

EFFECTS OF PARTICIPATION IN A MARTIAL ARTS–BASED ANTIBULLYING PROGRAM IN ELEMENTARY SCHOOLS

STUART W. TWEMLOW

Menninger Department of Psychiatry, Baylor College of Medicine

BRIDGET K. BIGGS, TIMOTHY D. NELSON, AND ERIC M. VERNBERG

Clinical Child Psychology Program, University of Kansas

PETER FONAGY

Department of Psychiatry, University College, London

STEPHEN W. TWEMLOW

School of Martial & Meditative Arts, Topeka, Kansas

This study evaluated the Gentle Warrior Program, a traditional martial arts–based intervention to reduce aggression in children, as it was implemented in three elementary schools. The sample consisted of 254 children in grades 3, 4, and 5 who participated in the Gentle Warrior Program as part of a larger school violence intervention. Results indicated that boys who participated in more Gentle Warrior sessions reported a lower frequency of aggression and greater frequency of helpful bystanding (i.e., helpful behavior toward victims of bullying) over time, relative to boys with less frequent participation. The effect of participation on aggression was partially mediated by empathy. The effect of participation on helpful bystanding was fully mediated by changes in student empathy. No significant results were found for girls. Results of the study provide preliminary support for the use of martial arts–based interventions to address bullying in schools for boys, by teaching empathy, self-control, and peaceful strategies to resolve conflicts. © 2008 Wiley Periodicals, Inc.

For years, school violence has been acknowledged as a common problem in the United States (Smith, Twemlow, & Hoover, 1999) and abroad (Olweus, 1994). Aggressive behaviors such as bullying can have consequences for bullies, victims, and the school as a whole (Grossman et al., 1997; Smith et al., 1999; Van Schoiack-Edstrom, Frey, & Beland, 2002). Traditional methods of dealing with school bullying such as suspension and expulsion may be ill-suited to address the challenges of reducing violence in schools, because they lack a systematic intervention to change the beliefs that support aggression. In an attempt to address this pervasive problem, many schools and communities are trying to develop policies and procedures that effectively reduce bully–victim problems and the serious violence that sometimes follows extreme or chronic bullying (Twemlow, Fonagy, Sacco, O’Toole, & Vernberg, 2002).

Interventions at the schoolwide level have attempted to reduce school violence by changing the school culture with regard to bullying: Some whole-school approaches try to get adults in the school to be more aware of bullying problems and more active in preventing such interactions (e.g., Olweus, 1994). In addition to activating adults, many school interventions attempt to change the attitudes of students toward bullying and aggression through lectures and classroom discussion (e.g., Van Schoiack-Edstrom et al., 2002).

Research was supported by the Menninger Foundation, Child and Family Center, Topeka Kansas, and the Department of Psychiatry, Baylor College Medicine, Houston Texas.

Staff and students involved in the Peaceful Schools Project, USD 501, Topeka, Kansas, did the majority of the work and provided most of the good ideas for this work. Larry Wolgast, Pat McElliott, Martin Gies, Debora Hess, and Ruth Mott were pivotal in implementing the project. Anne Jacobs, Michael Wright, Edward Dill, and Bridget Biggs played a valuable role in organizing and coordinating data collection.

Correspondence to: Stuart W. Twemlow, M.D., The Menninger Clinic, 2801 Gessner Drive, PO Box 809045, Houston, TX 77280. E-mail: stuart.twemlow@gmail.com

Martial arts training is one method of intervention that may be well-suited for changing students' aggressive behaviors and attitudes toward aggression. It is important to distinguish from the start between *traditional martial arts* instruction, characterized by a substantial emphasis on the psychological, spiritual, and nonaggressive aspects of the art, and *modern martial arts*, which tends to underemphasize these aspects and focuses instead on competition and aggression (Fuller, 1988). Training in traditional martial arts has been associated with a decrease in aggressive thoughts and behavior (Nosanchuk, 1981; Nosanchuk & MacNeil, 1989; Zivin et al., 2001), whereas modern martial arts training has been associated with an increase in aggressive thoughts (Nosanchuk & MacNeil, 1989; Trulson, 1986). Building on this literature, the present study evaluated the Gentle Warrior Program, a traditional martial arts–based intervention specifically designed to reduce aggression in school children.

Psychosocial Benefits of Martial Arts

Although the literature examining the psychosocial effects of traditional martial arts is limited, most research suggests potential benefits. Specifically, martial arts training has been associated with lower levels of aggression (Skelton, Glynn, & Berta, 1991) and anxiety (Kurian, Caterino, & Kulhavy, 1993), and increases in warm-heartedness (Pyecha, 1970) and independence (Kurian et al., 1993).

A few intervention programs relying in part on traditional martial arts training have been designed and implemented for aggressive children and adolescents. Trulson (1986) reported decreases in self-reported aggression and anxiety, along with increases in self-esteem, for a group of aggressive male adolescents after a 6-month training program in traditional martial arts. These improvements were largely maintained at a 1-year follow up. In contrast, a group receiving nontraditional martial arts training focused entirely on fighting skills actually increased in aggression, whereas a control group that engaged in supervised physical activity did not change significantly. More recently, Zivin and colleagues (2001) tested a traditional martial arts intervention on a sample of boys with bullying behaviors in a large urban middle school. Results indicated a significant decrease in violent behavior for the treatment group and no change over time for the controls. Also, improved schoolwork and increases in self-reported happiness were noted for participants in the treatment condition. Four-month follow-ups showed that the behavioral improvements were maintained. Following the posttreatment data collection, the control group was given the intervention and showed improvements similar to those of the original treatment group.

