SPECIAL POPULATIONS

Cognitive–Behavioral Intervention to Reduce African American Adolescents’ Risk for HIV Infection

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Two hundred forty-six African American adolescents were randomly assigned to an educational program or an 8-week intervention that combined education with behavior skills training including correct condom use, sexual assertion, refusal, information provision, self-management, problem solving, and risk recognition. Skill-trained participants (a) reduced unprotected intercourse, (b) increased condom-protected intercourse, and (c) displayed increased behavioral skills to a greater extent than participants who received information alone. The patterns of change differed by gender. Risk reduction was maintained 1 year later for skill-trained youths. It was found that 31.1% of youths in the education program who were abstenst at baseline had initiated sexual activity 1 year later, whereas only 11.5% of skills training participants were sexually active. The results indicate that youths who were equipped with information and specific skills lowered their risk to a greater degree, maintained risk reduction changes better, and deferred the onset of sexual activity to a greater extent than youths who received information alone.

Although adolescents represent fewer than 1% of diagnosed AIDS cases in the United States (Centers for Disease Control [CDC], 1993), the long latency between initial infection and the later appearance of AIDS means that many AIDS cases diagnosed among individuals in their 20s probably reflect adolescent-acquired HIV infection. Heterosexual contact now accounts for the largest increase in reported AIDS cases, and rates of heterosexually transmitted HIV infection are highest in the southeastern United States (CDC, 1993). Adolescents’ primary risk for HIV infection is from sexual activity, although not all adolescents are at equal risk. Adolescents who are sexually abstinent, do not combine self-injection with needle sharing, or use condoms consistently are at lower risk, whereas youths who engage in unprotected sexual activity or who self-inject and share needles are at a risk level proportional to the incidence of HIV infection in their communities.

In the absence of population-based studies of HIV infection prevalence in adolescents, the best predictor for the potential spread of adolescent-acquired HIV infection is the incidence of sexually transmitted diseases (STDs). Adolescents typically have higher STD rates than all other age groups. From 1981 through 1991, 24% to 30% of the reported morbidity from gonorrhea and 10% to 12% of the morbidity from syphilis in the United States affected adolescents (Webster, Berman, & Greenspan, 1993). Some of the highest rates of gonorrhea during that decade were among 15- to 19-year-olds, and gonorrhea rates among adolescents increased or remained unchanged whereas rates among older age groups decreased. If STDs are cofactors or predictors for transmission of HIV, the high STD incidence among adolescents may presage dramatic increases in HIV acquisition for adolescents. Inner-city minority adolescents, in particular, are at higher risk as a function of greater concentrations of HIV in inner-city areas, higher STD rates among ethnic minority youths, and the disproportionate impact of AIDS on racial and ethnic minorities in the United States (Conway et al., 1993; Webster, Berman, & Greenspan, 1993).
Although adolescent sexual activity is not a recent phenomenon, the past 2 decades have seen increased sexual experimentation by a larger number of adolescents at an earlier age with a greater number of sexual partners (Cochran & Peplau, 1991). Risk reduction programs for adolescents are now a high priority, although few intervention models have been implemented and evaluated with adolescents. In addition, long-term follow-ups from successful interventions are needed to evaluate maintenance of behavior change, as changes need to be sustained for an indefinite period in the absence of any vaccine or cure for HIV. Few studies have produced longitudinal information, beyond two reports of 3-month follow-ups (Jemmott, Jemmott, & Fong, 1992; Walter & Vaughn, 1993) and one study that followed homeless and runaway youths for 6 months after an intervention (Rotheram-Borus, Koopman, Haingnere, & Davies, 1991). Assessment of possible gender differences is also an important consideration, although most of the published programs targeted only male adolescents (cf. Jemmott, Jemmott, & Fong, 1992; Schinke, Gordon, & Weston, 1990).

Providing HIV risk reduction interventions to adolescents is also a socially sensitive undertaking. Deeply held and emotional concerns have been expressed that if adolescents are provided with sexually explicit information or skills training, they may misconstrue such information as tacitly condoning or even promoting sexual activity. As a result, arguments are advanced for both abstinence-based programs and more sexually explicit safer-sex approaches. Advocates of abstinence-based approaches argue correctly that celibacy offers the only absolute protection from HIV or other STDs. Advocates of skill training approaches note that sexual activity is already high among U.S. teenagers, early onset of sexual activity is rarely followed by a return to abstinence, and youths need to be equipped with self-protective skills (DiClemente, 1993). As the debate continues, HIV infection rates among adolescents are escalating (Young, Feldman, Bracklin, & Thompson, 1992).

