

A COMPUTER-BASED VIOLENCE PREVENTION INTERVENTION FOR YOUNG ADOLESCENTS: PILOT STUDY

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ABSTRACT

Technology must be explored as a means of teaching adolescents ways to resolve conflict without violence. This paper reports on the development and pilot testing of a multimedia tool (SMART Talk) that teaches anger management, perspective taking, and mediation skills using games, interactive assessment interviews, cartoons, and animation. Results indicate that SMART Talk is popular with both males and females, and its use increases knowledge and practice of prosocial behaviors.

Violence in the adolescent population is a serious public health problem (Hammond & Yung, 1993). Adolescents are at increasing risk for exposure to violence either as a victim, witness, or perpetrator (Gladstein, Rusonis, & Health, 1992). Homicide is the second leading cause of death among 15- to 24-year-olds, and the third leading cause of death among 10- to 14-year-olds (Cochanek & Hudson, 1994). Approximately 135,000 students bring guns to school every day, and a child is killed or injured by a gun every 36 minutes (Slavin & Stiber, 1990). Unfortunately, these numbers are only the tip of the iceberg; they do not reflect the number of violent and aggressive acts that do not lead to homicide, or the psychological impact of violence in the middle school years.

Schools and other organizations that serve youth have begun implementing various programs aimed at the prevention of violence (Cueto, Bosworth, & Sailes, 1993; Hausman, Spivak, Prothrow-Stith, & Roeber, 1992; Wilson-Brewer, Cohen, O'Donnell, & Goodman, 1991). Because of the complexity of the problem, a variety of strategies must be employed. Some strategies involve traditional educational ap-

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proaches, while others, such as peer mediation, reflect attempts at innovation. Yet, few of these approaches have been systemically evaluated to a degree that would allow a determination of the most effective strategies or configuration of strategies.

The three approaches most frequently found in the school setting are curriculum, peer mediation, and specific interventions targeted at the most aggressive students. As can be seen in Table 1, each has limitations. While curriculum involves all students, the skills learned require practice and refinement before they can be consistently effective in resolving conflict. Peer mediation programs provide students for whom anger control is an issue with the skills to deal with immediate conflicts. Unfortunately, only those students who are trained or participate in mediation receive the benefits. In contrast, curricula expose everyone in a class to conflict resolution methods, but the timing and delivery are controlled by the teacher, not student need, and few will have sufficient opportunity to practice and receive coaching. The more resource-intensive, skill-building programs, such as anger replacement therapy (Goldstein & Glick, 1987), usually are offered only to the most aggressive teens. While each of these approaches has an important role to play in a comprehensive prevention strategy, shortcomings include the time and expense of teacher training, as well as the issues of intervention consistency, student control, and access to personal information.

A computer-based intervention could overcome many of these limitations. Computer-based interactive interventions have been successful with other complex interpersonal skills, health promotion, and prevention strategies (Bosworth, Gustafson, & Hawkins, 1994; Gustafson, Bosworth, Chewning, & Hawkins, 1987; Orlandi, Dozier, & Marta, 1990). Several unique features of the technology allow for branching, user control, personalization, flexibility, open access, and anonymity.

Table 1

Components of Violence Prevention Strategies

	Curriculum	Peer Mediation	Interventions
Teaching skills	X	X	X
Involve all students	X		
Practice skill	X*	X	X
Crisis intervention		X	X
Degree of training needed	Low	Medium	High
Timeliness		X	

*Practice components not included in all curricula.

This paper reports the results of a pilot study designed to test the efficacy of a computer-based (multimedia) violence prevention intervention for young adolescents (SMART Talk).

SMART Talk

The SMART Talk computer program engages young adolescents through games, simulations, cartoons, animation, and interactive interviews, enabling them to learn new ways of resolving conflict without violence. Although the six modules may be used sequentially, they are designed to stand alone and can be used in any order without losing continuity or impact. Modules have been developed in three areas: anger management, dispute resolution, and perspective taking.

Anger management. For adolescents, anger is a major precipitator of fighting or violence. The modules on anger (What's Anger?, Triggers and Fuses, Anger Busters, and Channel Surfin') are based on anger replacement therapy (ART; Feindler, Marriot, & Iwata, 1984; Goldstein, Sprafkin, Gershaw, & Klein, 1980). In What's Anger?, students learn about the anger cycle. In Triggers and Fuses, students identify, through an interactive interview, the situations and events that are likely to trigger their anger. In Anger Busters, seven ways to de-escalate anger are described. In Channel Surfin', anger management skills are practiced using a game format.

