

Teacher Adherence and Its Relation to Teacher Attitudes and Student Outcomes in an Elementary School-Based Violence Prevention Program

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Abstract. This study examined variability in teachers' reported adherence to a school-based violence prevention program, Creating a Peaceful School Learning Environment, and investigated the relations of teacher adherence to teachers' attitudes related to the intervention and students' attitudes about and responses to bullying. The results provide evidence of variation in adherence among teachers and schools and that teachers' attitudes may have affected adherence. Prospective analyses demonstrated dose–effect relations of teacher adherence with students' attitudes about and responses to bullying, particularly their tendency to assist victims. Findings underscore the importance of assessing and promoting adherence for school-based programs, inform the use of self-report to assess teacher adherence, and provide evidence that teachers are important contributors to the success of school-based antibullying interventions.

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Pressure on school personnel to address school bullying and a growing emphasis on empirically supported interventions have created an urgent need for school-based violence prevention programs with scientific support. Although numerous programs have been tried in schools, few have undergone rigorous evaluation (for reviews, see Clayton, Ballif-Spanvill, & Hunsaker, 2001; Howard, Flora, & Griffen, 1999). Sadly, anecdotal evidence suggests that inconsistencies in program implementation have diminished treatment effects and, in some cases, led to null findings (Howard et al., 1999; Hunter, Elias, & Norris, 2001; Roland, 1989; Stevens, Van Oost, & De Bourdeaudhuij, 2001). Despite these suspected threats to effectiveness, systematic work addressing intervention fidelity in school violence prevention is scarce and, in the absence of systematic implementation checks, no solid conclusions regarding dose–effect relationships can be drawn (Kazdin, 1986; Yeaton & Sechrest, 1981). The current study addresses this gap by describing our team’s approach to assessing teacher adherence to the classroom-specific aspects of the Creating a Peaceful School Learning Environment program (CAPSLE; Twemlow, Fonagy, & Sacco, 2001), a whole-school approach to school violence prevention in elementary schools. We present data regarding variability in adherence, teachers’ beliefs and attitudes that may affect adherence, and the effect of teacher adherence on students’ attitudes and responses to bullying.

CAPSLE

The CAPSLE program is based on the assumption that all members of the school community play a role in bullying and that anyone can assume the roles of bully, victim, and bystander (Twemlow, Sacco, & Williams, 1996). CAPSLE promotes awareness of interpersonal dynamics and capacity for perspective taking, which are believed to encourage empathy and decrease preaggression attitudes. In addition, the intervention enlists all members of the school community to take an active stance against bullying, especially when they witness bullying as bystanders, by supporting victims (i.e., helpful bystanding) and refrain-

ing from the encouragement of bully behavior (i.e., aggressive bystanding). This underlying philosophy is integrated into the school’s daily activities and environment via four primary elements: a classroom management plan, positive climate campaign, Gentle Warriors martial arts instruction, and student mentorship programs (see Table 1). CAPSLE’s positive, nonpunitive approach and emphasis on the school climate at multiple levels (e.g., school, classroom, and individual) is compatible with the best practices for school-based violence prevention programs (e.g., Reinke & Herman, 2002; Whitted & Dupper, 2005). Empirical study of CAPSLE supports its effectiveness in addressing aggression and aggressive bystanding and in promoting empathy and academic achievement compared to matched controls (Fonagy, Twemlow, Vernberg, Sacco, & Little, 2005; Twemlow, Fonagy, Sacco, Gies et al., 2001) and in a recent cluster randomized controlled trial (Fonagy et al., in press).

The current study builds on empirical evidence of the intervention’s overall effectiveness by examining whether teachers vary in their implementation of the intervention, as has been suspected but seldom measured in previous school-based violence-prevention efforts (Howard et al., 1999; Hunter et al., 2001; Roland, 1989; Stevens et al., 2001). Because teachers are primarily responsible for students’ daily exposure to CAPSLE, the central element of interest for this study was teachers’ use of the CAPSLE classroom management plan. As part of this plan, teachers are expected to include all students in the establishment of class goals and rules for behavior. “Reflection time” is to be set aside at the end of each day for class discussion of students’ behavior regarding their goals and rules. Students decide whether they should signify that they had a peaceful day by hanging their “peace banner” outside the classroom. In addition, teachers are asked to help students generalize self-control strategies (e.g., “relaxation response”) that they learn in Gentle Warriors, the martial arts component of CAPSLE teaching self-defense, self-control, and respect for others. Broadly speaking, the plan also encourages teachers to integrate CAPSLE con-

Table 1
CAPSLE Program Components

Classroom Management

Teachers integrate the CAPSLE philosophy into their classroom by responding to students' behavior in ways that emphasize the effects of each class members' behavior on others, using Reflection Time to facilitate class participation in setting class goals and in reflecting on progress toward those goals, and by encouraging students to use skills learned in Gentle Warriors training (e.g., Relaxation Response).

Positive Climate Campaign

The Positive Climate Campaign promotes mentalizing (i.e., being empathic and reflective on one's own feelings and those of others) through the use of a variety of "campaigns," including any of the following: posters, magnets, buttons, class projects, the school peace flag, lectures, school assemblies, and integration of the program philosophy into the curriculum at teachers' discretion. The overarching goal is to make awareness of power struggles, reflection, and modulation of feelings a regular part of the children's day so that it eventually becomes part of their language. Another goal is to shift the tone of the school such that social rewards come from helpfulness and consideration of others rather than from the power gained and retained with aggression.

Gentle Warrior Program

As the only part of the Peaceful Schools Program that involves a specified curriculum, the Gentle Warrior Program is a structured set of activities that teach children to be agents of positive social change in their school. Activities include physical exercises such as stretching, relaxing, self-defense, and role-playing activities as well as the reading of stories that emphasize ethical conduct including self-respect, respect for others, self-control, kindness, and generosity. The program fulfills the school requirement for physical education, is easily implemented, requires no martial arts experience, and is well accepted by physical education teachers.