Although studies of traditional martial arts interventions have offered some evidence of promise, many important questions remain unanswered (Twemlow & Sacco, 1998). Most germane to the present study, it is unknown whether the traditional martial arts interventions delivered to selected children in small groups in the Zivin and colleagues (2001) and Trulson (1986) studies can be delivered successfully to a larger group, such as an entire school. Studies of martial arts as a psychosocial intervention thus far have only studied boys, so the effects of such programs for girls are unknown. Likewise, previous work has intervened with aggressive adolescents only. It remains to be seen if traditional martial arts can change the behavior of other groups of interest, such as children who are not highly aggressive but contribute to bully–victim problems through occasional aggression or aggressive bystanding. Earlier work has occurred in middle or junior high schools, so it is unclear if these programs can be effective at the elementary school level. This study attempts to address these issues.

Gentle Warrior Program

The Gentle Warrior Program is a component of Creating A Peaceful School Learning Environment (CAPSLE), which aims to reduce school violence by promoting a social ethos in which

bully–victim problems are viewed not only as unhealthy for the larger peer group (Twemlow, Sacco, & Twemlow, 2000), but also as a product of a larger social system that inadvertently fails to address violence among children in an effective manner. This system includes the children themselves, but also teachers, support staff, administrators, volunteers, and parents. All members of a group (e.g., school, classroom) participate in bully–victim interactions when they occur; individuals who are not directly engaged in or are the target of bullying serve as bystanders whose behavior either promotes or discourages bullying. According to the CAPSLE philosophy, peace is promoted by changing the entire social dynamic surrounding bully–victim interactions, not just the behaviors of those who bully and are victimized. As such, central tenets are respect for others and building a sense of responsibility among students and adults alike to stop bullying when they witness it (Twemlow, Fonagy, & Sacco, 2004).

Using a traditional martial arts model, the Gentle Warrior Program attempts to contribute to this shift in social climate by offering each student instruction in peace-promoting philosophy (nonaggressive attitudes, respect for self and others), self-protective techniques, and problem-solving skills related to common bully–victim-bystander scenarios. The program aims to change children’s attitudes about aggression and facilitate the development of effective social problem-solving skills. The program may be especially effective in promoting problem solving because children are encouraged to engage in physical practice of appropriate responses, rather than merely discussing them verbally. Role plays encourage students to apply skills in responding effectively to aggression, without reciprocating with aggression, and in generating and choosing appropriate prosocial responses, rather than aggressive ones, to typical daily dilemmas. In addition to addressing typical victim and bully roles, the program is unique among martial arts–based interventions in its attempt to address the behavior of bystanders to aggressive encounters. By attempting to change beliefs and attitudes about aggression, the curriculum teaches bystanders to come to the aid of victims (i.e., to be a *helpful bystander*), rather than to encourage violent interactions. The overall aim of the Gentle Warrior Program, then, is that students will be victimized less often, aggress less often, and help victims when they are bystanders to bully–victim interactions.

One way by which the Gentle Warrior Program may promote behavioral change is via changes in students’ beliefs and attitudes about aggression. Previous research has demonstrated the central role of attitudes toward aggression as a mediator of aggressive behavior (Guerra & Slaby, 1990; Slaby & Guerra, 1988; Vernberg, Jacobs, & Hershberger, 1999). Like many traditional martial arts approaches, the Gentle Warrior Program emphasizes a philosophy of nonaggression (i.e., negative sanctioning of aggression except when defending oneself or others), self-control, empathy, and respect. In doing so, the program may effectively challenge beliefs and attitudes supporting aggression by providing an alternative system of beliefs.

Evidence suggests that the CAPSLE program, of which the Gentle Warrior Program is a key component, is a successful intervention for decreasing school violence. In a pilot study, Twemlow and colleagues (2001) reported a significant drop in school suspension rates following the implementation of the CAPSLE intervention in two elementary schools. Substantial decreases in visits to the principal’s office for problem children have also been noted (Smith et al., 1999). Of interest in this current study is whether students who participated in the Gentle Warrior Program evidence changes in victimization by peers, aggression toward peers, and helping victims of peer aggression and whether these changes are mediated by student empathy and attitudes about aggression. Furthermore, the current study builds on previous research on the effectiveness of martial arts–based interventions by studying its effects on a large, school-based sample that included girls as well as boys.

Hypotheses

We predicted that students' participation in Gentle Warrior sessions would be associated with decreases in aggressive behavior and peer victimization and with increases in helpful bystander behavior. In addition, we expected that these associations would be mediated by changes in students' attitudes, in particular their empathy toward victims and the degree to which they believe that aggression is legitimate and warranted.

METHOD

Participants

The children participating in the study were recruited from public elementary schools that were implementing the CAPSLE program as part of a 3-year cluster-randomized controlled trial of school-based aggression/bullying prevention programs (Fonagy et al., in press). A total of 254 children (147 boys and 107 girls) in grades 3–5 (98 third graders, 78 fourth graders, 78 fifth graders) composed the sample for the study, based on a selection of students who were enrolled in a school receiving CAPSLE and completed the measures used in this study. The sample was 59.8% White, 22.4% African American, 16.5% Hispanic-American, and 1.2% Native American. More than half (61%) of children lived in low-income households, as indicated by eligibility for free or reduced fee lunches. The schools were located in a large central city (population 250,000) in the Midwest region of the United States.