Clear guidelines are not available regarding the optimal content, timing, or format for HIV risk reduction efforts targeting adolescents (St. Lawrence, 1993a). Brief informational programs are the most widely used intervention targeting adolescents in schools, health care settings, and community-based programs. For example, DiClemente et al. (1989) provided AIDS education to middle and high school classes in San Francisco. Students who received the AIDS information evidenced greater knowledge and less fear of casual contact than students in the control classrooms. However, all of the available evidence suggests that, although informational approaches successfully disseminate knowledge, information alone is not motivating adolescents to change risk-associated behavior (Baldwin, Whitely, & Baldwin, 1990; Bellingham & Gillies, 1993; Kirby, Barth, Leland, & Petro, 1991). These studies and others consistently find that sexually active adolescents continue to engage in unprotected sexual intercourse even after they become knowledgeable about HIV transmission (DiClemente et al., 1992; Kegeles, Adler, & Irwin, 1988; Kipke & Hein, 1990; Thurman & Franklin, 1990). Even when adolescents report using condoms, very few report consistent use (Jay, Bridges, Gottlieb, & DuRant, 1988). In a review of the existing literature, Ross and Rosser (1989) concluded that education alone is unrelated to behavior change in the absence of skills training or modification of attitudes, beliefs, or situational determinants of risky behavior. This makes intuitive sense because information does not necessarily motivate recipients to apply the information in their personal lives (Obeidallah et al., 1993). In comparison with other populations, adolescents may also be more resistant to behavior change, given the feelings of invincibility that characterize this developmental period (DiClemente, Lanier, Horan, & Lodico, 1991; Elkind, 1967).

All of the behaviors implicated in HIV risk are interpersonal and occur within social interactions. As such, they are intertwined with social effectiveness, decision-making competency, vulnerability to peer pressure, and the unique difficulties inherent in negotiating behaviors that are rarely the subject of discussion, even among adolescents. Instruction may be more effective when it is not limited to information provision alone but expanded to provide skills training relevant to implementing risk reduction changes successfully. Such skills include the ability to use condoms correctly and consistently if a youth is sexually active; interpersonal competencies to refuse unwanted sexual initiations, to resist coercions or to negotiate safety; self-management skills to implement preferences successfully; and motivating youths to implement self-protective behavior by recognizing and personalizing their vulnerability.

Pregnancy prevention programs for adolescents proliferated in the past three decades, but very few have been subjected to evaluation (Stahler & DuCette, 1991) and the limited number of empirically evaluated programs targeting youths' sexual HIV-risk behavior produced mixed results. Schinke, Gordon, and Weston (1990) developed a self-instruction risk reduction program and evaluated two variations of their intervention with 60 adolescents in New York City. Adolescents were randomly assigned to receive a self-instructional guide and group instruction in its use, to receive the guide without group instruction, or to a no-treatment control condition. Postintervention data confirmed that participants in both self-instruction groups acquired the self-instruction skills, but their acquisition of cognitive skills did not convert into behavioral risk reduction.

In a more promising effort, Jemmott, Jemmott, and Fong (1992) conducted a risk reduction program with 157 male African American adolescents and assessed whether the intervention promoted changes in knowledge, attitudes, intentions, or behavior. Participants were randomly assigned into 27 small groups that simultaneously received one of two interventions led by trained facilitators. A 5-hr AIDS risk reduction intervention provided information and skills training in the context of developmentally and culturally appropriate activities. A comparison control group received a career opportunities intervention that constituted an attention placebo. Immediately after the interventions, participants completed postassessment measures before departing from the day-long program. Postintervention, participants in the AIDS condition evidenced greater knowledge, less favorable attitudes toward risky sexual behavior, and weaker intentions to engage in such behavior than their counterparts in the career-focused intervention. Three months later these differences sustained for the knowledge and intention measures, although they were no longer significant for the measure of attitudes toward risky sexual behavior. More importantly, at the 3-month follow-up, an aggregate sexual behav-
ior index was lower for participants in the AIDS condition relative to the control condition.