Dispute resolution. The dispute resolution module, Talking It Out, uses the branching and interactive interview capabilities of the computer to walk two adolescents who are in conflict through the problem-solving process. After reaching consensus on a solution, a contract for each adolescent is printed. Talking It Out can be accessed either by two students who are in a dispute or by a single user who is interested in the process.

Perspective taking. In the perspective-taking module, Celebrity Interviews, four celebrities (a recording artist, a football player, a comic book artist, and a columnist for a popular teen magazine) describe how they resolve conflict and manage stress in interpersonal relationships. Students have the opportunity to hear their responses to questions about how they handle anger and conflict.

Early in the program development process, nine teenagers, who had been trained as peer mediators in an established mediation program at an urban high school, were interviewed. These teenagers, representing a variety of socioeconomic and ethnic backgrounds, talked freely about both their experiences as mediators and their own personal experiences with conflict and anger. Their advice appears regularly throughout each of the modules. For example, in the module that teaches alternatives to fighting and arguing, teen panel members present examples of when they used a particular strategy, and elaborate on its effectiveness.

Hypotheses

On the basis of prevention theory and instructional design models (Bandura, 1976; Dreyfus & Dreyfus, 1986; Goldstein & Glick, 1987), it was hypothesized that SMART Talk users will (1) increase their repertoire of nonviolent strategies (knowledge); (2) increase their knowledge about what triggers their anger (self-knowledge); (3) increase their confidence in the ability to use nonviolent strategies (self-efficacy); (4) increase reported intentions to use nonviolent strategies (intentions); (5) decrease violent behavior; and (6) increase prosocial behavior.

Sample

In the present study, SMART Talk was pilot tested with seventh-grade students in a small-city middle school with a diverse socioeconomic population. For a 4-week period, students had access to SMART Talk in a lab setting. Although a staff person was available to answer questions, students worked independently. Most students used SMART Talk for a 40-minute class period. After each use, students completed a short questionnaire that inquired about satisfaction and suggestions for improvement.

In addition, 98 seventh graders completed the 175-item Teen Conflict Survey (pretest). Of these, 81 (83%) participated in a posttest 4 weeks later; thus, the final sample consisted of students who provided data at both test points. Fifty-five percent were female and 45% were male. The ethnic representation was 90% White, 6% Black, 3% Hispanic, and 1% other.

Survey Instrument

The Teen Conflict Survey was used to collect baseline data across a range of issues, including knowledge and attitudes regarding nonviolent and violent strategies of conflict resolution; self-efficacy as it relates to conflict resolution and anger management; intentions to use nonviolent strategies in conflict situations; self-reported caring and noncaring behaviors (i.e., helping others, fighting); and self-esteem, impulsivity, nonviolent role models, and peer influence. Although most items were derived from previously published materials (DeJong, Spiro, & Cross, 1992; Resnick, 1992), some were developed by the project investigators based on a thorough review of the literature on health behavior change, anger management, and conflict resolution.

Sixty-five items were retained for the posttest survey. These included items on knowledge, self-knowledge, confidence, nonviolent in-

tentions, prosocial behavior, and trouble behavior. In addition, several items assessing student perception of the computer program were included.

Students and parents provided informed consent. Pretest and posttest survey administration took place in two large groups situated in two areas of the school cafeteria. A trained reader was present in both locations and was accompanied by two survey monitors.

Dependent Variables

Knowledge. Four items were included to determine the level of declarative knowledge students gained from SMART Talk. In a multiple-choice format, students were asked at pretest and posttest to recognize the definition of a "trigger," an "anger buster," and a "short fuse." In addition, students were asked how people should react in situations that may trigger anger.

Self-knowledge. Knowledge of how personal behavior can escalate or de-escalate a conflict was assessed using an 8-item scale in which the students were asked to imagine that they were in a conflict situation. They had to indicate whether certain behaviors or reactions (i.e., fight, tell an adult, call the person names) would likely escalate the conflict. Responses were measured on a 4-point Likert scale, ranging from *very unlikely* (1) to *very likely* (4). Responses were summed, with higher scores indicating higher self-awareness and knowledge of actions that escalate conflicts (range = 8 to 32). Cronbach's alphas were .69 at pretesting and .70 at posttesting.