Mentoring Programs

Schools can choose from two types of mentoring programs. Peer Mentors are often high school students assigned to specific elementary school children identified by the school as likely to benefit from a mentoring relationship. Peer Mentors spend time weekly with their assigned child at his or her elementary school and are closely supervised. For The Bruno Program, older adults are encouraged to help children manage unstructured school time such as recess and lunch hours. Adults functioning in this way often use creative ways to help children resolve problems such as setting rules for basketball games, sharing play equipment, and so on.

Note. CAPSLE = Creating a Peaceful School Learning Environment.

cepts in their interactions with students to promote awareness of their effect on others. The manual and training provide an intermediate level of specificity (Gresham, 1989) by conveying the conceptual framework and examples for using concepts in classroom management while allowing flexibility in how teachers apply concepts to their classroom. Specific techniques consistent with CAPSLE include addressing disruptive behavior via comments

to the class as a whole (rather than singling out individual students), praising behavior that contributes to a positive classroom climate, involving students in setting classroom goals and evaluating progress toward those goals, and pointing out how others are affected by behaviors to increase interpersonal awareness. With these actions, teachers model and teach empathy for victims, promote attitudes that bullying is unacceptable, and encourage stu-

dents to take responsibility for classroom dynamics by changing how they respond to provocation.

Assessing Treatment Adherence

Although multiple barriers to implementation are believed to threaten the effectiveness of violence-prevention efforts (Vernberg & Gamm, 2003), careful attention to fidelity issues is rare among school interventions (Gresham, Gansle, Noell, Cohen, & Rosenblum, 1993). Further, a recent study found that only 3.5% of published randomized clinical trials of psychotherapeutic interventions gave adequate attention to treatment integrity (Perepletchikova, Treat, & Kazdin, 2007). Measurement of treatment adherence is needed to know if an intervention has been delivered as intended and consistently across agents (e.g., teachers) and time (Kazdin, 1986; Yeaton & Sechrest, 1981). Assessing adherence is also necessary for determining factors that may influence the degree to which agents implement the intervention and whether variability in the use of the intervention affects outcomes (Kazdin, 1986; Yeaton & Sechrest, 1981).

Although direct observations are considered by many to be the gold standard for assessing adherence, multiple options have been presented including self-monitoring and rating scales (Gresham, 1989; Lane, Bocian, MacMillan, & Gresham, 2004; Perepletchikova & Kazdin, 2005). Direct observation procedures are labor intensive (Lane et al., 2004) and create time and staffing demands that exceed the resources of many school-based programs, particularly those integrated into the daily classroom routine (i.e., as opposed to discrete lessons or modules), as is the case for the CAPSLE program. Reactivity to observation can also be a concern (Gresham, 1989). Although reactivity can sometimes increase treatment fidelity at least during the observed period (Gresham, 1989), in the case of this intervention trial, some teachers perceived the in-class observations conducted in Year 1 as more evaluative than supportive, thus threatening implementation. We responded to this dynamic by creating a self-

report measure of teacher adherence that was used in Years 2 and 3 of the 3-year cluster randomized controlled trial. In creating a measure of teacher adherence, we also saw an opportunity to assess teacher perceptions that may affect the degree to which teachers use the intervention. Assessing factors other than CAPSLE adherence per se had the additional advantage of allowing the teacher survey to assume a less evaluative tone. With experience from one year to the next, we determined that other factors might need to be captured. In the next section, we describe the factors and our rationale for including them.

Factors That May Influence Teacher Adherence

Multiple factors may influence teachers' decisions to implement interventions. Among these may be teacher's perceptions of the intervention's effectiveness (Gresham, 1989; Lane et al., 2004). Such a relation between perceived utility and fidelity has been found in studies of substance use prevention (Ringwalt et al., 2003). As such, we included in the teacher survey items assessing teachers' perceptions that CAPSLE is a helpful program (CAPSLE Helpfulness) in both Years 2 and 3.

As part of the learning process, our team realized that other teacher attitudes might be important to assess, so we added additional scales in Year 3. First, we expected that teachers would be more likely to use CAPSLE elements in their classrooms if their belief systems aligned closely with the conceptual framework of the intervention. One of the central tenets of CAPSLE is that teachers contribute to students' academic success by addressing bully-victim problems, which are seen as distractions to learning. Similar to this expected effect of teacher beliefs, Kallestad and Olweus (1992) found that teachers' perceptions of staff importance in resolving bully-victim problems predicted teacher implementation of the intervention's classroom procedures. Another factor is the degree to which the intervention is considered acceptable (Perepletchikova & Kazdin, 2005), which may depend on how well the program fits with

teachers' existing classroom management attitudes and practices (Detrich, 1999). Accordingly, we created two scales that were added to the teacher survey in Year 3: one for the degree to which teachers shared the CAPSLE tenet that they can affect academic success via their influence on peer relationships (Influence) and one assessing teachers' attitudes about the classroom management strategies promoted by CAPSLE (Classroom Management Attitudes).

Teacher Adherence and Student Outcomes

The degree to which teachers implement interventions in their classrooms can contribute significantly to student outcomes. Such a dose-outcome association has been found in a highly controlled study of computer-implemented student instruction (Noell, Gresham, & Gansel, 2002) and in studies of natural variation in treatment fidelity. For example, treatment outcomes have been positively related to teacher adherence to a peaceful conflict resolution program (Aber, Brown, & Jones, 2003) and to therapist fidelity in implementing multisystemic therapy for juvenile offenders (Henggeler, Melton, Brondino, Scherer, & Hanley, 1997). Specific to bullying prevention, Hirschstein and colleagues (Hirschstein, van Schoiack Edstrom, Frey, Snell, & MacKensie, 2007) assessed the degree to which teachers implemented lessons of the Steps to Respect program and provided support for students' generalization of skills. Interestingly, the most consistent effects on student outcomes were what teachers did outside of the lessons to support skill generalization. Consistent with this finding, the classroom management aspect of CAPSLE provides guidance for integrating CAPSLE concepts and skills into the everyday practice of the classroom (rather than discrete lessons) with the aim of reducing bully-victim problems by changing students' cognitive, emotional, and behavioral responses to bullying. As such, outcomes important to the classroom management piece were students' empathy for victims, students' beliefs regarding the accept-

ability of aggression, the degree to which students help victims, and the degree to which students join bullies in victimizing others.

