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Journal

American Journal of Community Psychology, 25(3)

ISSN

00910562

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Publication Date

1997-06-01

DOI

10.1023/A:1024624610117

Peer reviewed

American Journal of Community Psychology, Vol. 25, No. 3, 1997

Adolescent AIDS Prevention in Context: The Impact of Peer Educator Qualities and Classroom Environments on Intervention Efficacy¹

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Peer-led, school-based interventions show promise for preventing AIDS among adolescents, but little is known about the processes underlying effective peer education or the conditions that promote its efficacy. This study examined the implementation in one school of an effective, peer-led AIDS prevention program for inner-city 7th-grade participants (n = 123) and identified the qualities of peer educators (n = 15) and classroom environments (n = 5) that contributed to improvement in participants' postintervention AIDS-related attitudes. The Peer Educator Rating Scale was developed to assess two dimensions of participants' perceptions of peer educators: "positive regard" and "perceived similarity." Participants reported greater positive regard for more

¹This research was partially supported by National Institute of Mental Health Center Grant MH42459 to the University of California, San Francisco Center for AIDS Prevention Studies and a University of California-Berkeley University Fellowship for the first author. Preliminary results were presented at the 71st annual meeting of the American Orthopsychiatric Association, April 1994, Washington, DC; the Fifth Biennial Conference on Community Research and Action, June 1995, Chicago, Illinois; and the annual meeting of the American Psychological Association, August 1995, New York. The authors thank 3 anonymous reviewers, Lonnie Snowden, Tony Fields, Elizabeth Ozer, Mindy Rosenberg, and James Pollack for their helpful comments; Maria Ekstrand and the Healthy Oakland Teens Project members and peer educators for their collaboration in the research project; Albert Bandura for his assistance in instrument development; Sheldon Zedeck and members of the Prevention Science Methodology Group for consultation regarding data analysis; and Rene D'Valery, Rick Fullerton, Isabel Melese D'Hospital, and Lindsay Sedgwick for their research assistance.

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highly individuated and less shy peer educators, and participants' positive regard for peer educators in turn was associated with lowered AIDS risk as measured by perceptions of peer norms regarding sexual activity and self-efficacy for peer communication regarding sexual topics and condoms. Participants' perceived similarity was not associated with any postintervention improvements in AIDS-related knowledge and attitudes. Participants' classroom membership was associated with improvements in all 5 knowledge and attitude scales, and exploratory classroom-level findings indicated that classroom intervention environments perceived as more organized by participants showed slightly greater overall improvements across AIDS-related knowledge and attitudes scales. Consistent with individual-level findings regarding participants' positive regard for peer educators, the two classrooms with the greatest positive regard for their peer educator teams showed the most student improvement. Implications for further research and the design of future prevention and promotion programs for adolescents are discussed.

KEY WORDS: Peer Educator Rating Scale; peer-led AIDS prevention intervention; adolescents.

Adolescents are one of the fastest growing populations with Acquired Immune Deficiency Syndrome (AIDS) in the U.S. (Centers for Disease Control [CDC], 1995). As of 1995, more than 21,300 young people ages 13–24³ had been diagnosed with AIDS, and many more are estimated to be HIV-positive (CDC, 1995). There is an increasing focus on school-based AIDS interventions for adolescents, especially for ethnic minorities at highest risk for HIV infection (DiClemente, 1993; Walter & Vaughan, 1993). The majority of school-based AIDS prevention programs are led by teachers or other adults, but there is mounting evidence that peer educators are more effective health promoters for adolescents (Jay, Durant, Shoffitt, et al., 1984; Kirby et al., 1994; Perry, Grant, Emberg, Florenzano, & Langdon, 1989; Tobler, 1986). A new wave of peer-led prevention programs for AIDS and other health problems is currently being implemented and evaluated in secondary schools.

Numerous studies report that many adolescents hold attitudes and beliefs that discourage them from learning and enacting AIDS-preventive behavior (Brown, Fritz, & Barone, 1989; Slonim-Nevo, Ozawa, & Auslander, 1991). Some teenagers have incorrect information about HIV and underestimate their personal vulnerability for infection (National Community AIDS Partnership, 1993). Others believe that having sex with multiple partners will make them popular; and that condom use is “uncool,” signifies that they have a disease, or implies that they are promiscuous (Worth & Rodriguez,

³Figures for young adults ages 20–24 are included here because people in this age group were likely to have been infected with HIV during adolescence.

1987). Given the attitudes, beliefs, and norms undermining adolescents' protecting themselves from HIV infection, changing attitudes and norms are major goals of many AIDS prevention programs. Despite the proliferation of peer-led sexuality-oriented programs for teenagers, only a handful thus far have undergone rigorous empirical evaluation and been shown to influence adolescents' attitudes and behavior in a direction consistent with AIDS prevention (Jemmott, Jemmott, & Fong, 1992; St. Lawrence et al., 1995; Walter & Vaughan, 1993). While recent reviews of the adolescent sexual risk behavior field (Kirby et al., 1994; Marin, 1995) have identified broad components shared by effective interventions (including theoretical foundations in social learning theory, specific behavioral goals, interactive curricula, and preliminary work with the target population), little is known about how these interventions work to change adolescents' attitudes and behaviors. There is a dearth of empirical work addressing this issue, and national organizations concerned with adolescent health have explicitly called for investigation of the mechanisms through which peers influence health-related behavior and the relationship between intervention process and outcome in school-based prevention programs (Lamberty, Papai, & Kessel, 1996; National Institute of Nursing Research [NINR], 1993; National Institute on Drug Abuse, 1994). Such research would require within-intervention designs that document program implementation and link process to outcomes (Judd & Kenny, 1981; Koepsell et al., 1992).

Diverse psychological theories offer explicit and implicit frameworks for mapping the peer education process and guidelines for enhancing peer-led prevention and health promotion. Social-psychological models of attitude and behavior change emphasize the qualities of intervention leaders, and the way leaders are perceived by program participants, for enhancing the effectiveness of prevention programs. Whereas social-psychological conceptualizations of peer education focus on qualities of individuals and the relationships between them, ecologically oriented theories highlight the importance of the contexts (i.e., classroom settings) in which peer education occurs. We believe that both conceptual foci are critical to identifying the effective components of peer-led interventions implemented in classroom settings, and we provide here an overview of the theoretical bases for our empirical investigation of peer education on the level of both interpersonal and classroom-level dynamics.

Theoretical Significance of Peer Characteristics for AIDS Prevention

Peer-led AIDS prevention programs for adolescents can demand a great deal from peer educators and participants alike. Peer educators must

talk to other adolescents about sensitive topics such as sexuality, drug use, and AIDS; and participants are asked to "buy into" AIDS prevention, learn AIDS-related information, develop new skills, and successfully apply these skills in their daily lives despite social pressures and other barriers. Literatures reviewed below suggest that characteristics and perceptions of peer educators influence the peer-led AIDS prevention process, and also allude to the complex interplay of leader, participant, and contextual factors at work in the implementation of peer-led programs.