Prosocial behavior. Six items measured prosocial behavior. Students were asked how many times they performed a behavior (e.g., "helped other students solve a problem" and "helped someone stay out of a fight") in the last 30 days: *never* (0), *1 time* (1), *2 to 4 times* (2), or *more than 4 times* (3). Responses were then summed (range = 0 to 18). Cronbach's reliability coefficient was .64 at pretesting and .65 at posttesting.

Confidence. Confidence in the ability to manage anger and deal with conflict nonviolently was assessed using four items. Students were asked to what extent they agreed or disagreed with each statement (e.g., "I am confident in my ability to calm down when I am mad" and "I can learn how to stay out of a fight"). Responses ranged from *strongly disagree* (1) to *strongly agree* (5), and were summed (range = 4 to 20). Cronbach's reliability coefficient was .87 at pretesting and .85 at posttesting.

Intentions. An 8-item scale investigated students' intentions to use negotiation and other nonviolent strategies when faced with a conflict situation. Students were asked to indicate the likelihood, ranging from

very unlikely (1) to *very likely* (4), that they would consider using a number of anger reduction and negotiation strategies (e.g., “explore a variety of solutions,” “talk it out,” and “calm down and tell his or her story”). Responses were summed (range = 8 to 32). Cronbach’s reliability coefficient was .74 at pretesting and posttesting.

Trouble behavior. Students were asked how many times they had been in trouble at home, in the community, and at school in the last 30 days: *never or no opportunity* (0), *1 time* (1), *2 to 4 times* (2), or *more than 4 times* (3). Responses were summed (range = 0 to 9). Cronbach’s reliability coefficient was .79 at pretesting and .82 at posttesting.

Computer use. Students were asked to what extent they agreed or disagreed with the following statements: “the computer was fun,” “the computer was easy to use,” “I learned a lot using the computer program,” and “I would recommend the computer program to a friend.” Data were collected only on the posttest, with responses measured on a 4-point Likert scale, ranging from *strongly disagree* (1) to *strongly agree* (4). Cronbach’s alpha was .78 at posttesting.

Data Analysis

Chi-square statistics were used to analyze the difference in the percentage of correct answers on the multiple-choice knowledge items at pretesting and posttesting. To measure differences on other dependent variables (self-knowledge, prosocial behavior, confidence, intentions, and trouble behavior), paired *t* tests were conducted. A .01 significance level (Bonferroni adjustment) was applied. Frequencies for the last dependent variable, computer use, were also calculated.

RESULTS

During the pilot testing, 102 seventh graders used SMART Talk; 17 of them used it twice (total = 119 uses). Of those 119 uses, 41% were by males and 59% were by females. Nearly half of the time SMART Talk was used, there were two people at the computer. Table 2 identifies variations in module use.

Student Computer Use

The content of student responses concerning satisfaction fell into three categories: technical improvements, specific knowledge gained, and general comments.

Technical comments. Although the majority of the students offered no suggestions in this category, many identified areas where the directions were confusing. Other comments included: “make Triggers and

Table 2

Variations in Use of SMART Talk ($n = 119$)

	Number of Uses	%	Average Time (in minutes)
What's Anger?	40	34	2
Triggers and Fuses	73	61	4
Anger Busters	47	39	3
Channel Surfin'	113	95	9
Celebrity Interviews	67	56	3
Talking It Out	20	17	12

Fuses a little more lively," "What's Anger? has too much to read," and "in Celebrity Interviews, you could make the life story shorter."

Specific knowledge gained. Most students identified increased understanding or some knowledge gain as a result of using SMART Talk. After using Talking It Out, one female said, "I liked that if you have a fight, you can solve it on the computer." Another said, "... makes me be more understanding of people." A male said, "I think Talking It Out would help in a real fight." Other comments included: "It told me a lot of things to do when I am angry or when someone wants to fight me," "[It] makes me more understanding of people," and "Triggers and Fuses is good because it helps you understand about your anger." Several students said that SMART Talk "makes you think a lot."

General comments. General comments were all positive. One male said, "it was educational and fun!" A female said, "I liked Channel Surfin'. It puts you in a real situation." Most students described their use of SMART Talk as "fun," "challenging," "interesting," and "educational."

Survey Data

Significant positive outcomes were found except for increased confidence in using nonviolent strategies.

