

THE TALENT DEVELOPMENT MIDDLE SCHOOL

Creating a Motivational Climate Conducive to Talent Development in Middle Schools: Implementation and Effects of Student Team Reading

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The Center

Every child has the capacity to succeed in school and in life. Yet far too many children, especially those from poor and minority families, are placed at risk by school practices that are based on a sorting paradigm in which some students receive high-expectations instruction while the rest are relegated to lower quality education and lower quality futures. The sorting perspective must be replaced by a “talent development” model that asserts that all children are capable of succeeding in a rich and demanding curriculum with appropriate assistance and support.

The mission of the Center for Research on the Education of Students Placed at Risk (CRESPAR) is to conduct the research, development, evaluation, and dissemination needed to transform schooling for students placed at risk. The work of the Center is guided by three central themes — ensuring the success of all students at key development points, building on students’ personal and cultural assets, and scaling up effective programs — and conducted through seven research and development programs and a program of institutional activities.

CRESPAR is organized as a partnership of Johns Hopkins University and Howard University, in collaboration with researchers at the University of California at Santa Barbara, the University of California at Los Angeles, University of Oklahoma, University of Chicago, Manpower Research Demonstration Corporation, WestEd Regional Laboratory, University of Memphis, and University of Houston-Clear Lake.

Abstract

Central East Middle School in Philadelphia and CRESPAR are working together to implement a Talent Development Middle School model of schooling. Part of this effort includes use of the Student Team Reading (STR) program, which changes both the instructional processes and curriculum in Reading, English, and Language Arts (RELA) to create a motivational climate that is conducive to learning and personal development. Teachers at Central East Middle School in Philadelphia were trained in STR in the summer of 1995 and received curricular materials and technical support throughout the first semester of the 1995-1996 school year. Implementation and outcome data were collected in February 1996 at Central East Middle School and a matched comparison school. Hierarchical Linear Models (HLM) analyses reveal that STR was used significantly more at Central East Middle School than at the control school. Further HLM analyses suggest that STR implementation helps create classrooms where peer support for achievement is high, where student-teacher relations are positive, where students work hard to master course content and meet adults' standards, and where students are confident both in their ability to learn and in the future utility of what they are learning.

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Creating a Motivational Climate Conducive to Talent Development in Middle Schools: Implementation and Effects of Student Team Reading

Braddock & McPartland (1993) have outlined several sources of motivation that can encourage all students to work hard at learning tasks in the middle grades, and have examined the special obstacles often encountered by poor and minority students as barriers to each type of motivation. Three of these sources are: (1) a caring and supportive human environment, (2) classroom tasks that are interesting and are relevant to future goals, and (3) opportunities for academic success at challenging learning tasks.

For middle school students, one of the most potent sources of motivation is to have caring teachers and peers who are rooting for them to do well, who are encouraging them to give their best in the classroom, and who are doing everything in their power to help them improve their skills and increase their understanding. When a student perceives his or her teacher as a supportive teammate rather than as an opponent or a stranger, this is conducive

to talent development because it creates a desire within the student to keep the respect of and meet the standards set by the teacher.

Unfortunately, many urban middle school students are not certain that their teachers are “on their side” or care how they feel (e.g., Mac Iver & Plank, 1996). As a result, these students are unwilling to cooperate enthusiastically with the teacher’s agenda in the classroom or to accept academic coaching from the teacher (Braddock & McPartland, 1993). Further, a majority of urban middle school students report little peer support for their achievement efforts (Mac Iver & Plank, 1996) because the peer norms that develop in urban middle schools seldom extol effort and achievement (e.g., McHugh, Nettles, & Gottfredson, 1993). In fact, studies suggest that in many young adolescent peer groups, students who give their best in the classroom are put down by their fellow students for “acting white” or are labeled as “nerds,” “dweebs,” or “brainiacs.” This lack of peer support for achievement can be a very powerful discouragement to continuing to work up to one’s potential in the classroom (Fordham & Ogbu, 1986; Ogbu, 1985; Brown, 1989; Kinney, 1993).

Another potent source of motivation for middle school students is curriculum and instruction that relates to their current interests, connects well to future educational and occupational goals, features intrinsically interesting higher-order learning tasks, and offers leeway for social interaction, student initiative, creative expression, and active participation in the learning activity. But, in the typical urban middle school classroom, most learning tasks are not intrinsically motivating because they are neither inherently interesting nor directly relevant to students’ current interests. Similarly, students’ courses are seldom instrumentally motivating because they are not obviously related to preparation for future goals and aspirations. And the classwork in urban middle schools seldom matches early adolescents’ developmental needs for more autonomy, self-regulation, and positive peer interactions because it features passive learning in a teacher-controlled lecture format of instruction with little opportunity to work cooperatively with other students (Epstein & Mac Iver, 1990). In addition, minority students “seldom see models from their own cultural heritages in learning materials, which weakens the personal interest they might otherwise find in classwork” (Braddock & McPartland, 1993, p. 159).

In addition to a climate of support by teachers and peers, and schoolwork that is relevant to their current interests and future goals, middle school students need to experience regular success at challenging academic tasks in order to develop confidence in their ability. Virtually every cognitive theory of motivation suggests that changes in ability perceptions can lead to dramatic changes in effort (for a brief review, see Mac Iver, Stipek, & Daniels, 1991). Students who develop increasing confidence in their ability try harder while those who lose confidence in their ability reduce their effort. This role of ability perceptions in influencing effort, especially in the face of difficulty, has been confirmed in several

empirical studies (Mac Iver, Stipek, & Daniels, 1991; Helmke, 1987; Meyer, 1987; Andrews & Debus, 1978; Diener & Dweck, 1978; Licht, Kistner, Ozkaragoz, Schapiro, & Clausen, 1985; Weiner, 1979).

