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Roads to Success: Estimated Impacts of an Education and Career Planning Program During Middle School

Final Report

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ABSTRACT

Roads to Success (RTS) is a school and career planning program designed to be implemented for 45 minutes per week in grades 7 through 12. Researchers at Mathematica Policy Research used a random assignment design to estimate the impacts of receiving RTS in grades 7 and 8. More than half of the students in these schools were eligible for free or reduced-price lunches and the schools had few minority students. Using student survey data collected from more than 1,400 students, we found no evidence of statistically significant impacts of the RTS program on motivation to go to school to learn job skills or on learning and study habits at the end of grade 8. We did find a statistically significant impact at the .10 level suggesting that RTS reduced a composite measure of negative behaviors. However, exploratory analyses of subcomponents of this measure suggested mixed results for student behaviors.

We conducted exploratory analyses of additional outcomes and found positive impacts of RTS on talking to school staff about career and school plans, confidence in knowing how to find out about what types of jobs are best, and confidence in knowing what is required to succeed in different careers. However, students in both the treatment and control group reported talking to their parents more than to school staff about most issues regarding school and career planning; more than 90 percent reported agreeing or strongly agreeing with the statement that they "will be able to overcome barriers that stand in the way of achieving my career goals." Also, fewer than 10 percent of the treatment and control group students reported career aspirations or expectations that seemed too high; fewer than one percent reported career aspirations that seemed too low.

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I. INTRODUCTION AND BACKGROUND

In early 2005, the Roads to Success (RTS) program was launched as an ongoing part of middle and high school programs to help forge connections between students' school experiences and their aspirations for adulthood. In 2006, RTS partnered with Mathematica Policy Research (Mathematica) to conduct an eight-year evaluation of the intervention. This evaluation was designed to estimate impacts of RTS by using random assignment. Funding for the RTS program and study was cut severely in 2008 due to health problems of the funder; consequently, our final data collection occurred in spring 2009. This report describes the RTS intervention, research design, evaluation data, and analysis methods, and presents estimated impacts of receiving RTS in grades 7 and 8 on outcomes measured at the end of grade 8.

A. SIGNIFICANCE

While access to college has improved in the past 30 years, current educational practices do not adequately address the many steps needed to prepare students for success in high school, postsecondary education, and careers. Each year more than half a million young people drop out of high school; and this figure has been stable for most of the last 30 years (Heckman and Lafontaine 2007). This number is particularly troubling considering the high economic returns to education (Card 1999). In addition, occupations normally requiring a bachelor's degree or more are expected to grow faster than others during the next decade (Dohm and Shniper 2007).

Although federal and state policies are pushing high schools to focus on improving test scores, academic achievement is not the only obstacle to education and career success (Goble et al. 2006; DeLuca and Rosenbaum 2001; Roderick et al. 2006). One reason many youth continue to drop out of high school may be a lack of engagement in their education. Forty-seven percent of high school dropouts cite a lack of connection to school as the reason for leaving before they graduate (Bridgeland et al. 2006), and many students report that school is not relevant to their future careers (Steinberg 1996; Rosenbaum 2001). Although career plans and expectations are linked to students' choices and school motivation, many schools do not consistently address them (Yazzie-Mintz 2007). Without developing clearer connections to their future careers, it may be difficult to increase student engagement in education. Many students either fail to understand the advantages afforded by a college degree or overestimate the barriers to attending college (Ikenberry and Hartle 1998). Unfortunately, overburdened high school guidance counselors often provide college information and advice in a single short meeting during a student's senior year (McDonough 2005) and do not devote adequate time to the often complex college application process. Teachers are the de facto college resource when guidance counselors are unavailable and they are often unprepared to guide students through the process (Kirst et al. 2004).

Lack of sufficient planning for their future education and career paths may have negative impacts on outcomes for many young adults. Inadequate education and career planning may result in students developing "unaligned ambitions" (Schneider and Stevenson 1999). Some students aim too low, seeking only "a few college classes" in fields where jobs require degrees, while others aim too high, planning degrees that will take more years of college than their budgeted amounts of time or money allow (Rosenbaum et al. 2006). Thus better career and

education planning that engages students and provides information about post-secondary options may be a vital component of K–12 education reform (Whiston et al. 1998; Oliver and Spokane 1988; Lapan, Gysbers, and Sun 1997).

B. THE RTS INTERVENTION

RTS is an in-school guidance program designed to address (1) the lack of systematic guidance offered to students regarding their future and (2) the lack of engagement with school reported by many youth. Unlike the wide array of college access and guidance programs that are operating in high schools, RTS is a classroom-based program serving whole-grade cohorts at a low cost per student. Specially trained facilitators implement RTS. Key features of RTS include the following:

- ***A Comprehensive and Consistent College and Career Planning Curriculum.*** A standardized curriculum covering career exploration, education planning, and education/workplace skills
- ***Engaging Teaching Methods.*** Active classroom methods, technology, project-based learning activities, and student accountability
- ***Weekly Delivery of Curriculum*.** Three-quarters of an hour per week for six school years (grades 7–12)[1]

The RTS curriculum is intended to improve postsecondary education and career outcomes by helping students (1) learn about career opportunities, (2) plan for their education appropriately, and (3) develop the skills needed to take full advantage of future educational and workplace opportunities (Figure 1). The early focus on career exploration is designed to increase student engagement by ensuring that youth see how their education relates to their future careers. The focus on education planning helps ensure that students complete the relevant high school coursework and related preparation activities in time to take full advantage of potential postsecondary and early career options. All three curriculum components are designed to help students succeed in critical transitions between grades, between schools, and when entering the workforce.

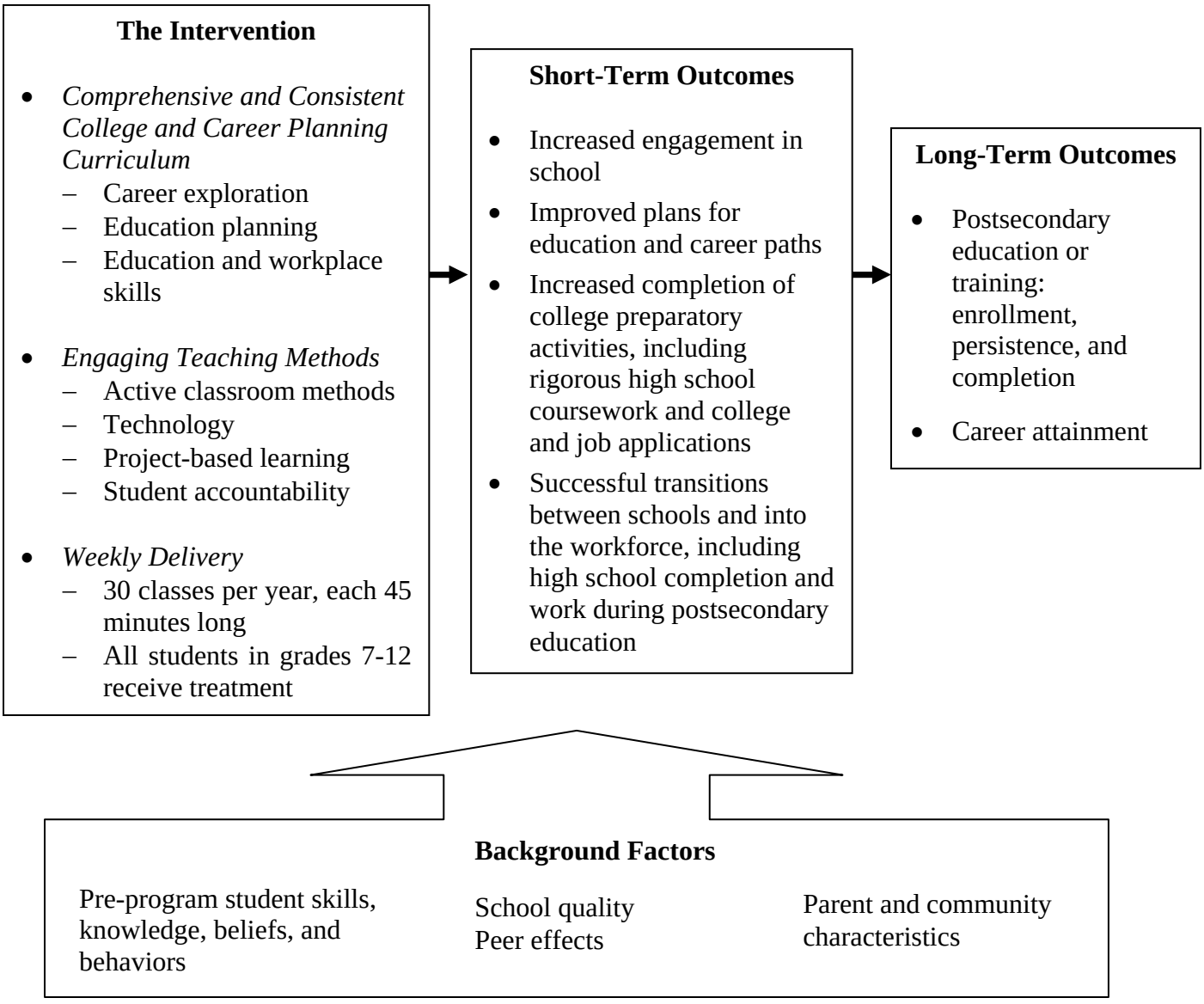
RTS was created by a nonprofit organization (the RTS organization) that started designing the intervention in 2004. First, the organization examined the theoretical and empirical research base for a career and education planning program. It also met with numerous individuals and organizations to seek advice about specific program elements. Based on this work, the RTS organization staff created a scope and sequence of thematic units and lesson plans, which are summarized in the Grade Overviews in Appendix A of the design report (Chaplin et al. 2009). Outlines were developed for each lesson and then sent to professional curriculum writers, who

[1] Due to funding cuts in 2008, the treatment group students in this study received only two years of RTS (during grades 7 and 8).

developed complete lesson plans and related student handbook and portfolio materials. A sample lesson plan is available in Appendix B of Chaplin et al. 2009. The scope and sequence was revised several times up through the 2008–2009 school year, with input from content experts, an RTS advisory board, and school district partners. Quantitative and qualitative feedback has also been obtained from RTS facilitators after each lesson and from RTS students at the middle and end of each school year.

FIGURE 1

LOGIC MODEL FOR RTS PROGRAM



The design of RTS is based in part on recommendations of the American School Counselors Association (ASCA) (Bowers and Hatch 2005). Although RTS is intended to help facilitate the

work of school counselors, it is not designed to replace them. Rather, by providing schools with a means of addressing the career and education planning needs of students, RTS is designed to help school counselors focus on the tasks that already consume much of their time—in particular, responding to the short-term needs of youth who require individual counseling, crisis management, referrals, and/or consultations (Bowers and Hatch 2005). Even though ASCA standards also call for counselors to develop classroom-based guidance programs, the reality is that most counselors, especially in low-income schools, do not have the time to do so (Lee and Ekstrom 1987). RTS is designed to address this reality.

C. RESEARCH QUESTIONS AND STUDY DESIGN

In fall 2006, Mathematica randomly assigned 25 middle and high schools to one of two treatment conditions. Thirteen of the schools were randomly assigned to deliver the RTS intervention to all grade 7 students during the 2007–2008 school year. These schools continued to deliver the RTS intervention to the same set of students in 2008–2009, when the students were in grade 8. The other 12 schools were randomly assigned to the control group and did not offer RTS to grade 7 students during the 2007–2008 school year or to grade 8 students in 2008–2009.

Mathematica collected baseline test score data from the end of grade 6 (spring 2007), conducted a student baseline survey at the beginning of grade 7 (fall 2007), and conducted a student follow-up survey at the end of grade 8 (spring 2009). The current study is designed to answer two sets of research questions:

1. What are the short-term impacts of the RTS program at the end of grade 8 for all students?

2. How do the impacts vary by student and school characteristics?

D. CONCEPTUAL BACKGROUND FOR THE STUDY

Following is a detailed description of the key features of the RTS program, a discussion of its feasibility, and preliminary evidence of its efficacy.

1. Comprehensive and Consistent College and Career Planning Curriculum

The ASCA calls for the "systematic delivery" of a comprehensive guidance program (Bowers and Hatch 2005). In line with this recommendation, RTS lessons are part of a standardized, fully articulated six-year program. As noted earlier, the RTS curriculum follows a scope and sequence for each grade level (within a larger six-year scope) and includes detailed lesson plans (see Appendix B of Chaplin et al. 2009 for a sample lesson plan). It also uses student handbooks and portfolios and monthly parent newsletters that are aligned with program content (see Appendix C of Chaplin et al. 2009 for a sample parent newsletter). Although the balance of content differs by grade level, each year of the RTS program contains elements of career exploration, education planning, and education/workplace skills. To help ensure that RTS is implemented consistently at all sites, national RTS staff train and supervise the RTS

facilitators at each school to deliver the intervention to students. Staff from the national organization conduct biannual classroom observations of the facilitators as they deliver RTS lessons (see Appendix D of Chaplin et al. 2009 for a sample classroom observation protocol).

In contrast, many interventions with similar goals may be implemented less consistently both within and across schools or program sites. For example, the federal Gaining Early Awareness and Readiness for Undergraduate Programs (GEAR UP) provides nearly 300 different local grants, each supporting a different program mix developed from a general set of guidelines; the federal Talent Search program consists of approximately 360 grants with a similar framework (Humphrey et al. 2002). Evaluations of both programs have noted the difficulty of assessing their effectiveness due to the variable nature of "the program" (U.S. Department of Education 2002a, 2002b).

Many programs similar to RTS target only a subset of students. Such programs that operate as more of a "pullout" for a subset of students (for example, Talent Search) can suffer from highly variable student participation, particularly over successive years of enrollment in a program. Similarly, programs that are offered after school, during the summer, or as electives, also suffer from highly variable participation and limit which students may participate (U.S. Department of Education 2002b). In contrast, RTS is intended as a mandatory program for an entire cohort, serving all students in a school or given grade during the school day as a regular part of each student's schedule. This treatment regimen helps ensure that the program is delivered in a consistent manner and has the potential to create a peer culture focused on motivation, planning, and educational attainment (Hossler et al. 1999; McDonough 2005). Following is a detailed description of the curriculum elements of the RTS intervention.

a. Career Exploration

Career exploration is a key early component of the RTS intervention because of the need to motivate students to plan for their education and develop appropriate education and workplace skills. Research suggests that career planning is positively associated with student engagement in both middle and high school (Kenny et al. 2006; Lapan et al. 2001; Lapan 2004). Hossler et al. (1999) argue that, in order to maximize their chances of postsecondary and career success, students should develop career and educational aspirations in grades 7 to 9. Meta-analyses suggest that career guidance activities may have the largest positive effects in junior high or middle school (Oliver and Spokane 1988; Whiston et al. 1998).

Consistent with these findings, the RTS program contains a significant yearly focus on career exploration and planning starting in grade 7, when students are starting to decide whether to go to college. The goal is to increase student motivation through the development of career aspirations before students enter high school. The content for grades 7 through 9 includes interest inventories; a grade 7 student-led career fair; lessons on identifying careers of interest; the education required to enter those careers; and the benefits of a college education. In later grades, additional career exploration activities are presented, including a grade 11 job shadowing project. Appendix A of Chaplin et al. 2009 includes an overview of the RTS curriculum by grade.

b. Education Planning

Students who decide to go to college must have sufficient information about how to search successfully for appropriate postsecondary alternatives and how to choose among them (Hossler and Gallagher 1987). Many students and their families lack this information (Cabrera and La Nasa 2000). Some overestimate the cost of college and are unaware of available financial assistance (U.S. Department of Education 2003). The RTS program provides students and their families with this information. Although good information is important, that alone is not enough. Many students can state their career aspirations, but do not understand what makes those aspirations desirable, what it would be like to have those jobs, or what actions they must take to make their goals a reality. Bridging this gap in understanding may be difficult for guidance counselors in a typical 15-minute session with a student. Consequently, RTS incorporates planning skills into its curriculum.