According to social-cognitive theory, the effectiveness of modeling for promoting adolescents' knowledge, skills, and self-efficacy depends partly on how adolescents perceive the model's characteristics (Bandura, 1992), with adolescents paying more attention to models whom they perceive as warm, supportive, and attractive (Bandura, 1986; Grusec & Skubiski, 1970; Yussen & Levy, 1975). Bandura (1986, 1992) also suggests that adolescents will be more likely to enact modeled behaviors when they perceive the models as similar to themselves in terms of characteristics such as gender, ethnicity, and age. Adolescents' perceptions that models are similar promote shifts in attitudinal and behavioral change because they experience vicarious feelings of effectiveness when observing similar others as effective (Bandura, 1992). A study by Stevenson and Davis (1994) provides limited support for the claim that AIDS prevention programs will be more effective when they are led by "similar" peers: African American teenagers who watched an AIDS education video with African American characters similar to themselves in dress, speech, and environment gained greater AIDS knowledge and reported more positive feelings toward the video than those who viewed a video without these culturally similar elements. There were no differences found, however, between the two groups regarding their beliefs about AIDS prevention or abilities to identify AIDS-risk behavior. Jemmott et al.'s (1992) intervention with African American male adolescents found that male facilitators were more effective than females in increasing participants' AIDS-related knowledge but that female facilitators were more successful in influencing AIDS-related attitudes and behavior (all facilitators were African American). Because the facilitators were not assessed or observed systematically, and there were no female program participants, it is unclear what characteristics or behaviors may have contributed to the female facilitators' relative effectiveness (i.e., if it was related to being female, of the opposite sex, or if facilitator gender was a proxy for other salient personality characteristics or behaviors).

Similar to social cognitive theory, social influence research indicates that characteristics of the source (person delivering the message) are related to more effective attitude and behavior change for the target (person receiving the message). Highly individuated persons, or people who engage

in behaviors that differentiate themselves from others (e.g., through expressive nonverbal behavior and creativity) have been found to have greater social impact than those who are less individuated (Whitney, Sagrestano, & Maslach, 1994). As adolescence is typically viewed as a time of high conformity and personal insecurity, degree of individuation could influence the confidence and effectiveness of teenaged educators. Along these lines, other personality characteristics of adolescent educators, such as their degree of shyness and sociability, are likely to influence their skills in engaging effectively with participants. In other research, Petty and Cacioppo (1981) demonstrated that the source's perceived expertise or credibility can greatly enhance the persuasiveness of a message under certain conditions; and research on social comparison processes (e.g., Festinger, 1954) highlights similarity between the source and the target as an important factor in determining the effectiveness of persuasion attempts. When uncertain about their own opinions, people seek guidance from those who hold similar opinions or are similar on other salient dimensions, and the opinions of similar others are expected to hold more sway than those of dissimilar others (Zimbardo & Leippe, 1991).

Fisher (1988) provides a model of AIDS-related attitudes and behavior on the level of the adolescents' social network or peer group: Social network norms are either consistent or inconsistent with AIDS-Preventive Behavior (APB), and a social network exerts powerful influences on its members in accordance with its stance regarding APB. This social influence is often internalized by network members. For adolescent groups that favor risk taking as a positive trait, then, effective interventions must be successful in shifting peer norms. According to social network theory, members of teenagers' peer groups—particularly respected or “cool” members—are the ones with the credibility and power to shift other adolescents' perceptions of peer norms.

Importance of Classroom Intervention Environment for School-Based AIDS Prevention

As indicated earlier, schools are increasingly serving as sites for adolescent interventions and AIDS prevention in particular, and it makes intuitive sense that the classroom settings in which peer educators find themselves and the intervention environments that they create could influence program efficacy. Even before considering classroom climate research, questions about the implementation of school-based, peer-led AIDS prevention programs are readily raised (e.g., Will peer educators create an environment in which participants feel comfortable enough to participate

but do not get "silly?"). The highly charged topics and the use of discussions and role-plays to improve attitudes and norms suggest that supportive, organized, and participatory environments would facilitate implementation of school-based AIDS prevention programs.

Numerous studies have investigated the interactive relationships among teaching styles, aggregate characteristics of students, perceived class climate, and students' achievement and affective outcomes. Directive teachers have been found to foster classroom environments high on control, competition, and task orientation (Shultz, 1982) whereas less directive and more humanistic teachers tend to develop classes high in affiliation, involvement, teacher support, clarity, and innovation (Harty & Hassan, 1983; Moos & Trickett, 1987). While teachers bring their own styles to classroom interactions, aggregate characteristics of students "pull" for teacher behavior and class climates (Moos, 1979); for example, teacher control tends to be higher in classes with more male students (Moos & Trickett, 1987). Although the impact of classroom environments on student outcomes at least partly depends on the fit between students' ideal and perceived environments (Fraser & Fisher, 1983a, 1983b, 1983c), "main" effects of classroom environments on students' feelings and academic outcomes have been found, with Moos and Trickett's (1987) review suggesting that students feel more satisfied and achieve better in highly supportive and organized classes. The effects of teachers' level of organization or control varies depending on its relational context: High control in a setting with positive interstudent and student-teacher relationships is expected to promote student satisfaction and achievement whereas the same behavior in the absence of positive relationships has been associated with students' feelings of low satisfaction with their teacher and classmates, alienation, and insecurity (Moos, 1979; Moos & Trickett, 1987; Trickett & Moos, 1974). Meta-analysis of the classroom climate literature indicates that students learn best in classes high on cohesiveness; goal direction, task difficulty, and democratic participation (Haertal, Walberg, & Haertal, 1981); learning was negatively associated with friction, cliquishness, apathy, and disorganization. Classroom climate dimensions of cohesiveness, affiliation, participation, and organization were found to be positively correlated with students' positive attitudes towards class content in 100 elementary and junior high classrooms (Haladyna, Olsen, & Shaughnessy, 1982; Haladyna, Shaughnessy, & Redsun, 1982a, 1982b). Similarly, junior high students in science classes high on organization, innovation, and participation developed greater interest and more positive attitudes regarding science, along with stronger scientific thinking skills (Fraser & Fisher, 1982).

In sum, classroom cohesiveness, organization (in the context of positive relationships), and participation are associated with positive academic

and affective outcomes whereas friction, cliquishness, apathy, and disorganization are predictive of negative outcomes (Fraser, 1989). Classroom environment variables are important in predicting students' cognitive and affective outcomes in diverse, "regular" school classes, suggesting that classroom environments during implementation could determine the effectiveness of classroom-based health interventions. Classrooms could receive distinctive versions of programs if the implementation differs on dimensions including aggregate student characteristics, aggregate peer educator characteristics, and implementation climate. It is unclear if the relationships between classroom environment and student outcomes discussed above generalize to school-based AIDS interventions; on the basis of research reviewed here and considering the tasks of the peer education process, however, we expect that class environments high in participation and organization would be effective settings for peer-led AIDS prevention programs. Aggregate participant and peer educator characteristics such as demographic similarity (i.e., gender and ethnic match) and peer educators' individuation, shyness, and sociability are also expected to boost implementation efficacy.

Empirical Gaps and Special Challenges

Social-cognitive and social influence theories identify qualities of peer educators, including similarity, warmth, expertise, credibility, high individuation, and physical attractiveness, predicted to enhance the efficacy of prevention programs and of AIDS prevention in particular. Our empirical knowledge is extremely limited, however, regarding: (a) the qualities or behaviors manifested by peer educators that contribute to adolescent observers' perceptions of them as similar, warm, attractive, expert, or credible; and (b) the impact of the qualities and perceptions of peer educators in actual interventions. Despite identification of the impact of health promoter characteristics on program efficacy as a key area of future study (e.g., NINR, 1993), it appears that these empirical gaps have yet to be addressed.

Gaps: The Need for Process-Outcome and Contextual Research. Also missing from the prevention and health promotion literature is a consideration of the ecological factors, particularly qualities of classroom settings, in the implementation of school-based interventions. To our knowledge, no school-based health intervention has comprehensively described or assessed the classroom environment in which the program was implemented, nor explored the interaction between aspects of the classroom context and program efficacy. The issue of classroom differences in the implementation of

school-based prevention programs has also yet to be studied. To examine these questions, it is necessary to look inside implementations of preventive programs so as to link intervening processes with the degree of change among participants. This type of design is critical, with or without overall program efficacy, because within-intervention studies can point to where, for whom, and how program components and their implementation result in the desired outcomes (e.g., Chen & Rossi, 1983; Koepsell et al., 1992; Lipsey, 1990). Process and context-oriented evaluations provide the knowledge necessary for improving interventions and also aid in the building, testing, and generalization of theories regarding the causal mechanisms that generate program outcomes (Judd & Kenny, 1981; Scott & Sechrest, 1989). Such work is key to effective evaluation across research fields, as demonstrated by calls for and examples of process-outcome studies in the program evaluation, public health, psychotherapy, education, and community psychology literatures (e.g., Chen & Rossi, 1989; Cherniss, 1991; Koepsell et al., 1992; van Ryn & Vinokur, 1992).