Furthermore, there is considerable empirical evidence to support the proposition that any event that enhances students' self-concepts of ability in their schoolwork will also enhance their intrinsic motivation on academic tasks (e.g., Ryan, Connell, & Deci, 1985; Mac Iver, Stipek, & Daniels, 1991). Unfortunately, many poor and minority adolescents find it difficult to develop confidence in their academic ability because they experience little or no genuine academic success — instead, they encounter low grades, little recognition for their learning, teacher disrespect for their potential, an insulting, “dumbed-down” curriculum and ineffective instruction, course failures, and grade retention.

The Student Team Reading (STR) program (Stevens, 1989) changes both the instructional processes and the curriculum in middle grades Reading, English, and Language Arts (RELA) to create a conducive motivational climate that addresses each of the three sources of motivation considered above and to further students' reading comprehension and understanding of good literature. We will first describe the components of the STR program, then examine how STR helps create a conducive motivational climate.

The Student Team Reading Program

In the Student Team Reading (STR) program, reading instruction is made more meaningful because students read good literature (e.g., award-winning novels) rather than stories from a “basal.” The teacher prepares the students to read the book by introducing the author and the genre, discussing relevant background information, and introducing the new vocabulary words. Then, for each section of the book, students engage in a series of cooperative learning activities which the teacher monitors. The teacher leads the students through a discussion of the daily activities as the students complete them. The activities include:

Partner reading. Students read a section of the book first silently, then orally with a partner. During oral reading, each student reads aloud while the partner follows the text and helps the reader with his/her errors. The oral reading practice is designed to build

fluency and automaticity of decoding (Samuels, 1979), and the repeated reading builds both automaticity and comprehension (Anderson, et al., 1985).

Treasure Hunts. Students are given challenging, high-level questions about the book they are reading that require them to think analytically and comparatively and draw conclusions, and to analyze the plot, literary devices, and the writer’s style and technique. For example, students are asked to explain the significance of the main characters and setting in relation to the story, draw conclusions about any special relationships between characters, make predictions regarding what will happen next based on solid textual evidence that they have already read, and develop interesting, unusual or thought-provoking ideas related to the book’s theme. Students discuss the answers to Treasure Hunt questions with their partner, then each student writes his or her answers separately. The use of Treasure Hunts helps ensure a schoolwide focus in RELA on higher-order competencies.

Word mastery. Students practice saying the new vocabulary aloud with their partners until they are able to say them accurately and smoothly. This helps students master the new words so that they will not interfere with their comprehension of that section of the book (Perfetti, 1985). After reading the appropriate section, students write a vivid, elaborated “meaningful sentence” for each selected word from the vocabulary list. The goal is to show they understand the meaning of the word by embedding context clues in the sentence which help to create a picture in the reader’s mind (e.g., “Richard was so *anxious* about the test he had to take that sweat poured down his forehead and his hands shook wildly” not “Richard was *anxious*”). Students use a metacognitive checking strategy to evaluate the meaningfulness of their sentences. They take the vocabulary word out of the sentence to see if they can substitute other words in its place. If the word can be replaced easily by other words (excluding synonyms), the sentence is not a “meaningful” use of the vocabulary word.

Story-retelling. After reading the selection and discussing it in their teams and with the whole class, students summarize the main parts to their partners. Summarizing and paraphrasing content in one’s own words has been found to improve students’ comprehension of what has been read (Weinstein, 1982).

Story-related writing. After reading the selection, the students are given “Adventures in Writing” prompts that require them to respond in a brief composition to what they have just read. The writing activities allow students to elaborate upon what they have read and relate it to their prior knowledge and experiences, thus increasing their depth of comprehension (Anderson et al., 1985).

Extension activities. These activities offer a variety of cross-curriculum assignments that use writing, research, fine arts and media, dramatics, or interdisciplinary projects to explore themes and ideas from the story.

Tests. Three tests follow each section of a book: A story test assessing students' understanding of the story (students respond to a mixture of analytical and detail-oriented questions about the story's main issues), a word meaning test (students write meaningful sentences for selected vocabulary words), and a "words out loud" test (students read the Word Mastery List aloud quickly and accurately to the teacher or other adult). Students complete the tests independently and they are scored by the teacher. The test scores are used to determine team scores and team recognition.

Explicit instruction in comprehension strategies. Students receive explicit instruction in comprehension strategies such as identifying main ideas and themes, drawing conclusions, making predictions, and understanding figurative language. The instruction provides students with comprehension-fostering strategies and metacognitive checking strategies such as those developed in basic and applied research in reading comprehension (e.g., Palincsar & Brown, 1984; Paris, Lipson, & Wixon, 1983; Stevens, 1988). After teacher-directed instruction in the strategies, students engage in cooperative learning activities to master the strategies. Teachers then review and apply the strategies when relevant to later literature selections.