The Current Study

The study had three primary goals. The first was to evaluate the measure's sensitivity to variations in teachers' use of CAPSLE concepts and techniques. Because of the variability in program adherence suspected in other violence-prevention efforts, we expected that teachers and schools would vary in their use of CAPSLE from *almost never* to *frequent*. Second, we examined whether teacher-reported use of CAPSLE was related to teacher's attitudes relevant to CAPSLE. We expected use to be greater among teachers who reported attitudes consistent with the CAPSLE philosophy. Specifically, we expected use to be positively correlated with views that CAPSLE is helpful, a view that teachers can promote academic success via influence over children's peer relations, and attitudes toward classroom discipline consistent with CAPSLE classroom management techniques. The third goal was to determine whether teachers' reported adherence predicted change in students' attitudes and behaviors. Specifically, we expected that teachers' adherence would be related to changes in students' empathy for victims, their attitudes about the legitimacy of aggression, and peer reports of students' helpful and aggressive behaviors as bystanders. Specifically, students of teachers with high adherence were expected over time to be more empathetic, see aggression less favorably, help victims more, and join bullies less, relative to their peers in classrooms with less teacher adherence.

Method

Participants

The participants in this study were teachers and their students in three elementary schools that were implementing the CAPSLE intervention. At the time of this study, the three schools were in Years 2 and 3 of a 3-year trial of the intervention. In Year 2, 50 out of 52 teachers participated by completing the

teacher survey (Schools A and C each had one teacher who did not complete the teacher survey). In Year 3, 51 out of 53 teachers participated (Schools A and B each had one teacher who did not complete the survey). Grade levels were evenly distributed among teachers and ranged from kindergarten to fifth grade.

We selected the student samples for Years 2 and 3 by identifying students in participating teachers' classrooms who had data available for the current and preceding years, so that we could examine the relation of teacher adherence to change in student attitudes and behavior regarding aggression from the previous school year (when students had a different teacher). To ensure adequate reading level, only students in Grades 3–5 completed the outcome measures. As such, the student samples for Years 2 and 3 were comprised of students in Grades 4 and 5 who also had data from the previous year (i.e., they were in Grade 3 or 4 in Year 1). Of the students enrolled in fourth and fifth grades, 74% had parental consent in each year; of those, 55% and 46% had data available for the study's analyses in Years 2 and 3, respectively. The resulting samples were as follows: for Year 2, 122 students (50.8% female) distributed across 16 teachers ($M = 7.63$, $SD = 3.41$, students/teacher); for Year 3, 119 students (48.7% female) distributed across 16 teachers ($M = 7.44$, $SD = 3.28$, students/teacher). Demographics of the student samples closely approximated the ethnic and socioeconomic characteristics of the medium-sized Midwestern city in which the study was conducted. Ethnicity of the student samples as recorded by school records for Year2/Year3 was 63.1%/61.3% White, non-Hispanic; 25.4%/23.5% African American; 9.8%/13.4% Hispanic American; and 1.6%/0.8% Native American. As an indicator of socioeconomic status, 52.5% and 40.0% of children were receiving free or reduced-cost lunches in Year 2 and Year 3, respectively.

Measures

Teacher survey. For this study, we designed a teacher survey to assess both teach-

ers' adherence to the CAPSLE classroom management plan (CAPSLE Use) and attitudes we believed could influence teachers' adoption of the CAPSLE intervention. To create a CAPSLE Use scale with strong content validity, we followed a series of steps. Initially, the first author studied the CAPSLE program manual (Twemlow, Sacco, & Twemlow, 1999), consulted with the developers of the program, and attended monthly meetings of the implementation team to become familiar with the intervention. Second, the implementation team listed the aspects of CAPSLE that teachers should use in the classroom as part of the classroom management plan. The list was checked against the manual and discrepancies were clarified with the authors of the manual. Third, several drafts of the teacher survey were presented to the implementation team, who gave feedback regarding coverage of major components, the ease of completing the measure, and scoring.

In addition to the CAPSLE Use scale, the teacher survey initially included two items assessing teachers' beliefs that CAPSLE is a helpful intervention (CAPSLE Helpfulness). We expanded the survey in Year 3 to include items measuring two other types of teacher attitudes. First, we added three items assessing the belief that teachers can influence students' academic achievement via their influence on the peer group (Influence), a tenet of the CAPSLE approach. Second, we added items to assess teachers' attitudes toward classroom management techniques that are promoted by the CAPSLE classroom management plan (Classroom Management Attitudes).

We tested the proposed scale structure of the teacher survey with exploratory factor analysis. Specifically, we used principal axis factoring with a promax (oblique) rotation with Kaiser normalization. To determine the most appropriate number of factors, we examined the scree plots for drops in variance explained by each additional factor as well as the rotated solutions of multiple models with differing number of factors (i.e., 1–5) for their interpretability and theoretical plausibility. The best solution based on these criteria for Year 2 yielded a solution consistent with the

Table 2
Teacher Survey Scales, Scale Internal Consistencies, and Item Factor Loadings