Challenge: The Relationship Between AIDS-Related Attitudes and Behavior. Considering the pressures associated with AIDS-risk situations, how much do people's knowledge and attitudes regarding AIDS prevention influence their actual *behavior* when faced with AIDS prevention decisions? This question is important, particularly because knowledge is a necessary but not always sufficient determinant of behavioral change with respect to AIDS prevention (e.g., DiClemente et al., 1992; Kegeles, Adler, & Irwin, 1988). There is evidence from the adolescent and adult AIDS prevention literatures, however, that attitudinal dimensions such as self-efficacy and perceptions of peer norms frequently serve as valid proximal indicators of more distal AIDS-related behavior: A large longitudinal study of gay men found that positive feelings and expectations regarding condom use was a strong predictor of consistent condom use (Catania, Coates, Stall, Bye, et al., 1991) and a comprehensive review identified high self-efficacy as the factor most strongly associated with consistent condom use among gay and bisexual men (Stall, Coates, & Hoff, 1988). Furthermore, recent interventions effective in reducing adolescents' AIDS-risk behavior reported parallel improvements in AIDS knowledge, perceived peer norms regarding sexual activity, and condom use attitudes (Jemmott et al., 1992; St. Lawrence et al., 1995). Because interventions with adolescents have been more successful in postponing and preventing the initiation of AIDS-risk behavior than in transforming established behavior patterns (e.g., Howard & McCabe, 1990; St. Lawrence et al., 1995), early intervention is considered the best strategy for working with adolescents. Without lengthy, multiyear follow-ups, early prevention approaches necessitate the reliance on proximal, attitudinal, outcome measures of adolescents' risk for HIV contraction

because only small numbers of participants have initiated risky behavior if the preventive intervention is timed correctly; this creates challenges for the evaluation of programs for younger, less sexually active adolescents as there are fewer sexual behavior data points with which to analyze intervention efficacy.

Hypotheses of Present Study

The present study was conducted in the context of a school-based, peer-led AIDS prevention program for seventh-grade students found to be effective, in comparison to control students, in positively influencing several critical domains of participants' AIDS-related knowledge, attitudes, and behavior (Ekstrand et al., 1996). The purpose of our within-intervention study was to examine more closely the "black box" of the peer-led program by assessing the manner and context of the intervention implementation, and to identify the characteristics of peer educators and classroom environments linked to stronger intervention effects on the individual and class levels.

We investigated relationships between the characteristics of ninth-grade peer educators, perceptions of peer educators by participants, and participants' self-reported changes in AIDS-related attitudes at the level of individual participants. First, we predicted that highly individuated, sociable, and less shy peer educators would be rated by participants as higher in credibility, expertise, warmth, attractiveness, and sense of humor. Second, we predicted that improvements in AIDS-related knowledge and attitudes would be associated with (a) adolescents' perceptions of peer educators as similar, credible, expert, warm, attractive, and humorous; and (b) adolescents' exposure to peer educators of the same gender and ethnicity. As all dimensions had been strongly implicated in theories of attitude and behavior change, we had no conceptual basis for specifying the variables that would most powerfully explain adolescents' changes in AIDS-related knowledge and attitudes. Because classroom-level variables such as class climate were considered likely to affect intervention process and outcomes, we also conducted analyses using classes rather than individual students as the unit of analysis. Our third prediction was that participants would experience more improvement in AIDS-related knowledge and attitudes in classes that were: (a) rated higher on perceived climate dimensions of organization and participation; and (b) instructed by peer educator teams rated higher on individuation, similarity, credibility, expertise, warmth, attractiveness, and humor. Class observations were also conducted

to explore the qualities of implementation which could help clarify and illustrate the nature of the relationships studied quantitatively.

METHOD

The Overall Intervention Study

Design. The present study was conducted in collaboration with a multiyear, peer-led AIDS prevention study implemented in three urban junior high schools (one intervention and two control schools) with a high proportion of ethnic minority and low-income adolescents. Directed by the Center for AIDS Prevention Studies of the University of California-San Francisco (UCSF), the intervention used teams of trained 9th graders to lead a series of hour-long AIDS prevention classes for 7th-grade students at their school. Intervention students participated in the peer-led program while the control students received only a brief, didactic, adult-led AIDS education program implemented in all district schools. With extensive preliminary work in the setting, an interactive, social learning-based curriculum, and an ethnically diverse group of peer educators, the UCSF intervention combined several components considered to be effective in influencing the AIDS-related knowledge, attitudes, and behavior of the target population.

Intervention Effects. As reported by Ekstrand et al. (1996), there were significant differences at 8- to 11-month follow-up between the intervention and control students on important attitudinal outcomes including perceived peer norms regarding sexual activity and popularity of sexually active peers; and self-reported behaviors such as initiation of deep kissing, genital touching, and vaginal intercourse. While deep kissing and genital touching do not directly put adolescents at high risk for HIV infection, they indicate that the teenagers have been in sexual situations that could escalate into intercourse or other sexual activities that do entail increased HIV risk. Indeed, longitudinal evaluations of the overall intervention demonstrated that participants who reported having experienced breast touching at baseline were more likely to have initiated vaginal intercourse by 8th-grade follow-up. From 7th-grade baseline to 8th-grade follow-up, there were striking differences between the intervention and control schools in the initiation of sexual behaviors such as breast touching (initiated by 10% of intervention vs. 20% of control students), genital touching (9% intervention vs. 23% control), and vaginal intercourse (5% intervention vs. 18% control). Attitudinal dimensions such as perceiving peer norms as supportive of sexual activity and the perceived costs and benefits of condom use were also found

to predict sexual activity at follow-up. Although some of the attitudinal improvements for intervention school students were small in magnitude, attitudes and norms for the control students worsened over time in the junior high environment, suggesting a "natural history" of increasingly risky AIDS-related attitudes and norms for ethnic minority adolescents in this urban context.

The Present Study

The present study constitutes an in-depth, process-oriented investigation of one cohort of intervention students across 1 year in one intervention school of the UCSF AIDS prevention project. The goals of the intervention centered on the evaluation of overall program effects across classrooms and participant cohorts; our focus was on identifying and explaining within-intervention variation in program efficacy, as measured at the end of the classes, and in particular, examining the potential utility of theoretically important factors such as the participants' perceptions of peer educators, peer educator characteristics, and classroom climate in interpreting variation. Because our intensive design necessitated working with only one intervention cohort, we did not have sufficient statistical power to use sexual behavior, which occurred at a relatively low frequency in this young adolescent population, as an outcome measure. Instead, we relied on attitudinal outcomes previously found to serve as proximal indicators of behavioral change (Jemmott et al., 1992; Stall et al., 1988; St. Lawrence et al., 1995).

Participants

Participants were an ethnically diverse group of 120 seventh graders (68 female; 52 male) and 15 ninth-grade peer educators (11 female; 4 male) from the UCSF intervention project described above. Fifty-three (44%) of the 7th-grade participants identified as African American; 41 (34%) as Asian American; 8 (7%) as Caucasian; 7 (6%) as Latino; and 5 (4%) as Native American. Seventh-grade participants were members of five classes that differed in terms of size, gender ratio, ethnic composition, and percentage of sexually active students (Table I). Peer educators were nominated by counselors and others to reflect the ethnic diversity of the school so as to increase the likelihood of perceived similarity by participants. Eight of the peer educators identified as African American, 4 as Latino; 2 as Asian American, and 1 as Caucasian, with Asian Americans underrepresented in the peer educator group.