Student Team Reading and Motivational Climate

In Student Team Reading, as in all Student Team Learning methods (Slavin, 1990), students work in cooperative teams. Each team is made up of four to five students of different races, sexes, and levels of achievement, and each reflects the composition of the class as a whole on these attributes. The teams receive rewards and recognition based on the degree to which they can increase the academic performance of each member. The team awards give students a reason to support the achievement efforts of their peers because the team can succeed only if each team member learns. Peer support for achievement is also emphasized by the cooperative nature of the learning tasks and by the teacher, who tries to communicate an “all for one, one for all” attitude (Slavin, 1995).

During early adolescence, students’ relationships with teachers need to evolve so that teachers allow students to become more self-regulating and responsible for their own learning while providing students with dependable support and external standards. Student Team Reading encourages healthy student initiative and personal judgment by making team members directly responsible for the learning of their teammates. In Student Team Reading, teachers direct students to “Ask 3 before me” — to ask their teammates for help when they have a question and involve the teacher only if the whole team is stumped. This ceding of responsibility and control to students is a very salient indicator to students that the teacher respects them and understands an early adolescent’s need for autonomy and peer interaction.

In many classrooms, when a student attempts to establish a close personal relationship with the teacher, the student’s peers view this behavior with suspicion. Even such seemingly innocent actions as demonstrating alertness or responsiveness in class often are interpreted by other students as strategic behavior designed to bias the instructor’s grading. As a result, student norms develop that forbid “fraternizing with the teacher” and that tacitly state that it is “cool” to appear bored in class and to exhibit only grudging cooperation with the teacher’s agenda. The Student Team Reading program helps weaken these student norms that interfere with close student-teacher relationships by implementing externally defined criteria for team awards that are consistent across classrooms and are not subject to teacher bias. These externally defined standards in Student Team Reading help to de-emphasize the teacher’s role as a standard-setter and evaluator and instead emphasize the teacher’s role as a coach and an ally.

Student Team Reading also helps make reading instruction more relevant and interesting because students read good literature (e.g., award-winning novels). Student Team Reading also features the use of literature whose authors represent a wide variety of different cultures and groups. This increases the perceived relevance and future utility of the course content compared to more traditional RELA (**R**eading, **E**nglish, and **L**anguage **A**rts) classrooms. Finally, the

challenging high-level questions that students discuss in STR, the emphasis on adding words to one's everyday working vocabulary and on authentic "Adventures in Writing" assignments and extension activities all help students to see that the knowledge and skills emphasized in RELA are valuable and likely to be useful in their lives. (All of these characteristics of STR are illustrated by the series of Treasure Hunts that accompany the novel *Circle of Gold*, contained in Appendix A.)

Effects of Student Team Reading in the Talent Development Middle School

In this report, we summarize data on the implementation of STR at Central East Middle School (and in a matched comparison school) during the first semester in which Central East Middle School began the process of becoming a Talent Development Middle School. Then, we present analyses that test whether STR implementation helped create motivationally conducive RELA classrooms where peer support for achievement is high, where student-teacher relations are positive, where students work hard to master the material and meet adults' standards, and where students are confident both in their ability to learn and in the future utility of what they are learning.

Although other components of the Talent Development Model have also begun to be implemented at Central East Middle School in other subject areas, this paper focuses solely on the implementation and immediate effects of STR in RELA classrooms.

Research Design and Analysis Methods

Research sites

The study design involves Central East Middle School as the experimental site and another Philadelphia middle school as a control site. Of the two schools, Central East was selected for the study first, being a site which faced many of the challenges typical of urban schools. After the Central East staff had the Talent Development model described to them, they voted to adopt the model and to work with CRESPAR researchers.

Subsequently, the research office of the School District of Philadelphia identified the other school as an appropriate comparison site, being the middle school in the city that was most similar to Central East in terms of the student population being served and characteristics of the teaching staff. Each school serves the fifth, sixth, seventh, and eighth grades. Each enrolls

approximately 1,000 students. These students tend to come from families with fairly low socioeconomic levels. Also, many of the students have learned English as their second language. At Central East, approximately 53 percent of the students spoke a language other than English before they started going to school. At the control school, the comparable number is 48 percent.

Regarding racial and ethnic composition, Central East's student body is about 45 percent Hispanic, with most of these students being of Puerto Rican descent. Another 24 percent of the students are African-American. About 13 percent of the students are of Asian descent, primarily Cambodian and Vietnamese. Another 8 percent are white. The remaining 10 percent identify themselves as belonging to other racial or ethnic groups. These other groups include Arab-Americans and biracial students.

The control school's student body is similarly diverse although, in comparison with Central East, it has a higher proportion of Hispanic students, somewhat lower proportions of African-American and white students, and very few Asian-American students. Specifically, 57 percent of the students are Hispanic; 16 percent are African-American; 15 percent are white; fewer than 1 percent are Asian-American; and the remainder describe themselves as biracial or other.

For the purposes of this paper, the treatment which differentiates the experimental site from the control site is the fact that the Central East teachers were trained in STR techniques in the summer of 1995, and have received curricular materials and technical support during the 1995-1996 school year. The Central East RELA teachers have been asked to utilize STR in their classes. Periodic classroom visits by CRESPAR observers, and the ongoing partnership between CRESPAR and Central East, have encouraged this utilization. In contrast, teachers at the control site have not received STR training from CRESPAR staff and have not been asked to utilize these methods. The reader will note in the following analyses, however, that we do not make the assumption that STR implementation is complete at the experimental site and absent at the control site. Rather, we measure implementation for each classroom and model it as, successively, both an outcome and an independent variable.