The importance of planning is suggested by the fact that adolescents with coherent, aligned plans demonstrate greater motivation and effort and have an increased capacity to draw on resources (Schneider and Stevenson 1999). More generally, experts suggest that helping students plan for their education and careers appears to be important for high school completion and later outcomes (Dynarski et al. 2008; Woloszyk 1996; Hayward and Tallmadge 1995; Bragg 1997; Bauer and Michael 1993).

The RTS six-year sequence of activities for students and monthly newsletters for parents are designed to ensure that students and families have sufficient information and planning skills to make informed educational choices. Beginning in grade 7, students learn about postsecondary options; in grade 10, students take part in a college visit and prepare for the PSAT during class time. RTS activities in grades 11 and 12 focus class time on the specific activities in which students must engage to attend college—including preparing for the SAT/ACT, filling out college and financial aid applications, and engaging in scholarship search and postsecondary budgeting activities. They also participate in job shadowing in grade 11 and in informational interviewing in grade 12. RTS students develop education plans early in the process, revisit the plans each year, and receive advice to help them understand their plans as well as encouragement to make sure that their plans are aligned with career goals, personal interests, values, and academic preparation.

Students with a low socioeconomic background are less likely than other students to have access to education planning and other related guidance activities needed for a successful secondary and postsecondary experience. Furthermore, students who lack access to guidance counseling are more likely to be placed in non-academic curricular tracks and take fewer mathematics courses (Lee and Ekstrom 1987). Consequently, all RTS students participate in the planning and researching of education options, helping ensure that students receive the counseling and information they need to make informed decisions about the courses they take in high school and about their post-high school careers.

c. Education and Workplace Skills

Employers readily acknowledge that America's high school graduates lack many non-academic skills needed for success in the workplace (Olson 2007) and the competitive global

economy (Hamilton and Hamilton 1999; Orfield 1997; Conley 2007). Similarly, educators believe that many college students lack key skills necessary for postsecondary success (Rosenbaum et al. 2006). Indeed, both sets of skills, many of which overlap, receive scant attention in most secondary schools in the United States compared to other nations (Stevenson and Stigler 1992). To address these issues, RTS includes components designed to teach a number of non-academic skills, including information gathering, planning, group work, presentation methods, and financial management.

The RTS middle school program includes lessons on short-term planning, study skills, note-taking, managing stress, and budgeting. The grade 7 career fair introduces students to the rudiments of research and public speaking, as does a grade 8 project-based learning unit on improving one's community. Students learn how to work in groups effectively, reflect on projects, and complete tasks in long-term projects.

The high school program covers information-gathering skills through lessons on researching postsecondary and career opportunities. Self-presentation skills are enhanced through lessons on interviewing, networking, and preparing a résumé. Finally, financial literacy activities include planning a postsecondary budget and learning about credit, insurance, and consumer rights.

Both the middle and high school components of RTS cover test-taking lessons, with a focus on the PSAT and SAT/ACT. Test-taking skills taught in a vacuum may yield little benefit (Allensworth et al. 2008); therefore, RTS embeds this work into a broader focus on the development of general reasoning skills and career and education planning to help ensure that students are engaged when developing these skills. The lessons cover samples of tests required in non-college contexts, such as tests for employment as a Federal Express courier or admission to an electrician's apprenticeship program. The lessons are designed to inform students of the existence and purpose of these tests, to familiarize them with the types of questions they will encounter, connect them with other resources to help them prepare for future tests, walk them through the registration process for the SAT or ACT, and to underscore more generally the need for good mathematics and reading skills for a variety of postsecondary paths.

2. Engaging Teaching Methods

To ensure that students learn the topics covered in the curriculum, RTS uses methods designed to maximize student engagement, including the use of active teaching methods, technology, annual project-based learning activities, and student accountability.

a. Active Teaching Methods

Research suggests that students learn and retain more when they are active participants and can relate to the content that is taught (Akey 2006). Career exploration appears to encourage student engagement (Kenny et al. 2006). The evidence also suggests that students benefit when teachers use a wide range of instructional strategies, such as group activities, long-term projects, hands-on activities, lessons that draw from student interests, and cooperative learning, to engage divergent student interest in learning (Garcia-Reid et al. 2005; Akey 2006; Heller et al. 2003;

Wynne 1995). For these reasons RTS instructional methods are designed to require a minimum amount of lecturing.

b. Technology

RTS uses educational technologies to encourage student engagement primarily through the use of web-based career exploration and college research programs such as Career Cruising (www.careercruising.com). Some evidence on career planning interventions suggests that combining individual counseling with computer applications is more effective than individual counseling alone (Whiston et al. 1998).

c. Project-Based Learning

Experiential education has demonstrated the ability to raise student engagement in learning (Akey 2006; Heller et al. 2003). In RTS, students participate in many types of project-based learning as discussed earlier, including a grade 7 career fair project, a grade 8 community improvement project, and a grade 9 workplace-simulation project. In grade 10, RTS students make a college visit; in grade 11, they participate in a job shadowing experience; and in grade 12, students apply for colleges and/or jobs.

d. Student Accountability

Being held accountable for their performance in school activities can also encourage students to be more engaged (Kozik et al. 2005). RTS students receive pass/fail grades that are reported to parents either by the school or RTS. In some cases, performance in RTS counts toward student grades in non–RTS classes.

3. Weekly Delivery of Curriculum

RTS was designed to be a weekly long-term intervention. It includes approximately 30 lessons per year, each 45 minutes long, beginning in grade 7 and continuing through grade 12. By contrast, most career-related interventions are short term (Oliver and Spokane 1988), and many college preparatory interventions (for example, College Summit) are designed for a narrow grade span. This creates the risk of getting to students too late to help many of them and not persisting long enough to make a difference (Whiston et al. 1998).

Due to funding cuts, this study estimates impacts of an abbreviated version of the intervention that includes only two years of exposure (grades 7 and 8). Thus this study does not enable us to estimate the impact of the RTS intervention when fully implemented in grades 7 through 12.

4. Feasibility

RTS has been designed to be implemented without undue effort on a school's part. Time demands on a school's academic schedule are minimal—about two percent of a student's school time over the course of a year—but the cumulative program dosage of the full six-year program is sizable. The format reflects the reality that the demands of state standards and federal law (including No Child Left Behind requirements) prevent a greater allocation of time to classroom-based guidance activities.

Direct program costs—including facilitator compensation, training and support, student materials, classroom supplies, and technology—average about $300 per student per year, or about three percent of the average 2006 public school spending rate of more than $9,000 per student (U.S. Census Bureau 2008). As important, RTS meets many of the requirements of existing funding streams such as the federal GEAR UP program and thus may be incorporated into current and new GEAR UP grants as a standardized component of such programs.

There is significant evidence of RTS feasibility in authentic education delivery settings. Since 2005, RTS has been implemented in public secondary schools in three states—New York, Pennsylvania, and West Virginia. During the 2008–2009 school year, it was implemented in a mix of 30 urban and rural low-income schools (see Appendix E of Chaplin et al. 2009 for a complete list) and served more than 4,000 students (an increase from 3,500 students in 23 schools during the 2007–2008 school year).

In addition to collecting evidence reflecting the commitment of schools and districts to the program, the RTS organization collects evidence of lesson-specific implementation. These data are collected weekly by RTS facilitators using implementation forms listing which classes were taught and the percentages of each lesson delivered to each class (see the Facilitator Implementation Form in Appendix F of Chaplin et al. 2009 for the form used during the 2008–2009 school year). Using these data we estimate that the RTS facilitators reported covering 88 percent of the grade 7 material during the 2007–2008 school year and 93 percent of the grade 8 material during the 2008–2009 school year in the treatment schools covered by our study. Using data from the 2007–2008 school year, the RTS staff reviewed lessons with low implementation rates for comparison with written comments provided in journals by the facilitators and then revised and/or compressed several lessons.

5. Potential Efficacy

Prior to the current study, the RTS organization administered anonymous end-of-year student feedback forms to an earlier cohort of RTS students to help obtain early evidence on the potential efficacy of the RTS intervention. These feedback forms included several questions taken from the High School Survey of Student Engagement (HSSSE). The HSSSE was administered in the same year (2006–2007) to a diverse sample of students spread across 26 states (Yazzie-Mintz 2007). The HSSSE students were asked how much their overall school experience had helped them learn work skills, work well with others, solve real-world problems, develop career goals, and understand themselves; the RTS feedback form asked the same questions with respect to how much RTS had helped RTS students in the same areas. For each question, student choices included "Very Much," "Some," "A Little," and "Not at All." Table I.1

presents the percentages of students responding "Very Much" to each question. Assuming simple random sampling, all of the differences between outcomes for the RTS and HSSSE students are statistically significant at the 0.01 level.[2] The results suggest that RTS participants believed that the RTS program helped them learn these types of skills more than students in the HSSSE study felt that their school experiences helped them.[3]

TABLE I.1

STUDENT REPORTS ON WHETHER RTS/SCHOOL EXPERIENCES

HELP LEARNING, BY TOPIC

	Percentage Answering "Very Much"	
Skill	RTS students	HSSSE students
Work skills	38%	23%
Working well with others	45%	29%
Solving real-world problems	38%	20%
Developing career goals	53%	23%
Understanding yourself	56%	25%

Source: The HSSSE survey for the HSSSE students and data collected by RTS staff on the RTS students.
Note: There are 1,100 RTS students from 7 schools and 81,499 HSSSE students from 110 schools covered in this table. All data are for the 2006–2007 school year, prior to the beginning of the current study. All differences between the RTS and HSSSE student outcomes are statistically significant at the 0.01 level using two-tailed tests and assuming simple random sampling. They all have *t*-statistics greater than 10.

E. ORGANIZATION AND CONTENT OF THIS REPORT

The rest of this report presents the methods, data, and impact findings. Chapter II describes the study design, methods, and random assignment of schools. Chapter III discusses the data collection process, including informed consent of both parents and students, and presents response rates for each student survey. Chapter IV presents the research questions and estimation approach. In Chapter V, we present estimates of the impact of RTS on student motivation, learning and study habits, and attendance and negative behaviors; these are followed by the

[2] All tests of statistical significance are based on two-tailed tests. Unless stated otherwise, findings that are reported as "not statistically significant" have *p*-values > 0.10, the highest value typically used to define statistical significance and findings that are reported as "statistically significant" have *p*-values <0.01, a relatively low (stringent) cut off for statistical significance. Thus we are erring on the side of caution in both directions. For other findings we specify an upper bound for the significance level.

[3] For the comparisons in Table I.1, we did not have access to the student-level data, so we could not correct for clustering by school, student background characteristics, or the complexity of the HSSSE survey design. However, the *t*-statistics we did calculate (assuming simple random sampling) were all greater than 10.

estimated impacts on school engagement in school, career exploration behavior, and career exploration efficacy. In Chapter VI, we present our conclusions.

II. STUDY DESIGN AND METHODS

A. SELECTION OF SCHOOLS

RTS recruited the 25 middle and high schools in this study based on their regional proximity to each other, their willingness to participate in the study, and the apparent availability of data that would facilitate the proposed analyses. The study was originally designed to be an eight-year evaluation of the intervention and involved following the students through high school. Thus, the study schools were also selected so that (1) most students in each of the selected middle/junior high schools attend only one corresponding high school and (2) each high school in the study receives students from only one middle/junior high school in the study. This method was used to help ensure that treatment and control group members from the same cohort in different junior high/middle schools would not end up in the same high school. As mentioned earlier, funding for the RTS program and study was cut severely in 2008 due to health problems of the funder. Consequently, the study ended following the 2008–2009 school year, and the program also ended in most of the study schools at that time.

The districts that participated in the program are low-income, rural districts with lower income and education levels than the averages for their state. The 25 schools that were randomly assigned came from three geographic areas—9 schools in New York; 6 in Wayne County, West Virginia; and 10 in other counties in West Virginia. All of the schools are in rural counties, are more than 94 percent white, and have attendance rates of at least 89 percent.

B. RANDOM ASSIGNMENT OF SCHOOLS TO TREATMENT CONDITION

In fall 2006, Mathematica randomly assigned the 25 schools to one of two treatment conditions. Thirteen of the schools were randomly assigned to deliver the RTS intervention to all grade 7 students during the 2007–2008 school year. These schools continued to deliver the RTS intervention to the same set of students in 2008–2009, when the students were in grade 8. The other 12 schools were randomly assigned to the control group and did not offer RTS to grade 7 students during the 2007–2008 school year or to grade 8 students in 2008–2009.

To ensure that the sample was balanced and to increase precision, we grouped the 25 schools into blocks of two or three schools each before random assignment. These blocks were chosen so that schools in each block came from one of three geographic areas—Western New York and two parts of rural West Virginia. Within these areas, Mathematica matched schools based on the fraction of students eligible for free or reduced-price lunch and school average test scores.

To combine the school-level data on free lunch eligibility and test scores used to match schools, we first calculated an average test score variable equal to the average of the z-scores for

each relevant test score variable we had in the data.[4] The test score variables covered the fractions of students proficient in mathematics, science, and English (separately). We then took an average of a z-score transformation of the average test score variable and a negative z-score transformation of the free lunch variable. We used the negative value of the free lunch variable because higher free lunch rates are generally associated with lower test scores.

The blocking resulted in 12 blocks of schools—11 blocks with two schools each and one block with three schools.[5] One school was chosen randomly within each block to deliver the RTS intervention to grade 7 students starting in fall 2007, except in the block with three schools, where two of the three schools were chosen. The remaining schools were allowed to have a later cohort of grade 7 students participate in RTS starting in the 2008–2009 school year. The students in the later cohort are not included in the current report.

C. SCHOOL-LEVEL TREATMENT-CONTROL BALANCE AT BASELINE

In order to test the balance between the treatment and control groups, we compared baseline characteristics of the two sets of schools based on school-level data that we collected from state and district websites.

Table II.1 presents means of these variables for the treatment and control schools. None of these differences is statistically significant, and neither is a joint significance test of the differences for the free lunch and test score variables combined. The differences between the two group means are also generally small in a substantive sense. For example, there is only a five percentage point difference in the free and reduced-price lunch eligibility rate, around 0.1 of a standard deviation. That is similar to the year-to-year changes observed in many of these schools. The differences in the remaining variables are even smaller in terms of standard deviation units, as shown in the last column of Table II.1.

D. STUDENT-LEVEL TREATMENT-CONTROL BALANCE AT BASELINE

The baseline characteristics reported in Table II.1 cover all of the schools in the original sample and all students at those schools. After random assignment, two schools dropped out of the study and many students in the remaining schools did not respond to the survey (see Chapter III for response rates). To deal with non response at the student level, we used weights, designed so that our results provide unbiased estimates of the impacts of RTS for responding students in responding schools.[6] A detailed description of our weighting procedure is provided below in the section on impact estimation methods.

[4] The z-scores were created by subtracting the mean within the geographic area and then dividing by the standard deviation at the school level for that area; the test scores were analyzed separately for each grade and subject.

[5] Only 23 of the original sample of 25 schools are used when estimating impacts at the end of grade 8 because one matched pair of schools dropped out of the study.

[6] The two non-responding schools came from the same matched block. Thus, our estimates do not cover that block.

TABLE II.1

COMPARING SCHOOL-LEVEL MEANS

Variable	Treatment Schools	Control Schools	Difference	Standard Deviation	Difference/Standard Deviation
Free and reduced-price lunch	0.51	0.56	0.05	0.50	0.10
Mathematics	0.66	0.67	0.01	0.47	0.02
English	0.67	0.70	0.03	0.46	0.06
Science	0.83	0.82	-0.01	0.38	-0.03
Attendance	0.95	0.96	0.01	0.21	0.05

Source: School-level data collected by Mathematica and RTS staff from state and district websites.
Notes: Standard deviation is at student level.
No differences are statistically significant at the 10 percent level.
Mathematics/English/Science = fraction of students tested proficient in subject.
West Virginia tests combined grade 7 results from the 2004–2005 school year with grade 6 results from the 2003–2004 school year's West Virginia Educational Standards Test (Westest).
New York tests based on grade 8 results from the 2004–2005 school year intermediate-level tests.
Attendance = attendance rate at school in 2005–2006.