Procedure

Parents of all students in the CAPSLE intervention schools were asked to give written permission for their child to participate in the larger research project and in the Gentle Warrior training sessions. Overall, 74% of parents gave their permission. Children with parental permission took part in the Gentle Warrior intervention and in the data collection procedure.

Data for this study were obtained during the third year of the intervention trial, which was a maintenance phase following actively managed implementations in the first 2 years. Questionnaire data were gathered in November 2001 (Time 1) and April 2002 (Time 2). The questionnaires were administered within the classroom setting by trained research assistants who were available to answer questions from the children. Children were assured that their individual answers would not be shared with anyone in the school. To ensure confidentiality, students were asked not to write their names on the measures and placed their completed questionnaires directly into an envelope. For each time period, children completed a series of questionnaires over three sessions of 15–45 minutes, although only a subset of these measures was used for this study.

After the data collection at Time 1, the children participated in the CAPSLE intervention. The CAPSLE intervention featured a number of components detailed by Fonagy and colleagues (in press) including the Gentle Warrior Program taught by a martial arts instructor. Because the third year was an intervention maintenance phase, the program consisted of three 45-minute Gentle Warrior training sessions rather than the lengthier version (nine 45-minute sessions) that were administered in the first 2 years of the intervention. Emphasis was placed on nonaggression, respect for self and others, self-control, and relaxation techniques. No aggressive movements were taught. Self-protective techniques taught included blocking, escapes, defensive positioning, and balance. Children were also taught various ways of avoiding physical conflicts, such as using one's voice when faced with a potentially aggressive peer.

The Gentle Warrior curriculum was highly structured. Each session began with breathing and relaxation exercises designed to increase the children's awareness and control over their physiological arousal. Next, children were led through stretching exercises in preparation for the lesson. After stretching, children were taught defensive techniques, role-played common bully-victim-bystander situations, and engaged in a question and answer discussion of philosophy with the martial arts instructor. Throughout the instruction, the basic philosophical foundations of nonaggression, self-awareness, respect for self and others, and self-control were reinforced through question and answer discussion. At the conclusion of the session, the lesson was reviewed, another brief period of relaxation was practiced, and stories depicting traditional martial arts values were shared. Data were collected following the intervention at Time 2 using the same measures and protocol described for Time 1.

Measures

Demographics. The school district provided information about gender, grade, ethnicity, and free/reduced lunch status for all students with parental informed consent.

Gentle Warrior Participation. The instructor for the Gentle Warrior sessions recorded students' participation in each session. The total number of sessions attended was used in the analyses and ranged from 0 to 3.

Gentle Warrior Skill Acquisition. The instructor rated children's acquisition of the 16 skills taught in the Gentle Warrior sessions based on observations of their performance of these skills during the lessons. Possible ratings were 0 = skill not demonstrated, 1 = skill partially demonstrated (does most of the skill but makes errors), 2 = skill demonstrated (performed skill well at least once), and 3 = skill mastered (performed skill more than once). Skills fell into three categories. *Ground skills* included four physical maneuvers to escape from harm if one gets knocked onto the ground. *Standing skills* included three physical maneuvers to escape physical danger and two assertive communication skills (verbal and nonverbal). *Mental skills* included articulation of six concepts important for the Gentle Warrior and CAPSLE philosophy: knowing how to relax one's body; the roles of bully, victim, and bystander; peaceful ways of dealing with bullies; how to break up fights peacefully and safely; and defining respect and self-control.

Aggression. Aggression toward others was assessed using 10 items comprising the *Victimization of others (VO)* scale of the Bully-Victim Questionnaire (Dill, Vernberg, Fonagy, Twemlow, & Gamm, 2004). Items assess major forms of aggression, including overt aggression (hitting, kicking, grabbing) and relational aggression (ignoring, telling lies about someone). For each item, students indicated on a five-point scale (never, once or twice, a few times, about once a week, or a few times a week) how often they engaged in the type of aggression over the past 3 months. Possible scores ranged from 10 to 50 for each scale, with higher scores indicating greater aggression. High internal consistency was noted in previous work with early adolescents (Vernberg et al., 1999) and with elementary age children (Dill et al., 2004). Cronbach's α for the fall and spring measurements for this study were .92 and .94, respectively.

Victimization. The Victimization of Self (VS) scale of the Bully-Victim Questionnaire measured children's self-reported peer victimization (Dill et al., 2004). Composed of 10 items, the VS scale assesses a broad range of experiences including overt physical victimization (e.g., "A kid hit, kicked, or pushed me in a mean way"), overt verbal victimization (e.g., "A kid teased me in a mean way"), relational victimization ("A kid told lies about me so other kids wouldn't like me"), and

ostracism (“Some kids left me out of things just to be mean to me”). Using a scale from 1 (never) to 5 (a few times a week), children reported the frequency with which they were bullied by other children in the previous 3-month period. Cronbach’s α for the fall and spring measurements for this study were .91 and .92, respectively.

Bystander Behavior. Helpful bystander behavior was assessed with three items assessing students’ tendency to help victims during bully–victim interactions (e.g., “I try to stop it when I see a kid get bullied or picked on”). Students were asked to indicate on a four-point scale (almost never, sometimes, most of the time, or always) how often each of the items applied to them over the past 3 months. Scores in this sample covered the entire range of possible scores from 3 to 12, with higher scores indicating greater helping behavior. Cronbach’s α for the fall and spring measurements for this study were .73 and .79, respectively.