Our recognition that some practices which are consistent with STR may be used in classrooms at the control site comes from the fact that Student Team Learning techniques, which inspired Student Team Reading techniques, have been utilized at a fairly high rate in various schools in Philadelphia in the past decade. Because of the proximity of Philadelphia to Baltimore, where both Student Team Learning and STR originate, and because numerous staff development training sessions have been conducted in Philadelphia over the years, it is probable that some teachers from the control site would have been exposed to these methods at some point in their careers. Furthermore, some of the techniques used in STR are practices that any well-trained English teacher might use.

Despite these reasons why classrooms at the control site might exhibit some level of STR implementation as we have measured it, we initiated our data collection and analyses with the expectation that implementation would be markedly greater at the experimental site. It is there, after all, that an explicit effort is being made to have teachers use the techniques. As will be seen in the following analyses, our expectation was realized.

Data collection

Our data come from a survey conducted in both schools in February of 1996. This questionnaire was administered to students in all four grades, as well as in ungraded special education classes. The focus of the survey was the student's experiences in, and attitudes about, his or her RELA class. Every student at the two schools is enrolled in RELA. In the majority of cases, the surveys were administered in the RELA classroom, with both the teacher and a CRESPAR researcher present. In other cases, due to scheduling constraints, surveys were administered in non-RELA classes, but with the instructions that students should answer the questions with reference to RELA.

A total of 1776 students from 72 RELA classrooms were surveyed. Of these, 918 students were from 34 RELA classes at Central East. The other 858 were from 38 RELA classes at the control school. In asking about the student's experiences in, and attitudes about, his or her RELA class, the survey focused on issues of peer support for achievement, relations with the teacher, self-perceptions of ability, interest in the subject matter, motivation to learn, and effort put toward learning. Also, the student was asked to report the frequency with which he or she had experienced a set of learning activities which are parts of Student Team Reading (STR). Finally, other items on the questionnaire, which are not used in the present analyses, asked about the student's long-term educational and occupational expectations, preparation for high school, and career exploration.

Measures

The specific measures used in our analyses can be subdivided into measures of STR implementation and attitudinal measures. Both groups of measures are described in Table 1. As the table shows, STR implementation is measured by a composite variable which is based on the student's responses to nine individual items. Students were asked how often each of the nine learning activities happened in RELA class. Responses were coded in terms of days per month. Z-scores were then calculated for each of the nine items. The composite measure, STR, is the mean of each student's Z-scores for the nine items. A factor analysis of the nine items was conducted to confirm that the items jointly measure a single underlying construct. Throughout this report, we use a classroom's mean on this composite as our measure of STR implementation in that classroom.

Table 1
Composites Used to Measure Students' Perceptions

STR: Frequency of Student Team Reading Implementation ($\alpha = .81$)

(Every item on this composite had the same response options: <i>never, once or twice a month, once or twice a week, most days, every day</i>)	
Students read a part of a novel silently and then read the same part aloud with a partner.	
Students discussed a novel with a partner.	
Students worked in teams to master the vocabulary used in a novel.	
Students wrote a brief composition related to the topic or theme of a novel.	
After reading part of a novel, students made predictions about what might happen in the rest of the story.	
Students composed meaningful sentences using vocabulary words from a novel.	
Teams of students could earn certificates or other rewards if they showed good progress.	
Students explained answers to their teammates and checked to make sure that all their teammates understood the material.	
Students took turns with partners asking questions, and answering the questions the partners asked.	

PEER SUPPORT: Peer Support for Achievement ($\alpha = .71$)

My classmates want me to be a good student.	(<i>definitely false, mostly false, mostly true, definitely true</i>)
My classmates want to help me to do my best work.	(<i>definitely false, mostly false, mostly true, definitely true</i>)
My classmates believe it is important to come to school every day.	(<i>definitely false, mostly false, mostly true, definitely true</i>)
When I work in this class, it is because it is important to my classmates that I do well.	(<i>not at all a reason, a very important reason</i>)
If I don't do my best in this class, my classmates will be mad at me.	(<i>definitely false, mostly false, mostly true, definitely true</i>)

TCHR CARES: My Teacher Cares ($\alpha = .77$)

My teacher cares about how we feel.	(<i>almost never, almost always</i>)
I feel that my teacher is rooting for me to do well.	(<i>almost never, almost always</i>)
I feel that my teacher is "on my side."	(<i>almost never, almost always</i>)
My teacher does everything she or he can to help us improve our skills and increase our understanding.	(<i>almost never, almost always</i>)

My teacher and I are like...

(opponents or strangers, teammates)

Table 1 (continued)

WORK FOR ADULTS: I Work to Meet Adults' Standards ($\alpha = .66$)

When I work in this class, it is because it is important to my parents that I do well.	<i>(not at all a reason, a very important reason)</i>
When I work in this class, it is because it is important to my teacher that I do well.	<i>(not at all a reason, a very important reason)</i>
When I work in this class, it is because I want a good grade.	<i>(not at all a reason, a very important reason)</i>

FUTURE UTILITY: Utility Value of RELA For My Future ($\alpha = .76$)

When I work in this class, it is because it helps prepare me for a career.	<i>(not at all a reason, a very important reason)</i>
When I work in this class, it is because the knowledge and skills are useful in my life.	<i>(not at all a reason, a very important reason)</i>
When I work in this class, it is because it helps prepare me for high school.	<i>(not at all a reason, a very important reason)</i>
How useful will what you learn in this class be for future classes you might take?	<i>(not at all a reason, a very important reason)</i>

