year follow-up surveys conducted by Mathematica.

Note: The numbers in the three "Outcomes by study group" columns are regression-adjusted predicted values.

***/**/* Impact estimates are statistically significant at the .01/.05/.10 levels, respectively, two-tailed test.

[a] Difference remains statistically significant at the .10 level, two-tailed test, after applying the Benjamini-Hochberg correction for multiple hypothesis testing for pairwise contrasts across the research groups.

RQ+ = Relationship Smarts PLUS.

Table A.9. Impacts on confirmatory outcomes: Clusters weighted equally

Measure	Outcomes by study group			Full *RQ+* versus control group			Shortened *RQ+* versus control group			Full *RQ+* versus shortened *RQ+*		
	Full *RQ+* group	Shortened *RQ+* group	Control group	Impact	Effect size	*p*-value	Impact	Effect size	*p*-value	Impact	Effect size	*p*-value
Relationship experiences												
Currently in an unhealthy relationship	9	10	10	-1	-0.04	0.51	-1	-0.02	0.76	-1	-0.03	0.65
Ever had sex	39	38	42	-2	-0.05	0.52	-4	-0.08	0.28	2	0.03	0.58
Had sex without using a condom in the last three months	12	15	16	-4	-0.10	0.12	-0.75	-0.02	0.76	-3	-0.09	0.13
Relationship quality												
Relationship quality with parents (range: 1 to 4)	3.16	3.18	3.16	0.00	0.00	0.97	0.02	0.02	0.74	-0.01	-0.02	0.82
Relationship quality with friends (range: 1 to 4)	2.88	2.89	2.91	-0.03	-0.03	0.64	-0.02	-0.02	0.78	-0.01	-0.01	0.90
Relationship skills												
Perceived general relationship skills (range: 1 to 4)	3.19	3.20	3.21	-0.2	-0.01	0.64	-0.01	-0.01	0.82	-0.01	-0.01	0.85
Perceived conflict management skills (range: 1 to 4)	2.80	2.76	2.79	0.01	0.01	0.80	-0.03	-0.05	0.48	0.04	0.06	0.35
Sample size	**435**	**451**	**428**									

Source: Baseline and three-year follow-up surveys conducted by Mathematica.

Note: The numbers in the three "Outcomes by study group" columns are regression-adjusted predicted values.

***/**/* Impact estimates are statistically significant at the .01/.05/.10 levels, respectively, two-tailed test.

[a] Difference remains statistically significant at the .10 level, two-tailed test, after applying the Benjamini-Hochberg correction for multiple hypothesis testing for pairwise contrasts across the research groups.

RQ+ = Relationship Smarts PLUS.

Subgroup analyses

For our confirmatory outcomes, we examined subgroup differences by students' gender and primary language spoken at home. Previous research suggests that high school students' romantic relationship attitudes and experiences may differ by gender (Goesling and Alamillo 2018; Wood et al. 2008). To explore the possibility that the program impacted girls and boys differently, we estimated impacts on students' longer-term relationship experiences, quality, and skills separately by their self-reported gender (Table A.10). For these analyses, we looked only at differences in outcomes between the full *RQ*+ group and the control group (without the shortened *RQ*+ group).

For the outcomes related to students' relationship experiences, the patterns suggested more favorable program impacts for girls than for boys. As compared to girls in the control group, girls who were offered the full *RQ*+ curriculum were less likely to report being in an unhealthy relationship and less likely to report having sex without using a condom in the last three months, with both impacts statistically significant. There were no statistically significant impacts for boys on these outcomes. Moreover, the test for differences in impacts between girls and boys on these outcomes were also statistically significant. Girls who were offered the full *RQ*+ curriculum were also less likely than girls in the control group to report ever having sex, although the difference was not statistically significant.

For the outcomes related to students' relationship quality and skills, we found one statistically significant outcome. As compared with girls in the control group, girls in the full *RQ*+ group reported a lower level of relationship quality with friends, with the difference significant at the .10 level. The difference in impacts on this outcome between girls and boys was also statistically significant at the .05 level. For the remaining outcomes, we found no statistically significant impacts for girls or boys.