Table I. Descriptive Data for Entire Intervention and By Classroom

Variable	Total	Class 1	Class 2	Class 3	Class 4	Class 5
7th-grade participants						
Time 1 total n^a	120	17	24	25	21	33
Gender						
Female	68	5	12	15	11	25
Male	52	12	12	10	10	7
Ethnicity						
Asian American	41	1	9	11	6	14
Latino	7	0	2	1	2	2
Caucasian	8	0	1	2	1	5
African American	53	14	12	9	7	11
Native American	5	1	0	2	2	0
Other/missing information	6	1	0	1	3	1
Sexually active at Time 1						
n	16	4	2	2	7	1
%	13	24	8	8	33	3
Ethnic match ^b						
n	84/115	14/16	13/24	20/25	10/18	27/32
%	73	88	54	80	56	84
Gender match ^b						
n	96/120	5/17	12/24	25/25	21/21	33/33
%	80	30	50	100	100	100
Class climate						
Participation subscale						
M	17.5	15.4	18.8	17.8	17	17.3
SD	3.6	2.3	3.8	3.2	3.8	3.5
Rank		5	1	2	4	3
Organization subscale						
M	13.1	13.7	12.1	14.0	12.0	13.7
SD	3.1	2.8	2.1	2.0	1.4	1.9
Rank		2	4	1	5	2
9th-grade peer educators						
Individuation						
M	46.1	52.7	46.3	45.3	42.3	43.7
SD	8.1	4.9	4.9	9.5	3.5	14.5
Rank		1	2	3	5	4
Shyness ^c						
M	13.2	10.0	14.0	14.3	14.0	14.0
SD	2.7	1.7	2.0	3.5	3.0	3.0
Rank		5	2	1	2	2
Sociability						
M	14.6	15.3	13.3	14.0	15.3	15.0
SD	1.6	1.53	2.0	1.0	1.2	2.6
Rank		1	5	4	1	3

Table I. Continued

Variable	7th-grade participants' perceptions of peer educators					
	Strongest score	Team scores				
Positive regard factor ^c						
<i>M</i>	10.3	8.5	12.7	11.6	12.1	13.2
<i>SD</i>	3.1	3.0	2.2	3.1	3.4	3.1
Rank		1	4	2	3	5
Similarity factor ^c						
<i>M</i>	6.8	6.6	7.3	7.3	7.5	7.8
<i>SD</i>	1.5	2.0	1.2	1.8	1.7	1.5
Rank		1	2	2	4	5

^aRefers to the number of students who completed the pretest AIDS knowledge scale.

^bEthnic match refers to the presence of at least one ethnically similar peer educator; gender match refers to the presence of at least one same-sex peer educator.

^cThese variables are reverse coded such that higher scores are lower on the dimension.

Intervention Procedure

After 6 weeks of training (in a daily, hour-long class attended by all peer educators) with a teacher experienced in leadership training, teams of three peer educators led eight AIDS prevention sessions using the same curriculum in five social studies classes. An adult facilitator was present during the hour-long sessions to assist with questions. Each class had previously received five scripted educational sessions from an adult health educator. The peer-led curriculum consisted of interactive games, role-plays, and discussions regarding topics including: HIV transmission, drug use and HIV risk, decision making, communication, and condom use. In the last session, participants developed and videotaped "commercials" with an AIDS prevention theme. In the communication skills session, peer educators helped participants practice refusing sexual advances and the condom session included peer-led demonstrations of proper condom use with plexiglas models. The peer educators were provided with scripts for each session (although they were also encouraged to elaborate), which they practiced in their daily, hour-long training class.

Measures

Administration of self-report measures occurred before and after the peer-led intervention; classroom observations were conducted during the

last three peer-led sessions. A week before the peer-led intervention began (pretest), 9th-grade peer educators completed individuation, shyness, and sociability measures; and participants were administered the Healthy Oakland Teens (HOT) Questionnaire to assess AIDS-related knowledge and attitudes. During the last peer-led session, participants assessed their perceptions of their peer educators and of the class climate during the intervention; 1 week later, the participants again completed the HOT questionnaire (posttest).

Measures Completed By Peer Educators

Demographic Information. Peer educators reported their gender and ethnicity (coded as African American, Asian American, Caucasian, Latino, or Native American).

Shyness and Sociability Scale. Peer educators completed the Shyness and Sociability Scale (Cheek & Buss, 1981), indicating the degree to which 14 statements (e.g., "when conversing I worry about saying something dumb") described them [9 items constituted the shyness measure ($\alpha = .72$) and 5 the sociability measure ($\alpha = .71$)]. The adult-oriented response format was adapted such that peer educators responded to items with either "yes," "no," or "sometimes" (coded 0–2). Higher scores indicated higher levels of shyness or sociability.

Individuation. Peer educators completed the 12-item Individuation Scale (Maslach, Stapp, & Santee, 1985) ($\alpha = .84$). Using a 5-point response format (from *definitely not willing* to *very much willing*), participants indicated their willingness to engage in behavior such as "speak up about your ideas even if you are uncertain of whether you are correct." Higher scores indicated stronger individuation.

Measures Completed By Participants

Perceptions of Peer Educators. During the last session of the peer-led intervention, participants were administered a 9-item Peer Educator Rating Scale that assessed their perceptions of each of three peer educators who presented in their class on the dimensions of similarity, credibility, competence, warmth, physical attractiveness, and sense of humor. This scale was developed and piloted by the authors of this study to reflect salient peer educator characteristics drawn from literature reviews and focus groups conducted with participants from the previous intervention cohort. On a 4-point scale ranging from *definitely true* to *definitely not true*, participants evaluated 9 statements about each peer educator (e.g., "Mary believes in

what she taught us"; "Juan knows a lot about HIV/AIDS"). Lower scores indicate higher levels of the characteristics. Factor analysis of the scale with oblique transformation revealed that the items clustered into two factors accounting for 58% of the variance. One factor, "positive regard" (all loadings above .58; $\alpha = .73$) consisted of 6 items referring to warmth, expertise, credibility, "someone I could talk to," attractiveness, and sense of humor. "Perceived similarity" (all loadings above .65; $\alpha = .72$) consisted of the three similarity items (e.g., "when Mary was in the 7th grade, she had the same kinds of attitudes about sex as I do"; "Juan has a life a lot like mine").

Class Climate. During the last session of the peer-led intervention, participants completed short forms of the order and organization scale ($\alpha = .74$) of the Classroom Environment Scale (Moos & Trickett, 1987) and the participation scale ($\alpha = .73$) of the Individualized Classroom Environment Questionnaire (Fraser, 1985). Participants were instructed to assess their class when the peer educators were in charge; and "peer helpers" was substituted for "teacher" in relevant items. The order and "organization" scale consisted of 5 items (e.g., "this is a well-organized class") and the participation scale consisted of 4 items (e.g., "students give their opinions during discussions").