Table II.2 presents unweighted averages of baseline characteristics from the fall 2007 student survey and from grade 6 baseline test scores for the students in our study. The differences are not statistically significant at the 0.05 level, either individually or jointly.

TABLE II.2

COMPARING STUDENT-LEVEL MEANS

Variable	Treatment Students	Control Students	Difference	Sample Size
Female	50.4%	52.4%	-2.4	1,590
Race/Ethnicity				
White	91.5%	90.4%	1.1	1,590
Black or African American	1.3%	1.4%	-0.1	1,590
Hispanic or Latino/Latina	0.4%	0.8%	-0.4	1,590
Asian	0.4%	0.4%	0.0	1,590
American Indian or Alaska Native	0.1%	0.1%	0.0	1,590
Other/mixed/unknown	6.1%	6.9%	-0.8	1,590
Mother's Highest Level of Education				
At least high school diploma	68.4%	64.8%	3.6	1,590
At least bachelor's degree	23.9%	22.8%	1.1	1,590
Father's Highest Level of Education				
At least high school diploma	61.5%	57.1%	4.4	1,590
At least bachelor's degree	15.6%	14.6%	1.0	1,590
English Spoken at Home	98.6%	98.8%	-0.2	1,590
Computer Access at Home	82.3%	80.4%	1.9	1,590
New York Test Scores Means (SD)				
Math proficiency	2.8 (0.81)	2.9 (0.84)	-0.1	232
Reading proficiency	2.8 (0.63)	2.7 (0.62)	0.1	232
Math scale score	663.4 (39.32)	673.4 (42.08)	-10.1	232
Reading scale score	661.5 (29.28)	660.6 (31.16)	0.9	232
West Virginia Test Scores Means (SD)				
Math proficiency	3.0 (0.88)	3.1 (0.91)	-0.1	1,358
Reading proficiency	3.3 (0.82)	3.3 (0.92)	0.0	1,358
Math scale score	675.7 (34.17)	678.2 (34.47)	-2.5	1,358
Reading scale score	670.8 (26.37)	670.3 (30.60)	0.5	1,358

Source: Mathematica student surveys administered to all study students in fall 2007 and spring 2009; if data were missing for the baseline survey, we used the follow-up survey data from 2009 covering the same information. Baseline test score data are from grade 6 standardized math and English/language arts tests from spring 2007. The sample includes only students with complete data on all of the variables in the table.

Notes: These results are unweighted. None of the differences are statistically significant at the 0.05 level using a two-tailed test. SD = standard deviation.

III. DATA

A. DATA COLLECTION METHODS

In accordance with the conceptual framework presented in Chapter II, Mathematica collected detailed data on students' learning and study habits, attitudes toward school, career efficacy, and important background characteristics that may have influenced student outcomes. We administered a baseline student survey in fall 2007, at which time we also requested passive parental consent and student assent to participate in the study. In spring 2008, we collected grade 6 baseline test score data from spring 2007. In spring 2009, we administered a follow-up student survey and collected school-level attendance data for the 2008–2009 school year. We requested student rosters to track student mobility during both years of the study. Table III.1 presents a schedule of the data collection activities during each year of the study. A brief description of each data collection activity is provided below.

TABLE III.1

PROJECT DATA COLLECTION SCHEDULE

	Calendar Year				
	2006–2007	**2007–2008**		**2008–2009**	
Grade Level of Students	6	7		8	
Data Collection Activity	**Spring**	**Fall**	**Spring**	**Fall**	**Spring**
Student test score data (collected in spring 2008)	x				
Student rosters and mobility data		x	x	x	x
Baseline student survey		x			
Follow-up student survey					x
Follow-up attendance data					x

Note: The baseline student survey was administered a few weeks after the RTS intervention had begun in some treatment schools; the follow-up student survey was administered a few weeks before the conclusion of the grade 8 RTS intervention.

Our informed consent procedure was based on a process approved by the Public/Private Ventures Internal Review Board. In fall 2007, all schools sent informational letters to parents describing the study and the types of data to be collected. Parents in all but three schools were given the option to contact Mathematica to request that their child not participate in the study. We did not receive any such requests from parents in fall 2007, so all students in these schools were eligible to participate in the study. The remaining three schools in the study required active consent during both the 2007–2008 and 2008–2009 school years: parents had to sign and return a

consent form to their child's school in order for their child to participate during that year of the study. Not all parents signed and returned the form.[7]

Students who received passive or active parental consent were asked to read and sign a student assent form prior to completing the baseline and follow-up surveys. Students were allowed to decline participation. Students who did not receive parental consent were not asked to complete the student assent form or participate in the student survey.

B. STUDENT ADMINISTRATIVE DATA

1. Student Rosters and Mobility Data

At the beginning of each school semester (fall 2007, spring 2008, fall 2008, and spring 2009), Mathematica requested student rosters from each school. Some schools were able to export electronic files and others sent hard-copy student rosters. In addition to student names and identification numbers, some school rosters also included each student's gender and birth date. Schools were asked to provide the names of previous and/or subsequent schools if study students moved in or out of study schools. Mathematica used this student roster information to track student mobility in and out of study schools and districts during both years of the study.

2. Student Test Score Data

In spring 2008, Mathematica collected baseline test score data based on standardized math and English/language arts tests that study students had taken in spring 2007, while they were in grade 6. Mathematica worked with schools and districts to determine the most appropriate method for collecting these data. Some schools and districts were able to export electronic files containing test score data; others sent hard-copy test score reports to Mathematica. Mathematica asked schools to send scale scores and performance levels from both math and English/language arts state standardized tests, but some schools sent only one.

Mathematica obtained an 81 percent response rate for the grade 6 test scores among the sample of students enrolled in the original set of randomized schools in fall 2007. This response rate includes the school that dropped out of the study and three schools that required active parental consent.

Because the baseline test scores are from two different states, the scores must be standardized so that they fit comparable scales. We transformed the test scores by subtracting from each student's score the sample mean for that test, subject, grade, and year and dividing by

[7] Two of the schools that required active consent were in the same block and had student response rates of 51.2 and 38.5 percent for the spring 2009 follow-up survey. The third school that required active consent was in a separate block and had a student response rate of 53 percent. This school was paired with a school that had a student response rate of 85 percent. The remaining schools, which required passive parental consent, had response rates ranging from 58 to 91 percent.

the sample standard deviation for that test, subject, grade, and year.[8] This yields a standardized "z-score" that equates each student to the average student in the sample and that is comparable across all the students in the sample.

3. Follow-Up Student Attendance Data

In spring 2009, Mathematica contacted schools to collect school-level student attendance information. Eighteen schools provided information that could be used to calculate the average number of days that grade 8 students were absent during the 2008–2009 school year. These data were used to help validate the attendance question on our student survey instrument. We found a positive correlation of 0.28 between the school-level reported attendance rates and the average of the self-reported survey responses. Results by gender were available for three schools; for these schools, the results by gender did not match as well. Schools reported that females had higher attendance levels than males, whereas in the self-reported data, the opposite was true. Nevertheless, the differences between the female/male differentials on the two sets of measures were not statistically significant.

School-level attendance data may have differed from student-level data for several reasons: (1) not all students responded to the student survey, but all students were included in school-level attendance data; (2) the response scale for the student survey item included only four categorical response categories whereas the school measure was open-ended; and (3) schools may have used various methods for calculating absences (for instance, some schools may have categorized missing one period as an absence, whereas other schools might require a student to miss the whole day before categorizing it as an absence).

C. STUDENT SURVEYS

1. Baseline Student Survey

Mathematica developed and oversaw administration of a baseline student survey in fall 2007, when students were in grade 7. At the beginning of the 2007–2008 school year, each school sent student rosters to Mathematica. Mathematica prepared and labeled student surveys for each treatment and control student. Survey packets were then disseminated to the relevant teachers using the class rosters provided by the schools. Packets contained a survey, student assent form, and envelope for each eligible student; an instruction sheet for the teacher; and postage-paid return materials.

The survey was administered in RTS classes in treatment schools and in homeroom classrooms in control schools. Teachers first asked students to read and sign the student assent form. Teachers then asked the students who had provided assent to peel off and throw away their name from the outer label of the survey, leaving only the student's study ID number. Students completed the 30-minute paper-and-pencil survey during class and sealed the completed

[8] Students for whom scaled scores were imputed are included in the sample mean for calculating the z-scores but not in the sample standard deviation.

instrument in the envelope. Teachers then mailed the surveys back to Mathematica. When needed, Mathematica staff sent reminder emails to RTS facilitators or other school liaisons to prompt teachers to return the surveys.

One of the schools originally assigned to the treatment group did not participate in the administration of the student survey in fall 2007. Also, as mentioned above, three study schools required active parental consent (parents had to sign and return a consent form to their child's school in order for their child to participate in the survey). Both of these occurrences decreased the response rate for the survey. Overall, Mathematica obtained a 79 percent response rate on the baseline survey among the sample of students from the original set of randomized schools (Table III.2). The difference in response rates between the treatment and control groups was not statistically significant.

TABLE III.2

STUDENT-LEVEL RESPONSE RATES FOR BASELINE SURVEY, FALL 2007

	Student Survey Complete	No Student Assent	No Parental Consent	Student Absent	No Survey Booklet Returned	No School Participation	Total
Treatment Group							
N	891	28	30	88	16	96	1,149
Percentage	78%	2%	3%	8%	1%	8%	100%
Control Group							
N	804	5	84	102	12	0	1,007
Percentage	80%	0%	8%	10%	1%	0%	100%
Total							
N	1,695	33	114	190	28	96	2,156
Percentage	79%	2%	5%	9%	1%	4%	100%

Source: Mathematica student surveys administered in fall 2007.
Note: The response rates for the baseline survey are based on the sample of grade 7 students in the original set of randomized schools in fall 2007.

2. Follow-Up Student Survey

Mathematica administered a follow-up student survey in spring 2009, when students were finishing grade 8 (see follow-up survey instrument in Appendix A), using the same procedures that were used for the baseline student survey. One of the schools originally assigned to the treatment group and one of the schools originally assigned to the control group did not participate in the administration of the student survey in spring 2009. These two schools were paired in the same block during our original random assignment, so this block of schools is dropped from the impact analyses. Also, as mentioned earlier, three study schools required active parental consent in order for their child to participate in the survey. These occurrences decreased the response rate for the survey. Overall, we obtained a 67 percent response rate on the follow-up

survey among the sample of students that was enrolled in the original set of randomized schools in fall 2007 (Table III.3).[9] Sixty-two percent of the original sample of students responded to both the baseline and follow-up surveys. Our final analysis sample consists of 1,305 students (60.5 percent of the original baseline sample). Some students are omitted from our impact analysis because of missing data on specific survey items or because they did not respond to at least one of the two surveys.

TABLE III.3

STUDENT-LEVEL RESPONSE RATES FOR FOLLOW-UP SURVEY, SPRING 2009

	Student Survey Complete	No Student Assent	No Parental Consent	Student Absent	No Survey Booklet Returned	No School Participation	Student Moved Out of Study	Total
Treatment Group								
N	800	5	16	104	11	96	117	1,149
Percentage	70%	0%	1%	9%	1%	8%	10%	100%
Control group								
N	651	7	84	114	9	52	90	1,007
Percentage	65%	1%	8%	11%	1%	5%	9%	100%
Total								
N	1,451	12	100	218	20	148	207	2,156
Percentage	67%	1%	5%	10%	1%	7%	10%	100%

Source: Mathematica student surveys administered in spring 2009.
Note: The response rates for the follow-up survey are based on the sample of grade 7 students in the original set of randomized schools in fall 2007 (the same denominators as in Table III.2).

[9] The treatment-control difference in response rates to the follow-up survey was not statistically significant.

IV. RESEARCH QUESTIONS AND IMPACT ESTIMATION

Impacts of the RTS intervention were estimated by comparing outcomes for the treatment and control groups, after the treatment schools had received two years of the RTS intervention. The research design ensures that the estimates are unbiased, but we control for background factors to add precision to the estimates by using appropriate multivariate regression methods. We adjust standard errors for clustering of students within schools.

We used student survey data and school administrative data to estimate program impacts. The survey data enable us to estimate impacts on a number of outcomes not available in administrative data, such as students' habits, attitudes, and plans and any early activities students take part in as they prepare for postsecondary education and careers. Survey data on demographic characteristics (age, gender, race/ethnicity, and language spoken at home) are used to show how estimated impacts of RTS vary with these characteristics. The administrative data collected from schools (or school districts when possible) enable us to ascertain how impacts vary with characteristics such as pre-RTS grade 6 test scores.

Our impact analysis focuses on two types of outcomes—a confirmatory set and an exploratory set. The confirmatory outcomes are used to test how well our pre-specified hypotheses (laid out in Chaplin et al. 2009) are supported by the data. Our main findings are based on these results. The exploratory outcomes are used to test additional hypotheses that might be the basis for more rigorous testing in later studies. We made this distinction, based on recommendations by Schochet (2008), in order to reduce the likelihood of reporting both false positives and false negatives in our results. Our confirmatory and exploratory sets of outcomes for grade 8 are based on the design of the RTS intervention and the degree to which similar variables have been shown to be associated with later measures of success such as postsecondary educational and career outcomes. The confirmatory and exploratory outcomes are described below.

As noted earlier, although RTS was originally designed as a six-year intervention, this study ended after students in the treatment group had received only two years of RTS. In Appendix C we describe additional outcomes that we were planning to measure at the end of the six-year program.

A. CONFIRMATORY OUTCOMES

The three confirmatory outcomes of interest for grade 8 are (1) motivation to go to school to learn job skills (Question A1b in the follow-up survey in Appendix A), (2) learning and study habits/preparation (Question B1 in the follow-up survey), and (3) school attendance and negative behaviors (Question B3 in the follow-up survey).[10] Research by Rosenbaum (2001) suggests that

[10] Questions B1 and B3 contain multiple sub-questions. We took the average response across the sub-questions.

students' motivation to go to school (that is, future relevance) strongly predicts their efforts in school and that poor attendance and discipline problems have significant negative effects on future earnings 10 years after high school.

We estimated the impacts of assignment to RTS on these three main outcomes separately. In addition, we tested for the joint significance of these coefficient estimates, one of the options recommended by Schochet (2008) when doing confirmatory analyses for outcomes that differ in substantively important ways. Conducting a joint significance test reduces the likelihood of having a false positive finding, compared to not conducting such a test. In addition it avoids complications associated with choosing how to combine disparate outcomes (another method of avoiding false positives).

B. EXPLORATORY OUTCOMES

For our exploratory analyses, we estimated impacts of RTS on a number of other outcomes at the end of grade 8, including (1) the five sub-questions used to create the confirmatory outcome, school attendance and negative behaviors; (2) career exploration behavior with parents (Question A6 in the follow-up student survey); (3) career exploration behavior with teachers/school staff (Question A7 in the follow-up student survey);[11] (4) school engagement (Questions A1a and A2 in the follow-up survey); (5) importance of grades (Question A2 in the follow-up survey); (6) career exploration efficacy (Question C11 in the follow-up survey); and (6) desired and expected careers (Questions C6 and C7 in the follow-up survey).[12] Most of these measures have been validated by previous research (Kirschner 1989; Glanville and Wildhagen 2007; Ogbu 2003; Nichols 2003; Ehrenberg et al. 1991; Balfanz and Herzog 2006; Smerdon 1999; Coleman and Delaire 2003), and some have been shown to be correlated with later measures of success (Buchanan 1998). We also tested to see whether the estimated impacts of RTS on these outcomes varied with baseline student characteristics such as student test scores and parent education.

Table IV.1 presents psychometric properties for each of the confirmatory outcome measures and most of the exploratory outcome measures. The table does not present psychometric properties for the individual items we used to create constructs measuring school absences and negative behaviors, career exploration with others, or career exploration efficacy. The "reasonably ambitious and realistic career expectations" outcome is also not included in Table IV.1; this measure is based on open-ended data from the follow-up student survey. See Appendix B for a description of the procedures we used to code these data.