Table A.10. Subgroup impacts by gender (full *RQ*+ group versus control group)

Measure	Girls (Sample size = 422)		Boys (Sample size = 441)		*p*-value for subgroup difference
	Control group	Impact	Control group	Impact	
Relationship experiences					
Currently in an unhealthy relationship	11	-6*	10	2	0.09†
Ever had sex	50	-6	47	-2	0.65
Had sex without using a condom in the last three months	21	-12***	12	2	0.02††
Relationship quality					
Relationship quality with parents (range: 1 to 4)	3.05	0.05	3.28	-0.02	0.51
Relationship quality with friends (range: 1 to 4)	2.94	-0.18*	2.85	0.11	0.02††
Relationship skills					
Perceived general relationship skills (range: 1 to 4)	3.21	-0.01	3.22	-0.04	0.60
Perceived conflict management skills (range: 1 to 4)	2.73	0.04	2.83	-0.00	0.55

Source: Baseline and three-year follow-up surveys conducted by Mathematica.

Note: The numbers for the control group are regression-adjusted predicted values of outcomes for each subgroup. Data are weighted to account for survey nonresponse.

***/**/* Impact estimates are statistically significant at the .01/.05/.10 levels, respectively, two-tailed test.

†††/††/† Statistically significant differences among the subgroup impact estimates at the .01/.05/.10 levels, respectively.

RQ+ = Relationship Smarts PLUS.

We also estimated impacts separately by students' primary language spoken at home. About half of students in the sample reported that English was not the primary language spoken in their home. Cultural norms related to relationship experiences might differ by students' ethnicity and primary language (Allison 2016; Schwarz 2012). In addition, as discussed in the one-year impact report, one challenge faced by MTCI was a lack of Spanish-speaking facilitators to work with the substantial proportion of students whose primary language was Spanish. Although MTCI made several efforts to address this challenge, we hypothesized that program impacts might differ depending on students' primary language spoken at home. As with the gender subgroup analysis, for the analysis of primary language spoken at home, we looked only at differences in outcomes between the full *RQ+* group and the control group (without the shortened *RQ+* group). We found no statistically significant differences in impacts between students who reported primarily speaking English at home and students who reported primarily speaking Spanish or another language at home (Table A.11).

Table A.11. Subgroup impacts by primary language spoken at home (full *RQ+* group versus control group)

Measure	English (Sample size = 368)		Spanish or other language (Sample size = 494)		*p*-value for subgroup difference
	Control group	Impact	Control group	Impact	
Relationship experiences					
Currently in an unhealthy relationship	12	-4	8	1	0.30
Ever had sex	46	-4	42	-3	0.83
Had sex without using a condom in the last three months	17	-4	16	-5	0.85
Relationship quality					
Relationship quality with parents (range: 1 to 4)	3.18	0.05	3.15	-0.01	0.65
Relationship quality with friends (range: 1 to 4)	2.92	0.04	2.88	-0.09	0.26
Relationship skills					
Perceived general relationship skills (range: 1 to 4)	3.22	0.02	3.20	-0.05	0.34
Perceived conflict management skills (range: 1 to 4)	2.80	0.05	2.77	-0.01	0.40

Source: Baseline and three-year follow-up surveys conducted by Mathematica.

Note: The numbers for the control group are regression-adjusted predicted values of outcomes for each subgroup. Data are weighted to account for survey nonresponse.

***/**/* Impact estimates are statistically significant at the .01/.05/.10 levels, respectively, two-tailed test.

†††/††/† Statistically significant differences among the subgroup impact estimates at the .01/.05/.10 levels, respectively.

RQ+ = Relationship Smarts PLUS.

Details of exploratory analyses

For our exploratory analysis, we estimated impacts on four outcomes related to students' relationship status and quality (Table A.12). The two measures of relationship status were (1) whether students had ever been in a romantic relationship and (2) whether they were currently in a romantic relationship. Although the HMRE program did not explicitly aim to make students more or less likely to have a relationship, it may have impacted these outcomes by, for example, making students more interested in or confident about starting a relationship or, conversely, making students more cautious or deliberate about starting a relationship. The two measures of relationship quality we examined were (1) students' happiness with their current relationship and (2) students' satisfaction with their current relationship. Given that one of the main goals of the HMRE program was to improve students' relationship quality, our intention was to include these measures as confirmatory outcomes. However, as noted earlier, these outcomes were available for only the 471 students who were in a relationship at the time of the follow-up study; in addition, baseline equivalence analyses indicated that the research groups may not have been equivalent for this analytic sample. As a result, the impact estimates on these outcomes may be biased. Therefore, we opted to include these outcomes as exploratory rather than confirmatory.