Knowledge. Declarative knowledge about conflict management terms and principles increased after computer use. Table 3 shows the percentages of students who answered each of the four multiple-choice items correctly on the pretest and posttest, together with their respective chi-square statistic.

Self-knowledge. There was a significant increase in the students' knowledge of how certain behaviors may contribute to the escalation of a conflict situation, $t(1, 80) = -2.64, p < .01$ (see Table 4). More specifically, students who recognized that fighting would escalate a

Table 3

Items Answered Correctly at Pre-Testing and Post-Testing

Item	Pre (% correct)	Post (% correct)	χ^2	<i>p</i>
A trigger is...	64%	90%	2.54	.10
Anger busters are...	36%	71%	3.61	.05
A short fuse is...	3%	81%	5.86	.05
If I know my triggers, I can...	51%	62%	.98	.79

Table 4

Results for Dependent Variables

Variable	Mean Score (standard deviation)		<i>t</i>	<i>df</i>
	Pre	Post		
Self-Knowledge	18.5588 (2.501)	20.9412 (5.081)	-2.64**	1,80
Prosocial Behavior	10.7625 (3.365)	12.2750 (3.409)	-3.14**	1,80
Intentions	16.3667 (3.079)	22.500 (2.862)	-10.12**	1,80
Confidence	15.4691 (3.245)	15.4321 (3.409)	.12	1,80
Trouble Behavior	2.8205 (2.304)	1.8974 (2.393)	2.45**	1,80

***p* < .01

conflict increased from 43% (pretest) to 77% (posttest). Moreover, students who felt that talking with the other person would de-escalate a conflict also increased from 27% and 75%.

Prosocial behavior. A significant increase was found in the students' self-reported frequency of prosocial behavior, $t(1, 80) = -3.14$, $p < .01$ (see Table 4). Students who reported helping another student solve a problem doubled from 15% (pre) to 30% (post). In addition, there was a decrease in name calling (two or more times) from 45% to 23%.

Intentions. A significant increase in students' intentions to use non-violent strategies was found, $t(1, 80) = -10.12$, $p < .01$ (Table 4). When presented with a hypothetical situation in which the student was a trained mediator and two disputing students requested assistance with a conflict, 10% of the respondents at pretesting, as compared with

67% at posttesting, intended to have the pair establish rules for the negotiation process. Further, 78% at posttesting, as compared with 44% at pretesting, intended to have the pair explore a number of solutions.

Confidence. There was no significant pre/post difference in the students' confidence in handling conflict situations using nonviolent strategies, $t(1, 80) = .12, p > .05$ (Table 4).

Trouble behavior. The number of times students reported getting into trouble at home, school, and in the community decreased significantly $t(1, 80) = 2.45, p < .01$ (Table 4). For example, from pretesting to posttesting, there was an increase in students who reported never getting into trouble at home (13% to 32%), at school (33% to 44%), and in the community (6% to 54%).

Perception of SMART Talk. When asked for their reactions to SMART Talk, 89% of the students found it easy to use, 91% agreed that it was fun, 68% agreed that they learned a lot, and 79% agreed that they would recommend SMART Talk to a friend.

DISCUSSION

The highest quality violence prevention program will have little impact if it does not actively engage young adolescents. This pilot evaluation of a unique multimedia violence prevention intervention revealed high acceptance by the target population. Both males and females were attracted to the technology and used a wide range of components. Nearly all (95%) used the most sophisticated game, Channel Surfin'. Although the interactive games had the highest frequency of use, about a third of the students viewed the most text-based module, What's Anger? Clearly, this medium is attractive to young adolescents, both for text-based information and for skill development through a game format.

Most computer-based educational interventions demonstrate increases in declarative knowledge, and SMART Talk was no exception. As might be expected, SMART Talk users learned the anger reduction vocabulary and increased their knowledge about potential reactions in conflict situations. It is important to note the dramatic increases in the percentage of students who could correctly define terms and concepts, even though only a third actually used What's Anger?, in which clear definitions were given. Thus, many students must have acquired this knowledge through the games and interactive interviews, where terms were used but not specifically defined, indicating the power of the medium as an educational tool.

In a hypothetical situation, where one might expect socially desirable responses, less than half of the students indicated on the pretest that fighting might increase a conflict. At posttest, a higher percentage of students had a more realistic view of fighting. Students not only improved their ability to identify what would escalate a conflict, but what might calm it down as well. After using SMART Talk, two-thirds of the students believed that discussion, when one is angry, can de-escalate a conflict. While these are important changes in knowledge about the nature of the conflict cycle, whether students will put these principles into action is the true test of any prevention intervention.