EFFORT ($\alpha = .80$)

How hard are you working to learn about this subject?	<i>(not hard at all, as hard as I can)</i>
How hard do you study for tests in this class?	<i>(just enough to pass, whatever it takes to get a good grade)</i>
How hard do you work in this class?	<i>(much less than most classes, much more than most classes)</i>
How much do you care about learning a lot in this class?	<i>(don't care at all, care very much)</i>
If a student works to his or her highest potential in a class, then we would say that he or she is putting forth 100% effort to learn the subject matter. How much effort do you usually put forth in this class?	<i>(0% — I'm not trying at all, 100% — I'm working to my highest potential)</i>

SCA: Self-Concept of Ability ($\alpha = .85$)

How good do you think you are in this subject compared to other students in your school?	<i>(much worse than other students, much better than other students)</i>
How good are you in this subject?	<i>(not good at all, very good)</i>
How often do you feel smart in this class?	<i>(never, very often)</i>

How much natural ability do you have in this subject?	<i>(no ability at all, a lot of ability)</i>
How much have your skills in this class improved this year?	<i>(my skills have not improved at all, my skills have improved a lot)</i>

Table 1 (continued)

GIVE MY BEST: I try to “give my best” in RELA ($\alpha = .78$)

Showing improvement in this class is important to me.	<i>(strongly disagree, strongly agree)</i>
Doing the best I can in this class is important to me.	<i>(strongly disagree, strongly agree)</i>
When my teacher returns exams in this class, I like to see if my work has improved.	<i>(not very true of me, very true of me)</i>
I try to do the best I can in this class.	<i>(not much of the time, all of the time)</i>
How upset would you be if you were not doing as well in this class as you thought you could do?	<i>(not at all upset, very upset)</i>

INTRINSIC: Intrinsic Value of RELA ($\alpha = .79$)

How much do you like working on the assignments in this class?	<i>(not at all, very much)</i>
How much do you enjoy the work you do in this class?	<i>(not much at all, very much)</i>
How often do you get to work on exciting stuff in this class?	<i>(not much at all, very much)</i>
When I work in this class it is because I’m really interested in the subject matter.	<i>(not at all a reason, a very important reason)</i>
How often do you feel bored in this class?	<i>(never, very often) reverse coded</i>

ANTI-ACADEMIC: Anti-Academic Norms ($\alpha = .47$)

My classmates make fun of students who ask questions in this class.	<i>(definitely false, mostly false, mostly true, definitely true)</i>
My classmates don’t think it is important to pay attention to the teacher in this class.	<i>(definitely false, mostly false, mostly true, definitely true)</i>
My friends would make fun of me if I did too well in this class.	<i>(definitely false, mostly false, mostly true, definitely true)</i>
My classmates do not care whether I work hard or not in this class.	<i>(definitely false, mostly false, mostly true, definitely true)</i>
Sometimes I don’t do as well in this class as I could so that I will fit in better with my friends.	<i>(definitely false, mostly false, mostly true, definitely true)</i>

TCHR DISRESPECT: Teacher Shows Disrespect for Students ($\alpha = .56$)

My teacher thinks that some of the students in this class can't do very good work.	(Every item on this composite had a response scale with the same verbal anchors: <i>almost never, almost always</i>)
My teacher treats some students better than other students.	
The work in this class is just busy work and a waste of time.	

The ten composite variables described in Table 1 are calculated to capture students' attitudes toward RELA. These ten constructs have been used in previous research (e.g., Mac Iver, Stipek, & Daniels, 1991; Mac Iver, 1993; Mac Iver & Reuman, 1993) and the questionnaire was designed with the intention of measuring them. As with the implementation items, a factor analysis was conducted to confirm that individual items clustered in the combinations we had anticipated. Using a ten-factor solution of forty-eight individual items as a guide in constructing ten meaningful composites, we calculated the following composite variables:

Peer Support for Achievement (PEER SUPPORT)
My Teacher Cares (TCHR CARES)
I Work to Meet Adults' Standards (WORK FOR ADULTS)
Utility Value of RELA for my Future (FUTURE UTILITY)
Effort (EFFORT)
Self-Concept of Ability (SCA)
I Try to "Give My Best" in RELA (GIVE MY BEST)
Intrinsic Value of RELA (INTRINSIC)
Anti-Academic Norms (ANTI-ACADEMIC)
Teacher Shows Disrespect for Students (TCHR DISRESPECT)

Analysis plan

Broadly, our analysis plan was (1) to examine STR implementation as an outcome, comparing the experimental and control sites, and (2) to examine the attitudinal measures as outcomes that might be affected by STR implementation. In each case, we relied on hierarchical linear models (HLM) as a method by which we could do the appropriate disaggregating of within- and between-classroom variation.

In analyzing implementation at level one, we modeled the composite measure, STR, as a function of an unadjusted classroom mean (the intercept) and random variation at the student level. At level two, we modeled the unadjusted classroom mean as a function of an intercept, school (experimental versus control), and random variation at the classroom level. Similarly, each of the nine individual items of which STR is composed were modeled in this way. With these estimated models, we can assess the mean levels of student-reported implementation at each school, as well as the within- and between-classroom variation in the student reports.