Scale (Coefficient Alpha)/Item	Year 2		Year 3		
	F1	F2	F1	F2	F3
CAPSLE Use (.84 for Year 2, .74 for Year 3)					
Not including reflection time, how often do you use Peaceful Schools' concepts to address disruptive behavior?	.96	.48	.37	.90	.58
Not including reflection time, how often do you use Peaceful Schools' concepts to recognize positive, prosocial behavior?	.88	.48	.34	.70	.55
How often do you have reflection time?	.75	.39	.08	.52	.18
How often do you ask students to use or practice the 5-point relaxation response (a.k.a., self-protective response)?	.40	.27	.15	.53	.42
CAPSLE Helpfulness (.90 for Year 2, .92 for Year 3)					
How helpful do you find the Peaceful Schools Project in managing classroom behavior?	.45	.99	.66	.58	.89
How helpful do you find the Peaceful Schools Project in promoting positive relationships among students?	.58	.84	.67	.50	.95
Influence (.78, Year 3 only)					
In your opinion, how influential are teachers for how students behave in the classroom?	—	—	.89	.19	.49
In your opinion, how influential are teachers for how well students get along with each other?	—	—	.74	.40	.59
In your opinion, how influential are children's peer relationships for their academic achievement?	—	—	.63	.26	.49
Classroom Management Attitudes (.67, Year 3 only)					
How effective do you think the following practices are for promoting classroom discipline? (stem)	—	—	—	—	—
Recognizing 'good' behavior of the class in general (e.g., say you like how hard students are working at their desks)	—	—	—	—	—
Recognizing 'good' behavior of specific individuals	—	—	—	—	—
Asking students to help establish their own classroom rules or goals and having them evaluate how they are doing with those rules.	—	—	—	—	—
Using group comments (e.g., stating that there is talking instead of pointing out who is talking and asking them to stop)	—	—	—	—	—
Pointing out how behaviors affect others' well being or their ability to learn (e.g., stating that talking keeps others from hearing the teacher)	—	—	—	—	—

Note. Item loadings are from the rotated solution. F1 = Factor 1; F2 = Factor 2; F3 = Factor 3. Boldface signifies loadings onto the assigned scale.

proposed two-factor structure. That is, CAPSLE Use items loaded on the first factor and CAPSLE Helpfulness items loaded on the second factor. The two-factor structure accounted for 75.6% of the variance. Table 2 shows the results from the factor analyses, the teacher survey scales and their items, as well as coefficient alphas for each scale.

For the Year 3 data, in which items were added to capture additional constructs (i.e., Influence and Classroom Management Attitudes), attempts to extract factors failed due to communalities over 1.0 (this Heywood case was observed across models with differing number of factors specified). The model converged on an interpretable solution, however,

when the Classroom Management Attitudes items were removed. The results of the Year 3 factor analysis, also shown in Table 2, indicated a three-factor structure consistent with the hypothesized structure, i.e., CAPSLE Use (Factor 2), CAPSLE Helpfulness (Factor 3), and Influence (Factor 1). The three-factor solution accounted for 73.1% of the variance. The difficulty with including the Classroom Management Attitudes items into the factor structure may be from inadequate sample size or may indicate that these items do not have a common factor structure. That is, teachers' attitudes about the various classroom management practices described by the items may not come from a common source or reflect a cohesive set of practices. In fact, these items showed marginal internal consistency as a scale ($\alpha = .67$). In other words, although the items may have face validity as classroom management practices promoted by CAPSLE, they form a minimally cohesive scale. Therefore, interpretation of results using the Classroom Management Attitudes scale should be interpreted with the marginal reliability of this scale in mind.

To compute a score for each scale of the teacher survey, teachers' responses were averaged across items (items are listed by scale in Table 2). The 6-point (0–5) response set for CAPSLE Use was *Rarely/never*, *Few times/month*, *Few times/week*, *Almost daily*, *1–2 times/day*, and *3+ times/day*. The 5-point (0–4) response set for CAPSLE Helpfulness was *Not at all helpful*, *A little helpful*, *Somewhat helpful*, *Generally helpful*, and *Greatly helpful*. The 5-point (0–4) response set for Influence was *Not at all*, *A little*, *Somewhat*, *Quite a lot*, and *Greatly*. The 5-point (0–4) response set for Classroom Management Attitudes was *Not at all effective*, *A little effective*, *Somewhat effective*, *Generally effective*, and *Greatly effective*.

As a test of the criterion validity for the CAPSLE Use scale, teachers' responses to the CAPSLE Use items were compared to independent observations of reflection time available from Year 1 (of the independent observations made, only data for reflection time was recorded systematically). Observational data

were available for 41 of the 50 and 35 of the 51 teachers who completed the teacher survey in Years 2 and 3, respectively. Missing observational data were from some teachers joining the schools in Year 2 or 3. Of the 41 teachers from Year 2, 20 were observed using reflection time (A = Adherent) and 21 were never observed using reflection time (NA = Not Adherent); of the 35 teachers from Year 2, 18 were observed using reflection time (A) and 17 were never observed using reflection time (NA). Supporting the criterion validity of the CAPSLE Use scale, adherent teachers, compared to nonadherent teachers, reported significantly greater CAPSLE use in Year 2, $M_A = 2.36$, $SD_A = 1.10$, vs. $M_{NA} = 1.38$, $SD_{NA} = 0.85$, $t(39) = 3.22$, $p < .01$; and in Year 3, $M_A = 2.48$, $SD_A = 0.92$, vs. $M_{NA} = 1.51$, $SD_{NA} = 0.89$, $t(33) = 3.15$, $p < .01$. In addition, adherent and nonadherent teachers showed significant differences on all scale items in both years, including the item specific to the behavior observed (i.e., reflection time), for Year 2, $M_A = 2.70$, $SD_A = 1.34$, vs. $M_{NA} = 1.52$, $SD_{NA} = 1.12$, $t(39) = 3.15$, $p < .01$; and for Year 3, $M_A = 2.44$, $SD_A = 1.54$ vs. $M_{NA} = 1.12$, $SD_{NA} = 0.93$, $t(33) = 3.06$, $p < .01$.