Attitudes Toward Aggression. Student attitudes regarding aggression were assessed with seven items comprising the Aggression is Legitimate (AL) scale of the Bully–Victim Questionnaire (Dill et al., 2004; Vernberg et al., 1999). Items on this scale ask students to indicate their level of agreement with seven statements suggesting that aggression toward peers is legitimate and warranted (e.g., “It’s okay to be a bully sometimes.”). For each item, students rated their level of agreement on a four-point scale (I don’t agree at all, I agree a little, I agree a lot, or I completely agree). Scores in this sample ranged from 7 to 28, covering the entire range of possible scores. High scores on the AL scale indicate a greater acceptance of the belief that aggression is legitimate. Cronbach’s α for the fall and spring measurements for this study were .80 and .81, respectively. The empathy scale consists of three items assessing children’s agreement with statements expressing concern for victims of aggression (e.g., “I feel bad when I see a kid get bullied or picked on.”) indicated on the same four-point scale. Observed scores in this sample ranged from 3 to 12, covering the entire possible range. Higher scores on the empathy scale indicate a greater concern for victims of aggression. Cronbach’s α for the fall and spring measurements for this study were .84 and .88, respectively.

RESULTS

Preliminary Analyses

As a fidelity check, ratings of students’ skill acquisition were completed at the conclusion of the Gentle Warrior sessions. Ratings were completed for all participating students except 30 children who were absent during the last Gentle Warrior session when skill performance was rated ($n = 238$). In general across the 16 skills, students demonstrated the full range of skill acquisition, from not at all demonstrated to full mastery (i.e., skill performed accurately multiple times). Exceptions to this pattern occurred in nonverbal and verbal assertive communication skills, for which all students demonstrated this skill at least partially (i.e., made some mistakes). On average, students demonstrated ground, standing, and mental skills at least once (mean [M] = 1.99, standard deviation [SD] = .51 for ground skills; $M = 1.96$, $SD = .46$ for standing skills; $M = 2.18$, $SD = .49$ for mental skills), indicating that students generally acquired and were able to perform the skills taught in the Gentle Warrior sessions.

Analysis of variance (ANOVA) tested for differences in the dependent variables (i.e., aggression, victimization, helpful bystander behavior) by gender, race/ethnicity, and grade (see Table 1). Boys reported more aggression than did girls in both the fall, $F(1,252) = 8.50$, $p < .01$, and spring, $F(1,252) = 11.51$, $p < .01$. There was a significant effect of grade for helpful bystander behavior in the fall, $F(1,251) = 12.21$, $p < .001$, and spring, $F(1,251) = 14.07$, $p < .001$. Post hoc Sheffé tests ($p < .05$) indicated that helpful bystander behavior was greatest among third graders and least among fifth graders with a significant difference among all three grades. Significant effects of ethnic

Table 1
Means and (Standard Deviations) by Gender, Race/Ethnicity, and Grade

	Gender		Race/Ethnicity				Grade			Total sample <i>n</i> = 254
	Girls <i>n</i> = 107	Boys <i>n</i> = 147	W <i>n</i> = 152	AA <i>n</i> = 57	H <i>n</i> = 42	NA <i>n</i> = 3	3rd <i>n</i> = 98	4th <i>n</i> = 78	5th <i>n</i> = 78	
Gentle Warrior sessions attended	2.64 (.85)	2.52 (1.08)	2.64 (.90)	2.47 (1.07)	2.48 (1.13)	2.00 (1.73)	2.54 (1.04)	2.54 (1.05)	2.64 (.87)	2.57 (.99)
Aggression										
Preintervention	11.60 ^a (2.71)	13.73 ^b (7.21)	12.02 ^a (3.89)	16.14 ^b (9.66)	11.45 ^a (2.86)	10.67 (1.15)	11.92 (4.98)	13.45 (6.91)	13.37 (5.64)	12.83 (5.85)
Postintervention	12.12 ^a (3.49)	15.09 ^b (8.34)	12.93 ^a (6.03)	17.11 ^b (10.02)	12.88 ^a (4.85)	11.32 (1.53)	13.02 (6.72)	14.14 (7.20)	14.56 (7.54)	13.84 (7.13)
Victimization										
Preintervention	14.63 (6.93)	15.61 (8.34)	15.44 (7.99)	15.94 (8.31)	13.45 (6.30)	13.00 (1.73)	16.28 (9.18)	15.34 (7.91)	13.69 (5.14)	15.20 (7.78)
Postintervention	16.14 (8.40)	15.73 (7.51)	16.00 (8.18)	16.01 (7.68)	15.56 (7.49)	13.48 (.83)	16.57 (8.82)	16.17 (7.97)	14.78 (6.40)	15.90 (7.89)
Helpful bystander										
Preintervention	8.55 (2.54)	8.71 (2.93)	8.82 (2.74)	8.32 (2.97)	8.52 (2.66)	7.83 (2.02)	9.54 ^a (2.51)	8.61 ^b (2.75)	7.55 ^c (2.73)	8.64 (2.77)
Postintervention	8.39 (2.72)	8.24 (3.00)	8.50 (2.87)	7.96 (3.03)	8.10 (2.79)	8.00 (2.65)	9.29 ^a (2.43)	8.30 ^b (2.93)	7.08 ^c (2.92)	8.31 (2.88)

Notes. W: White; AA: African American; H: Hispanic; NA: Native American/American Indian. Superscripts denote significant mean differences (Scheffé tests, $p < .05$) by gender, race/ethnicity, and grade. NA not included in race/ethnicity mean comparisons due to low sample size.

group for aggression in the fall, $F(1,248) = 12.71$, $p < .001$, and spring, $F(1,248) = 7.94$, $p < .001$ were explained by a tendency for African-American students to report greater aggression compared to European-American and Hispanic students, as indicated by post hoc Sheffé tests ($p < .05$)¹. In light of these group differences, gender, grade, and ethnicity were entered as control variables in the primary analyses.