In analyzing the attitudinal measures as outcomes, we modeled each of the ten attitudinal composites with the following functional form, unless a more parsimonious model described the data equally well:

$$Y_{ij} = \beta_{0j} + \beta_{1j} (\text{FEMALE}_{ij}) + \beta_{2j} (\text{WHITE}_{ij}) + r_{ij}$$

$$(1) \beta_{0j} = \gamma_{00} + \gamma_{01} (\text{STR})_j + \gamma_{02} (\text{SCHOOL})_j + \gamma_{03} (\text{SEVENTH})_j + \gamma_{04} (\text{SIXTH})_j + \gamma_{05} (\text{FIFTH})_j + \gamma_{06} (\text{UNGRADED})_j + u_{0j}$$

$$\beta_{1j} = \gamma_{10} + u_{1j}$$

$$\beta_{2j} = \gamma_{20} + u_{2j}$$

where all predictors are grand mean-centered and the usual assumptions are made about error terms (Bryk & Raudenbush, 1992)

The model above specifies the dependent variable as a function of an adjusted classroom mean (the intercept), race (white versus nonwhite), gender (represented by a dummy variable for female), and a random error term at the student level.¹ However, race and gender were retained in our final hierarchical linear models only if they were significant predictors. When they were retained, a data-guided decision was made regarding whether to treat them as fixed or random effects.

The classroom-level model specifies the classroom mean of the dependent variable, adjusted for racial and gender composition of the class, as a function of an intercept, STR implementation, school (represented by a dummy variable for the experimental site), grade (represented as a series of dummy variables with eighth grade as the excluded reference category), and a random error term. The dummy variables for grade were retained only if an omnibus test suggested that they were significant as a block. The slopes for FEMALE and WHITE are not modeled as functions of any classroom-level variables but, rather, each is modeled simply as a function of a grand mean and either a random or fixed error term, as is mentioned above. With these estimated models for the ten attitudinal outcomes, we can assess the relationship between STR implementation and this important set of attitudinal measures.

Results

¹ The decision to limit our investigation of race effects to white versus nonwhite at this point was guided by findings from some preliminary OLS regression models. Additionally, we selected one of the attitudinal outcomes — PEER SUPPORT — for a more detailed investigation of race and ethnicity within the HLM framework. Dummy variables for white, Asian-American, African-American, and other were included as student-level predictors, with Hispanic as the excluded reference category. Only the coefficient for white was significantly different from zero. This added to our evidence that the white-nonwhite dichotomy is the important racial and ethnic distinction in modeling these outcomes for our sample.

School as a predictor of between-classroom differences in STR implementation

As indicated earlier, we use a classroom’s mean on the STR composite as our measure of STR implementation in that classroom. Thus, our HLM analysis uses SCHOOL as a predictor of the classroom mean on this composite in our level two model to test whether there was higher implementation of STR in RELA classrooms at Central East Middle School than in the RELA classrooms of the control school. This analysis indicated that overall STR implementation at Central East Middle School was .68 standard deviations higher than at the comparison school ($\gamma = .19, p = .006$).

Figure 1
STR Implementation in Experimental & Control Classrooms

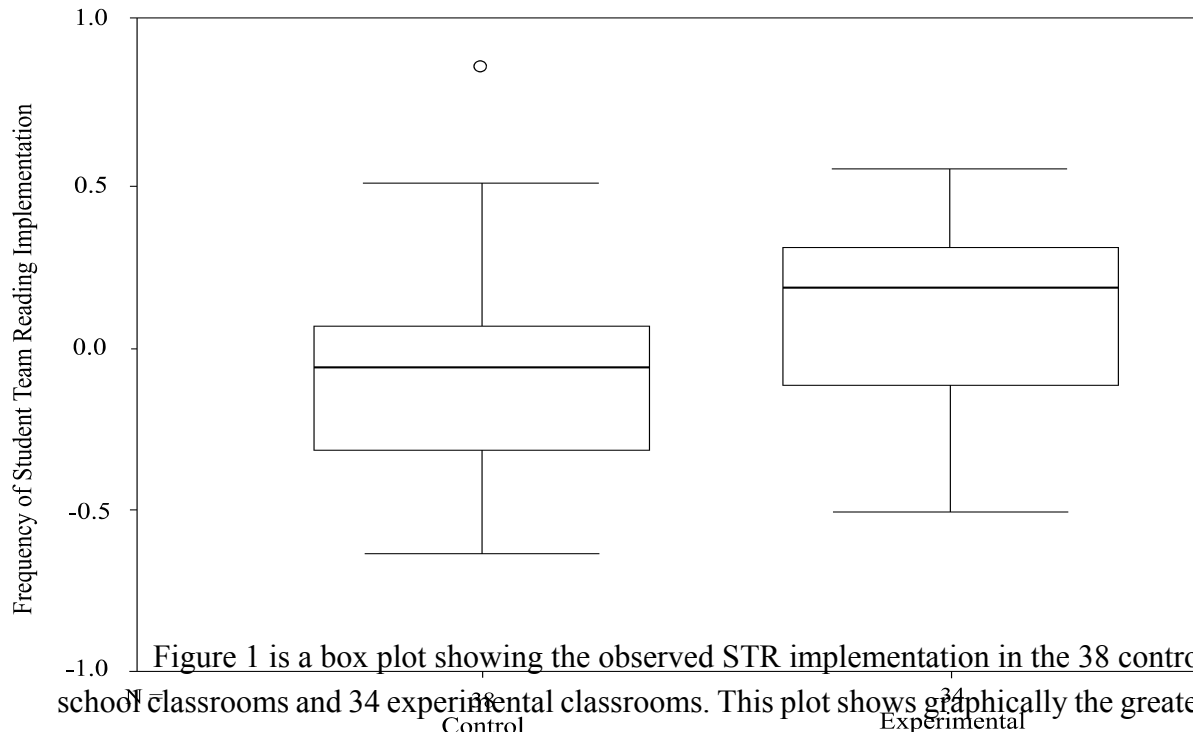


Figure 1 is a box plot showing the observed STR implementation in the 38 control school classrooms and 34 experimental classrooms. This plot shows graphically the greater use of STR at Central East Middle School. It also shows that, as expected, some teachers use STR at the comparison school, including one “outlier” teacher who uses STR more frequently than any other teacher in either school.