Walter and Vaughn (1993) evaluated a teacher-delivered risk reduction curriculum's impact in modifying knowledge, beliefs, and risk behavior of high school students in New York City. Students in the intervention groups displayed modest changes in knowledge, beliefs, self-efficacy, and risk behavior in comparison with students who did not receive the intervention. Bellingham and Gillies (1993) evaluated an AIDS education program for youths in vocational training centers and documented increases in knowledge but no effects on sexual behavior, intentions, or attitudes.

Fisher and Fisher (1992) argue that to achieve substantial changes in risky behavior, programs need to attend simultaneously to participants' informational needs, motivational influences, and behavior, terming this the IMB risk reduction model. The IMB model and social learning theory provided the theoretical framework for the present intervention study comparing 246 African American adolescents who were randomly assigned to either an educational intervention or a behavioral skills training intervention that attended to all three components of the IMB model. Outcome measures evaluated each program's impact on HIV-AIDS knowledge, attitudes theoretically relevant to risk reduction, interpersonal skills in simulated risky situations, and self-reported sexual behavior. Program impact was evaluated separately for male and female adolescents, and maintenance was assessed through a 12-month follow-up period.

Method

Participants and Participant Recruitment

The study was conducted in a southern city of 400,000 residents that is typical of many medium-sized U.S. cities with respect to the prevalence and demography of HIV. However, youths in the area where the study was conducted may be at higher risk than adolescents living in other geographic areas. The state ranks first nationally in births to teenagers, teenage pregnancy, and syphilis and is third nationally in the incidence of gonorrhea. One third of STDs in the state are diagnosed among 15- to 19-year-olds, a substantially higher rate than any other age group. In addition, the demographics of HIV and AIDS in the city are substantially higher for African Americans than corresponding national percentages. Forty-nine percent of the state's AIDS cases are African American, compared with 31% across the United States and 71% of HIV infections are diagnosed among African Americans, indicating that the future AIDS statistics will increasingly affect ethnic minority residents (Mississippi State Department of Health, 1993).

The project was conducted in collaboration with a Public Health Service (PHS)-330-funded comprehensive health center that serves predominantly low-income minority patients.1 Brochures describing the study were distributed in the clinic to adolescent patients and their parents or guardians. Project staff were present to answer questions and explain the project. After informed consent was received from the parents and guardians and from the adolescent, individual assessments were conducted in a private conference room at the health center. Inclusion criteria were as follows: (a) African American adolescent between the ages of 14 to 18, (b) informed consent by parents and guardians and by the adolescent, and (c) no current symptoms of HIV infection or AIDS.

Participation criteria were met by 246 African American adolescents. Participants' mean age was 15.3 (SD = 1.4), and the average school grade was 9.7 (SD = 1.6). Gender composition of the sample was 28% male and 72% female, consistent with the gender distribution of adolescent patients in the health center. Participants reported an average of 2.7 (SD = 4.7) lifetime sex partners and a mean of 1.8 (SD = 3.2) sex partners in the past 12 months. Average age of first intercourse was 12.9 years (SD = 2.6). Clinic records indicated that 8.6% of the participants were treated for a STD within 2 months of their recruitment into the study, and 13.1% of the sample already had one or more children. Approximately half of the participants (50.2%) reported alcohol use to intoxication in the previous 2 months, and 3% reported marijuana use during the same period. No other substance use was reported, consistent with other data indicating that intravenous drug use is uncommon among ethnic minority adolescents (St. Lawrence & Brasfield, 1991; Turner, Miller, & Moses, 1989). Although most youths were not aware of their household income, 82% of the health center's patients received Medicaid, which confirms that the youths were drawn from a low-income population. All youths attended public schools or were school dropouts; public schools in the city where this intervention was conducted did not include HIV education in the curriculum (St. Lawrence, 1993b), ensuring that the youths were not exposed to comparable presentations in the classroom. Thus, this sample consisted of apparently healthy ethnic minority adolescents, many of whom were engaging in sexual activities that placed them at risk for adolescent-acquired HIV infection. Participants were paid $5/hr for their participation and received a T-shirt with the project logo for attending all sessions. At the final session, all participants received a personalized certificate of completion.

Measures

All participants completed self-report and behavioral measures and engaged in simulated role-play assessments of (a) potentially risky interactions and (b) opportunities to share information with their peers.

Paper-and-pencil measures. For the promotion of candid responses, all measures were completed using code numbers devised by the subjects rather than their names.