Associations of Gentle Warrior Participation with Student Behavior

Table 2 presents bivariate correlations of Gentle Warrior participation with each of the outcome variables. Our primary focus was the association of Gentle Warrior participation with changes in aggression, victimization, and helpful bystander behavior, which we tested using analysis of partial variance, which uses hierarchical multiple regression (Cohen, Cohen, West, & Aiken, 2003). For the three separate models predicting postintervention aggression, victimization, and helpful bystander behavior, preintervention scores were entered on the first step to control for different baseline levels and to examine change over time. Second, gender, grade, and ethnicity (dummy coded African American/non-African American and Hispanic/non-Hispanic) were entered as control variables. Finally, Gentle Warrior participation and a Gentle Warrior participation \times Gender interaction term were entered individually in sequential steps. The Gentle Warrior participation variable was mean-centered for the main effect and interaction term to reduce effects of multicollinearity that occurs

¹ Because of a low sample size ($n = 3$), data for Native-American students were not included in tests of race/ethnic group differences.

Table 2
Bivariate Correlations Among Gentle Warrior (GW) Participation and Outcome Variables for Girls and Boys

	GW Participation	Aggression T1	Aggression T2	Victimization T1	Victimization T2	Helpful bystander behavior T1	Helpful bystander behavior T2
GW Participation	–	.03	.07	.15	.17	.16	.03
Aggression T1	.04	–	.47**	.11	.10	–.16	–.07
Aggression T2	–.26**	.66**	–	.05	.18	–.15	–.12
Victimization T1	–.10	.25**	.08	–	.57**	.37**	.25**
Victimization T2	–.06	.22**	.29**	.40**	–	.26**	.23*
Helpful bystander behavior T1	–.15	–.36**	–.31**	.15	.13	–	.52**
Helpful bystander behavior T2	.03	–.32**	–.43**	.13	–.03	.65**	–

Notes. Correlations for girls ($n = 107$) are above the diagonal; correlations for boys ($n = 147$) are below the diagonal. T1: Time 1/preintervention; T2: Time 2/postintervention.
 * $p < .05$. ** $p < .01$.

in analyses with moderator effects (Cohen et al., 2003). Table 3 summarizes the results of the hierarchical regression models.

Aggression. Gentle Warrior participation was significantly associated with change in aggression from pre- to postintervention, and this effect was moderated by gender. To interpret this effect, the analyses were conducted separately for boys and girls to calculate the gender-specific regression slopes (Cohen et al., 2003). Results indicated that the effect was significant for boys ($\beta = -.31$, $t = -5.34$, $p < .001$) but not for girls ($\beta = .14$, $t = .18$, not significant). These results revealed that boys who had more frequent Gentle Warrior exposure reported less aggression over time relative to boys who participated less often.

Table 3
Summary of Regression Analyses Predicting Postintervention Aggression, Victimization, and Helpful Bystander Behavior

Step	Variable entered	Aggression		Victimization		Helpful bystander behavior	
		ΔR^2	β	ΔR^2	β	ΔR^2	β
1	T1 of dependent variable	.43**	.63**	.21**	.16**	.36**	.57**
2	Gender	.01	.10*	.01	–.05	.03*	–.07
	African American		.03		–.01		–.01
	Hispanic		.00		.02		–.02
	Grade		.07		–.03		–.17**
3	Gentle Warrior participation	.04**	.03	.00	.14	.00	–.09
4	Gender \times Gentle Warrior participation	.03**	–.30**	.00	–.12	.01*	.19*

Note. T1: Time 1/preintervention.
 * $p < .05$. ** $p < .01$.

Victimization. In the model predicting postintervention victimization, only preintervention victimization was a significant predictor. Gentle Warrior participation was not significantly associated with change in victimization over the study period.

Helpful Bystander Behavior. Gentle Warrior participation was significantly associated with a change in helpful bystander behavior, and, similar to the aggression model, this effect was moderated by gender. Results of post hoc analyses revealed that the effect was significant for boys ($\beta = .15$, $t = 2.28$, $p < .05$) but not for girls ($\beta = -.07$, $t = 0.97$, not significant). These results indicated that boys who had greater participation in Gentle Warrior reported greater helpful bystander behavior over time relative to boys who participated less often.

Mediation of Student Attitudes

Mediation analyses (Baron & Kenny, 1986) tested whether changes in student attitudes accounted for the effect of Gentle Warrior participation in predicting changes in aggressive and helpful bystander behavior for boys. According to Baron and Kenny (1986), the first criterion for mediation is that Gentle Warrior participation must be significantly associated with a change in aggression. Second, the relationship between Gentle Warrior participation and change in attitudes must be significant. Third, the relationship between change in attitudes and change in aggression must be significant. Finally, shared variance between change in attitudes and Gentle Warrior participation must be such that when change in attitudes is entered before Gentle Warrior participation in predicting aggression, the relationship between Gentle Warrior participation and aggression is reduced. To represent change in student attitudes (i.e., empathy, aggression is legitimate), we used the unstandardized residuals resulting from a linear regression in which the postintervention measurement was regressed on the preintervention measurement. This procedure provides a measure of an individual's change that is more appropriate than a simple difference score (Cohen et al., 2003).