Participants' Demographic Characteristics and AIDS-Related Knowledge and Attitudes. Participants' demographic data, AIDS-related knowledge, AIDS-related attitudes, and sexual behavior were assessed by the UCSF project through pre- and postintervention administrations of the HOT Questionnaire (Siegel, 1992). Participants' demographic data included sex, age, and ethnicity (coded as African American, Asian American, Caucasian, Latino, or Native American). Participants' ethnicity was compared with the ethnicity of the peer educators teaching each class to determine if the participant was instructed by any peer educator of the same ethnicity; and an "ethnic match" variable was created. A similar variable was not constructed for "gender match" between peer educators and participants because most students had at least one peer educator of the same gender. On the basis of conceptual relevance and sufficient alpha reliability, the present study selected 5 scales from the extensive HOT questionnaire. On all scales below, higher scores indicate higher levels of the variable. AIDS-Related Knowledge was assessed with 19 items ($\alpha = .63$) covering knowledge of HIV transmission and prevention. The items used true-false response formats with 1 point for each correct answer. The 13-item Communication Self-Efficacy ($\alpha = .82$) assessed confidence regarding talking about topics such as sex and condoms with peers (e.g., "I could talk with friends about STDs"; "I could tell a boy/girlfriend to stop sexual touching") using a 4-point response format from 0 (*definitely*) to 3 (*definitely not*). The 6-item Unpopularity of Sexual Activity scale ($\alpha = .86$) asked participants to agree

or disagree with items such as "having sex makes a boy popular" (0 = *strongly agree*; 3 = *strongly disagree*). The 5-item Condom Self-Efficacy scale ($\alpha = .64$) assessed beliefs about likelihood of condom use in specific situations (e.g., "I would insist on using a condom even if my partner didn't want to") (0 = *definitely*; 3 = *definitely not*). The 4-item Positive Feelings for Condom Use scale ($\alpha = .66$) included items such as "I would respect my partner if he suggested using a condom" (0 = *definitely*; 3 = *definitely not*).

Classroom Observations

The first author and another observer worked to develop a narrative record of one peer-led session implemented in each of the five intervention classrooms. The observer team used several intervention sessions to practice their classroom observation techniques and targeted the final intervention session as the basis for the narrative record. The team took extensive notes regarding the peer educators' verbal and nonverbal communication with the class, the participants' reactions to the peer educators, and class climate dimensions of order and participation. After the sessions, the observers verbally reviewed their class notes with each other. This conversation was tape-recorded and transcribed in order to develop a thorough record of the classroom implementation of the peer-led intervention.

RESULTS

Data Analytic Strategy

Descriptive Statistics

The means and standard deviations for study variables are shown in Tables I and II (Table II reflects means and standard deviations for participants present at both pre- and posttest assessments). Missing data were addressed in several ways. Subscales from the Peer Educator Rating Scale and the HOT questionnaire missing more than 25% of items were deleted from analyses; scales missing fewer than 25% of items were included using the mean of answered items as the participants' scale score (the mathematical equivalent of a mean substitution). Thus, the *ns* for analysis of the five AIDS-related knowledge and attitude scales differed slightly based on available data. A combination of correlations and chi-square analyses (for continuous and categorical variables, respectively) were calculated to de-

Table II. Seventh-Grade Students' AIDS-Related Knowledge and Attitudes^a

Variable	<i>n</i>	Before intervention (Time 1)	After intervention (Time 2)
AIDS knowledge	90		
<i>M</i>		8.0	9.1
<i>SD</i>		2.0	1.9
Communication self-efficacy	88		
<i>M</i>		28.1	29.8
<i>SD</i>		5.8	6.1
Unpopularity of sexual activity	87		
<i>M</i>		13.9	14.0
<i>SD</i>		3.8	3.8
Condom self-efficacy	88		
<i>M</i>		12.1	12.0
<i>SD</i>		2.8	2.7
Positive feelings for condom use	83		
<i>M</i>		7.8	7.8
<i>SD</i>		1.6	1.6

^aMeans and standard deviations reflect participants present at both Time 1 and Time 2; *ns* differ slightly due to missing data.

termine if participants with missing items differed systematically from those not missing items in terms of age, gender, ethnicity, and class membership (Cohen & Cohen, 1983); no significant relationships were found. Nineteen participants dropped out of the study from pre- to posttest; major sources of attrition were chronic inattendance or transfers. Correlational and chi-square analyses indicated that adolescents absent at posttest did not differ from adolescents present at posttest in terms of age or gender but differed in ethnicity, $\chi^2(N = 134) = 8.2, p < .01$, and classroom membership, $\chi^2(N = 134) = 25.7, p < .01$; participants absent at posttest were likely to be members of Class 4 and not of Asian ethnicity.

Unit of Analysis for Participants' Ratings of Peer Educators

The fact that peer educators presented the AIDS prevention curriculum in teams rather than alone raised conceptual and methodological challenges. The social-psychological theories utilized here are primarily concerned with the influence of a single model or educator on observers and do not explicitly address the impact of groups of educators. Because we collected data on the participants' perceptions of each team member,

the question arose as to which set of perception ratings should be correlated with the participants' changes in AIDS-related knowledge and attitudes (statistical assumptions of independence of observations prohibited correlating more than one set of perception ratings). It was consistent with the social-psychological theories reviewed earlier to propose that just one "positively regarded" or "similar" peer educator could serve as an effective change agent and that it would not be necessary for every team member to fit that criterion. It is, however, also plausible that the effects of peer education occur at the level of the peer educator team rather than at the level of the individual peer educator. To explore both possibilities, we analyzed our data two ways, using as an independent variable either (a) each participants' single strongest positive regard and similarity score for any of the three peer educators; or (b) the sum of each participants' ratings of each of the three peer educators. Because the composite sum ratings did not predict any dependent variables when tested at the individual participant level, we used the single strongest positive regard or similarity score as the independent variable for assessing the relationship between participants' perceptions of peer educators and their degree of change in AIDS-related knowledge and attitudes. Composite team scores, the sum of the three ratings for each peer educator on the team, were used in the classroom-level analyses.

Data Analysis

We explored relationships at two levels of analysis, investigating the predictors of individual change across the whole sample and of classroom change in the context of five different implementations. With regard to individual change, we examined (a) the characteristics of peer educators associated with participants' perceptions of peer educators as high in positive regard and in perceived similarity (the two factors that best accounted for ratings on the Peer Educator Rating Scale); and (b) the predictive power of participants' perceptions of peer educators, participant-peer educator ethnic match, and classroom membership for explaining participants' changes in AIDS-related knowledge and attitudes. With regard to classroom level change, we explored (a) the relationship of classroom characteristics (as reflected in the aggregate qualities of participants, peer educator teams, and participants' perceptions of peer educators and of classroom climate) to classroom level changes in AIDS-related knowledge and attitudes, and (b) the role of implementation behavior (as reflected in classroom observation records) in illuminating the results.

Looking at Individuals: Predictors of Change in AIDS-Related Knowledge and Attitudes

Determinants of Participants' Perceptions of Peer Educators

Peer educators' shyness ($r = -.82$; $p < .001$) and individuation ($r = .75$; $p < .01$) but not sociability were significantly correlated with participants' ratings of positive regard. That is, participants expressed stronger positive regard for peer educators who were less shy and more individuated. Participants' ratings of perceived similarity were not significantly correlated with peer educators' shyness, sociability, or individuation scores, indicating that perceived similarity to peer educators could not be explained by these qualities of the educators.

Predicting Improvements in Participants' AIDS-Related Knowledge and Attitudes

Hierarchical multiple regressions (3 for each outcome variable) were used to calculate the variance in participants' postintervention AIDS-related knowledge and attitudes, after controlling for pretest scores and classroom membership, and as explained by the following variables describing qualities of the peer educator-participant relationship: (a) participants' positive regard for peer educators, (b) participants' perceived similarity to peer educators, and (c) participant-peer educator ethnic match. As shown in Tables III and IV, pretest scores on each AIDS-related knowledge and attitudes scale were the strongest predictors of posttest scores for the same variables (variance explained ranged from 9% for positive feelings for condom use to 44% for unpopularity of sexual activity), indicating that participants' knowledge and attitudes before they started the intervention were strong predictors of their knowledge and attitudes after the intervention. Classroom membership, when entered as a block of the four classroom vectors, was also significantly associated with postintervention improvements for all five knowledge and attitude scales.