Risk behavior survey. Modeled after instruments extensively used in HIV prevention research (Darrow, 1983), this self-administered measure elicits detailed information about sexual behavior and substance use over the past 2-month period and for the past year. The measure collected information about the frequency of unprotected and condom-protected vaginal, oral, and anal intercourse and the number of sex partners. Data on sexual activities for the past year were collected for sample description purposes only. Behavior in the previous 2 months constituted a pre-intervention baseline. This time frame was selected on the basis of evidence that shorter retrospective assessment periods yield more reliable information (Kauth, St. Lawrence, & Kelly, 1991).

Condom Attitude Scale (CAS). The CAS (Sacco, Levine, Reed, & Thompson, 1991) assesses attitudes toward condom use and was revised from 57 to 35 items, adjusted to a fifth-grade reading level, and pre-tested with a separate sample of African American adolescents (St. Lawrence, 1993a). Cronbach's alpha for the revised measure with the current sample was .80.

AIDS Risk Knowledge Test. The version of the AIDS Risk Knowledge Test (Kelly, St. Lawrence, Hood, & Brasfield, 1989b) used in this study contains 24 true-false items assessing practical knowledge of HIV risk behavior and misconceptions regarding HIV transmission. A single summary score reflects the number of items answered correctly. The original instrument was normed with adults and has been revised for adolescents by reducing the number of items from 40 to 24 and adjust-

1 PHS-330 health centers are funded by the Department of Health and Human Services to provide care to medically underserved populations.
ing language to a seventh-grade reading level and was pretested with a separate sample of African American adolescents (St. Lawrence, 1993a). The Kuder-Richardson (K-R) 20 estimate of internal consistency for the revised version with this sample was .75.

Three additional items gathered information about self- and response efficacy and perceptions of personal HIV infection risk on a 10-point scale (0 = low efficacy belief or no risk and 10 = high efficacy belief or extremely high risk). Self-efficacy refers to the youths' beliefs as to whether they could effectively prevent HIV risk, and response efficacy is the belief that options available to them (such as condom use or abstinence) could effectively prevent HIV transmission.

Sexual assertion role play assessments. All HIV risk behaviors occur in an interpersonal context and lack of assertion can contribute to risk if an adolescent is unable to refuse sexual initiations, extricate from coercions to engage in unwanted sexual activity, or initiate discussion with a sex partner concerning the importance of safer sex. To assess assertion skill, we constructed three role play scenarios. Scripts were generated by a focus group of high school students and rated by a separate sample of high school students who indicated (a) whether they had ever encountered a situation similar to the portrayal in the script and (b) whether the situation had been difficult for them to handle to their satisfaction. A scenario was retained for use in this study if more than 75% of the social validation sample indicated that they had personally experienced a comparable situation and found it difficult. Following standard paradigms for assertion assessment (cf. Eisinger, Miller, & Hersen, 1973), each scenario consisted of an audiotaped narration followed by three prompts from a research assistant who simulated the verbal conduct of the other person. Narrations described situations in which a boyfriend or girlfriend attempts to pressure the participant to engage in unprotected intercourse and situations in which sexual activity is imminent and the participant has not previously discussed the need for safety. Parallel scripts were developed for boys and girls. Participants' responses were audiotape recorded for later rating. An example of a role play script is as follows (for male participants):

**Narration:** You and your girl friend went out tonight. Now you're alone and things are getting out of hand. She's really worked up and wants to have sex. She says:
**Prompt 1:** I need you, Baby.
**Prompt 2:** Let's do it, Baby.
**Prompt 3:** Sweetheart, I can make it really good to you.

Peer education role play assessments. Research has shown that peer educators are effective sources of information (Kelly et al., 1992). Two additional role play scenes, following the same format, evaluated HIV-related information provision to peers. A sample narration is as follows (for female participants):

**Narration:** You're spending the night at a girlfriend's house, and the two of you are just talking. Somehow you end up on the subject of sex and your friend tells you that she doesn't use protection.
**Prompt 1:** When you bring up the idea of using rubbers, she says:
**Prompt 2:** Me and my baby don't mess around on each other.
**Prompt 3:** After all the time we've been together, I haven't caught nothing.