Student attitudes. We assessed students' empathy toward victims of aggression and their attitudes regarding the legitimacy of aggression with two scales of the Peer Experiences Questionnaire (Dill, Vernberg, Fonagy, Twemlow, & Gamm, 2004; Vernberg, Jacobs, & Hershberger, 1999). The Empathy scale consists of three statements expressing concern for victims of aggression (e.g., "I feel bad when I see a kid get bullied or picked on"). The Aggression is Legitimate (AL) scale consists of seven statements endorsing aggression and victimization of peers as a legitimate and warranted action (e.g., "A kid who gets picked on must have done something wrong"). For both scales, students indicated agreement on a 4-point scale (*I don't agree at all*, *I agree a little*, *I agree a lot*, and *I completely agree*). Responses to all scale items were averaged to compute scale scores. These scales demonstrated good internal consistency: for Empathy, $\alpha = .84$, $\alpha = .88$, and $\alpha = .84$; and for

AL $\alpha = .81$, $\alpha = .84$, and $\alpha = .86$, in Years 1, 2, and 3, respectively.

Student bystander behavior. Students' behavior as bystanders of bully–victim interactions was assessed using peer report on two sets of behavioral nomination items. The Helpful Bystander scale assessed students' reputations for helping victims when they are being bullied with three items (e.g., “Tries to stop it when they see a kid get bullied or picked on”). The Aggressive Bystander scale assessed students' reputations for encouraging and joining in when classmates are bullying others with three items (e.g., “Joins in or cheers when they see a kid get bullied or picked on”). For each item, participants circled an unlimited number of individuals on a classroom roster who fit the indicated description. Scale scores were calculated by dividing the total number of nominations by the total number of possible nominations across the three scale items.

Study Procedures

The study of teacher adherence was conducted during Years 2 and 3 of a 3-year cluster randomized controlled trial comparing CAPSLE to an alternative intervention (i.e., psychiatric consultation on school teams to address concerns about individual students) and to a “treatment as usual” condition. Because this study focused on adherence to the CAPSLE program, only data from the CAPSLE condition were analyzed.

Treatment integrity was promoted starting in Year 1 following four steps outlined by Kazdin (1986): define the intervention, provide training in intervention implementation, supervise treatment implementation, and assess implementation. In accordance with the first step, creators of CAPSLE developed a manual that delineated the intervention, its theoretical basis, and implementation procedures (Twemlow et al., 1999). Second, all teachers attended an all-day CAPSLE training in-service at the beginning of each of the 3 years of the implementation study. Third, an implementation team consisting of the manual authors and teachers, administrators, and staff

from the initial pilot school provided ongoing supervision to teachers, administrators, and staff at the three schools randomly assigned to the CAPSLE intervention condition during the first 2 years of the implementation study. The implementation team was withdrawn in Year 3, making this year a maintenance phase for CAPSLE. The teacher report of CAPSLE adherence (CAPSLE Use) was designed to address the fourth step, assessment of implementation.

Informed, written consent for student participation was obtained from parents at the beginning of each school year at enrollment and via letters sent home with students. Students with parental consent were given the option of nonparticipation; however, very few students chose not to participate. Children did not receive incentives for participation. Teachers were compensated monetarily for completing the teacher survey and other measures used for the larger study.

Students in Grades 3–5 completed self-report questionnaires and peer nomination forms in the spring of Years 1, 2, and 3 as part of the larger study of CAPSLE's effectiveness. Trained research assistants administered student measures over three 15- to 45-min sessions held about a week apart for each measurement occasion. Teachers at the three elementary schools participating in the CAPSLE program completed the teacher survey in Years 2 and 3 of the intervention study. Teachers returned the completed surveys to research assistants, and their responses were kept confidential from school administrators.

Results

Teacher Adherence

As anticipated, the CAPSLE Use scale was sensitive to variability in teachers' implementation. Individual scores ranged from 0 to 4.25 in Year 2 and from 0 to 4.00 in Year 3, indicating that some teachers reported daily use of the intervention whereas others openly reported zero adherence. Means and standard deviations for teacher-reported CAPSLE Use by school and year are presented in Table 3. We evaluated differences among schools and

Table 3
Teacher Adherence: Means and Standard Deviations for Each Scale and Item by School and Year

Element: CAPSLE Use	Year	School			
		A	B	C	All
Total	2	2.4 (1.3)	1.1 (1.0)	1.9 (0.6)	1.9 (1.0)
	3	2.3 (1.1)	1.3 (0.8)	2.0 (0.7)	1.9 (1.0)
Behavior Management Concepts	2	3.0 (1.8)	1.3 (1.3)	2.3 (0.9)	2.3 (1.5)
	3	2.7 (1.5)	1.6 (1.2)	2.8 (1.2)	2.4 (1.4)
Prosocial Concepts	2	3.0 (1.7)	1.4 (1.2)	2.9 (1.4)	2.5 (1.6)
	3	2.5 (1.4)	2.0 (1.4)	3.0 (1.3)	2.5 (1.4)
Reflection Time	2	2.6 (1.4)	1.2 (1.3)	2.2 (0.8)	2.1 (1.3)
	3	2.8 (1.5)	1.1 (0.9)	1.1 (0.9)	1.7 (1.4)
Relaxation Response	2	0.8 (1.1)	0.6 (1.0)	0.3 (0.5)	0.6 (0.9)
	3	1.2 (1.0)	0.6 (1.0)	0.9 (1.0)	0.9 (1.0)

Note. Data reflect responses only from teachers participating in both years. Reported mean values are average item ratings. $N = 14$ for School A; $N = 10$ for School B; $N = 13$ for School C; Total $N = 37$.

changes over time in teachers' overall CAPSLE Use in the classroom using a mixed, repeated-measures analysis of variance with one within-subjects factor (Year) and one between-subjects factor (School). Because of teacher turnover (all three schools had 4–5 teachers leave after Year 2 and 4–7 new teachers begin in Year 3), only teachers who participated in both years were included in analyses to test Year and School effects. Results indicated a significant main effect for school, $F(2, 34) = 4.46, p < .05, \eta^2 = .21$. Post hoc Sheffé tests ($p < .05$) indicated CAPSLE Use in School A was consistently higher than in School B. There was no significant main effect for Year or for the Year \times School interaction. As a test of teacher turnover effects, independent sample t tests of reported adherence among those present in both years ($N = 37$), Year 2 only ($N = 13$), and Year 3 only ($N = 14$) indicated no significant differences. The Holm-modified Bonferroni method controlled for experiment-wise error resulting from multiple analyses for each pairing of the three groups (Jaccard & Guilamo-Ramos, 2002).