Mediation of the Effect on Aggression. Because Gentle Warrior participation was found to be associated with changes in aggression and helpful bystander behavior for boys only, girls were excluded from the mediation analyses. Criterion 1 for mediation, a significant association between Gentle Warrior participation and change in aggression, was established in prior analyses (see results above). Criterion 2 was established for changes in empathy but not for changes in the attitude that aggression is legitimate in that Gentle Warrior participation was significantly associated with changes in empathy ($\beta = .16$, $t = 2.14$, $p < .05$) but not with changes in the attitude that aggression is legitimate ($\beta = -.11$, $t = -1.31$, not significant), although the effect was in the anticipated direction. We conducted no further analyses testing the mediational model for aggression is legitimate, because Criterion 2 was not met for this hypothesized mediator. Criterion 3 was met for change in empathy in that it was significantly associated with changes in aggression ($\beta = -.19$, $t = -3.04$, $p < .01$). Finally, with regard to Criterion 4, the association of Gentle Warrior participation with change in aggression (controlling for the effects of grade and ethnicity) was reduced slightly ($\beta = -.31$, $p < .001$ to $\beta = -.29$, $p < .001$) when the empathy change score was entered in the prior step in the regression model. Partial mediation was suggested by a Sobel test of the indirect effect of Gentle Warrior participation on change in aggression via change in empathy ($t = -1.75$, $p = .08$).

Mediation of the Effect on Helpful Bystander Behavior. As with the model for aggression, Criterion 1 for mediation, a significant association between Gentle Warrior participation and change in helpful bystander behavior was established in prior analyses (see results for boys above). In terms of Criterion 2, as stated above, we conducted mediation analyses only for empathy, because Criterion 2 was not met for the hypothesized effect of changes in the attitude that aggression is legitimate. Criterion 3 was met for change in empathy in that it was significantly associated with changes in

helpful bystanding ($\beta = .42, t = 7.83, p < .001$). Finally, with regard to Criterion 4, the association of Gentle Warrior participation with change in helpful bystanding (controlling for the effects of grade and ethnicity) was reduced to a nonsignificant level ($\beta = .15, p < .001$ to $\beta = .07$, not significant) when the empathy change score was entered in a prior step in the regression model, indicating full mediation. Full mediation was further supported by a Sobel test of the indirect effect of Gentle Warrior participation on change in helpful bystanding via change in empathy ($t = 2.06, p < .05$).

DISCUSSION

Analyses indicated that participation in the Gentle Warrior Program was significantly related to aggression and helpful bystander behavior for boys after controlling for baseline scores. Consistent with expectations, Gentle Warrior participation was negatively associated with change in aggression and positively associated with change in helpful bystander behavior. Boys who participated in more sessions reported less aggression and more helpful bystander behavior over time compared to boys who participated in fewer sessions. For boys, program participation also predicted a change in empathy, and this change was found to mediate, or explain, the relationship between participation and helpful bystander behavior and to partially mediate the relationship between participation and aggression. It should be noted that, although Gentle Warrior participation was significantly related to a change in bullying behavior and helpful bystander behavior for boys, the amount of variance explained in each case was relatively small. This is not surprising given the short duration of the intervention in this study; future work investigating the effects of a longer exposure appears warranted. Finally, the positive results observed in this study were limited to boys. For girls, Gentle Warrior participation was not a significant predictor of the behaviors of interest.

The significant findings for boys in this study are consistent with past research supporting the benefits of traditional martial arts, in general (e.g., Trulson, 1986; Zivin et al., 2001), and the Gentle Warrior Program, specifically (e.g., Twemlow & Sacco, 1998). The finding that Gentle Warrior participation is significantly related to helpful bystander behavior adds to the literature on martial arts interventions and supports the program's ability to influence the behavior of bystanders as well as bullies, seen as a key to change of behavior in complex social systems (Twemlow, Fonagy, & Sacco, 2004). The role of empathy as a mediator is new in the literature on martial arts interventions and is consistent with research that suggests the importance of attitudes in participation in violent interactions (e.g., Vernberg et al., 1999). This variable is a measure of mentalization, the capacity of the mind to be aware of the mental states of self and others, associated with optimal health (Fonagy, Gergely, Jurist, & Target, 2002). Improving mentalization in students has been associated with improved academic performance (Fonagy, Twemlow, Vernberg, Sacco, & Little, 2005) and in creating a peaceful, nonviolent school environment (Twemlow, Fonagy, & Sacco, 2005).

This study failed to find a significant relationship between Gentle Warrior participation and the outcome variables for girls. Because this study is among the first evaluations of a martial arts intervention to include girls, it is difficult to interpret this finding in light of previous research. Girls reported significantly less aggression than did boys; therefore, it could be that aggression among girls was not substantially high at baseline to observe a statistically significant change. Gender differences in the type of aggression used may have also played a role. Previous research has demonstrated that girls tend to use relational forms of aggression (e.g., Crick & Grotpeter, 1995), and these forms may not have been as thoroughly targeted by the intervention as were physical forms of aggression. This question could be addressed by comparing the effectiveness of Gentle Warrior in its current form to an enhanced version that more specifically targets relational forms of aggression. Alternatively, martial arts-based training may have different benefits for girls such as increased assertiveness or

self-esteem. The Gentle Warrior trainer observed increased assertiveness and self-confidence among young girls; these changes were not observed empirically in the current study but would be important outcomes to examine in future trials.