[11] Career exploration behavior might be seen as a measure of program fidelity rather than as an outcome.

[12] Questions A6, A7, and C11 contain multiple sub-questions. We took the average response across the sub-questions for our main analysis. We then compared outcomes for treatment and control students on each individual sub-question.

TABLE IV.1

PSYCHOMETRIC PROPERTIES OF OUTCOME MEASURES

Outcome	Number of Items	Mean	SD	Minimum Value	Maximum Value	Cronbach's Alpha
Motivation to go to school to learn job skills *("I attend school to learn skills for a job.")*	1	3.26	0.75	1 (strongly disagree)	4 (strongly agree)	n/a
Learning and study habits *(for example, "I stick with a class assignment until it is done.")*	6	4.01	0.73	1 (never)	5 (always/almost always)	0.85
School absences and negative behaviors *(for example, "How many times were you late for school?")*	5	1.78	0.55	1 (never)	4 (10+ times)	0.69
Career exploration with parents *(for example, "I discussed whether to go to college with a parent.")*	5	3.27	1.04	1 (never)	5 (very often)	0.88
Career exploration with school staff (*for example, "I discussed whether to go to college with a teacher/school staff.")*	5	2.77	1.13	1 (never)	5 (very often)	0.93
School engagement *("I go to school because the subjects I'm taking are interesting.")*	1	2.49	0.79	1 (strongly disagree)	4 (strongly agree)	n/a
Importance of grades *("How important are good grades to you?")*	1	3.42	0.75	1 (not at all important)	4 (very important)	n/a
Career exploration efficacy *(for example, "I know what is required to succeed in different careers.")*	4	3.28	0.54	1 (strongly disagree)	4 (strongly agree)	0.81

Source: Mathematica student surveys administered in spring 2009.
SD = standard deviation.

C. IMPACT ESTIMATION

1. Description of Benchmark Model

To estimate impacts, we use linear regressions of student outcomes at the end of grade 8 on an indicator of treatment status and control for student baseline test scores and other characteristics. In all analyses, standard errors are adjusted for the clustering of students within schools and for heteroskedasticity. The following equation illustrates the model:

(1) $Y_i = \alpha + T_i * \beta_1 + X_i'\beta_2 + \varepsilon_{cs} + e_{i,}$

where

Y_i = the outcome variable for individual *i*
T_i = treatment status (1 if treatment, 0 if control)
X_i = student and school baseline characteristics (grade 6 test scores, race/ethnicity, gender, age, parent education, main language spoken at home, Internet access at home, school average 6th grade test scores, and school average free lunch)
ε_{cs} = unobserved school- or cohort-level factors
e_i = unobserved student-level factors
α, β_1, β_2 = parameters to be estimated

This work is complicated by four important factors—student mobility, the possibility of contamination of the control group by the treatment group through the sharing of information across grade levels within schools, student nonresponse to the surveys, and missing baseline test score data. All of these factors could affect estimated impacts. We deal with these problems in the analyses, as explained below.

2. Student Mobility

Students often change schools within districts and sometimes move between districts. RTS could affect student mobility if, for example, the presence of the RTS intervention encourages some students to remain in their current school and perhaps even attracts others to that school. According to student rosters provided by the schools, 13 students who were originally enrolled in treatment schools in fall 2007 moved to control schools during the course of the study. Likewise, nine students who were originally enrolled in control schools in fall 2007 moved to treatment schools during the course of the study.

Students who started grade 7 in a treatment school could have skipped a grade or been held back during the course of the study, meaning that they would enter or exit the grade receiving the RTS intervention. Likewise, students who started grade 7 in a control school could have skipped a grade or been held back during the course of the study, meaning that they would enter or exit the control group. According to the student rosters provided by schools, this type of movement did not occur during the course of the study.

We address student mobility in our analyses in a number of ways. First, students are analyzed based on their treatment/control group status at the beginning of the study in fall 2007. Thus we use an "Intent to Treat" analysis.[13] Second, we use the baseline test score data to test whether the RTS intervention appears to have any impact on student mobility. We found no statistically significant difference between the test scores of the students who moved into the treatment group from the control group and those who moved into the control group from the treatment group. Third, we tested to see if the total number of mobile students differed between the treatment and control groups. As Table III.3 (above) shows, the fractions of students who moved out of the treatment and control schools were very similar (10 and 9 percent respectively).[14]

3. Contamination

Our estimation method relies heavily on the assumption that the control group is not affected by the presence of the RTS program in its school. This assumption could be violated in at least two ways.

1. **Schoolwide Elements.** The control group schools were allowed to have a younger cohort of grade 7 students participate in RTS starting in the 2008–2009 school year. Data from this younger cohort of students are not included in the current report. However, the control group students in the current study were in schools that offered RTS to younger students during the 2008–2009 school year and thus were exposed to any schoolwide elements of the RTS intervention during this period. Counselors (and other staff) at these schools were likely to learn at least some information from the RTS facilitator and may have used this information to improve outcomes for control group students. The presence of the RTS program may have also enabled the counselors to spend more time with the control group students if they felt that the treatment group students needed less of their time. Finally, the RTS organization purchased a license for the Career Cruising website that provided students with career planning information. Members of the control group as well as the treatment group could have accessed the website.

2. **Siblings with RTS Exposure.** Students in the control group during the 2008–2009 school year may have had siblings in enrolled in grade 7 in the same school who were receiving the RTS intervention. These siblings could share information obtained from RTS, either directly or through their parents, who received an RTS newsletter. According to student responses on the spring 2009 follow-up survey, 17 percent (n = 109) of the 631 control students who responded to the survey question reported having a sibling or someone else in their home who was currently attending grade 7 at their school.

[13] Students who were not in the study in fall 2007 but who later moved into a study school are omitted from all analyses because their movement into these schools could have been influenced by the presence of RTS.

[14] The difference is not statistically significant at the 0.10 level.

RTS staff members believe that these spillover effects were negligible because the program was implemented in only one grade at a time requiring any sharing of information to occur across grade levels. Because some sharing of information is likely for the reasons given above, we are, in effect, estimating the impacts of this type of sharing for the control group compared to a far more intensive intervention for the treatment group that includes 45 minutes per week of instruction. If the information shared across grades creates impacts comparable to the intensive RTS intervention, this would suggest that a less time-intensive intervention might be sufficient to obtain similar impacts. Thus, bias caused by these types of spillovers will not invalidate the usefulness of the results of this study. That said, we did run models controlling for whether a child in the control group had a sibling in the treatment group. Those results are described below.

4. Nonresponse to Student Surveys

We deal with nonresponse bias in two ways. First, we include control variables in our analyses. These control variables adjust for any differences between the treatment and control groups in observable characteristics that might be due to differential nonresponse. Second, we weight the data so that the treatment and control groups are balanced with respect to the blocks of matched schools. Following is a more detailed description of how we created our weights.

As explained above, schools were matched into blocks with two or three schools per block. One school was randomly selected from each block to be in the treatment group. The remaining schools were put in the control group. The numbers of responding students in these schools were used to create the weights as follows:

(2) Treatment Group Weights = NBR / NBR_t

(3) Control Group Weights = NBR / $NBR_{c,}$

where

NBR = total student respondents in block (across all schools)
NBR_t = total student respondents in treatment schools in block
NBR_c = total student respondents in control school in block (each block has only one control school).

Students who are non-respondents are omitted from these calculations. This includes all students in the non-responding schools as well as the non-responding students within the responding schools. Thus our estimates are not representative for those students.

Table IV.2 provides characteristics of the students used in our analyses, both weighted and unweighted. We consider two groups of students (those with full control variables and the larger set including some students with missing control variables). As Table IV.2 illustrates, the characteristics of the students used in our analyses are generally similar regardless of which group is used or whether the results are weighted or unweighted.

We calculated separate weights for each of the two different analysis samples. The first sample, referred to as the full analysis sample, is used in the analyses without control variables,

such as those reported in Table V.2 and Table V.4. The second sample, referred to as the control variables analysis sample, is used in the analyses that include control variables, such as those reported in Table V.3 and Table V.5. The weights for the control variables analysis sample are calculated using only cases that have at least one of the outcome variables and all of the control variables. The weights for the full analysis sample are calculated using a larger set of cases, still limited to those with at least one outcome but including cases with missing control variables.

TABLE IV.2

SAMPLE CHARACTERISTICS

	Full Analysis Sample		Control Variables Analysis Sample	
Variable	Unweighted	Weighted	Unweighted	Weighted
Female	50.8%	50.9%	52.1%	52.1%
Race/Ethnicity				
White	90.8%	91.4%	91.2%	91.8%
Black or African American	1.3%	1.1%	1.3%	1.0%
Hispanic or Latino/Latina	0.6%	0.6%	0.6%	0.6%
Asian	0.4%	0.4%	0.3%	0.3%
American Indian or Alaska Native	0.1%	0.1%	0.2%	0.1%
Other/mixed/unknown	6.8%	6.4%	6.4%	6.1%
Mother's Highest Level of Education				
At least high school diploma	68.6%	67.5%	69.4%	68.2%
At least bachelor's degree	24.5%	24.1%	24.1%	23.8%
Father's Highest Level of Education				
At least high school diploma	62.0%	61.0%	62.6%	61.5%
At least bachelor's degree	15.5%	14.4%	15.6%	14.5%
English Spoken at Home	98.1%	98.2%	98.7%	98.9%
Over Age for Grade	2.6%	2.8%	2.2%	2.2%
Computer Access at Home	82.5%	81.5%	82.6%	81.7%
Baseline Math Z-score	0.09	0.08	0.09	0.09
Baseline Reading Z-score	0.12	0.09	0.13	0.10
Sample Size	**1,444**		**1,305**	

Source: Mathematica student surveys administered to all study students in fall 2007 and spring 2009; if data were missing for the baseline survey, we used the follow-up survey data from 2009 covering the same information. Baseline test score data are from grade 6 standardized math and English/language arts tests from spring 2007.

5. Missing Baseline Test Score Data

Some schools provided proficiency level data for students but not their scaled test scores. We include these students in the regression analysis by using their proficiency level to impute their scaled score, separately for math and reading. This imputation procedure involves regressing scaled scores on proficiency-level indicators, as well as other student-level control variables, for students with non-missing scaled scores. This regression is then used to predict

scaled score values for students where those scores are missing, based on their proficiency level and other observable characteristics. We imputed test scores in this way for 155 out of the 1,305 students in the control variables analysis sample.

Some students are omitted from the control variables analysis sample because of missing data. From the full analysis sample of 1,444 students with non-missing values for at least one of the outcome variables, 58 are omitted because they are missing the race/ethnicity variable, 78 are omitted because they lack the data necessary for calculating their math or reading z-score (because they are missing both scale scores and proficiency levels), and 3 additional students are omitted because they are missing one of the other control variables. This leaves a control variables analysis sample of 1,305 students.[15]

[15] The control variables analysis sample sizes vary slightly by outcome measure, from 1,287 to 1,299 students. All students included have data on at least one outcome, but for each outcome measure there are some students in the analysis sample with missing data. Data on parent education was missing for a quarter of the sample. These students are included in all of the tables in this report. The missing values were included in the omitted category for parent education. We also ran the results for the last two columns of Table V.3 without these observations. The results were substantively the same. The only estimated effect of Roads to Success that was statistically significant was for the same outcome as in Table V.3 (school absences and negative behaviors). That estimate remained negative and statistically significant at the 10% level but not at the 5% level. None of the estimated impacts of Roads to Success in Table V.3 changed in a statistically significant way. These results are available upon request.

V. IMPACT FINDINGS

We estimate intervention impacts by comparing outcomes for the treatment and control groups using multivariate regression methods. The impact analysis focuses on two types of outcomes—a confirmatory set, used to test how well our pre-specified hypotheses are supported by the data and an exploratory set, used to test additional hypotheses that might be the basis for more rigorous testing in later studies. We first present simple differences in means, followed by the regression analysis controlling for baseline test scores and other observable characteristics and a weighted analysis to control for potential bias due to nonresponse.

Table V.1 shows unweighted descriptive characteristics of the control variables analysis sample, separately for treatment and control students. Although there are differences, none of them are statistically significant.

TABLE V.1

TESTS OF EQUIVALENCE FOR ANALYSIS SAMPLE

Variable	Treatment Students	Control Students	Difference
Female	51.4%	53.0%	-1.6
Race/Ethnicity			
White	91.9%	90.3%	1.6
Black or African American	1.2%	1.4%	-0.2
Hispanic or Latino/Latina	0.4%	0.9%	-0.5
Asian	0.3%	0.3%	0.0
American Indian or Alaska Native	0.3%	0%	0.3
Other/mixed/unknown	5.9%	7.1%	-1.2
Mother's Highest Level of Education			
At least high school diploma	70.6%	67.9%	2.7
At least bachelor's degree	24.7%	23.4%	1.3
Father's Highest Level of Education			
At least high school diploma	63.9%	61.0%	2.9
At least bachelor's degree	16.3%	14.6%	2.7
English Spoken at Home	98.5%	99.0%	-0.5
Over Age for Grade	1.6%	2.9%	-1.3
Computer Access at Home	82.8%	82.4%	-1.6
Baseline Math Z-score	0.06	0.13	-0.07
Baseline Reading Z-score	0.13	0.12	0.01
Sample Size	**728**	**577**	

Source: Mathematica student surveys administered to all study students in fall 2007 and spring 2009; if data were missing for the baseline survey, we used the follow-up survey data from 2009 covering the same information. Baseline test score data are from grade 6 standardized math and English/language arts tests from spring 2007.

Notes: These results are based on unweighted data. None of the differences are statistically significant at the 0.05 level using a two-tailed test.

A. CONFIRMATORY OUTCOMES

Table V.2 shows the differences between treatment and control group students on the three confirmatory outcomes: (1) motivation to go to school to learn job skills; (2) learning, study habits, and preparation; and (3) school absences and negative behaviors. Observations are weighted to adjust for differences in nonresponse rates, and standard errors are adjusted for the clustering of students within schools.[16] This comparison of group means for the full analysis sample reveals no statistically significant differences in average responses between treatment and control group students.

TABLE V.2

SAMPLE DIFFERENCES ON GRADE 8 CONFIRMATORY OUTCOMES

Outcome	Sample Size	Treatment Mean	Control Mean	Difference	*p*-value
Motivation to go to school to learn job skills	1,420	3.201	3.319	-0.118	0.101
Learning and study habits and preparation	1,435	3.983	4.038	-0.055	0.394
School absences and negative behaviors	1,434	1.779	1.817	-0.038	0.431

Source: Mathematica student surveys administered in spring 2009.
Notes: Observations are weighted to adjust for nonresponse. Standard errors are adjusted for clustering of students by school. The standard deviations of the outcomes are 0.75, 0.73, and 0.55 respectively.
*Significantly different from 0 at the .10 level, two-tailed test.
**Significantly different from 0 at the .05 level, two-tailed test.
***Significantly different from 0 at the .01 level, two-tailed test.

Table V.3 presents results from a linear regression analysis comparing outcomes for treatment and control students for the control variables analysis sample, including baseline test scores as a control variable. The first column of results does not include the control variables in the model but does adjust for clustering of students within schools. There is a statistically significant difference at the 0.10 level between treatment and control groups on the first outcome measure, with the control group students reporting greater motivation to go to school to learn job skills. Differences on the other two confirmatory outcome measures are not statistically significant.

The second column of results in Table V.3 is from a regression model that includes controls for baseline math and reading test scores, as well as for other observable student and school characteristics. When these controls are included, none of the differences are statistically significant.

Because the analysis sample does not include every student from the original baseline sample, due to nonresponse and missing data issues, it is possible that the results are biased due

[16] See Chapter III for a discussion of the method for constructing the nonresponse weights. Because the analyses performed in tables V.2 and V.4 do not require control variables, whereas the analyses in tables V.3 and V.5 do, different weights were constructed for each pair of tables.

to differential response between treatment and control groups. To account for this possibility, we ran an analysis weighting each observation to adjust for nonresponse.[17] The results of this analysis are shown in the last column of Table V.3.[18] Once we control for nonresponse, none of the confirmatory outcome measures are statistically significant at the .05 level. Additionally, we tested the joint significance of all three confirmatory outcomes, and they are not jointly significant at the 0.10 level. There is statistically significant difference between treatment and control students on school absences and negative behaviors at the 0.10 level, with treatment group students reporting fewer absences and negative behaviors.