We also estimated impacts on 15 outcomes related to students' relationship attitudes, knowledge, and expectations (Table A.12), including 12 outcomes that we examined in the one-year impact study and 3 added to the three-year follow-up survey. Although we did not find impacts on these outcomes after one year, we acknowledge that impacts could surface as time elapsed following the program. For instance, given that many students had experience with romantic relationships by the time of the three-year follow-up survey, it is possible that these experiences reinforced lessons the students learned in the HMRE program related to relationship attitudes, knowledge, or expectations. For all exploratory outcomes, we estimated impacts by using the same methods and statistical software as we used in the confirmatory analysis.

Table A.12. Exploratory outcomes

Outcome	Measure
Relationship status	
Ever been in a romantic relationship[a]	Binary variable: Equals 1 if student reported ever being in a romantic relationship or dating anyone; equals 0 if student reported never being in a romantic relationship or dating anyone.
Currently in a romantic relationship	Binary variable: Equals 1 if student reported currently being in a romantic relationship; equals 0 if student reported not currently being in a relationship.
Relationship quality	
Happiness with current relationship[a,b]	Continuous variable measuring "happiness of current relationship" on 1–10 scale, with higher values indicating greater happiness with the relationship. The Parents and Children Together (PACT) HMRE study used a similar measure (Moore et al. 2018).
Satisfaction with current relationship[a,b]	Continuous scale variable: Average of responses to the following three statements included on the survey: 1. I am very satisfied with how my partner and I talk to each other. 2. I am very satisfied with how my partner and I treat each other. 3. I can turn to my partner for advice about problems. Values range from 1 to 4, with higher values indicating greater agreement. These items were adapted from a prior evaluation of the Love Smarts HMRE program (Kerpelman 2009).

Outcome	Measure
Relationship attitudes	
Disagreement with unrealistic relationship beliefs	Series of three separate continuous variables: Each variable corresponds to students' reported level of disagreement with the following statements: 1. There is only one true love out there who is right for me to marry. 2. In the end, feelings of love should be enough to sustain a happy marriage. 3. Living together before marriage will improve a couple's chances of remaining happily married. Values on each variable range from 1 to 4, with higher values indicating stronger disagreement. These items were taken from the Attitudes About Romance and Mate Selection Scale (Cobb et al. 2003) and used in a prior evaluation of *RQ+* by Kerpelman and colleagues (2009).
Disapproval of teen dating violence	Continuous scale variable: Average of responses to the following 12 statements included on the survey from the Acceptance of Couple Violence Scale (Dahlberg et al. 2005): 1. A boy angry enough to hit his girlfriend must love her very much. 2. Girls sometimes deserve to be hit by the boys they date. 3. A girl who makes her boyfriend jealous on purpose deserves to be hit. 4. A girl angry enough to hit her boyfriend must love him very much. 5. Boys sometimes deserve to be hit by the girls they date. 6. A boy who makes his girlfriend jealous on purpose deserves to be hit. 7. Violence between dating partners can improve the relationship. 8. There are times when violence between dating partners is okay. 9. It's okay to stay in a relationship even if you're afraid of your dating partner. 10. Sometimes violence is the only way to express your feelings. 11. Some couples must use violence to solve their problems. 12. Violence between dating partners is a personal matter and people should not interfere. Values range from 1 to 4, with higher values indicating greater disapproval of teen dating violence.
Desire to avoid teen pregnancy	Series of three separate continuous variables taken from the Evaluation of Adolescent Pregnancy Prevention Approaches (Smith et al. 2012). Each variable corresponds to students' reported level of agreement with the statements: 1. Getting pregnant in the next year or two would hurt my chances of being successful in life. 2. If I got pregnant in the next year or two, I would have to become a responsible adult before I wanted to. 3. If I got pregnant in the next year or two, my life would become a lot better. Each variable ranges from 1 to 4, with higher values indicating a greater desire to avoid teen pregnancy.
Importance of postponing childbearing[a]	Series of two, separate continuous variables. Each variable corresponds to students' level of agreement with the following statements: 1. It is important to finish school before having a child. 2. It is important to have a job and stable income before having a child. Each variable ranges from 1 to 4, with higher values indicating a greater level of agreement.