Although not of central interest in this study, our findings revealed some noteworthy demographic differences in aggression and helpful bystanding. Preliminary analyses indicated that boys and African-American children were most aggressive and that older children (fifth grade) engaged in less helpful bystanding behavior compared to younger children (i.e., third grade). These findings are consistent with previous research that has shown that boys and ethnic minority children are at greater risk for aggressive and violent behavior (Aber, Brown, & Jones, 2003), with gender differences being most pronounced for overt forms of aggression (Rose & Rudolph, 2006). Very little scholarly work has focused on bystander behavior; however, our findings related to age are consistent with previous research findings that suggest that children's endorsement of prosocial interpersonal negotiation strategies tend to decline in middle childhood whereas their endorsement of aggressive strategies increases (Aber et al., 2003).

Limitations and Directions for Future Research

A number of limitations of this study should be noted. One important limitation was the relatively short duration of the Gentle Warrior intervention. Participants attended a maximum of three training sessions in this third year of a larger implementation study. Despite this relatively brief exposure, positive effects were noted. Almost all children had participated in a longer sequence of Gentle Warrior training offered in the previous 2 years, and the effects noted here may represent the impact of the "booster sessions" offered as a follow-up to this earlier, more extensive training. Because the same lead instructor was involved in training across the 3 years, positive expectations based on prior experiences and continuity of relationships may have played a role in producing the effects found here. Unfortunately, participation in the Gentle Warrior sessions was not tracked at the level of individual children until the third year of the intervention study, so we were unable to gauge the impact of the more extended nine-session training sequence offered earlier in the overall project.

Another limitation of this study was the reliance on self-report of victimization and helpful bystander behavior. Although self-report was used to maximize sensitivity to change over a short period of time, it is possible that social desirability bias affected responses. This was a particular concern for self-report of aggression because this behavior is seen as socially undesirable and may be subject to underreporting (Perry, Kusel, & Perry, 1988; Stone & Lamanek, 1990). However, because the analyses focused on change over time and this study occurred during the third year of the larger intervention, social desirability bias should not have differentially influenced preintervention versus postintervention reporting. It is possible that all aggression was underreported, but there is little reason to believe that this underreporting occurred in a systematic way that would affect the analyses conducted.

It should also be noted that, even when significant intervention effects were observed, there was an increase in the mean level of aggression over time, regardless of the degree of participation in the Gentle Warrior Program. This finding suggests that participation in the program might not actually decrease aggressive behavior over time, but rather might limit a natural increase in aggression that characterizes the developmental trend at this age (Aber et al., 2003; Vernberg et al., 2008). Future work using a no-treatment control group would be helpful in clarifying this issue. Analyses of the effects of CAPSLE compared to an alternative intervention and delayed intervention control groups indicate that students in CAPSLE schools showed less peer reported victimization, less aggression and aggressive bystanding, and less of a decline in empathy (awareness of the plight of other victimized children) than those in either control group (Fonagy et al., in press). However, because

the Gentle Warrior Program was administered within a larger intervention study and students within this treatment condition were not randomly assigned to Gentle Warrior and control conditions, confounds such as the effects of other aspects of the larger intervention on students' behavior could not be definitively ruled out.

Despite these limitations, that the frequency of participation in Gentle Warrior was related to behavioral change from pre- to postintervention indicates that further evaluation of the intervention's effects is warranted. Future evaluation of the Gentle Warrior Program should measure relevant outcome behaviors prior to any exposure to the intervention and study the intervention's effects over a longer exposure to treatment. Greater exposure to the intervention should allow for a more informative evaluation of the clinical significance of changes associated with participation in the program. Future work should also compare children receiving the Gentle Warrior intervention to a control group not receiving the intervention. Such a design would be helpful in separating the effects of the intervention from normal developmental trends. Finally, future work appears warranted in understanding how boys and girls may have differentially viewed Gentle Warrior and in identifying means of changing girls' attitudes about aggression and mentalizing capabilities as a means of reducing the degree to which they engage in and respond to aggressive behavior.

CONCLUSIONS

The positive effects found in this study provide preliminary empirical support for the Gentle Warrior Program as a promising intervention for decreasing bullying behavior and increasing helpful bystander behavior among boys by changing their capacity to mentalize, or empathize with victims of aggression. The effects found in this study are additionally compelling in light of the limited exposure to the intervention (i.e., three sessions) the students received during the study period. On a broader scale, the current study suggests that traditional martial arts-based programs, which are based on the concepts of self-control, respect, and nonviolence, may be a fruitful avenue for schools to explore in addressing bullying while also meeting the demands for physical education curricula.

REFERENCES

- Aber, J. L., Brown, J. L., & Jones, S. M. (2003). Developmental trajectories toward violence in middle childhood: Course, demographic differences, and response to school based intervention. *Developmental Psychology, 39*, 324–348.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*, 1173–1182.
- Cohen, J., Cohen, P., West, L. S., & Aiken, S. G. (2003). *Applied multiple regression/correlation analysis for the behavioral sciences* (3rd ed.). Mahwah, NJ: Erlbaum.
- Crick, N. R., & Grotpeter, J. K. (1995). Relational aggression, gender, and social-psychological adjustment. *Child Development, 66*, 710–722.
- Dill, E. J., Vernberg, E. M., Fonagy, P., Twemlow, S. W., & Gamm, B. K. (2004). Negative affect in victimized children: The roles of social withdrawal, peer rejection, and attitudes to bullying. *Journal Abnormal Child Psychology, 32*, 139–173.
- Fonagy, P., Gergely, G., Jurist, E., & Target, M. (2002). *Affect regulation, mentalization and the development of the self*. New York: The Other Press.
- Fonagy, P., Twemlow, S. W., Vernberg, E. M., Nelson, J. M., Dill, E. J., Little, T. D., et al. (2007). A cluster randomized controlled trial of a child-focused psychiatric consultation and a school systems-focused intervention to reduce aggression. Manuscript submitted for publication.
- Fonagy, P., Twemlow, S. W., Vernberg, E. M., Sacco, F. C., Little, T. D. (2005). Creating a peaceful school learning environment: The impact of an anti-bullying program on educational attainment in elementary schools. *Medical Science Monitor, 11*, 317–325.
- Fuller, J. R. (1988). Martial arts and psychological health. *British Journal of Medical Psychology, 61*, 317–328.
- Grossman, D. C., Neckerman, H. J., Koepsell, T. D., Liu, P. Y., Asher, K. N., Beland, K., et al. (1997). Effectiveness of a violence prevention curriculum among children in elementary school: A randomized controlled trial. *Journal of the American Medical Association, 277*, 1605–1611.
- Guerra, N. G., & Slaby, R. G. (1990). Cognitive mediators of aggression in adolescent offenders: II. Intervention. *Developmental Psychology, 26*, 269–277.