**Intervention Procedures**

After the baseline assessment, participants were randomly assigned to either (a) an educational program that met once time (EC) or (b) a 4-hour, multi-session educational role play assessment (BST). Two months later, participants from both groups were individually reassessed to evaluate changes associated with each intervention. Six and 12 months after the program ended, participants were reassessed on the same measures to evaluate maintenance and positive desynchrony in program outcome (i.e., that one program might produce more gradual change that would not be detected postintervention). Of the 246 participants assigned to an intervention, 91.5% (n = 225) completed the intervention and postintervention assessments and 21 participants (8.5%) were lost to attrition. Attrition from both groups resulted primarily from family relocations out of the geographic area. Missed sessions because of illness, school activities, or other conflicts were replaced with an individual make-up session before the next week's group meeting. Group sizes for both interventions ranged from 5 to 15. All groups were led by a male and a female co-facilitator who followed a standard protocol for each condition. Sessions were audiotaped for later evaluation by the project's director to ensure adherence to each experimental protocol, and no substantial departures from the intervention protocols were noted across groups or sessions.

Successive waves (n = 14) received identical training across 3 years of implementation of this intervention.

**Education control condition (EC).** The education intervention consisted of a single 2-hr session that followed a standard curriculum and provided HIV-AIDS education in a developmentally and culturally appropriate format. Didactic modules were interspersed with games, group discussion, and other developmentally appropriate activities. This intervention approximated the type of HIV-AIDS information an adolescent might encounter in a classroom, health care, or community-based setting. Information was provided in the context of the local demographics for HIV and AIDS (i.e., 73% of newly identified HIV infections in Mississippi last year were African Americans) and its impact on the African American community locally, as well as nationally.

**Behavior skills training (BST) experimental intervention.** The experimental BST intervention consisted of eight 90- to 120-min weekly group meetings led by two trained project staff. Each session began with a review of key issues from the previous session.

**AIDS education.** The first session was identical to the education control condition and provided information about HIV-AIDS and methods of preventing HIV infection. Participants in this, as well as the education, were advised that abstinence was the only absolutely sure way to remain uninfected. However, given the reality that many of the youths already were sexually active, ways to lower HIV infection risk were included. Youths were not given prescriptive ultimate turns about what they should or should not do but were advised that the program's intent was to equip them with information and skills to make sound choices. As in an earlier risk reduction intervention with gay men (Kelly, St. Lawrence, Hood, & Brasfield, 1989), risk was conceptualized along a continuum from activities very high in risk (unprotected intercourse) to those that posed lesser risk (condom-protected intercourse) to those in which neither partner was at risk (hugging, massage, and other nonpenetrative activities). Activities were ordered along this continuum if they posed risk for either partner in a sexual interaction.

**Sexual decisions and values.** The second session addressed values clarification through group discussion about sexual decisions and pressures the adolescents' experienced, followed by a video specifically prepared for African American youths (Seriously Fresh: Hoffman & Life, 1989). The video was followed by discussion of the issues raised in the film (e.g., adolescents' vulnerability to AIDS; attitudes toward safer sex, condoms and abstinence; and social support for personal values from friends and family).

**Technical competency skills.** The third session presented information about sexual activity levels reported by adolescents in a statewide survey (St. Lawrence & Brasfield, 1991) and promoted group discussion about attitudes toward condom use. Project staff stressed that abstinence was the only assuredly safe way to avoid HIV or other STIs while recognizing that youths who were sexually active needed safer alternatives. Correct condom use was demonstrated by the group leaders, first using a cucumber to dissipate some initial stiffness and dis-
strengthened personal self-efficacy beliefs among participants that they
gram and the personal changes he or she made in response to participat­
Teen). This provided peer coping models from within the group and
comfort and then with a pen ile model. The demonstration was followed
quarter, whom they would call, what they would say, and how they
engage in sexual intercourse and a quarter to use for calling a parent or
lessen their risk.

difficult for the m to handle in the future, practiced problem identifica­
ted to unwanted pressures and situations they anticipated would be
were trained (a) to refuse or (b) to acknowledge the partner's desire but
to firmly state his or her position, provide a reason for their point of
and suggest an alternative that would not pose risk for either part­
Information provision scenes stressed the need to educate their
friends by expressing caring, sharing information, and providing spe­
cific information about how to avoid risk.

Participants divided into dyads or triads and role played practice sit­
uations with feedback and corrective suggestions from the group leaders.
The role play practice scenes were similar, but not identical, to the
scenarios used in the assessments. Participants then discussed their
comfort in using the skills if they encountered a similar situation and
were encouraged to practice these skills if the opportunity arose during
the week and return ready to discuss their experience with the group the
following week. Social competency skills training was the focus of three
group sessions.