We examined whether teachers implemented some elements of CAPSLE more than others and whether schools differed in their

use of each element using a mixed, repeated-measures multivariate analysis of variance with two within-subjects factors (Item and Year) and one between-subjects factor (School). Results indicated a significant main effect for Item, $F(3, 32) = 34.84, p < .001, \eta^2 = .77$, which was qualified by a significant Item \times School interaction, $F(6, 64) = 2.84, p < .05, \eta^2 = .21$. This interaction was further qualified by a significant Year \times Item \times School interaction, $F(6, 64) = 3.12, p < .01, \eta^2 = .23$. Follow-up analyses for Year 2 and Year 3 separately indicated a significant within-subjects main effect for Item in both years, $F(3, 102) = 37.49, p < .001, \eta^2 = .52$, and $F(3, 102) = 23.54, p < .001, \eta^2 = .41$, respectively. This effect was qualified by significant Item \times School interactions in both years, $F(6, 102) = 3.01, p < .01, \eta^2 = .15$, and $F(6, 102) = 4.11, p = .001, \eta^2 = .20$, respectively. Results of the within-subjects contrasts indicated that, in both years, promotion of the Relaxation Response was used less often than all other elements, $F(1, 34) = 55.35, p < .001, \eta^2 = .62$, and $F(1, 34) = 11.06, p < .01, \eta^2 = .25$, respectively, for Year 2 and Year 3. In Year 3, Reflection Rime was also used significantly less than Behavior

Table 4
Means (Standard Deviations) and Bivariate Correlations Between Scales of
the Teacher Survey

	Use T2 1.80 (1.05)	Use T3 1.86 (0.93)	Help T2 1.61 (0.91)	Help T3 2.21 (0.92)	Infl T3 3.19 (0.60)	Att T3 2.98 (0.53)
1. Use T2	—					
2. Use T3	.72**	—				
3. Help T2	.52**	.48**	—			
4. Help T3	.56**	.52**	.68**	—		
5. Infl T3	.32*	.32 [†]	.55**	.65**	—	
6. Att T3	.04	.13	.18	.23	.24	—

Note. $n = 50$ for Year 2 means and Year 2–Year 2 correlations, $n = 51$ for Year 3 means and Year 3–Year 3 correlations, and $n = 37$ for Year 2–Year 3 correlations. T2 = Time 2, T3 = Time 3, Use = CAPSLE Use, Help = CAPSLE Helpfulness, Infl = Influence, Att = Classroom Management Attitudes.

[†] $p = .05$.

* $p < .05$.

** $p < .01$.

Management Concepts and Prosocial Concepts, $F(1, 34) = 13.85$, $p = .001$, $\eta^2 = .29$. These contrast effects were qualified by interactions with School, $F(2, 34) = 4.24$, $p < .05$, $\eta^2 = .20$, for the Year 2 Reflection Time vs. Relaxation Response contrast, $F(2, 34) = 4.15$, $p < .05$, $\eta^2 = .20$, for the Year 3 Reflection Time vs. Relaxation Response contrast, and $F(2, 34) = 8.39$, $p = .001$, $\eta^2 = .33$, for the Year 3 Behavior Management Concepts vs. Reflection Time contrast. Inspection of the means in Table 3 indicates that the significant School \times Contrast interactions were from the relatively low use of all elements by School B.

Relation of Adherence With Teacher Attitudes

Analyses investigating the relation of CAPSLE Use with indicators of teachers' attitudes addressed the research question of whether teachers whose attitudes were consistent with the CAPSLE philosophy were more likely to use the intervention. Means, standard deviations, and bivariate correlations among subscales of the teacher survey are shown in Table 4. As expected, teacher-reported CAPSLE Use was positively and significantly correlated with CAPSLE Help-

fulness and positively correlated at the trend level with Influence; however, it was not significantly related to Classroom Management Attitudes. CAPSLE Use and CAPSLE Helpfulness were also highly stable over time. Year 2 CAPSLE Helpfulness was highly correlated with Year 3 CAPSLE Use, and Year 2 CAPSLE Use was highly correlated with Year 3 CAPSLE Helpfulness. In addition, a repeated-measures analysis of variance indicated that teachers' perceptions of CAPSLE's utility increased significantly over time, $F(1, 36) = 15.03$, $p < .001$, $\eta^2 = .30$.

Teacher-Reported Adherence and Student Outcomes

To complement the analyses showing variability in adherence, additional analyses addressed the question of whether inter-teacher variability in CAPSLE use affected students' attitudes and behaviors. A series of prospective analyses of partial variances (Cohen, Cohen, West, & Aiken, 2003) evaluated the relation of teacher-reported CAPSLE use to changes in student attitudes and behaviors from the previous year. For each analysis, the relevant student outcome variable (i.e., empathy, aggression is legitimate, aggressive bystanding, and helpful bystanding) for Year 2

Table 5
Summary of Hierarchical Regression Analyses Predicting Student Outcomes

Outcome predictors	Year 2		Year 3	
	Adj. R^2	β	Adj. R^2	β
Empathy				
Empathy (Prev.)	.27**	.39**	.29**	.55**
Use (Cur.)		.29**		.03
AL				
AL (Prev.)	.27**	.45**	.23**	.49**
Use (Cur.)		-.22**		-.03
HelpBy				
HelpBy (Prev.)	.25**	.31**	.12**	.24**
Use (Cur.)		.39**		.31**
AggBy				
AggBy (Prev.)	.40**	.59**	.23**	.49**
Use (Cur.)		-.14 [†]		-.04

Note. $N = 122$ for Year 2; $N = 119$ for Year 3. Prev. = Previous Spring; Cur. = Current Spring; Use = CAPSLE Use; AL = aggressive legitimate; HelpBy = helpful bystanding; AggBy = aggressive bystanding.