In a hypothetical situation, students reported greater intention to use more prosocial behaviors. In addition, students reported a significant increase in actual prosocial behaviors, such as helping others, and a decrease in name calling. They also reported a decrease in the amount of trouble they encountered in all settings. Students did not show a significant change in their confidence in handling conflict situations. However, this finding may be a statistical artifact, in that students uniformly reported a high level of confidence on the pretest.

With conflict and violence on the rise, new media must be explored to engage adolescents in resolving their disputes peacefully. Technology offers an avenue attractive to teens for such conflict resolution. The results of this pilot study indicate that multimedia may provide a powerful tool for violence prevention with young adolescents. Further study is underway to identify the profiles of adolescents for whom this intervention may be most appropriate.

REFERENCES

- Bandura, A. (1976). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.
- Bosworth, K., Gustafson, D. H., & Hawkins, R. P. (BARN Research Group). (1994). The BARN system: Use and impact of adolescent health promotion via computer. *Computers in Human Behavior, 10*, 467-482.
- Cochanek, K. D., & Hudson, B. L. (1994). Advance report of final mortality statistics, 1992. *Monthly Vital Statistics Report, 43*(Suppl. 6), 23. Hyattsville, MD: National Center for Health Statistics.
- Cueto, S., Bosworth, K., & Sailes, J. (1993). *Promoting peace: Integrating curricula to deal with violence*. Paper presented at the annual meeting of the American Education Research Association, Atlanta, GA, April 12-15.
- DeJong, W., Spiro, S., & Cross, T. P. (1992). *Interpersonal violence among youth: Measurement tools for assessing adolescents' knowledge, attitudes, and self-reported behavior*. Harvard School of Public Health. Manuscript submitted for publication.
- Dreyfus, H. L., & Dreyfus, S. E. (1986). *Mind over machine: The power of human intuition and expertise in an era of computers*. New York: Free Press.

- Feindler, E. L., Marriot, S. A., & Iwata, M. (1984). Group anger training for junior high school delinquents. *Cognitive Therapy and Research*, 8, 299-311.
- Gladstein, J., Rusonis, E. J. S., & Health, F. P. (1992). A comparison of inner-city and upper-middle class youths' exposure to violence. *Journal of Adolescent Health*, 13(4), 275-280.
- Goldstein, A. P., & Glick, B. (1987). *Aggression replacement training: A comprehensive intervention for aggressive youth*. Champaign, IL: Research Press.
- Goldstein, A. P., Sprafkin, R. P., Gershaw, N. J., & Klein, P. (1980). *Skill-streaming the adolescent: A structured learning approach to teaching prosocial skills*. Champaign, IL: Research Press.
- Gustafson, D. H., Bosworth, K., Chewning, B., & Hawkins, R. P. (1987). Computer-based health promotion: Combining technological advances with problem-solving techniques to effect successful health behavior changes. *Annual Review of Public Health*, 8, 387-415.
- Hammond, W., & Yung, B. (1993, February). Psychology's role in the public health response to assaultive violence among young African-American men. *American Psychologist*, 48(8), 142-154.
- Hausman, A. M., Spivak, H., Prothrow-Stith, D., & Roeber, J. (1992). Patterns of teen exposure to a community-based violence prevention project. *Journal of Adolescent Health*, 13, 668-675.
- Orlandi, M. A., Dozier, C. E., & Marta, M. A. (1990). Computer-assisted strategies for substance abuse prevention: Opportunities and barriers. *Journal of Consulting and Clinical Psychology*, 58, 425-431.
- Resnick, M. D. (1992). *Adolescent health survey*. University of Minnesota Adolescent Health Program and National Adolescent Health Resource Center.
- Slavin, S., & Stiber, J. (1990). Decade of the child. *Administrative Radiology*, 9(4), 15-17.
- Wilson-Brewer, R., Cohen, S., O'Donnell, L., & Goodman, I. (1991). *Violence prevention for young adolescents: A survey of the state of the art* (working papers). Cambridge, MA: Education Development Center. (Revised version of a working paper presented at the Carnegie Corporation Conference on Violence Prevention for Young Adolescents, Washington, DC, July 12-13).