- Kurian, M., Caterino, L. C., & Kulhavy, R. W. (1993). Personality characteristics and duration of ATA tae kwon do training. *Perceptual and Motor Skill*, 76, 363–366.
- Nosanchuk, T. A. (1981). The way of the warrior: The effects of traditional martial arts training on aggressiveness. *Human Relations*, 34, 435–444.
- Nosanchuk, T. A., & MacNeil, M. L. (1989). Examination of the effects of traditional and modern martial arts training on aggressiveness. *Aggressive Behavior*, 15, 153–159.
- Olweus, D. (1994). Bullying at school; basic facts and effects of a school-based intervention program. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 35, 1171–1190.
- Perry, D. G., Kusel, S. J., & Perry, L. C. (1988). Victims of peer aggression. *Developmental Psychology*, 24, 807–814.
- Pyecha, J. (1970). Comparative effects of judo and selected physical education activities on male university freshman personality traits. *Research Quarterly*, 4, 425–431.
- Rose, A. J., & Rudolph, K. D. (2006). A review of sex differences in peer relationship processes: Potential trade-offs for the emotional and behavioral development of girls and boys. *Psychological Bulletin*, 132, 98–131.
- Skelton, D. L., Glynn, M. A., & Berta, S. M. (1991). Aggressive behavior as a function of Tae kwon do ranking. *Perceptual and Motor Skills*, 72, 179–182.
- Slaby, R. G., & Guerra, N. G. (1988). Cognitive mediators of aggression in adolescent offenders: I. Assessment. *Developmental Psychology*, 24, 580–588.
- Smith, J., Twemlow, S. W., & Hoover, D. W. (1999). Bullies, victims and bystanders: A method of in-school intervention and possible parental contributions. *Child Psychiatry and Human Development*, 30, 29–37.
- Stone, W. L., & Lamanek, K. L. (1990). Developmental issues in children's self-reports. In A. M. La Greca (Ed.), *Through the eyes of the child: Obtaining self-reports from children and adolescents* (pp. 18–56). Boston: Allyn & Bacon.
- Trulson, M. E. (1986). Martial arts training: A novel "cure" for juvenile delinquency. *Human Relations*, 39, 1131–1140.
- Twemlow, S. W., Fonagy, P., & Sacco, F. C. (2004). The role of the bystander in the social architecture of bullying and violence in schools and communities. *Annals of New York Academy of Sciences*, 1036, 215–232.
- Twemlow, S. W., Fonagy, P., & Sacco, F. C. (2005). A developmental approach to mentalizing communities: The Peaceful Schools experiment. *Bulletin of the Menninger Clinic*, 69, 282–304.
- Twemlow, S. W., Fonagy, P., Sacco, F. C., Gies, M. L., Evans, R., & Ewbank, R. (2001). Creating a peaceful school environment: A controlled study of an elementary school intervention to reduce violence. *American Journal of Psychiatry*, 158, 808–810.
- Twemlow, S. W., Fonagy, P., Sacco, F. C., O'Toole, M. E., & Vernberg, E. M. (2002). Premeditated mass shootings in schools: Threat assessment. *Journal of the American Academy of Child and Adolescent Psychiatry*, 41, 475–477.
- Twemlow, S. W., & Sacco, F. C. (1998). The application of traditional martial arts practice and theory to the treatment of violent adolescents. *Adolescence*, 33, 505–518.
- Twemlow, S. W., Sacco, F. C., & Twemlow, S. W. (2000). *Creating a peaceful school learning environment: A training program and philosophy for elementary schools*. Agawam, Massachusetts: T & S Publishing Group.
- Van Schoiack-Edstrom, L., Frey, K. S., & Beland, K. (2002). Changing adolescents' attitudes about relational and physical aggression: An early evaluation of a school-based intervention. *School Psychology Review*, 31, 201–217.
- Vernberg, E. M., Jacobs, A. K., & Hershberger, S. L. (1999). Peer victimization and attitudes about violence during early adolescence. *Journal of Clinical Child Psychology*, 28, 386–395.
- Vernberg, E. M., Jacobs, A. K., Nelson, J. M., Little, T. D., Twemlow, S. W., Fonagy, P., et al. (2008). Developmental trends in peer aggression, victimization, bystanding, and aggression related attitudes. Manuscript submitted for publication.
- Zivin, G., Hassan, N. R., DePaula, G. F., Monti, D. A., Harlan, C., & Hossain, K. D. (2001). An effective approach to violence prevention: Traditional martial arts in middle school. *Adolescence*, 36, 443–459.