Cognitive competency skills. Adolescents typically do not personal­
ize their vulnerability or perceive themselves to be at risk for adverse
consequences, including HIV infection (Elkind, 1967). One session in­
cluded discussion with a small group of local HIV-seropositive youths
called the “Rap Team.” This component was included to promote risk
recognition and more accurate perceptions of vulnerability. Rap Team
members disclosed their HIV status to the group, discussed how HIV
had affected their lives, and “rapped” with participants. Group mem­
ers evidenced rapt attention throughout this session, asking many
questions of the Rap Team members.

The following session continued the cognitive skills training intro­
duced earlier and focused on behavioral self-management and problem­
solving strategies. Participants identified past situations when they con­
ceded to unwanted pressures and situations they anticipated would be
difficult for them to handle in the future, practiced problem identifica­
tion skills to clarify the dilemma, and developed behavioral strategies to
lessen their risk. Participants also shared strategies they used success­
fully in past situations. For example, one strategy participants developed
was a “condom and a quarter” card and they prepared a personal
“emergency survival kit” with a condom in the event they decided to
engage in sexual intercourse and a quarter to use for calling a parent or
friend to come and get them if they wanted to leave a risky situation.
Each participant specifically identified how he or she would use their
quarter, whom they would call, what they would say, and how they
would extricate themselves from the situation.

Social support and empowerment. During the final session, each
participant identified what he or she felt was most helpful in the pro­
gram and the personal changes he or she made in response to participat­
ing in the project (called Project B.A.R.T.—Becoming A Responsible
Teen). This provided peer coping models from within the group and
strengthened personal self-efficacy beliefs among participants that they
could successfully implement risk reduction strategies. Further activi­
ties illustrated the impact the group could have by educating their
friends and families and stressed the importance of supportive friend­
ship networks.

Rating of role play assessments and scoring of measures. All paper­
and-pencil measures were scored in their standard manner. The risk
behavior survey was scored to yield the number of sex partners over the
past 2 months and frequencies of unprotected and condom-protected
vaginal, oral, and anal intercourse and the proportion of intercourse
occasions when condoms were used. Tape recordings of the role play
assessments were coded so that the trained raters would not know
whether scenes were from pre- or postintervention or whether they were
from EC or BST participants. Responses in the scenes depicting peer
c coercions to engage in risk behavior were rated for the following specific
skill components: acknowledging the partner’s wish, providing reasons
for refusal, stressing the important of safety, and recommending specific
alternatives that would not pose risk or that would lower risk. In the
peer education scenarios, the skill components were: affirming the other
person, providing specific information about HIV risk and risk reduc­
tion, identifying safer alternatives, and providing reasons for their
effectiveness. The rater also assigned scores ranging from 1 (very
ineffective) to 10 (highly effective) to reflect the participant’s overall
skill. A highly effective response to the coercive situations was defined
as responses that would prevent high risk behavior from occurring.
A highly effective response to the peer education situations was defined
as one that provided constructive and specific information.

Results

Data analyses used SPSS and BMDP statistical software. Missing data were replaced with the mean value for that partic­
ient’s group at the same assessment. Missing data did not ex­
ceed 3% on any packet (missing data maximums for any partic­
ient were 3% at baseline and postintervention, 2.6% at the 6­
month follow-up, and 1.6% at the 12-month follow-up).

Preliminary Test of Group Equivalency and Gender

Differences

A preliminary 2 (Group) X 2 (Gender) multivariate analysis of variance (MANOVA) using Wilks’s criterion identified no
significant difference between groups at pre-intervention, F(14, 208) = 1.54, ns, and a significant main effect for gender, F(14, 208) = 3.11, p < .001. Male adolescents, relative to female ad­
olescents, were significantly lower in attitudes toward condoms and response efficacy and significantly higher in the number of
sex partners. This was expected on the basis of earlier research
with the same population (St. Lawrence, 1993a; St. Lawrence,
Brasfield, Jefferson, Alleyne, & Shirley, in press). Therefore,
gender was retained as a factor in subsequent analyses. The in­
teraction of Group X Gender was not significant, F(15, 678) =
1.64, ns.