TABLE V.3

ESTIMATED IMPACTS ON GRADE 8 CONFIRMATORY OUTCOMES (*p*-VALUES)

	Sample Size	Unweighted, No Control Variables	Unweighted, with Control Variables	Weighted, with Control Variables
Motivation to go to school to learn job skills	1,287	-0.117* (0.092)	-0.110 (0.122)	-0.083 (0.267)
Learning and study habits and preparation	1,299	-0.029 (0.631)	-0.070 (0.289)	-0.046 (0.524)
School absences and negative behaviors	1,298	-0.052 (0.301)	-0.052 (0.194)	-0.064* (0.087)

Source: Mathematica student surveys administered in fall 2007 and spring 2009.

Notes: The control variables include grade 6 test scores by subject (math and reading); race/ethnicity indicators (Black/African American, Hispanic, Asian, American Indian, other race); gender; age; parent education separately for the mother and father (has at least a high school diploma, has at least a bachelor's degree); primary language at home is not English; internet access at home; school average grade 6 test scores by subject; and school average free lunch. The standard deviations of the outcomes are 0.75, 0.73, and 0.55 respectively.

*Significantly different from 0 at the .10 level, two-tailed test.
**Significantly different from 0 at the .05 level, two-tailed test.
***Significantly different from 0 at the .01 level, two-tailed test.

Although the confirmatory outcome measures are not statistically significant by themselves, it is possible that there are significant differences in the outcomes by different student and school characteristics. To test for this, we interacted the treatment indicator with each of the control variables and then ran the weighted model including these interactions as additional control variables. The combined interactions are not jointly significant at the 0.10 level for any of the outcome measures, indicating that there are not statistically significant differences in the treatment effect by student or school characteristics.

[17] This is the specification from the design report (Chaplin et al. 2009).

[18] The coefficient estimates for all variables in this model, including the control variables, are presented in Appendix D.

As discussed above, there is some chance of spillover between the treatment and control groups if a control group child has a sibling in the treatment group. Consequently we estimated impacts of RTS on the three main confirmatory outcomes described above using the same methods as were used for the results in Table V.3, but adding in a covariate to identify if a control group child had a sibling in the treatment group. The results (coefficient estimates and standard errors) were similar to those shown in Table V.3 except that the standard error for the last outcome dropped and that result became statistically significant at the 10 percent level. The coefficient estimate on the RTS treatment variable was -0.068 in this regression as compared to -0.064 in Table V.3.

B. EXPLORATORY OUTCOMES

In our exploratory analyses we start by breaking out the individual items used to create the school absences and negative behaviors measure analyzed as a confirmatory outcome. We then look at five additional variables.

1. School Absences and Negative Behaviors

The construct measuring school absences and negative behaviors consisted of five individual items. Because the composite score may mask impacts for individual items, we compared outcomes for treatment and control students on each individual item (Table V.4). There is a statistically significant difference between treatment and control students on detentions, with the control group students reporting more detentions (at the 0.01 level).

TABLE V.4

SAMPLE DIFFERENCES ON SCHOOL ABSENCES AND NEGATIVE BEHAVIORS

Outcome	Sample Size	Treatment Mean	Control Mean	Difference	*p*-value
How many times…					
Were you late for school?	1,431	1.944	1.881	0.063	0.473
Did you cut or skip classes?	1,428	1.322	1.230	0.092	0.102
Were you absent from school?	1,428	2.620	2.685	-0.065	0.414
Were you sent out of class for bad behavior?	1,427	1.425	1.441	-0.016	0.824
Were you given a detention?	1,428	1.511	1.797	-0.286 ***	0.004

Source: Mathematica student surveys administered in spring 2009.

Notes: Scoring scale: (1) never, (2) 1–4 times, (3) 5–9 times, and (4) 10 or more times. These results are based on unweighted data. Standard errors are adjusted for clustering of students by school. The standard deviations of the outcomes are 0.87, 0.65, 0.89, 0.79, and 0.88 respectively.

*Significantly different from 0 at the .10 level, two-tailed test.
**Significantly different from 0 at the .05 level, two-tailed test.
***Significantly different from 0 at the .01 level, two-tailed test.

Table V.5 presents results for the control variables analysis sample. The first column of results does not include the control variables in the model but does adjust for clustering of students within schools. The estimated impact on the detention variable is still statistically significant (at the 0.01 level), as it was in Table V.4. Estimated impacts on the other four measures are not statistically significant. The second column of results in Table V.5 includes controls for baseline math and reading test scores as well as for other observable student characteristics. Once these control variables are included, the difference on cutting/skipping classes becomes significant (at the 0.10 level). The third column of results adds weights to adjust for nonresponse. After weighting, cutting/skipping classes, absences, and detentions are significant, at the 0.10, .05, and 0.10 levels, respectively. Thus, RTS seems to be helpful in two areas (by reducing absenteeism and detentions) but potentially harmful in another (by increasing the rate at which students skip class).

TABLE V.5
ESTIMATED IMPACTS ON SCHOOL ABSENCES AND NEGATIVE BEHAVIORS (*p*-VALUES)

	Sample Size	Unweighted, No Control Variables	Unweighted with Control Variables	Weighted with Control Variables
How many times…				
Were you late for school?	1,295	0.065 (0.466)	0.035 (0.736)	-0.020 (0.831)
Did you cut or skip classes?	1,293	0.079 (0.133)	0.115* (0.055)	0.124* (0.071)
Were you absent from school?	1,293	-0.073 (0.388)	-0.105 (0.110)	-0.124** (0.030)
Were you sent out of class for bad behavior	1,291	-0.028 (0.670)	-0.063 (0.270)	-0.088 (0.124)
Were you given a detention?	1,293	-0.292*** (0.002)	-0.226** (0.021)	-0.200* (0.058)

Source: Mathematica student surveys administered in fall 2007 and spring 2009.

Notes: The control variables include grade 6 test scores by subject (math and reading); race/ethnicity indicators (Black/African American, Hispanic, Asian, American Indian, other race); gender; age; parent education separately for the mother and father (has at least a high school diploma, has at least a bachelor's degree); primary language at home is not English; internet access at home; school average grade 6 test scores by subject; and school average free lunch. The standard deviations of the outcomes are 0.87, 0.65, 0.89, 0.79, and 0.88 respectively.

*Significantly different from 0 at the .10 level, two-tailed test.
**Significantly different from 0 at the .05 level, two-tailed test.
***Significantly different from 0 at the .01 level, two-tailed test.

2. Career Exploration and School Engagement

Table V.6 shows the differences between treatment and control group students on the five additional exploratory outcome measures: career exploration with parents, career exploration with school staff, school engagement, importance of grades, and career exploration efficacy. This

comparison of weighted group means reveals a statistically significant difference between treatment and control groups, with treatment group students reporting higher average values on career exploration with school staff (at the 0.01 level). For the other outcomes, there are no significant differences in average responses between treatment and control group students.

TABLE V.6

SAMPLE DIFFERENCES ON GRADE 8 EXPLORATORY OUTCOMES

Outcome	Sample Size	Treatment Mean	Control Mean	Difference	*p*-value
Career exploration with parents	1,435	3.262	3.242	0.020	0.862
Career exploration with school staff	1,435	3.011	2.494	0.517 ***	0.004
School engagement	1,426	2.455	2.549	-0.094	0.237
Importance of grades	1,431	3.400	3.415	-0.015	0.846
Career exploration efficacy	1,429	3.299	3.243	0.056	0.151

Source: Mathematica student survey administered to study students in spring 2009.
Notes: Observations are weighted to adjust for nonresponse. Standard errors are adjusted for clustering of students by school. The standard deviations of the outcomes are 1.04, 1.13, 0.79, 0.75, and 0.54 respectively.

*Significantly different from 0 at the .10 level, two-tailed test.
**Significantly different from 0 at the .05 level, two-tailed test.
***Significantly different from 0 at the .01 level, two-tailed test.

Table V.7 presents results for the control variables analysis sample. The first column of results does not include the control variables in the model, but does adjust for clustering of students within schools. Once this adjustment is made, the difference in career exploration with school staff (at the 0.05 level) is still statistically significant and career exploration efficacy (at the 0.10 level) is still significant. Differences on the other three exploratory outcome measures are not statistically significant.

The second column of results in Table V.7 includes controls for baseline math and reading test scores as well as for other observable student characteristics. The results change very little when these controls are included, with the only difference being that career exploration efficacy is no longer significant. The third column of results adds weights to adjust for nonresponse. After weighting, both career exploration with school staff and career exploration efficacy are significant, at the 0.01 and 0.10 levels respectively. Together, estimated impacts of RTS on the five exploratory outcomes in Table V.7 are jointly significant at the 0.05 level.

TABLE V.7

ESTIMATED IMPACTS ON GRADE 8 EXPLORATORY OUTCOMES (*p*-VALUES)

	Sample Size	Unweighted, No Control Variables	Unweighted with Control Variables	Weighted with Control Variables
Career exploration with parents	1,291	-0.016 (0.880)	-0.024 (0.841)	0.007 (0.956)
Career exploration with school staff	1,297	0.456** (0.012)	0.558*** (0.010)	0.596*** (0.006)
School engagement	1,299	-0.076 (0.265)	-0.065 (0.300)	-0.054 (0.400)
Importance of grades	1,299	-0.032 (0.599)	-0.048 (0.487)	-0.032 (0.674)
Career exploration efficacy	1,294	0.062* (0.090)	0.049 (0.163)	0.055* (0.068)

Source: Mathematica student surveys administered in fall 2007 and spring 2009.

Notes: The control variables include grade 6 test scores by subject (math and reading); race/ethnicity indicators (Black/African American, Hispanic, Asian, American Indian, other race); gender; age; parent education separately for the mother and father (has at least a high school diploma, has at least a bachelor's degree); primary language at home is not English; internet access at home; school average grade 6 test scores by subject; and school average free lunch. The standard deviations of the outcomes are 1.04, 1.13, 0.79, 0.75, and 0.54 respectively.

*Significantly different from 0 at the .10 level, two-tailed test.
**Significantly different from 0 at the .05 level, two-tailed test.
***Significantly different from 0 at the .01 level, two-tailed test.

3. Detailed Examination of Career Exploration with Others

We also looked more directly at how much the students were talking to their parents and school staff about future careers. As Table V.8 shows, the students in the control group, without RTS, were talking to their parents more than their teachers about careers. RTS increased how much students talk to school staff, but even the students in the treatment group spoke more to their parents than to school staff about "whether to go to college," "which college," to attend and "careers." We also created variables that looked at the maximum levels of how much the students spoke to either their parents or school staff.[19] RTS had no statistically significant impacts on these variables.

[19] These variables are equal to the maximum values of the corresponding variables for parents and school staff, A6 and A7.

TABLE V.8

SAMPLE DIFFERENCES ON CAREER EXPLORATION WITH OTHERS

		Treatment Means			Control Means		
Outcome	Sample Size	With Parent	With Teacher	Difference (Teacher-Parent)	With Parent	With Teacher	Difference (Teacher-Parent)
In the last year, how often have you discussed the following…							
College entrance exams	1,428	2.51	2.59	0.08	2.49	2.27	-0.22**
Whether to go to college	1,426	3.68	3.10	-0.58***	3.71	2.53	-1.18***
What college to choose	1,426	3.22	2.96	-0.26***	3.18	2.20	-0.98***
College majors and programs	1,413	3.08	3.03	-0.05	3.09	2.59	-0.50***
Possible jobs or careers	1,425	3.84	3.32	-0.52***	3.90	2.95	-0.95***

Source: Mathematica student surveys administered in spring 2009.

Notes: Survey asked how often students discussed topic with teacher or other school staff. Scoring scale: (1) never, (2) not very often, (3) sometimes, (4) often, and (5) very often. These results are based on unweighted data.

*Significantly different from 0 at the .10 level, two-tailed test.
**Significantly different from 0 at the .05 level, two-tailed test.
***Significantly different from 0 at the .01 level, two-tailed test.

4. Detailed Examination of Career Exploration Efficacy

The construct measuring career exploration efficacy consisted of four individual items. Because we were interested in the effect of RTS on each of these indicators, we compared outcomes for treatment and control students on each individual item (see Table V.9). Treatment students were more likely to report knowing how to find out about what types of jobs are best for them (statistically significant at the 0.01 level) and to report knowing what is required to succeed in different careers (significant at the 0.10 level).

TABLE V.9

SAMPLE DIFFERENCES ON CAREER EXPLORATION EFFICACY

Outcome	Sample Size	Treatment Mean	Control Mean	Difference	*p*-value
I know what is required to succeed in different careers.	1,422	3.216	3.125	0.091 *	0.053
I know how to find out about what types of jobs are best for me.	1,424	3.270	3.133	0.137 ***	0.001
I have a good idea about the kinds of jobs I would be good at.	1,423	3.443	3.443	0.000	0.999
I will be able to overcome barriers that stand in the way of achieving my career goals.	1,424	3.311	3.314	-0.003	0.942

Source: Mathematica student surveys administered in spring 2009.

Notes: Scoring scale: (1) strongly disagree, (2) disagree, (3) agree, and (4) strongly agree. These results are based on unweighted data. Standard errors are adjusted for clustering of students by school. The standard deviations of the outcomes are 0.66, 0.70, 0.64, and 0.66 respectively.

*Significantly different from 0 at the .10 level, two-tailed test.

**Significantly different from 0 at the .05 level, two-tailed test.

***Significantly different from 0 at the .01 level, two-tailed test.

Table V.10 presents results on career exploration efficacy for the control variables analysis sample. The first column of results does not include the control variables in the model but does adjust for clustering of students within schools. Once this adjustment is made, the differences in knowing how to find out about what types of jobs are best (at the 0.10 level) and in knowing what is required to succeed in different careers (statistically significant at the 0.01 level) are statistically significant. Differences on the other two outcome measures are not statistically significant. The second column of results in Table V.10 includes controls for baseline math and reading test scores as well as for other observable student characteristics. The results change very little when these controls are included, with the only difference being that knowing what is required to succeed in different careers is no longer statistically significant. The third column of results adds weights to adjust for nonresponse. After weighting, both knowing what is required to succeed in different careers and knowing how to find out about what types of jobs are best are statistically significant at the 0.10 and 0.01 levels, respectively.

We were particularly interested in the possibility that RTS might give students the sense that they can overcome barriers associated with career success (the fourth question in this set of survey items). For this reason, we also estimated impacts of RTS on whether students reported agreeing or strongly agreeing to this question.[20] The estimated impact of RTS remained not statistically significant with a coefficient estimate of -0.013 and a *p*-value of 0.71. Perhaps of

[20] A binary variable (1 = agree or strongly agree, 2 = disagree or strongly disagree) was used as the outcome in this analysis. We used the same linear regression model that was used for results presented in the last column of Table V.9.

greater importance, more than 90 percent of both the treatment and control groups reported agreeing or strongly agreeing with this statement.

TABLE V.10

ESTIMATED IMPACTS ON CAREER EXPLORATION EFFICIENCY (*p*-VALUES)

	Sample Size	Unweighted, No Control Variables	Unweighted, with Control Variables	Weighted, with Control Variables
I know what is required to succeed in different careers.	1,288	0.096* (0.057)	0.077 (0.120)	0.079* (0.057)
I know how to find out about what types of jobs are best for me.	1,290	0.147*** (0.000)	0.147*** (0.001)	0.161*** (0.000)
I have a good idea about the kinds of jobs I would be good at.	1,289	0.008 (0.836)	-0.007 (0.847)	-0.017 (0.641)
I will be able to overcome barriers that stand in the way of achieving my career goals.	1,291	0.009 (0.842)	-0.008 (0.853)	0.012 (0.764)

Source: Mathematica student surveys administered in fall 2007 and spring 2009.