[†] $p = .05$.

* $p < .05$.

** $p < .01$.

or 3 served as the dependent variable. CAPSLE use measured concurrently with the outcome variable and the previous spring's measurement of the outcome variable (i.e., Year 1 or 2) were entered as independent variables (see Table 5). For example, student empathy measured in the spring of Year 2 was predicted by teacher CAPSLE use in Year 2, controlling for student empathy in spring of Year 1. Because students completed questionnaires used in this study only in Grades 3–5 to ensure adequate reading level, these analyses included data from fourth- and fifth-grade teachers and their students who had data available from the current year (fourth or fifth grade) and previous year (i.e., third or fourth grade). As expected, teacher-reported CAPSLE use in Year 2 was significantly associated with changes during that year in student-reported empathy, student-reported attitudes that aggression is legitimate, and peer-reported helpful bystanding. There was also a trend for aggressive bystanding. These associations were in the expected directions. In Year 3, teacher-reported

CAPSLE use was significantly associated with changes in helpful bystanding only.

Discussion

As expected, teachers and schools varied in their reported adherence to CAPSLE's classroom management component. Variability in adherence reflected differences in some teacher attitudes and was related to changes in students' attitudes and responses to bullying. In regard to teachers' attitudes, findings suggest that teachers' perceptions of CAPSLE's helpfulness may have been an important factor in their decisions to integrate it into their classrooms. We found evidence at the trend level that this decision may have also been influenced by the degree to which they shared CAPSLE's philosophy that teachers can positively affect students' academic achievement via their influence on the student group dynamic. Notably, results of prospective analyses suggest that teachers' use of the CAPSLE classroom management component was re-

lated to students' attitudes and behaviors related to bullying. To be specific, we found consistent evidence that students in classrooms with more adherent teachers were seen by peers as more helpful to victims of bullying relative to students in other classrooms, even when student behavior from the previous year was considered. The study also revealed, albeit less consistently, more peaceful attitudes (i.e., greater empathy and less agreement with preaggression attitudes) and less aggressive bystanding among students with more adherent teachers relative to students in other classrooms.

Variability in Teacher-Reported Adherence

The variability we identified in teacher-reported use of the CAPSLE classroom management component was consistent with concerns present in the violence-prevention literature that treatment adherence may vary among teachers and schools (Howard et al., 1999; Hunter et al., 2001; Roland, 1989; Stevens et al., 2001). In addition, findings indicated teachers used CAPSLE concepts more than other elements such as daily reflection time, suggesting that teachers may be more likely to use elements that can be integrated into their teaching than those that could pose a diversion from the typical classroom routine.

Although issues of social desirability are a concern when using self-report instruments, the correspondence of teachers' self-reported adherence with independently observed adherence supported the validity of the self-report measure developed for this study. Further, the variability in reported adherence and in teachers' open-ended comments solicited at the end of the survey provide further evidence that they took the questionnaire seriously and felt comfortable providing an honest assessment of their adherence and attitudes related to the intervention. Whereas some comments spoke favorably of CAPSLE, others verbalized concern about the demands of data collection on classroom time or stated that the teacher saw no need to change his or her current approach

to classroom management. Nonetheless, interpretation of absolute fidelity based on self-reported data should be made with caution, because self-reports may overestimate fidelity (Lane et al., 2004).

Possible Determinants of Teacher Adherence

Findings also contribute to a growing literature on factors that may influence teacher adherence to school-based interventions and, arguably, to an intervention's effectiveness. Consistent with previous research (Kallested & Olweus, 1992; Ringwalt et al., 2003), teachers' use of the intervention was related to their perceptions of its utility and the degree to which their beliefs were consistent with the intervention's guiding principles.

Surprisingly, teachers' adherence was not related to their attitudes about classroom management techniques. We had expected that teachers would be more likely to use CAPSLE if their views on what constitutes effective classroom management corresponded with the methods endorsed by CAPSLE. Whereas the marginal internal consistency of the Classroom Management Attitudes scale could have limited our ability to detect a significant relation, other interpretations are also plausible. It could be that some teachers tried CAPSLE concepts even when they held differing views. Alternatively, some teachers whose views closely coincided with CAPSLE may have chosen not to endorse the intervention or may not have recognized that CAPSLE classroom management guidelines were consistent with their own practices. It is also possible that some teachers may have reported using CAPSLE concepts without fully understanding them, despite efforts to provide training and ongoing supervision consistent with best practices for enhancing treatment fidelity. Data on teachers' understanding of the intervention would have contributed to our assessment of intervention fidelity. Unfortunately, an attempt to assess teachers' knowledge about CAPSLE resulted in too low a response rate to be informative.

As to why teachers in School A reported greater adherence than did School B, we can offer findings from post hoc analyses and conjecture. We ran post hoc analyses to see if differences among schools in teacher attitudes (i.e., CAPSLE Helpfulness, Influence, Class Management Attitudes) might be congruent with school differences in adherence. School A did not stand out in terms of teachers' beliefs about CAPSLE helpfulness or their influence on peers and academics, but showed a trend for attitudes about classroom management. As such, it is possible that the conceptualization for CAPSLE fit with School A's general approach to classroom management. Another possibility that we observed informally was greater buy-in from the school principal. The principal at School A was especially enthusiastic about the intervention and actively sought feedback and input from the consultation team. Having such a champion for the intervention may have provided the leadership and energy needed to promote greater adherence among teachers (Vernberg & Gamm, 2003).