Controlling for all other variables in the hierarchical equation, positive regard for peer educators significantly predicted participants' postintervention unpopularity of sexual activity (7% of the variance, $p < .01$) and communication self-efficacy scores (8% of the variance, $p < .01$). That is, after the intervention and beyond the effect of classroom membership, participants who expressed positive regard for peer educators were more likely to indicate that sex does not make teenagers more popular and to report that they would feel confident talking with peers about sex and

AIDS-related topics. Ethnic match and perceived similarity were not found to predict any of the AIDS-related knowledge and attitude measures used as outcome variables in this study.

Looking at Classrooms: Predictors of Change in AIDS-Related Knowledge and Attitudes

Given the small number of classrooms, our analyses utilized a combination of approaches. A series of one-way ANOVAs (highly conservative due to the small number of peer educators and classrooms) with classroom as the independent variable were calculated to investigate classroom differences regarding (a) participants' demographic characteristics, (b) peer educator team characteristics, (c) participants' perceptions of the intervention class climate, and (d) participants' perceptions of the peer educators. Next, residualized change (from Time 1 to Time 2) for participants' AIDS-related knowledge and attitudes scales was calculated and aggregated by class. Classroom differences in improvements in AIDS-related knowledge and attitudes were examined using one-way ANOVAs. Classrooms were also ranked according to their improvements in AIDS-related knowledge and attitudes whereby the patterns between selected characteristics of the peer educator team, characteristics of classes, and the degree of classroom change were explored using a qualitative data display.

Preintervention Characteristics of Participants and Peer Educator Teams

In terms of the demographic characteristics of the classroom members, a series of one-way ANOVAs indicated significant classroom effects for participants' gender, $F(4, 124) = 2.78, p < .05$; ethnicity, $F(4, 114) = 4.19, p < .01$; age, $F(4, 105) = 6.07, p < .001$; and sexual experience, $F(4, 129) = 2.97, p < .05$. Class 1 had the highest proportion of males and African Americans; Classes 1 and 4 were significantly older; and Classes 1 and 4 had the highest percentages of participants (21 and 35%, respectively) who reported having had sexual intercourse prior to the intervention. Classrooms also differed significantly in the extent to which participants experienced at least one peer educator of the same ethnicity (ethnic match), $F(4, 107) = 3.1, p < .05$. Although the peer educator team that presented in Class 1 (Team 1) was the least shy, most highly individuated, and most sociable team (as reflected in mean scores), no significant classroom effects were detected for peer educators' shyness, $F(4, 10) = 1.51, ns$; individuation, $F(4, 10) = 0.664, ns$; or sociability, $F(4, 10) = 0.86, ns$.

Table III. Summary of Variance Accounted for by Hierarchical Regression Analyses Predicting AIDS-Related Knowledge and Attitudes^a

Variable	AIDS knowledge (n = 90)		Communication self-efficacy (n = 88)		Unpopularity of sexual activity (n = 87)		Condom self-efficacy (n = 88)		Positive feelings for condom use (n = 83)	
	R ²	R ² change	R ²	R ² change	R ²	R ² change	R ²	R ² change	R ²	R ² change
Step 1 Pretest score	.28 ^c		.32 ^c		.44 ^c		.31 ^c		.09 ^c	
Step 2 Class membership	.32	.04 ^c	.36	.04 ^c	.49	.05 ^c	.34	.03 ^c	.16	.07 ^c
Step 3 Positive regard	.32	—	.44	.08 ^c	.56	.07 ^c	.36	.02	.18	.02
Or										
Step 3 Perceived similarity	.32	—	.37	.01	.52	.03	.29	-.03	.17	.01
Or										
Step 3 Ethnic match	.34	.02	.36	—	.52	.03	.36	.02	.15	-.01

^ans differ slightly due to missing data.

^bp < .05.

^cp < .01.

Table IV. Hierarchical Regression Analyses Predicting Posttest AIDS-Related Knowledge and Attitudes^a

Variable	AIDS knowledge (<i>n</i> = 90)	Communication self-efficacy (<i>n</i> = 88)	Unpopularity of sexual activity (<i>n</i> = 87)	Condom self-efficacy (<i>n</i> = 88)	Positive feelings for condom use (<i>n</i> = 83)
Step 1					
Pretest score					
B	0.50	0.61	0.68	0.51	0.29
SE B	0.08	0.10	0.08	0.08	0.10
β	.53 ^c	.57 ^c	.66 ^c	.55 ^c	.30 ^b
Step 2					
Class membership					
Class 1					
B	1.20	2.03	1.30	-0.67	0.40
SE B	0.61	1.66	1.20	0.75	0.51
β	.20 ^b	-.12	.10	-.10	.10
Class 2					
B	0.16	1.08	-0.70	-1.47	0.22
SE B	0.48	1.56	0.82	0.71	0.48
β	.03	-.07	-.08	-.22 ^b	.06
Class 3					
B	0.84	-0.10	1.48	-0.98	-0.04
SE B	0.46	1.66	0.80	0.76	0.53
β	.19	-.01	.17	-.14	-.01

Class 4							
B	0.29	1.78	-0.04	-0.67	-0.94		
SE B	0.62	1.75	1.10	0.78	0.52		
β	-.04	.11	.00	-.09	-.22		
Step 3							
Positive regard							
B	0.02	-0.62	-0.30	0.07	-0.02		
SE B	0.07	0.22	0.12	0.09	0.02		
β	.04	-.31 ^c	-.24 ^c	.08	-.03		
Or							
Step 3							
Perceived similarity							
B	0.07	0.33	0.94	0.94	0.12		
SE B	0.13	0.41	0.18	0.18	0.11		
β	.05	.08	.02	.02	.15		
Or							
Step 3							
Ethnic match							
B	0.56	0.17	-0.62	-0.79	-0.84		
SE B	0.41	1.33	0.70	0.58	0.39		
β	.13	.01	-.07	-.13	-.23		

^aStatistics are controlled for variables entered in the preceding steps; ns differ slightly due to missing data.

Participants' Perceptions of Peer Educator Team and Intervention Climate

Regarding participants' perceptions of peer educators, classroom effects were found for participants' positive regard, $F(4, 98) = 5.92, p < .001$, but not for perceived similarity, $F(4, 97) = 1.02, ns$. A post-hoc comparison using Fisher's PLSD indicated that Team 1 received significantly stronger positive regard ratings than the others. Classrooms also differed significantly in participants' perceptions of organization, $F(4, 104) = 5.24, p < .001$, but not participation, $F(4, 104) = 1.89, ns$, during the peer-led intervention. Post hoc comparisons using Fisher's PLSD indicated that participants in Classes 1, 3, and 5 perceived a more organized intervention climate than did Classes 2 and 4.

Classroom Characteristics and Improvements in AIDS-Related Knowledge and Attitudes

As shown in Table V, classes' mean residualized change scores for AIDS-related knowledge and attitudes scales from Time 1 to Time 2 were ranked and summed. Concerned that classes' mean residualized change might be unduly influenced by outlying scores, we also calculated the percentage (rate) of participants who showed improvement on AIDS-related knowledge and attitudes scales and ranked the classes on the basis of these percentages. Comparison of the two sets of rankings revealed that they were nearly identical, and the mean residualized change scores were thus used for the qualitative displays. A series of one-way ANOVAs investigated classroom effects regarding the extent of residualized change on AIDS-related knowledge and attitudes. There was a classroom trend for the unpopularity of sexual activity variable, $F(4, 82) = 1.97, p = .10$, but no classroom effects were found for AIDS knowledge, communication self-efficacy, condom self-efficacy, or positive feelings for condom use.