Notes: The control variables include grade 6 test scores by subject (math and reading); race/ethnicity indicators (Black/African American, Hispanic, Asian, American Indian, other race); gender; age; parent education separately for the mother and father (has at least a high school diploma, has at least a bachelor's degree); primary language at home is not English; internet access at home; school average grade 6 test scores by subject; and school average free lunch. The standard deviations of the outcomes are 0.66, 0.70, 0.64, and 0.66 respectively.

*Significantly different from 0 at the .10 level, two-tailed test.
**Significantly different from 0 at the .05 level, two-tailed test.
***Significantly different from 0 at the .01 level, two-tailed test.

5. Desired and Expected Careers

We asked students to report on four careers in the survey, three that they wanted to have and one that they expected to have. As discussed above, we coded these careers based on how realistic and reasonably ambitious they were. The findings were remarkably similar across all four careers. Among treatment and control students, only about 10 percent reported careers that were unrealistic (such as professional sports, actor, model).[21] Fewer than one percent reported plans to be a homemaker and less than 1 percent reported careers in the low ambition category (babysitter, lawn mowing, and so on). We found no evidence of statistically significant impacts of RTS on these outcomes. Although these results are encouraging in the sense that they suggest that these grade 8 students had reasonable career expectations, it should be noted that the fraction with low expectations might increase in higher grades as students become more aware of the possible barriers to success.

[21] Only four students reported plans to be "president" with no clarification. One other student planned to be president of a famous computer game company.

C. SUBGROUP ANALYSIS

As part of our exploratory analyses we looked at impacts on our confirmatory outcomes separately by gender, test score (in quartiles separately for math and reading), parent education (less than high school, high school only, and greater than high school for each parent)[22], and for the half of students for whom the impacts of RTS on talking to school staff about careers was largest.[23] These breakouts suggested no clear findings, though the estimated impacts on talking to school staff about careers did appear to be somewhat higher for those with parents with lower levels of education. Results of these analyses are reported in Appendix E.

D. ADDITIONAL ANALYSES

We also estimated impacts on most of the remaining variables in our survey.[24] These included the topics discussed with a parent or guardian (questions A4 and A6 on the follow-up survey); learning and study habits preparation (B1); importance of various topics (C1); expected education (C2); desired education (C3); reasons for possibly not achieving educational goals (C5); interest in careers (C61a, C62a, C63a, and C7a); likelihood of entering careers (C61b, C62b, C63b, and C7b); expectations for performance in careers (C61c, C62c, C63c, and C7c); education or training needed (C8); likelihood of obtaining needed education (C9); and reasons for not achieving goals (C10). We found no consistent statistically significant results at the five percent level.[25]

[22] The subgroups were less than high school, high school only, and greater than high school.

[23] We identified this subgroup by estimating impacts of RTS on talking to a school staff member about careers and including interactions of RTS with the student test score and parent education variables described earlier in this paragraph. We then calculated the estimated impact of RTS on this outcome for each student and then separated students into the half with the largest impacts of RTS and the half with the smallest impacts of RTS.

[24] We excluded C4, which depended on the answer to another question, and section D, which covered student background information.

[25] Some coefficient estimates were statistically significant at the 10 percent level. Students were asked about how interested they were in four careers of their choosing. The estimated impact of Roads to Success on interest in the first career (C61a) was statistically significant and positive. However, a joint test across all four outcomes (C61a, C62a, C63a, and C7a) did not produce a statistically significant result.

VI. CONCLUSIONS

Many experts suggest that middle and high school students need help in planning for their education and careers and that this work should start early, even before high school. The federal government has made a substantial investment in this area through programs such as GEAR UP. In this report we estimate impacts of RTS, a program that provides such training to students in grades 7 and 8, as well as in high school. We estimate impacts on three confirmatory 8th grade outcomes that we identified in the design report (Chaplin et al. 2009):

- Motivation to go to school to learn job skills
- Learning, study habits, and preparation
- School absences and negative behaviors

We find no statistically significant impacts on motivation to go to school or learning and study habits, though we do find a statistically significant impact at the .10 level for school absences and negative behaviors. These three confirmatory outcomes are not jointly significant at the 0.10 level and the point estimates all suggest effect sizes less than 0.20, which is small when compared to the standards described by Cohen (1988).

We also did exploratory analyses on a number of other outcomes. Statistically significant impacts of RTS were found for a few of the individual items used to measure school absences and negative behaviors in weighted models controlling for test scores and observable student characteristics; students who received RTS reported fewer absences and detentions, but were more likely to report skipping class. Statistically significant impacts of RTS were also found for three career outcomes—career exploration with school staff (effect size approximately 0.50), knowing how to find out about what types of jobs are best for them (0.25), and knowing what is required to succeed in different careers (0.15). This suggests that RTS did increase the interactions these middle-school students had with school staff and their own career exploration efficacy. Overall, these results suggest that RTS does have not have clearly positive short-term impacts on the confirmatory outcomes we identified-- motivation to go to school, learning and study habits, and school absences and negative behaviors. However, the program was designed to last for six years, not just two. Because the exploratory analysis shows that it did increase communication with school staff regarding career exploration, the effects on career related outcomes could differ in the long term compared to the short term. This finding suggests that it would be valuable to conduct a study of the full six-year version of the RTS program or of a similar program.

The major limitation of this study is that it ended after only two years whereas the original study design called for following students for the full six years of their time in RTS. The study also had fairly low response rates. Only 67 percent of students provided follow-up data and only 62 percent provided both baseline and follow-up data. The results do not appear sensitive to how we deal with these missing data, but bias is possible. In the future it might be preferable to try to

obtain outcome data from school districts or college entrance information from the National Student Clearinghouse to help reduce the nonresponse problems.

A second limitation of this study is that the RTS intervention has been modified since this evaluation was done. For this reason, while the study provides good evidence of the impacts of the program at that time, it does limit the generalizability of the results to the current version of RTS. For example, in fall 2008, RTS added a new unit, "You Can Grow Your Intelligence," to its grade 7 program. The unit challenges the idea of fixed intelligence, and is based on the "stereotype threat" research of Steele and Aronson (1995) and the malleability of intelligence research of Blackwell et al., (2007). The treatment students in the current study were in grade 8 during the 2008-2009 school year and did not receive this new unit as part of their RTS experience.

A third limitation of this study is that the results may not generalize to students most in need of these services. Although more than half of the students in these schools were eligible for free or reduced price lunches, the schools had few minority students. Of perhaps greater relevance, on average, students reported talking to their parents more than school staff about most issues regarding school and career planning and more than 90 percent reported agreeing or strongly agreeing with the statement that they "will be able to overcome barriers that stand in the way of achieving my career goals." Also fewer than 10 percent of the treatment and control group students reported career aspirations or expectations that seemed too high and fewer than one percent reported careers that seemed too low. Thus, to the extent that the program was designed to improve communication with adults about career planning, improve career planning efficacy, or align student aspirations and expectations, these students may not have been in great need of these services.

Although additional research on RTS may not be feasible because of funding cut-backs, the program staff created a great deal of documentation about the intervention, which similar interventions (such as those funded by GEAR UP) may be able to draw on. More generally, due to the paucity of strong research on interventions in this area, more studies using rigorous methods to estimate impacts of clearly defined interventions (such as RTS) are needed in order to determine what works and to inform future policy decisions.

REFERENCES

Akey, T. M. "School Context, Student Attitudes and Behavior, and Academic Achievement: An Exploratory Analysis." New York: MDRC, January 2006. Available at [www.mdrc.org].

Allensworth, Elaine, Macarena Correa, and Steve Ponisciak. "From High School to the Future: ACT Preparation—Too Much, Too Late: Why ACT Scores Are Low in Chicago and What It Means for Schools." Chicago: Consortium on Chicago School Research, May 2008.

Balfanz, Robert, and Liza Herzog. "Keeping Middle Grades Students on Track to Graduation: Initial Analysis and Implications." Paper presented at Johns Hopkins University, Baltimore, May 2006.

Bauer, R., and R. Michael. "They're Still in School? Results of an Intervention Program for At-Risk High School Students." Paper presented at the annual meeting of the American Educational Research Association, Atlanta, 1993.

Blackwell, L., K. Trzesniewski, & C. S. Dweck. "Implicit Theories of Intelligence Predict Achievement Across an Adolescent Transition: A Longitudinal Study and an Intervention." *Child Development*, vol. 78, 2007, pp. 246-263.

Bowers, Judy, and Trish Hatch. "The ASCA National Model: A Framework for School Counseling Programs." Alexandria, VA: American School Counselor Association, 2005.

Bragg, D.D. "Educator, Student, and Employer Priorities for Tech Prep Outcomes." Berkeley, CA: National Center for Research in Vocational Education, 1997.

Bridgeland, J., J. DiIulio, and K. Morison. "The Silent Epidemic: Perspectives of High School Dropouts." Washington, DC: Civic Enterprises in association with Peter D. Hart Research Associates for the Bill & Melinda Gates Foundation, 2006.

Buchanan, Nancy. "The Effects of Parental Involvement on 12th Grade Achievement." *Georgetown Public Policy Review*, vol. 4, no. 1, fall/winter 1998, pp. 75–98.

Cabrera, A.F., and S.M. La Nasa. "Overcoming the Tasks on the Path to College for America's Disadvantaged." *New Directions for Institutional Research*, vol. 27, no. 3, fall 2000, pp. 31–44.

Card, D. "The Causal Effect of Education on Earnings." In Handbook of Labor Economics, edited by O. Ashenfelter and D. Card. Amsterdam, The Netherlands: North-Holland, 1999.

Chaplin, Duncan, Martha Bleeker, and Claire Smither. "Rigorous Evaluation of Roads to Success: Design Report." Washington, DC: Mathematica Policy Research, May 2009.

Cohen, J. *Statistical Power Analysis for the Behavioral Sciences.* 2nd ed. Hillsdale, NJ: Lawrence Earlbaum Associates, 1988.

Coleman, Margo, and Thomas Delaire. "An Economic Model of Locus of Control and the Human Capital Investment Decision." *Journal of Human Resources*, vol. 38, no. 3, 2003, pp. 701–721.

Conley, D.T. "Towards a More Comprehensive Conception of College Readiness." Eugene, OR: Education Policy Improvement Center, 2007.

Deluca, Stefanie, and James E. Rosenbaum. "Individual Agency and the Life Course: Do Low-SES Students Get Less Long-Term Payoff for their School Efforts?" *Sociological Focus*, vol. 34, no. 4, October/November 2001, pp. 357–376.

Dohm, Alrene, and Lynn Shniper. "Employment Outlook: 2006–16: Occupational Employment Projections to 2016." *Monthly Labor Review*, vol. 130, no. 11, November 2007, pp. 86–125.

Dynarski, M., L. Clarke, B. Cobb, J. Finn, R. Rumberger, and J. Smink. "Dropout Prevention: A Practice Guide (NCEE 2008–4025)." Washington, DC: National Center for Education Evaluation and Regional Assistance, Institute of Education Sciences, U.S. Department of Education, September 2008. Available at [http://ies.ed.gov/ncee/wwc].

Ehrenberg, Ronald G., Randy A. Ehrenberg, Daniel I. Rees, and Eric L. Ehrenberg. "School District Leave Policies, Teacher Absenteeism, and Student Achievement." *Journal of Human Resources*, vol. 26, no. 1, 1991, pp. 72–105.

Garcia-Reid, P., R. Reid, and N.A. Peterson. "School Engagement Among Latino Youth in an Urban Middle School Context: Valuing the Role of Social Support." *Education and Urban Society*, vol. 37, no. 3, May 2005, pp. 257–275.

Glanville, J., and T. Wildhagen. "The Measure of School Engagement: Assessing Dimensionality and Measurement Invariance Across Race and Ethnicity." *Educational and Psychological Measurement*, vol. 67, no. 6, 2007, pp. 1019–1041.

Hamilton, S., and M. Hamilton. "Creating New Pathways to Adulthood by Adapting German Apprenticeship in the United States." In *From Education to Work: Cross-National Perspectives*, edited by W. Heinz. New York: Cambridge University Press, 1999.

Hayward, B.J., and G.K. Tallmadge. "Strategies for Keeping Kids in School: Evaluation of Dropout Prevention and Reentry Projects in Vocational Education." Washington, DC: American Institutes for Research in the Behavioral Sciences, Research Triangle Institute, and RMC Corporation, 1995.

Heller, R., S. Calderon, and E. Medrich. "Academic Achievement in the Middle Grades: What Does Research Tell Us? A Review of the Literature." Atlanta: Southern Regional Education Board, 2003. Available at [http://www.sreb.org/programs/hstw/publications/pubs/02V47_AchievementReview.pdf].

Hossler, D., and K.S. Gallagher. "Studying Student College Choice: A Three-Phase Model and the Implications for Policymakers." *College and University*, vol. 2, no. 3, 1987, pp. 207–221.

Hossler, D., J. Schmidt, and N. Vesper. *Going to College: How Social, Economic, and Educational Factors Influence the Decisions Students Make*. Baltimore: Johns Hopkins University Press, 1999.

Humphrey, Justin G., Nancy L. Carey, and Wendy Mansfield. "A Profile of the Talent Search Program: 1999–2000." Washington, DC: Mathematica Policy Research, Inc., September 2002.

Ikenberry, S., and T. Hartle. "Too Little Knowledge Is a Dangerous Thing: What the Public Knows and Thinks It Knows about Paying for College." Washington DC: American Council on Education, 1998.

Kenny, M., D. Blustein, R. Haase, J. Jackson, and J. Perry. "Setting the Stage: Career Development and the Student Engagement Process." *Journal of Counseling Psychology*, vol. 53, no. 2, April 2006, pp. 272–279.

Kirschner, J.E. "Congruent versus Incongruent Vocational Treatments for Career Indecision in College Students: A Comparison of DISCOVER and a Career Workshop." Doctoral dissertation, University of Maryland College Park, 1989. *Dissertation Abstracts International*, vol. 50, p. 3163A.

Kirst, Michael, and Andrea Venezia. *From High School to College: Improving Opportunities for Success in Postsecondary Education.* San Francisco: Jossey-Bass, 2004.

Kozik, Peter L., Richard C. Cowles, and Dale J. Sweet. "Tying Academics to Co-Curriculars Can Teach At-Riskers Responsibility." *Education Digest*, vol. 70, no. 5, January 2005, pp. 32–37.

Landis, J. R., & G. G. Koch. The measurement of observer agreement for categorical data. *Biometrics*, vol. 33, 1977, pp. 159-174.

Lapan, P., N. Gysbers, and G. Petroski. "Helping 7th Graders to be Safe and Successful: A Statewide Study of the Impact of Comprehensive Guidance Counseling Programs." *Journal of Counseling and Development*, vol. 79, no. 3, summer 2001, pp. 320–330.

Lapan, R.T. "Career Development Across the K–16 Years: Bridging the Present to Satisfying and Successful Futures." Alexandria, VA: American Counseling Association, 2004.

Lapan, R.T., N.C. Gysbers, and Y. Sun. "The Impact of More Fully Implemented Guidance Programs on the School Experiences of High School Students: A Statewide Evaluation Study." *Journal of Counseling and Development*, vol. 75, March/April 1997, pp. 292–302.

Lee, V., and R. Ekstrom. "Student Access to Guidance Counseling in High School." *American Educational Research Journal*, vol. 24, no. 2, 1987, pp. 287–310.

McDonough, P. "Counseling Matters: Knowledge, Assistance, and Organizational Commitment in College Preparation." In *Preparing for College*, edited by William Tierney, Zoe Corwin, and Juliet Colyar. Albany, NY: SUNY Press, 2005.

Nichols, Joe D. "Prediction Indicators for Students Failing the State of Indiana High School Graduation Exam." *Preventing School Failure*, vol. 47, no. 3, 2003, pp. 112–123.

Ogbu, J. U. *Black American Students in an Affluent Suburb: A Study of Academic Disengagement*. Mahwah, NJ: Lawrence Erlbaum, 2003.