Table 2
Frequency of Implementation of Student Team Reading Components:
Mean Days per Month

Component	Control	Experimental	Effect Size
Compose meaningful sentences w/vocabulary	8.31	11.28	*** 1.10
Write a brief composition related to novel	6.06	7.83	*** 0.84
Work with team to master vocabulary	7.06	9.22	*** 0.75
Discuss novel with partner	6.72	7.96	** 0.64
Explain answers to team & make sure all understand	8.81	10.29	*0.57
Make predictions about “the rest of the story”	9.40	10.53	*0.56
Take turns w/partner asking & answering questions	7.91	9.15	0.49
Read silently, then read aloud with partner	6.90	7.57	0.27
Team awards for progress	7.50	6.27	-0.37

Table 2 displays the mean differences among experimental and control classrooms on each of the nine items that were included in the STR composite. Our HLM analyses indicate that SCHOOL is a significant predictor of a classroom’s mean on six of these nine items: Students in the experimental school experienced more frequent opportunities to compose meaningful sentences using vocabulary words from the novel they were reading, do story-related writing, work in teams to master the vocabulary used in a novel, discuss a novel with a partner, explain answers to their teammates and check to make sure that all their teammates understood the material, and to make predictions about what might happen in the rest of the story. In contrast, SCHOOL was not a significant predictor of using team awards for progress, partner reading, or partner questioning.

STR implementation as a predictor of between-classroom differences in ten attitudinal outcomes

Table 3 shows our final estimated hierarchical linear models for each of the ten attitudinal outcomes. Each of these models has a fixed effects component and a variance component. The exact combination of fixed effects and error terms retained for each dependent variable was determined empirically, as we sought parsimonious versions of the model presented in Equation 1.

Table 3
HLM Estimated Effects for Ten Attitudinal Measures

	PEER SUPPORT	TCHR CARES	WORK FOR ADULTS	FUTURE UTILITY	EFFORT
<i>Fixed effects</i>	<i>Coefficient</i>	<i>Coefficient</i>	<i>Coefficient</i>	<i>Coefficient</i>	<i>Coefficient</i>
For classroom means					
INTERCEPT	0.02	0.01	0.00	0.00	0.04
STR	*** 0.57	*** 0.55	** 0.28	* 0.22	*** 0.29
SCHOOL	*** -0.21	-0.09	0.00	-0.07	-0.10
SEVENTH					0.07
SIXTH					** 0.24
FIFTH					*** 0.34
UNGRADED					*** 0.43
For Female slope					
INTERCEPT		** 0.12	** 0.09	*** 0.17	*** 0.20
For White slope					
INTERCEPT	*** -0.16		* -0.19		
<i>Random effects</i>	<i>Variance component</i>	<i>Variance component</i>	<i>Variance component</i>	<i>Variance component</i>	<i>Variance component</i>
Classroom mean	*** 0.05	*** 0.06	*** 0.02	*** 0.02	*** 0.02
Female slope		** 0.05	<i>fixed as zero</i>	<i>fixed as zero</i>	<i>fixed as zero</i>
White slope	<i>fixed as zero</i>		*** 0.15		
Level-1 effect	0.39	0.42	0.54	0.55	0.49

Table 3
HLM Estimated Effects for Ten Attitudinal Measures
(continued)

	SCA	GIVE MY BEST	INTRINSIC	ANTI-ACADEMIC	TCHR DISRESPECT
<i>Fixed effects</i>	<i>Coefficient</i>	<i>Coefficient</i>	<i>Coefficient</i>	<i>Coefficient</i>	<i>Coefficient</i>
For classroom means					
INTERCEPT	0.01	0.00	0.04	0.05	0.05
STR	* 0.23	* 0.21	0.22	0.01	0.00
SCHOOL	-0.08	-0.04	*** -0.24	* 0.12	0.02
SEVENTH		0.09	* 0.19	0.06	-0.02
SIXTH		** 0.22	*** 0.42	0.04	-0.04
FIFTH		* 0.24	*** 0.52	0.00	0.07
UNGRADED		0.11	*** 0.52	*** 0.40	*** 0.42
For Female slope					
INTERCEPT	** 0.12	*** 0.19	*** 0.16	** -0.07	*** -0.13
For White slope					
INTERCEPT			* -0.14		*** -0.18
<i>Random effects</i>	<i>Variance component</i>	<i>Variance component</i>	<i>Variance component</i>	<i>Variance component</i>	<i>Variance component</i>
Classroom mean	*** 0.04	*** 0.02	*** 0.05	*** 0.03	*** 0.06
Female slope	<i>fixed as zero</i>	<i>fixed as zero</i>	* 0.02	<i>fixed as zero</i>	<i>fixed as zero</i>
White slope			* 0.06		<i>fixed as zero</i>
Level-1 effect	0.58	0.48	0.42	0.29	0.44