Outcome	Measure
Relationship knowledge	
Knowledge of pregnancy and STIs	Continuous index variable: Sum of correct responses to five true or false statements taken from the Evaluation of Adolescent Pregnancy Prevention Approaches (Smith et al. 2012): 1. All sexually transmitted infections (STIs) can be cured. (False) 2. A sexually active girl can become pregnant if she forgets to take her birth control pills for several days in a row. (True) 3. Using a condom can help prevent HIV. (True) 4. You cannot tell if a person has HIV by looking at them. (True) 5. Latex condoms are 100 percent effective in preventing pregnancy and STIs (including HIV). (False) Index values range from 0 to 5, indicating the total number of correct responses.
Expectations for the future	
Expects to get married	Continuous variable. Scale ranges from 1 to 5, with higher values indicating a greater chance of getting married.
Expects to be married to one person for life	Continuous variable. Scale ranges from 1 to 5, with higher values indicating a greater chance of being married to one person for life.
Expects to live with a partner outside marriage	Continuous variable. Scale ranges from 1 to 5, with higher values indicating a greater chance of living with a partner outside of marriage.
Expects to have children outside marriage	Continuous variable. Scale ranges from 1 to 5, with higher values indicating a greater chance of having children outside of marriage.
Expects pregnancy in next two years[a]	Continuous variable. Scale ranges from 1 to 5, with higher values indicating a greater chance of pregnancy in the next two years.

[a] Outcome was not included in the one-year impact study.

[b] Available only for students who reported being in a relationship at the three-year follow-up survey.

For the outcomes related to students' relationship status and quality, we found no impacts on students' likelihood of ever or currently being in a romantic relationship (Table A.13). Among students who were in a romantic relationship, we found no impacts on their reported relationship happiness or satisfaction.

Table A.13. Impacts on relationship status and relationship quality (exploratory)

Measure	Outcomes by study group			Full *RQ*+ versus control group			Shortened *RQ*+ versus control group			Full *RQ*+ versus shortened *RQ*+		
	Full *RQ*+ group	Shortened *RQ*+ group	Control group	Impact	Effect size	*p*-value	Impact	Effect size	*p*-value	Impact	Effect size	*p*-value
Relationship status												
Ever been in a romantic relationship	75	74	76	-2	-0.04	0.55	-2	-0.05	0.43	1	0.02	0.81
Currently in a romantic relationship	37	39	40	-3	-0.07	0.37	-1	-0.02	0.75	-2	-0.05	0.46
Relationship quality												
Happiness with current relationship[b] (range: 1 to 10)	8.51	8.45	8.77	-0.26	-0.15	0.24	-0.34	-0.19	0.15	0.05	0.03	0.84
Satisfaction with current relationship[b] (range: 1 to 4)	3.53	3.47	3.50	0.04	0.07	0.59	-0.04	-0.07	0.65	0.06	0.11	0.48
Sample size	**435**	**451**	**428**									

Source: Baseline and three-year follow-up surveys conducted by Mathematica.

Note: The numbers in the three columns labeled "Outcomes by study group" are regression-adjusted predicted values.

***/**/* Impact estimates are statistically significant at the .01/.05/.10 levels, respectively, two-tailed test.

[a] Difference remains statistically significant at the .10 level, two-tailed test, after applying the Benjamini-Hochberg correction for multiple hypothesis testing for pairwise contrasts across the research groups.

[b] Available for only the 471 students who reported being in a relationship (150 students in the full *RQ*+ group, 161 students in the shortened *RQ*+ group, and 160 students in the control group).

RQ+ = *Relationship Smarts PLUS*.

For the outcomes related to students' relationship attitudes, knowledge, and expectations for the future, consistent with our findings from the one-year survey, students in all three research groups generally had similar levels on these outcomes on the three-year survey (Table A.14). Out of nine measures of students' relationship attitudes, we found significant impacts on two. Students in the full *RQ*+ group reported slightly higher levels of disagreement with the statement "There is only one true love out there who is right for me to marry" than students in the control group ($p = .07$). In addition, students in the full *RQ*+ group reported higher levels of agreement with the statement "Teen pregnancy would make me become a responsible adult before I wanted to" than students in the control group ($p = .07$) or students in the shortened group ($p = .05$). For the outcome measuring students' knowledge of pregnancy and STIs, students in the shortened *RQ*+ group averaged significantly lower scores than students in the control group ($p = .01$). However, scores for students in the full *RQ*+ group and the control group were not significantly different. Finally, for the five measures of students' expectations for the future, we found a significant impact on one. Students in the full *RQ*+ group were less likely to expect to be married to one person for life than students in the shortened *RQ*+ group ($p = .09$).