Table VI displays the relationships between selected classroom characteristics and the magnitude of improvement on AIDS-related knowledge and attitude scales from Time 1 to Time 2. Although the small number of rankings does not permit statistical comparison, the matrix suggests interesting patterns. As described earlier, students in Classes 1, 3, and 5 reported significantly higher levels of organization than did Classes 2 and 4; these better-organized intervention classes showed slightly better improvement than the other two classes across the five AIDS-related knowledge and attitude scales. Classes' reported level of participation did not appear to be linked with classroom-level improvements in AIDS-related knowledge and attitudes. Class 1—the class with the most individuated, least shy, and

most positively regarded peer educator team—achieved the strongest overall improvement despite a low level of self-reported participation. Several demographic qualities of the Class 1 implementation were noteworthy: Participants in Class 1 were mostly male (the only male-majority class) and African American; and its peer educator team comprised three females (two of whom were African American).

Classroom Observations

Observations of the peer-led sessions indicated that—even with the same scripted curriculum presented in each class—characteristics of participants, characteristics of peer educators, and the ways in which peer educators implemented the curriculum served to combine in unique and interesting ways that clarify and suggest interpretations of the quantitative relationships reported earlier. Our primary focus here is on understanding how classroom climate dimensions of organization and participation were manifested during the intervention implementation and may have affected the effectiveness of the intervention in particular classrooms. Gaining insight into the dynamics of the Classroom 1 intervention setting is also of interest given the special characteristics and effectiveness of that implementation.

Observations of Class 1 session characterize peer educators' interactions with the class as dynamic, highly personalized, and directive (consistent with peer educators' self-assessments). Class 1 appeared disorganized to observers in the minutes before the peer-led sessions (i.e., participants shouting, sitting on their desks, and not responding to teachers' requests), but the peer team seemed to bring the class "in line" during the session. Classroom observations suggest that Class 1's low reported participation was perhaps partly related to the fact that students were made to feel acutely aware of their low participation when it occurred. The Class 1 team, besides improving, disciplining, and working to engage with their students, expressed their frustrations when they perceived that participants lacked enthusiasm:

For the third skit, M. (peer educator) also tries to get volunteers in an imploring tone: . . . (When students are talking amongst themselves and not paying attention, she says:) "Excuse me, but will you listen to what I'm saying!" . . . Then she asks: "Why aren't you guys asking questions?" One African American boy says: "Cause it's boring." M responds wistfully: "Last time, you were asking questions and you were so open."

Although the peer educator did express anger in this excerpt, it appears that her students did not ultimately hold it against her since this peer educator received the strongest positive regard ratings of the intervention. In-

Table V. AIDS-Related Knowledge and Attitude Scales for Entire Intervention and by Classroom^a

	Class 1	Class 2	Class 3	Class 4	Class 5
AIDS knowledge (<i>n</i> = 90)					
Pretest <i>M</i> (<i>SD</i>)	6.3 (2.6)	8.6 (1.7)	8.4 (1.7)	7.9 (1.9)	8.0 (2.1)
Residualized change	0.8	-0.2	0.5	-0.6	-0.4
Change ranking	5	3	4	2	1
Communication self-efficacy (<i>n</i> = 88)					
Pretest <i>M</i> (<i>SD</i>)	32.7 (5.4)	26.9 (5.9)	28.0 (6.5)	27.7 (6.6)	27.6 (4.3)
Residualized change	1.4	-1.1	-0.9	1.0	.7
Change ranking	5	1	2	4	3
Unpopularity of sexual activity (<i>n</i> = 87)					
Pretest <i>M</i> (<i>SD</i>)	11.6 (3.8)	13.6 (3.0)	14.0 (2.9)	14.1 (4.1)	14.5 (4.5)
Residualized change	1.0	-1.0	1.2	-0.4	-0.3
Change ranking	4	1	5	2	3
Condom self-efficacy (<i>n</i> = 88)					
Pretest <i>M</i> (<i>SD</i>)	13.2 (2.6)	12.1 (2.2)	12.5 (2.9)	11.7 (2.6)	11.7 (3.3)
Residualized change	-0.3	0.4	-0.5	-0.3	0.5
Change ranking	3	4	1	2	5
Positive feelings for condom use (<i>n</i> = 83)					
Pretest <i>M</i> (<i>SD</i>)	7.6 (1.4)	8.2 (1.4)	7.8 (1.9)	6.6 (1.8)	8.1 (1.2)
Residualized change	-0.8	-0.3	0.2	-0.2	-0.1
Change ranking	1	5	4	2	3
Sum of rankings	18	14	16	12	15

^aRankings of 5 indicate the strongest improvement on the variable; rankings of 1 indicate the least improvement; *n*s differ slightly due to missing data.

Table VI. Class Rankings of Selected, Conceptually Related Study Variables^a

	Self-rated peer qualities		Perceptions of peers: Positive regard for peer educators		Intervention climate		Improvements in AIDS-related knowledge and attitudes ^b				Total for 5 AIDS-related knowledge and attitude scales
	Individuation of peer educator team	Shyness of peer educator team	Organization	Participation	AIDS knowledge	Communication self-efficacy	Unpopularity of sexual activity	Condom self-efficacy	Positive feelings for condom use		
Class 1	5	5	4	1	5	5	4	3	1	5	
Class 2	3.5	3	2	5	3	1	1	4	5	2	
Class 3	2	1	5	4	4	2	5	1	4	4	
Class 4	1	3	1	2	2	4	2	2	2	1	
Class 5	3.5	3	3	3	1	3	3	5	3	3	

Significant at .05 level

Significant at .001 level

Significant at .10 level

^aWith the exception of shyness, rankings of 5 = the strongest level of the variable; rankings of 1 = the lowest level of the variable. For shyness, the coding is reversed.
^bRankings of 5 = strongest improvement; rankings of 1 = lowest improvement.

deed, perhaps part of her appeal stemmed from the genuine manner in which she interacted with students—she seemed to care about their participation and although they did not always respond as she wished, they did give her feedback about her performance.

This excerpt from the narrative record of Class 2 (ranked low on organization by its participants and described as “tense” and “disorganized” by observers) illustrates how high participation can be disruptive in the context of a disorganized intervention setting:

Peer educator asks: “Did everybody have fun?” . . . Boy shouts: “No, we didn’t get to have a party!” Peer educator asks: “Any questions?” Boy: “Why are you leaving?” . . . (Sporadic talking as peers talk amongst themselves). Boy laughs loudly and runs away to put himself in a particular group. Peer educator: “Why don’t you sit down?” He doesn’t respond. Facilitator shouts, “Sit down!” and appears angry . . . At 10:50 (20 minutes after class started), students are just getting into groups to start the first activity of the session.

In the case of Class 2, then, it may be that students participated in the peer-led sessions, but not in a manner conducive to learning the material. In the incident described above, the order in Class 2 was disrupted to such a degree that the adult facilitator eventually acted in an attempt to control unruly students. As the prescribed role of the facilitator consisted of observation and technical assistance to the peer team, facilitator’s disciplinary behavior was highly unusual and was considered a strategy of last resort (i.e., if peer educators were blocked from presenting for an extended period).

DISCUSSION

In the context of an effective school-based, peer-led AIDS intervention program, our research investigated the characteristics of peer educators and classroom environments associated with greater participant change in AIDS knowledge and attitudes. Using students as the unit of analysis, this study found that participants perceived their ninth-grade peer educators in terms of two main dimensions: positive regard and similarity. More highly individuated and less shy, but not more sociable, peer educators received stronger positive regard ratings from their participants. After the peer-led intervention, participants who expressed more positive regard for their peer educators were more likely to have confidence that they could talk about romantic and sexual topics with peers (communication self-efficacy) and to report the AIDS-preventive peer norm that having sex does not make someone more popular (unpopularity of sexual activity). These findings held after controlling for participants’ pretest scores on the vari-

ables and the effects of classroom membership. Further, consistent with our expectation of possible differences at a classroom level in the efficacy of school-based, peer-led interventions for adolescents, classroom membership was found to explain a significant proportion of variance in participants' postintervention AIDS-related knowledge and attitudes. Thus, the study's findings provide some support for the hypothesis that participants' perceptions of peer educators (here, positive regard) would be associated with improvements in AIDS-related knowledge and attitudes and further, that there would be classroom differences in intervention effects. Contrary to our prediction, ethnic match and perceived similarity between peer educators and participants were not identified as significant in promoting participants' postintervention AIDS-related knowledge and attitudes. Also, positive regard predicted participants' improvement on two but not all AIDS-related knowledge and attitude scales.