Oliver, L.W., and A.R. Spokane. "Career Intervention Outcomes: What Contributes to Client Gain?" *Journal of Counseling Psychology*, vol. 35, no. 4, October 1988, pp. 447–462.

Olson, Lynn. "What Does 'Ready' Mean?" *Education Week*, vol. 26, no. 40, June 12, 2007, pp. 7–12.

Orfield, Myron. *Metropolitics: A Regional Agenda for Community and Stability*. Washington, DC: Brookings Institution Press, 1997.

Roderick, Melissa, Jenny Nagaoka, Elaine Allensworth, Vanessa Coca, Macarena Correa, and Ginger Stoker. "From High School to the Future: A First Look at Chicago Public School Graduates' College Enrollment, College Preparation, and Graduation from Four-Year Colleges." Chicago: Consortium on Chicago School Research, 2006.

Rosenbaum, James, Regina Deil-Amen, and Ann Person. *After Admission: From College Access to College Success*. New York: Russell Sage Foundation Press, 2006.

Rosenbaum, James E. *Beyond College for All: Career Paths for the Forgotten Half*. American Sociological Association's Rose Series in Sociology. New York: Russell Sage Foundation, 2001.

Schneider, B., and D. Stevenson. *The Ambitious Generation: America's Teenagers, Motivated but Directionless*. New Haven, CT: Yale University Press, 1999.

Schochet, Peter. "Guidelines for Multiple Testing in Impact Evaluations of Educational Interventions." Princeton, NJ: Mathematica Policy Research, Inc., 2008.

Smerdon, Becky A. "Engagement and Achievement: Differences between African-American and White High School Students." *Research in Sociology of Education and Socialization*, vol. 12, 1999, pp. 103–134.

Steele, C. M., and J. Aronson. "Stereotype Threat and the Intellectual Test Performance of African-Americans." *Journal of Personality and Social Psychology*, vol. 69, no. 5, 1995, pp. 797–811.

Steinberg, Laurence. Beyond the Classroom: *Why School Reform Has Failed and What Parents Need to Do.* New York: Simon and Schuster, 1996.

Stevenson, H. W., and J. W. Stigler. *The Learning Gap: Why Our Schools Are Failing and What We Can Learn from Japanese and Chinese Education*. New York: Summit Books, 1992.

U.S. Census Bureau, Governments Division. "Public Education Finances: 2006." Available at [http://ftp2.census.gov/govs/school/06f33pub.pdf], 2008.

U.S. Department of Education. "Getting Ready to Pay for College: What Students and Their Parents Know About the Cost of College Tuition and What They Are Doing to Find Out." Washington, DC: U.S. Government Printing Office, 2003.

U.S. Department of Education. "National Evaluation of GEAR UP: A Summary of the First Two Years." Washington, DC: Office of the Under Secretary, Policy and Program Studies Service, 2002a.

U.S. Department of Education. "A Profile of the Talent Search Program: 1999–2000." Washington, DC: Office of Postsecondary Education, 2002b.

Whiston, S. C., T. L. Secton, and D. L. Lasoff. "Career-intervention Outcome: A Replication and Extension of Oliver and Spokane." *Journal of Counseling Psychology*, vol. 45, 1988, pp. 150–165.

Woloszyk, C. A. "Models for At-Risk Youth: Final Report." Kalamazoo, MI: Upjohn Institute for Employment Research, 1996.

Wynne, Edward A. "Cooperation-Competition: An Instructional Strategy." Bloomington, IN: Phi Delta Kappa Educational Foundation, 1995.

Yazzie-Mintz, Ethan. "Voices of Students on Engagement: A Report on the 2006 High School Survey of Student Engagement." Bloomington, IN: Indiana University, Center for Evaluation and Education Policy, 2007.

APPENDIX A

FOLLOW-UP STUDENT SURVEY INSTRUMENT

Student ID

MATHEMATICA
Policy Research, Inc.

Follow-up Survey
Spring 2009

INSTRUCTIONS

- This survey asks about your involvement in school and the community, learning and study habits, and plans for the future. The survey should take about 30 minutes.
- Mark only one answer for each question, unless the directions tell you to mark more than one answer. You may use a pen or pencil.
- Your answers are ***very important*** to us. This is not a test. There are no right or wrong answers. You may skip any question you do not wish to answer.
- If you have a question about the survey, raise your hand and someone will help you.

A. SCHOOL AND COMMUNITY INVOLVEMENT

A1. How much do you agree or disagree with each of the following statements?

	MARK ONE FOR EACH ROW			
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**
a. I go to school because I think the subjects I'm taking are interesting	1 ☐	2 ☐	3 ☐	4 ☐
b. I go to school because I'm learning skills that I will need for a job	1 ☐	2 ☐	3 ☐	4 ☐
c. I go to school because my parents or guardians expect me to succeed	1 ☐	2 ☐	3 ☐	4 ☐

A2. How important are good grades to you?

MARK ONE ONLY

1 ☐ Not important at all

2 ☐ Somewhat important

3 ☐ Important

4 ☐ Very important

A3. NOT IN THIS VERSION

A4. In the last year, how often have you discussed the following with a parent or guardian?

	MARK ONE FOR EACH ROW				
	Never	**Not Very Often**	**Sometimes**	**Often**	**Very Often**
a. Selecting courses or programs at school	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
b. School activities or events	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
c. Topics you've studied in class	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
d. Your grades	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

A5. NOT IN THIS VERSION

A6. In the last year, how often have you discussed the following with a parent or guardian?

	MARK ONE FOR EACH ROW				
	Never	Not Very Often	Sometimes	Often	Very Often
a. Taking college entrance exams (like the SAT or ACT)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
b. Whether to go to college	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
c. What college to choose	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
d. Different college majors and programs	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
e. Possible jobs or careers	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

A7. In the last year, how often have you discussed the following with one or more teachers or school staff (such as a guidance counselor)?

	MARK ONE FOR EACH ROW				
	Never	Not Very Often	Sometimes	Often	Very Often
a. Taking college entrance exams (like the SAT or ACT)	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
b. Whether to go to college	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
c. What college to choose	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
d. Different college majors and programs	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
e. Possible jobs or careers	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

B. LEARNING AND STUDY HABITS

B1. Do you . . .

	MARK ONE FOR EACH ROW				
	Never	**Not Very Often**	**Sometimes**	**Often**	**Always or Almost Always**
a. stick with a class assignment or task until it is done?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
b. put in your best effort on class assignments, projects, and homework?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
c. ask a teacher or another student for help when you don't understand an assignment?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
d. take part in class discussions or activities?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
e. come to your classes prepared with what you need (books, paper, and something to write with)?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
f. complete class assignments, projects, and homework on time?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

B2. NOT IN THIS VERSION

B3. During the current school year . . .

	MARK ONE FOR EACH ROW			
	Never	**1 – 4 Times**	**5 – 9 Times**	**10 or More Times**
a. How many times were you late for school?	1 ☐	2 ☐	3 ☐	4 ☐
b. How many times did you cut or skip classes?	1 ☐	2 ☐	3 ☐	4 ☐
c. How many times were you absent from school?	1 ☐	2 ☐	3 ☐	4 ☐
d. How many times were you sent out of class for bad behavior?	1 ☐	2 ☐	3 ☐	4 ☐
e. How many times were you given a detention?	1 ☐	2 ☐	3 ☐	4 ☐

C. PLANS FOR THE FUTURE

C1. How important is each of the following to you in your life?

	MARK ONE FOR EACH ROW			
	Not Important	**Somewhat Important**	**Important**	**Very Important**
a. Being successful in my line of work	1 ☐	2 ☐	3 ☐	4 ☐
b. Having a happy family life	1 ☐	2 ☐	3 ☐	4 ☐
c. Having lots of money	1 ☐	2 ☐	3 ☐	4 ☐
d. Having strong friendships	1 ☐	2 ☐	3 ☐	4 ☐
e. Being able to find steady work	1 ☐	2 ☐	3 ☐	4 ☐
f. Helping other people in my community	1 ☐	2 ☐	3 ☐	4 ☐
g. Getting a good education	1 ☐	2 ☐	3 ☐	4 ☐
h. Getting a good job	1 ☐	2 ☐	3 ☐	4 ☐

C2. As things stand now, I think I will . . .

MARK ONE ONLY

1 ☐ Complete high school and graduate with a diploma
2 ☐ Drop out of high school and complete the GED
3 ☐ Not finish high school

C3. How far would you like to get in school?

MARK ONE ONLY

1 ☐ High school graduate/GED
2 ☐ Technical or trade school
3 ☐ Associates degree (2 year college degree)
4 ☐ Bachelors degree (4 year college degree)
5 ☐ Masters degree or equivalent
6 ☐ Ph.D., MD or other advanced degree (like a medical or law degree)

C4. How likely is it that you will get this far in school?

MARK ONE ONLY

Not Very Likely ← → **Very Likely**

1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
0% - 20%	21% - 40%	41% - 60%	61% - 80%	81% - 100%

C5. What reasons might keep you from achieving your educational goals?

	MARK ONE FOR EACH ROW	
	Yes	**No**
a. I don't like school	1 ☐	0 ☐
b. My grades aren't high enough	1 ☐	0 ☐
c. Courses are too difficult for me	1 ☐	0 ☐
d. I can't afford it	1 ☐	0 ☐
e. I plan to join the military	1 ☐	0 ☐
f. No one in my family has ever gone on to school after high school	1 ☐	0 ☐
g. I'd rather work and make money than go to school	1 ☐	0 ☐
h. I don't think that going to school is important	1 ☐	0 ☐
i. I need to help support my family	1 ☐	0 ☐
j. Some other reason (name this reason) _____	1 ☐	0 ☐

C6. Tell us a little about your career goals. In the boxes below, name up to three careers you would most like to have and answer the three related questions about each career.

Name the career or careers you would most like to have:	**Answer these related questions:**	MARK ONE FOR EACH ROW **Not Very ⟷ Very**
1. _____	a. How interested are you in this career?	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
	b. How likely are you to enter this career?	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
	c. How well would you perform in this career?	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
2. _____	a. How interested are you in this career?	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
	b. How likely are you to enter this career?	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
	c. How well would you perform in this career?	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
3. _____	a. How interested are you in this career?	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
	b. How likely are you to enter this career?	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐
	c. How well would you perform in this career?	1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐

C7. Name the career you expect to be working in by age 30 and answer the three related questions.

_____

Answer these related questions:	MARK ONE FOR EACH ROW Not Very ← → Very				
a. How interested are you in this career?	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
b. How likely are you to enter this career?.....	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
c. How well would you perform in this career? ...	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

C8. What education or training do you need for this career?

MARK ONE ONLY

1 ☐ No education after high school is needed
2 ☐ Military training
3 ☐ Technical or trade school
4 ☐ Associates degree (2 year college degree)
5 ☐ Bachelors degree (4 year college degree)
6 ☐ Masters degree or equivalent
7 ☐ Ph.D., MD or other advanced degree (like a medical or law degree)
8 ☐ Other (*Please describe*) _____
d ☐ Don't know

C9. How likely is it that you could successfully complete the education and/or training required to enter this career?

MARK ONE ONLY				
Not Very Likely ←				→ Very Likely
1 ☐	2 ☐	3 ☐	4 ☐	5 ☐
0% - 20%	21% - 40%	41% - 60%	61% - 80%	81% - 100%

C10. What reasons might keep you from achieving your career goals by age 30?

MARK ALL THAT APPLY

1 ☐ Not enough education
2 ☐ Need to work to support my family
3 ☐ My parent or guardian wants me to have a different career
4 ☐ Other (*Please describe*) _____
5 ☐ I can't think of a reason that will keep me from achieving my career goals

C11. How much do you agree or disagree with each of the following statements?

	MARK ONE FOR EACH ROW			
	Strongly Disagree	**Disagree**	**Agree**	**Strongly Agree**
a. I know what is required to succeed in different careers	1 ☐	2 ☐	3 ☐	4 ☐
b. I know how to find out about what types of jobs are best for me	1 ☐	2 ☐	3 ☐	4 ☐
c. I have a good idea about the kinds of jobs I would be good at	1 ☐	2 ☐	3 ☐	4 ☐
d. I will be able to overcome barriers that stand in the way of achieving my career goals	1 ☐	2 ☐	3 ☐	4 ☐

D. BACKGROUND INFORMATION

D1. When were you born?

|__|__| / |__|__| / |_1_|_9_|__|__|
Month Day Year

D2. Are you:

1 ☐ Male?
2 ☐ Female?

D3. How do you describe yourself?

MARK ALL THAT APPLY

1 ☐ White
2 ☐ Black or African-American
3 ☐ Hispanic or Latino/Latina
4 ☐ Asian
5 ☐ Native Hawaiian or Other Pacific Islander
6 ☐ American Indian or Alaskan Native
7 ☐ Other (*Please describe*) _____

D4. What is the highest level of education completed by your mother or female guardian?

MARK ONE ONLY

1 ☐ Some high school
2 ☐ GED
3 ☐ High school graduate
4 ☐ Technical or trade school
5 ☐ Associates degree (2 year college degree)
6 ☐ Bachelors degree (4 year college degree)
7 ☐ Masters degree or equivalent
8 ☐ Ph.D., MD or other advanced degree (like a medical or law degree)
9 ☐ Other (*Please describe*) _____
d ☐ Don't know

D5. What is the highest level of education completed by your father or male guardian?

MARK ONE ONLY

1 ☐ Some high school
2 ☐ GED
3 ☐ High school graduate
4 ☐ Technical or trade school
5 ☐ Associates degree (2 year college degree)
6 ☐ Bachelors degree (4 year college degree)
7 ☐ Masters degree or equivalent
8 ☐ Ph.D., MD or other advanced degree (like a medical or law degree)
9 ☐ Other (*Please describe*) _____
d ☐ Don't know

D6. What is the main language spoken at home?

MARK ONE ONLY

1 ☐ English
2 ☐ Spanish
3 ☐ English and Spanish equally
4 ☐ Other (*Please describe*) _____

D7. Do you have a computer at home with access to the internet?

1 ☐ Yes
0 ☐ No

D8. Please fill in today's date.

|__|__| / |__|__| / |_2_|_0_|_0_|_9_|
Month Day Year

D9. Do you have any siblings or anyone else in your home who currently attend the 7th grade at this school?

1 ☐ Yes
0 ☐ No

D10. Have you participated in a program or class called Roads to Success?

1 ☐ Yes
0 ☐ No

Thank you very much for completing this survey.

APPENDIX B

CODING SCHEME FOR REASONABLY AMBITIOUS AND REALISTIC CAREER EXPECTATIONS

We coded the open-ended occupation data from the baseline and follow-up student surveys to reflect the degree to which each career was reasonably ambitious and realistic. Two survey associates were trained to use the coding scheme and independently coded a small subset of occupational data. The codes were then compared to those of an expert coder on the project. Discrepancies were noted and resolved through discussion and selection of the correct code.

Following the initial training, we measured coder reliability and accuracy. Each coder independently coded twenty percent of the occupation data, and inter-rater reliability was calculated using a Kappa coefficient. The Kappa statistic is a standard approach used to assess inter-rater reliability; this approach adjusts for chance agreement between two coders and therefore is preferable to assessing raw inter-rater agreement (Landis and Koch 1977). Coders attained a Kappa coefficient of 0.86 (98 percent agreement) for the reasonably ambitious/realistic expectation scale. Thus, the coding procedure used in this study was deemed reliable across coders. Routine checks were performed throughout the coding process to ensure consistency of coding and to check for possible "drifting" from the original intent of the coding scheme.

Coding Scheme

0 = Meaningless career (responses that are not careers, such as "get good grades" or "make lots of money")

1 = Very low expectation (for example, dishwasher, fast food, cashier)

2 = Homemaker (for example, stay-at-home mom/dad)

3 = Reasonably ambitious/realistic expectation (for example, plumber, doctor, teacher, lawyer)

4 = Very high/unrealistic expectation (for example, President, professional sports player, model, actress)

APPENDIX C

FUTURE OUTCOME VARIABLES

Although RTS was originally designed as a long-term intervention, beginning in grade 7 and continuing through grade 12, this study ended after students in the treatment group had received only two years of RTS. Thus this study does not enable us to estimate the full impact of the RTS intervention when implemented in grades 7–12. Here we describe outcomes that could be measured to estimate effects of the full program, if students were to receive all six years of the program.