*** p < 0.001

** p < 0.01

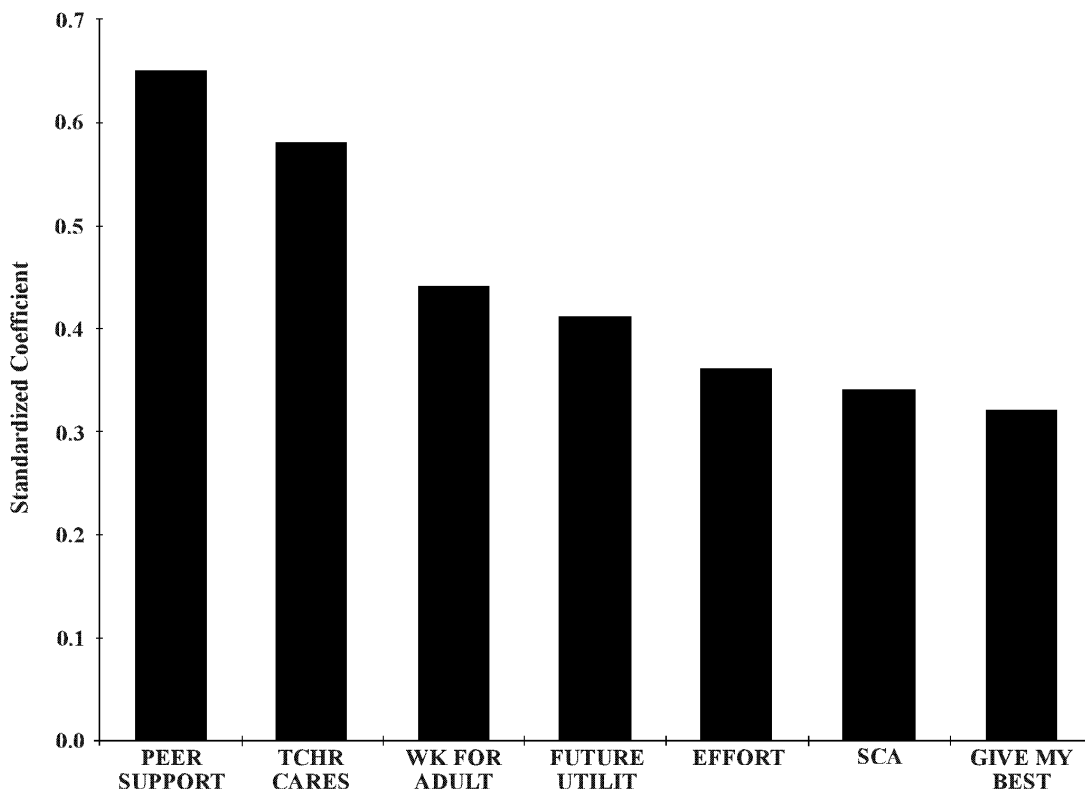
* p < 0.05

In each model, the estimated effect of greatest interest to us substantively is the fixed effect of STR. The results in Table 3 show that STR use in the classroom has significant effects on seven of the ten dependent variables. The size of these significant effects can be gauged by transforming each unstandardized coefficient from Table 3 into a standardized regression coefficient that indicates the proportion of a standard deviation that a student's

outcome score is predicted to rise given a one standard deviation increase in a teacher's use of Student Team Reading.

Figure 2 shows that these significant effects range in size from about one-third of a standard deviation to about two-thirds of a standard deviation. The largest effects are those on PEER SUPPORT ($\gamma^* = .65$), TCHR CARES ($\gamma^* = .58$), WORK FOR ADULTS ($\gamma^* = .44$), FUTURE UTILITY ($\gamma^* = .41$), and EFFORT ($\gamma^* = .36$). In contrast, a teacher's use of Student Team Reading is not a significant predictor of students' outcomes on three of our dependent variables: INTRINSIC ($\gamma^* = .21$), ANTI-ACADEMIC ($\gamma^* = .01$), and TCHR DISRESPECT ($\gamma^* = .00$).

Figure 2
Impact of STR Use on Outcomes



Discussion

The cross-sectional analyses reported here suggest that even after only one semester of use at Central East Middle School, STR implementation is a strong predictor of differences between classrooms on seven important measures of student motivation and motivational climate. For example, the relationship between STR implementation and peer support for achievement — $\gamma^* = .65$ — is as strong as the relationship between sixth-grade students' math computation and math concepts and applications scales scores on the CTBS/4 (Mac Iver & Plank, 1995). Similarly, the relationship between STR implementation and our measure of

teacher caring — $\gamma^* = .58$ — is as strong as the relationship between sixth-grade students' reading vocabulary and reading comprehension scale scores on the CTBS/4 (Mac Iver & Plank, 1995). The results suggest that the use of STR makes a significant difference in helping Central East Middle School create ideal classroom conditions for developing the academic talents of middle school students.

The motivational measures we have studied are important outcomes in themselves, but we also expect them to operate as intermediate variables in a more general model affecting more distal outcomes. According to this model, classroom practices and school organization affect motivation, attitudes, effort, and social relations. In turn, these variables affect students' future course-taking, persistence in schooling, academic achievement, job placement and/or career choice, and more. As further elements and components of the Talent Development Middle School are implemented, we will elaborate upon and evaluate this model more fully.

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APPENDIX A

TEACHERS' TREASURE HUNTS