An analysis of participant change in the context of the five intervention classes extends our understanding of the factors predicting intervention impact on participants. Despite the low statistical power available for the classroom-level analyses (thus, a conservative estimate), significant classroom differences were found in the positive regard expressed by seventh-grade classes for their peer educator teams and in the extent to which participants considered their intervention classes to be well-organized. The three most organized classes (as perceived by participants) showed greater overall improvements in AIDS-related knowledge and attitudes, providing support for the hypothesis that classes scoring high on organization during the intervention would show improvements in AIDS-related knowledge and attitudes. There was no evidence that high participation alone brought about classroom improvements in AIDS-related knowledge and attitudes. The "positive regard" effect found in the individual analysis was also evident at a classroom level since the two classes ranked high on positive regard and perceived organization showed the strongest overall improvement on AIDS-related knowledge and attitudes. Class 1, with the highest positive regard for its peer educators and the second-highest level of perceived organization, achieved the greatest overall improvement in AIDS-related knowledge and attitudes. In sum, positive regard for peer educators differentiated classrooms and further, classroom differences in positive regard for the educators as well as in perceived organization of the intervention environment appeared to be linked with greater improvements in knowledge and attitudes.

With regard to individual-level findings, the literature had suggested that specific characteristics of peer educators might each enhance the effectiveness of peer-led AIDS prevention programs, including warmth and attractiveness, credibility, expertise, and perceived similarity (Bandura,

1986, 1992; Petty & Cacioppo, 1981). This study found that participants in an adolescent AIDS prevention program did not differentiate between multiple characteristics of peer educators presented to them for evaluation; instead, they tended to perceive the peer educators in terms of more global positive regard and perceived similarity. That greater positive regard was expressed for less shy and more highly individuated peer educators is consistent with research linking high individuation and greater social impact (Whitney et al., 1994); the lack of relationship between peer educators' sociability and participants' perceptions of peers may have resulted from limitations of the sociability scale, which, in contrast with other measures used here, consisted of only socially desirable self-statements. Classroom observations of the peer educators' delivery of the curriculum provided anecdotal evidence to support the validity of peer educators' self-ratings and to illustrate how more individuated and less shy peer educators behaved. More individuated and less shy peer educators were observed personalizing the curriculum using eye contact and improvised comments and stories. For example, one highly individuated and highly regarded peer educator told the class a story about her brother, who "became really dumb from smoking weed," to illustrate the curriculum. Less individuated and more shy peer educators tended to read directly from the curriculum guide and have a less entertaining delivery.

Several patterns of findings merit further consideration. For example, why did positive regard significantly explain variability in some but not all AIDS-related outcome variables? Despite previous research relating gains in AIDS knowledge to curriculum delivery by culturally similar peers (Stevenson & Davis, 1994), AIDS knowledge acquisition in this classroom-based program may have been more of a factual learning task and thus less open to peer influence than subjective attitudinal dimensions such as sexual behavior norms. Psychometrics should also be considered in interpreting positive regard's relative power for explaining the variance in outcome variables as prediction may have been hampered by the fact that the AIDS knowledge, condom self-efficacy, and positive feelings for condom use scales were less internally consistent than the other two scales. Lack of evidence for a significant relationship between improvements in AIDS-related knowledge and attitudes and the variables of ethnic match and perceived similarity was unexpected in light of the theoretical emphases on similarity in the social cognitive (Bandura 1986; 1992) and social influence literatures (Festinger, 1954), and the evidence for some benefits from the use of culturally similar models in AIDS education (Stevenson & Davis, 1994). The possibility that ethnic matching indirectly boosted program outcomes through positive regard is weakened by the nonsignificant correlation between ethnic match and positive regard. The perceived similarity variable

had a lower standard deviation than the positive regard variable, reflecting a more restricted range not resulting from ceiling effects (the mean was in the "probably not similar to me" range). Despite low expressed similarity, the intervention influenced peer norms (in terms of unpopularity of sexual behavior), suggesting that the peer educators were perceived as similar enough to be considered members of the same broadly defined peer group. Overall, these findings suggest that other aspects of the peer educator-participant relationship, such as positive regard, are more salient than ethnic match or perceived similarity in influencing attitudinal change.

With regard to classroom-level findings, the classroom climate literature indicated that higher levels of organization and participation were each associated with greater satisfaction and better achievement on the part of students (e.g., Fraser & Fisher, 1982; Haladyna, Shaughnessy, & Redsun, 1982a, 1982b; Moos & Trickett, 1987), although the interactive impact of these dimensions on students' outcomes was not specified, nor was it known if these effects would hold true for AIDS-related peer education. Consistent with research on teacher control in the presence of supportive relationships with students (Moos & Trickett, 1987), this study suggests that strong classroom organization in program implementation can enhance the efficacy of peer education, particularly if it is enacted in the presence of high positive regard for peer educators. The intervention appeared to be most effective in Class 1, a mostly male setting that seemed to "pull" for high peer educator organization and had a peer educator team with the social skills to exert control while making a good impression on participants (evidenced by observations and the strong positive regard expressed for this peer team). Class 1 was also small, which may have assisted the peer team to develop a positive organizational and affective climate. In sum, an examination of participant change in the context of classroom membership supports previous climate findings concerning the importance of perceived classroom organization for growth, extending these findings to the impact of a peer-led AIDS curriculum. Further, quantitative and observational data on classroom-level characteristics and behavior deepens our understanding of the implementation factors with potential implications for the efficacy of peer-led health promotion efforts.

One constraint of the present study was the small sample and low statistical power available for the classroom-level analyses, which may have underestimated the extent of classroom effects. A larger sample of classrooms would also permit more sophisticated analyses such as hierarchical linear modeling (Bryk & Raudenbush, 1992). This study's focus was on in-depth analysis of one cohort of adolescents and one wave of implementations of a peer-led AIDS prevention program. Because of our focus on depth rather than breadth of study and the relatively low base rate of sexual

behavior for this early adolescent sample, proximal indicators of AIDS-risk behavior (AIDS-related knowledge and attitudes) were used as the outcome variables. Future research with the extensive resources to provide both depth (in the form of intensive, within-intervention observation and assessment) and breadth (in the form of multiple iterations of the intervention and a much larger sample of adolescents) could provide important extension and replication of this research with both more classrooms and sufficient data to use sexual behavior as a meaningful program outcome. An additional limitation of this study is that information on peer educators, classroom climate, and AIDS-related knowledge and attitudes were based primarily on self-report ratings. Cross-validation, however, was provided by peer educators' ratings of their own characteristics and by observations of the peer educators and the implementation class environment.

Study findings regarding the importance of peer educator characteristics (high individuation and low shyness), participants' positive regard for peer educators, and perceived organization in the intervention classroom have implications for the selection and training of peer educators and also suggest that mid-program assessments of intervention climate and perceptions of peer educators could be useful to identify difficulties and provide additional support and training as needed. In addition, presentations by shy and less individuated peer educators could be improved through the development and use of easily personalized curricula that encourage communication in educators' own words.

Although the dominant approach to studying adolescent health promotion limits itself to the evaluation of intervention outcomes, much is to be learned from more in depth analyses of implementation context and its relationship to outcome. Through continued investigation of the rich relationships and contexts in which social psychological theories of attitude and behavior change are tested in schools and other real-life settings, the conceptual work of theory development and validation and the practical work of health promotion will progress in tandem.

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