Teacher Adherence and Student Outcomes

This study provided empirical evidence of dose effects, which have been suspected but seldom tested in the violence-prevention literature (Howard et al., 1999; Hunter et al., 2001; Roland, 1989; Stevens et al., 2001). These findings also build on empirical evidence for CAPSLE's effectiveness (Fonagy et al., 2005, in press; Twemlow, Fonagy, Sacco, Gies et al., 2001) with data showing that greater use among teachers could increase its effectiveness. It is interesting that helpful bystanding behavior was the student outcome most consistently affected by teachers' use of CAPSLE, considering the intervention's unique emphasis on bystanders' roles in increasing, maintaining, and attenuating bully-victim problems.

It is unclear why the effects for student attitudes and aggressive bystanding were observed in Year 2 but not Year 3 of the study. One possible explanation is that teachers have the most effect in the early stages of the inter-

vention and effects plateau as classrooms are filled with students with previous exposure to the intervention. Notably, teachers' reported use across the 2 years remained stable, suggesting decreased implementation did not play a role. Although social desirability can affect self-reports, correspondence of teacher-reported adherence with independently observed adherence and teachers' observed openness to reporting zero adherence suggest this was not an issue. However, because independent observations of adherence were available only in Year 1 and were not available for teachers who joined the schools in Years 2 and 3, we cannot rule out the possibility of drift. By Year 3, even teachers who reported a higher use of CAPSLE may not have implemented it with the greatest fidelity. The addition of teachers in Year 3 when supervision from the implementation team was phased out could have contributed to a mismatch between perceived and actual fidelity to the model. Nonetheless, findings that teacher use of the intervention was related to changes in key student outcomes related to bullying suggest that teachers' use of the intervention is important to its success.

Limitations

Findings from this study should be interpreted in light of a few limitations. First, teachers reported adherence only during the second and third years of the 3-year trial, limiting our ability to provide information about teachers' initial perceptions and use of CAPSLE. Second, direct observation data were available only in Year 1, thus limiting our ability to assess correspondence of reported and observed adherence for all teachers and across all 3 years. Third, measurement of teachers' attitudes, particularly the CAPSLE Helpfulness and Influence scales, used relatively few items. We aimed to limit time demands for teachers; however, the limited item set may have restricted the degree to which we fully captured the constructs. Fourth, the advantages of self-reports should be balanced with careful consideration of their drawbacks. Finally, results of the factor analyses of the

teacher survey should be viewed as preliminary, because small sample sizes can produce unstable parameter estimates (Preacher & MacCallum, 2002). Findings utilizing the Classroom Management Attitudes scale should be interpreted with particular caution because of the difficulty including it in the teacher survey's factor structure and its marginal internal consistency.

Another limitation was the inability to partial out variance at the student, teacher, and school levels using hierarchical linear modeling, consistent with the nested nature of these data. Although a sample of over 50 teachers across three schools can be considered a good size, it was not sufficient for hierarchical linear modeling models to converge. Results indicating dose effects in this study should be interpreted in light of the limitations of regression analysis with nested data. We hope future studies will employ hierarchical linear modeling to build on our preliminary findings of the effects of teacher adherence on student outcomes.

Implications for Intervention and the Study of Treatment Outcomes

This study provided clear evidence that treatment adherence must be assessed rather than assumed (Kazdin, 1986; Moncher & Prinz, 1991; Yeaton & Sechrest, 1981); it informs the development and judicious use of self-report measures of adherence in future school-based intervention studies. As recommended by Calsyn (2000) for developing fidelity measures, we were able to demonstrate important psychometric properties of the CAPSLE Use scale, including its internal consistency and test-retest reliability, content validity, and criterion validity. Self-reports, however, should not be considered a panacea, as they do not always correspond well with observed adherence (Gresham, 2005) and can overestimate fidelity (Lane et al., 2004). We contend that more direct methods are preferable. Considering the low frequency of fidelity measurement in school-based outcome studies (Gresham et al., 1993) and the barriers to their inclusion in whole-school interventions, our approach to developing intervention-specific

self-report measures of adherence provides a much-needed option for assessing treatment fidelity efficiently in the context of school-based effectiveness studies.

Our findings of dose effects are particularly noteworthy considering that teacher-reported CAPSLE use was rather low. At best, teachers reported using each element daily, on average; at worst, their use of some elements averaged less than once a month. These rates are particularly concerning for interventions like CAPSLE that are designed to act via integration into the daily routine and climate of the school. Although it is encouraging that even such low treatment fidelity could have a positive effect on students' attitudes and behaviors, these rates of use raise concerns about the sustainability of a low rate of treatment use. At this time, it is unclear how likely teachers are to sustain their use of the intervention if it is not used on a regular basis. We believe daily use is optimal, for not only implementing CAPSLE as designed, but also for helping school staff and students create peaceful habits of daily interaction. As such, it appears that promotion of teacher buy-in and use of school-based interventions are important to their success and sustainability.

Our findings shed light on the promotion of teacher adherence by examining correlates of teachers' use of the intervention. Specifically, our study revealed the importance of teachers' perceptions of the intervention's utility and the degree to which the intervention fits with their existing belief systems. Findings also suggest that efforts to increase an intervention's use from the onset may have a snowballing effect on teachers' perceptions (i.e., the more they use it, the more they see it as effective and use it). Therefore, surveying teachers' attitudes about an intervention and their sense of empowerment could be important for assessing system readiness prior to launching an intervention effort and could be informative for determining ways to increase implementation in projects that are already underway. Commonly reported barriers to the successful implementation of school-based violence prevention efforts and potential solutions are discussed by Vernberg and Gamm

(2003). Bellg and colleagues (2004) also provide recommendations for enhancing treatment fidelity in health behavior change that may also apply to school-based violence prevention.

In sum, the results of the study underscore the importance of measuring, rather than assuming, treatment fidelity, and provide some valuable information about using self-reports to assess adherence. Findings support the judicious use of self-reported adherence as an efficient means of assessing treatment fidelity. Most importantly, results indicated the importance of teacher use of the intervention for promoting changes in students' attitudes and behaviors related to bullying.

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