Table A.14. Impacts on relationship attitudes, relationship knowledge, and expectations for the future (exploratory)

Measure	Outcomes by study group			Full *RQ*+ versus control group			Shortened *RQ*+ versus control group			Full *RQ*+ versus shortened *RQ*+		
	Full *RQ*+ group	Shortened *RQ*+ group	Control group	Impact	Effect size	*p*-value	Impact	Effect size	*p*-value	Impact	Effect size	*p*-value
Relationship attitudes												
Disagreement with unrealistic relationship beliefs (range: 1 to 4)												
Belief in only one true love	2.71	2.58	2.59	0.12*	0.13	0.07	-0.01	-0.01	0.92	0.13	0.15	0.13
Belief that love is enough to sustain a happy marriage	2.66	2.57	2.62	0.04	0.05	0.51	-0.06	-0.07	0.34	0.09	0.11	0.20
Belief that cohabiting will improve the chances of a happy marriage	2.31	2.35	2.28	0.03	0.04	0.62	0.07	0.09	0.16	-0.04	-0.05	0.47
Disapproval of teen dating violence scale (range: 1 to 4)	3.68	3.68	3.68	-0.00	-0.01	0.95	-0.00	-0.01	0.94	-0.00	-0.01	0.96
Desire to avoid teen pregnancy (range: 1 to 4)												
Teen pregnancy would hurt my chances of being successful	2.91	2.79	2.90	0.01	0.01	0.88	-0.11	-0.11	0.19	0.11	0.12	0.15
Teen pregnancy would make me become a responsible adult before I wanted to	3.32	3.19	3.23	0.09*[a]	0.11	0.07	-0.03	-0.04	0.52	0.12**[a]	0.14	0.05
Teen pregnancy would make my life a lot better (reverse coded)	3.12	3.06	3.14	-0.02	-0.03	0.76	-0.08	-0.12	0.15	0.06	0.09	0.30

Measure	Outcomes by study group			Full *RQ*+ versus control group			Shortened *RQ*+ versus control group			Full *RQ*+ versus shortened *RQ*+		
	Full *RQ*+ group	Shortened *RQ*+ group	Control group	Impact	Effect size	*p*-value	Impact	Effect size	*p*-value	Impact	Effect size	*p*-value
Importance of postponing childbearing (range: 1 to 4)												
It is important to finish school before having a child	3.51	3.48	3.49	0.02	0.030	0.72	0.00	0.00	0.97	0.02	0.03	0.74
It is important to have a job and stable income before having a child	3.66	3.66	3.72	-0.06	-0.11	0.17	-0.06	-0.12	0.22	0.00	0.01	0.94
Relationship knowledge												
Knowledge of pregnancy and STIs index (range: 0 to 5)	3.35	3.23	3.49	-0.14	-0.11	0.21	-0.26**[a]	-0.20	0.01	0.10	0.08	0.43
Expectations for the future												
Expects to get married	3.68	3.71	3.81	-0.13	-0.12	0.16	-0.10	-0.09	0.26	-0.03	-0.03	0.70
Expects to be married to one person for life (range: 1 to 5)	3.52	3.70	3.66	-0.13	-0.12	0.17	0.03	0.03	0.73	-0.17*	-0.15	0.09
Expects to live with a partner outside marriage (range: 1 to 5)	2.98	3.02	3.03	-0.04	-0.03	0.69	-0.01	-0.01	0.91	-0.03	-0.02	0.82
Expects to have children outside marriage (range: 1 to 5)	2.19	2.24	2.17	0.01	0.01	0.87	0.08	0.07	0.31	-0.07	-0.07	0.43
Expects pregnancy in next two years (range: 1 to 5)	1.49	1.46	1.46	0.03	0.04	0.60	0.00	0.00	0.97	0.03	0.03	0.65
Sample size	**435**	**451**	**428**									

Source: Baseline and three-year follow-up surveys conducted by Mathematica.

Note: The numbers in the three "Outcomes by study group" columns are regression-adjusted predicted values.

***/**/* Impact estimates are statistically significant at the .01/.05/.10 levels, respectively, two-tailed test.

[a] Difference remains statistically significant at the .10 level, two-tailed test, after applying the Benjamini-Hochberg correction for multiple hypothesis testing for pairwise contrasts across the research groups.

RQ+ = *Relationship Smarts PLUS*.

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