Grade 9 Confirmatory Outcome. On "on-track" indicator, previously described by the Chicago Consortium (Allensworth and Easton 2005), could be used as a confirmatory outcome for grade 9. The Chicago Consortium has used this on-track indicator as an intermediate indicator of school performance and has found that it is highly predictive of whether students eventually graduate from high school. Among students entering a high school in the Chicago Public School District in 1999, those who were on-track by the end of grade 9 were about three and one-half times more likely to graduate in four years than were off-track students (Allensworth and Easton 2005). Consistent with the Chicago Consortium's research, we would consider a student as on-track at the end of grade 9 if both of the following criteria were met: (1) the student has accumulated the number of credits needed to be promoted to grade 10 according to district policy, and (2) the student has no more than one semester F (that is, one-half of a full credit) in a core subject (English, math, science, or social studies).

Grade 9 Exploratory Outcomes. Additional exploratory analyses of other outcomes in grade 9, including (1) all of those listed for grade 8 (confirmatory and exploratory), (2) grade 9 grade-point average in core courses, and (3) number of accumulated credits in grade 9, could also be investigated.

Grade 10 Confirmatory Outcome. The confirmatory outcome for grade 10 could be a weighted average of the number of credits students have completed with a grade of C or better by course type (for example, algebra, other college preparatory work, and vocational education). We could weight the types of credits by using their estimated impacts on later outcomes, such as college completion or the log of earnings based on data from the National Educational Longitudinal Study (NELS) for students with characteristics similar to those of students in the RTS program. This measure would incorporate information about courses taken and student performance in those courses and should be affected by increases in student engagement in school caused by RTS.

Although some of the literature suggests that the impacts of course taking on test scores are ambiguous (Teitelbaum 2003), most research suggests that more rigorous courses have positive impacts on test scores (Gamoran and Hannigan 2000), years of education (Allensworth and Easton 2005), and later career success (Chaplin 1998) compared to less rigorous courses. The confirmatory grade 10 outcome also incorporates course performance that affects grade promotion, which in turn is highly correlated with later measures of success (Roderick and Nagaoka 2005; Hong and Raudenbush 2005; Allensworth and Easton 2005).

Grade 10 Exploratory Outcomes. We could also conduct exploratory analyses of other outcomes in grade 10, including (1) all of those listed for grade 8 (confirmatory and exploratory); (2) the percentages of students taking the SAT, ACT, PSAT, or Pre-ACT in schools where these tests are not mandatory; and (3) scores on standardized tests such as those taken for school accountability purposes.

Grade 12 Confirmatory Outcome. We could also use the point system described below to measure the degree to which students make progress toward a successful career by the end of grade 12.

For students on track to graduate on time (within six years after entering grade 7) and with a regular high school degree, the point system is as follows:

1. Accepted to college or secured a job that is reasonably ambitious given the student's preparation[1]
2. Applied to at least one college or job that is both reasonably ambitious and realistically attainable[2]
3. Applied to at least one college or job, but plans are either not ambitious enough or not realistically attainable
4. On track to graduate but not in the first three categories

For students not on track to graduate on time with a regular degree:

5. Still attending high school
6. Dropped out but have a GED
7. Dropped out and have no GED

This grade 12 outcome measure incorporates completed years of education, a factor that is highly correlated with later labor market success. In addition, it incorporates information on career planning, an important focus of the RTS program. In particular, the "reasonably ambitious" and "realistically attainable" caveats for outcomes 1 and 2 help capture the fact that RTS is designed to help students align their career and education plans and preparation.

[1] A reasonably ambitious job would be defined as one with earnings in the upper three quartiles at age 28 in data from NELS for students with similar grade 12 characteristics (grades and test scores). Thus, for example, starting work as an apprentice to an electrician, plumber, mechanic, or carpenter would likely qualify for a student with average characteristics. A reasonably ambitious college would be one in the upper three quartiles of what students with similar characteristics attended in NELS based on one of the standard measures of college quality (such as average freshman SAT scores). Students with below-average test scores would likely satisfy this by obtaining admission to any college, including one that is not selective (that is, does not require SAT or ACT scores for admission).

[2] A "realistically attainable" college/job would be based on whether the student is in the top three quartiles based on their grades and test scores compared to students entering that college/job category in NELS. Thus even if a student is rejected by all colleges and jobs, their applications could still count as realistically attainable.

The impacts of RTS on this outcome may not be linear. To allow for this possibility, we could also estimate an ordered logit model and test for the possibility that the impacts of RTS vary depending on the level of the variable considered.

Grade 12 Exploratory Outcomes. The exploratory outcomes for grade 12 could include all of the variables listed above for grades 8 and 10. In addition, we could analyze the fraction of students who fill out financial aid forms for college (if not required to do so by their high school) and analyze postsecondary enrollment using data from the National Student Clearinghouse.

APPENDIX D

FULL REGRESSION RESULTS FOR CONFIRMATORY OUTCOMES

TABLE D.1

COEFFICIENTS ON CONTROL VARIABLES FROM ANALYSIS OF GRADE 8 CONFIRMATORY OUTCOMES (TABLE V.3, LAST COLUMN, *p*-VALUES)

	Motivation to Go to School to Learn Job Skills	Learning and Study Habits and Preparation	School Absences and Negative Behaviors
Roads to Success participation	-0.083 (0.267)	-0.046 (0.524)	-0.064* (0.087)
Baseline math z-score	0.067 (0.113)	0.082* (0.056)	-0.052* (0.073)
Baseline reading z-score	0.028 (0.447)	0.153*** (0.003)	-0.068** (0.016)
Black/African American	0.225 (0.258)	-0.251 (0.206)	0.076 (0.670)
Hispanic	-0.263 (0.318)	-0.784** (0.029)	0.069 (0.731)
Asian	0.159 (0.662)	0.317 (0.343)	-0.096 (0.267)
American Indian	0.280 (0.397)	-0.121 (0.745)	-0.235* (0.064)
Other race	-0.004 (0.964)	-0.053 (0.516)	0.038 (0.570)
Male	-0.080 (0.169)	-0.189*** (0.000)	0.176*** (0.000)
Mom has at least HS diploma	-0.002 (0.978)	-0.002 (0.966)	-0.060** (0.048)
Mom has at least bachelor's degree	0.003 (0.971)	0.024 (0.655)	0.023 (0.566)
Dad has at least HS diploma	0.088 (0.143)	0.082* (0.069)	0.005 (0.865)
Dad has at least bachelor's degree	-0.015 (0.804)	0.004 (0.944)	-0.074 (0.138)
Computer access at home	-0.061 (0.494)	0.006 (0.927)	0.003 (0.960)
Non-English spoken at home	-0.492*** (0.009)	-0.429* (0.069)	0.135 (0.423)
Over age for grade	-0.203 (0.175)	0.025 (0.896)	0.050 (0.717)
School average free or reduced-price lunch eligibility	0.511 (0.312)	-0.213 (0.673)	-0.356 (0.349)

School average baseline math z-score	-0.041 (0.899)	-0.068 (0.837)	0.014 (0.934)
School average baseline reading z-score	0.353 (0.233)	-0.014 (0.953)	-0.043 (0.740)
Number of observations	1,287	1,299	1,298

Source: Mathematica student surveys administered in fall 2007 and spring 2009.

Notes: The control variables include grade 6 test scores by subject (math and reading); race/ethnicity indicators (Black/African American, Hispanic, Asian, American Indian, other race); gender; age; parent education separately for the mother and father (has at least a high school diploma, has at least a bachelor's degree); primary language at home is not English; internet access at home; school average grade 6 test scores by subject; and school average free lunch. The standard deviations of the outcomes are 0.75, 0.73, and 0.55 respectively.

*Significantly different from 0 at the .10 level, two-tailed test.
**Significantly different from 0 at the .05 level, two-tailed test.
***Significantly different from 0 at the .01 level, two-tailed test.

APPENDIX E

SUBGROUP RESULTS

TABLE E.1

ESTIMATED SUBGROUP IMPACTS ON GRADE 8 CONFIRMATORY OUTCOMES (TABLE V.3, LAST COLUMN, *p*-VALUES)

	Motivation to Go to School to Learn Job Skills	Learning and Study Habits and Preparation	School Absences and Negative Behaviors
Half of sample with highest estimated impacts on career exploration with school staff	0.014 (0.882)	0.004 (0.969)	-0.041 (0.353)
Half of sample with lowest estimated impacts on career exploration with school staff	-0.176** (0.019)	-0.110 (0.111)	-0.082** (0.047)
Lowest quartile of baseline math scores	0.046 (0.680)	0.071 (0.488)	-0.139* (0.068)
2nd lowest quartile of baseline math scores	-0.314*** (0.004)	-0.214*** (0.008)	-0.019 (0.782)
2nd highest quartile of baseline math scores	-0.012 (0.908)	0.021 (0.850)	-0.115** (0.037)
Highest quartile of baseline math scores	-0.013 (0.907)	-0.008 (0.943)	-0.024 (0.707)
Lowest quartile of baseline reading scores	-0.030 (0.738)	-0.019 (0.876)	-0.090* (0.099)
2nd lowest quartile of baseline reading scores	-0.004 (0.977)	0.026 (0.789)	-0.021 (0.711)
2nd highest quartile of baseline reading scores	-0.103 (0.259)	-0.139 (0.245)	-0.134** (0.029)
Highest quartile of baseline reading scores	-0.193** (0.030)	-0.048 (0.526)	0.017 (0.793)
Mother has less than HS diploma	-0.067 (0.522)	-0.026 (0.787)	-0.024 (0.635)
Mother has HS diploma but not a bachelor's degree	-0.111 (0.098)	-0.043 (0.567)	-0.111** (0.047)
Mother has a bachelor's degree	0.063 (0.707)	-0.036 (0.709)	-0.018 (0.865)
Father has less than HS diploma	-0.115* (0.094)	-0.033 (0.643)	0.039 (0.410)
Father has HS diploma but not a bachelor's degree	-0.048 (0.631)	-0.046 (0.562)	-0.113** (0.021)
Father has a bachelor's degree	-0.079 (0.500)	-0.129 (0.208)	-0.197** (0.029)
Male	-0.045 (0.652)	-0.022 (0.805)	-0.090* (0.068)

	-0.126*	-0.093	-0.022
Female	(0.086)	(0.197)	(0.681)

Source: Mathematica student surveys administered in fall 2007 and spring 2009.

Notes: The control variables include grade 6 test scores by subject (math and reading); race/ethnicity indicators (Black/ African American, Hispanic, Asian, American Indian, other race); gender; age; parent education separately for the mother and father (has at least a high school diploma, has at least a bachelor's degree); primary language at home is not English; internet access at home; school average grade 6 test scores by subject; and school average free lunch. The standard deviations of the outcomes are 0.75, 0.73, and 0.55 respectively.

To separate the sample into subgroups based on the estimated impacts on career exploration with school staff, we regressed that variable on the standard set of control variables plus interactions of the RTS treatment with parent education and test score quartile. We then created a variable equal to the sum of the interaction terms for each student. Finally, we separated the sample based on this variable into the half with the largest (most positive) interaction terms and the half with the smallest (least positive) interaction terms. Each interaction is equal to an indicator variable for being in the RTS treatment group times the characteristic in question. We omitted one category for test scores and one for parent education.

*Significantly different from 0 at the .10 level, two-tailed test.
**Significantly different from 0 at the .05 level, two-tailed test.
***Significantly different from 0 at the .01 level, two-tailed test.

TABLE E.2

ESTIMATED SUBGROUP IMPACTS ON GRADE 8 EXPLORATORY OUTCOMES (TABLE V.7, LAST COLUMN, *p*-VALUES)

	Career Exploration with Parents	Career Exploration with School Staff	School Engagement	Importance of Grades	Career Exploration Efficacy
Half of sample with highest estimated impacts on career exploration with school staff	0.040 (0.793)	0.817*** (0.001)	0.006 (0.933)	0.025 (0.809)	0.069 (0.137)
Half of sample with lowest estimated impacts on career exploration with school staff	-0.038 (0.792)	0.319 (0.113)	-0.138 (0.125)	-0.112 (0.165)	0.037 (0.331)
Lowest quartile of baseline math scores	0.116 (0.511)	0.317* (0.053)	0.154* (0.074)	0.057 (0.498)	0.166*** (0.001)
2nd lowest quartile of baseline math scores	-0.075 (0.663)	0.385 (0.204)	-0.241* (0.056)	-0.293*** (0.003)	-0.054 (0.324)
2nd highest quartile of baseline math scores	-0.046 (0.790)	0.746*** (0.010)	0.027 (0.803)	0.033 (0.801)	0.114* (0.097)
Highest quartile of baseline math scores	0.069 (0.649)	0.925*** (0.000)	-0.102 (0.268)	0.063 (0.515)	0.043 (0.233)
Lowest quartile of baseline reading scores	0.114 (0.556)	0.431** (0.030)	0.240** (0.043)	0.051 (0.562)	0.092 (0.168)
2nd lowest quartile of baseline reading scores	0.177 (0.361)	0.641** (0.020)	-0.062 (0.472)	-0.021 (0.814)	0.120** (0.041)
2nd highest quartile of baseline reading scores	-0.223 (0.115)	0.607** (0.025)	-0.223** (0.018)	-0.167 (0.208)	-0.030 (0.442)
Highest quartile of baseline reading scores	0.002 (0.986)	0.715*** (0.000)	-0.063 (0.413)	-0.010 (0.911)	0.000 (0.994)
Mother has less than HS diploma	0.123 (0.460)	0.649*** (0.008)	-0.074 (0.357)	-0.082 (0.350)	0.001 (0.985)
Mother has HS diploma but not a bachelor's degree	-0.076 (0.502)	0.601*** (0.002)	-0.013 (0.840)	-0.009 (0.915)	0.051 (0.133)
Mother has a bachelor's degree	0.191 (0.445)	0.500* (0.076)	0.040 (0.756)	0.053 (0.592)	0.184*** (0.008)
Father has less than HS diploma	0.172 (0.278)	0.708*** (0.004)	-0.152* (0.078)	-0.037 (0.619)	-0.008 (0.861)
Father has HS diploma but not a bachelor's degree	-0.173 (0.130)	0.513*** (0.005)	0.026 (0.730)	-0.086 (0.299)	0.092*** (0.005)
Father has a bachelor's degree	0.172 (0.484)	0.593* (0.094)	-0.033 (0.792)	0.028 (0.849)	0.020 (0.878)

Male	0.168 (0.360)	0.615 (0.015)	-0.014 (0.871)	0.037 (0.635)	0.021 (0.570)
Female	-0.143 (0.199)	0.547*** (0.009)	-0.127* (0.060)	-0.126 (0.145)	0.073 (0.118)

Source: Mathematica student surveys administered in fall 2007 and spring 2009.

Notes: The control variables include grade 6 test scores by subject (math and reading); race/ethnicity indicators (Black/African American, Hispanic, Asian, American Indian, other race); gender; age; parent education separately for the mother and father (has at least a high school diploma, has at least a bachelor's degree); primary language at home is not English; internet access at home; school average grade 6 test scores by subject; and school average free lunch. The standard deviations of the outcomes are 1.04, 1.13, 0.79, 0.75, and 0.54 respectively.

To separate the sample into subgroups based on the estimated impacts on career exploration with school staff, we regressed that variable on the standard set of control variables plus interactions of the RTS treatment with parent education and test score quartile. We then created a variable equal to the sum of the interaction terms for each student. Finally, we separated the sample based on this variable into the half with the largest (most positive) interaction terms and the half with the smallest (least positive) interaction terms. Each interaction is equal to an indicator variable for being in the RTS treatment group times the characteristic in question. We omitted one category for test scores and one for parent education.

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**Significantly different from 0 at the .05 level, two-tailed test.
***Significantly different from 0 at the .01 level, two-tailed test.