2 An intervention manual may be obtained on request from Janet S.
St. Lawrence.

A second research assistant independently rated the tapes to estab­
lish reliability of the role-play ratings. Inter-rater reliability coefficients,
calculated using Pearson product-moment correlations were .80 for
overall effectiveness in coercion scenes and .82 for overall effectiveness
in informational scenes, and they ranged between .81 and .93 for the
individual skill components.
Preliminary Test for Bias Caused by Attrition

A second MANOVA compared participants lost to attrition (dropout n = 21) with participants who were successfully retained (retention n = 225) and, using Wilks's criterion, revealed no significant differences in mean age, education, or on the measures of knowledge, attitudes toward condoms, self- or response efficacy, perceptions of vulnerability, or sexual behavior at baseline, $F(14, 210) = .78$ ns.

Intervention Outcome

Social competency during role play simulations. Means and standard deviations for the behavioral role play components and ratings of overall effectiveness are presented in Table 1. Bonferroni-adjusted univariate repeated measures analyses of variance (ANOVAs) compared the experimental group's and control group's performances at pre- and postintervention and controlled for experimentwise error ($.05/10 = .0005$). All measures exceeded a significance level of $p < .0005$, and the pattern of change on the role play measures was clear and consistent.

Table 1
Means, Standard Deviations, and Univariate Results for Behavioral Role Play Ratings

<table>
<thead>
<tr>
<th>Variable</th>
<th>Behavior skills training</th>
<th>Educational intervention</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Preassessment $M$ (SD)</td>
<td>Postassessment $M$ (SD)</td>
</tr>
<tr>
<td>Coercive scenarios</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall skill</td>
<td>13.2 (.4)</td>
<td>17.7 (.4)</td>
</tr>
<tr>
<td>Acknowledged partner</td>
<td>1.2 (.4)</td>
<td>2.7 (.1)</td>
</tr>
<tr>
<td>Reasons for refusal</td>
<td>0.5 (.3)</td>
<td>1.1 (.4)</td>
</tr>
<tr>
<td>Stresses safety</td>
<td>1.9 (.6)</td>
<td>3.3 (.9)</td>
</tr>
<tr>
<td>Recommends specific safer</td>
<td>0.8 (.4)</td>
<td>1.6 (.5)</td>
</tr>
<tr>
<td>alternative</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Peer education scenarios</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Overall skill</td>
<td>6.2 (.3)</td>
<td>10.2 (.3)</td>
</tr>
<tr>
<td>Expresses concern</td>
<td>0.7 (.7)</td>
<td>1.5 (.2)</td>
</tr>
<tr>
<td>Gives information about safety</td>
<td>1.8 (.3)</td>
<td>2.6 (.2)</td>
</tr>
<tr>
<td>Describes low-risk alternatives</td>
<td>0.4 (.1)</td>
<td>0.9 (.1)</td>
</tr>
<tr>
<td>Gives reasons why alternative</td>
<td>1.1 (.4)</td>
<td>1.8 (.6)</td>
</tr>
<tr>
<td>has lower risk</td>
<td></td>
<td></td>
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Note: Subscripts denote significant differences.

The MANOVA paralleled previous studies in demonstrating that male adolescents were consistently higher than female adolescents in the frequency of unprotected oral and anal intercourse (all $p < .0005$). Bonferroni-adjusted univariate tests revealed that male adolescents were consistently higher than female adolescents in the frequency of unprotected oral and anal intercourse (all $p < .0005$).


Within-group main effect differences based on time. The multivariate repeated measures test revealed significant within-group main effects for time using Wilks's criterion: (Wilks's lambda = .62, $F(18, 117) = 3.96, p < .0005)$. Following Bonferroni adjustments, significant univariate differences were present for the log$10$-transformed frequency of unprotected anal intercourse, $F(3, 132) = 8.27, p < .0005$. Planned comparisons revealed significantly higher frequencies of unprotected anal intercourse, $t(132) = 9.86, p < .005$, at baseline than at any time thereafter, indicating reductions in the highest risk practice across the pooled groups after their respective interventions and through the following year.

Within-group interaction of Gender $\times$ Time. The multivariate test of the interaction of gender with time was significant using Wilks's criterion: Wilks's lambda = .58, $F(18, 117) = 4.62, p < .0005$. Significant Bonferroni-adjusted univariate differences were present for the interaction of Group $\times$ Time on the log$10$-transformed frequencies of unprotected vaginal intercourse, $F(3, 132) = 15.22, p < .0005$, and unprotected anal intercourse, $F(3, 132) = 7.78, p < .0005$. Figure 1 depicts the changes in the frequency of unprotected vaginal intercourse over time for male and female adolescents in each condition.

Planned post hoc tests revealed that male adolescents significantly reduced the frequency of unprotected vaginal intercourse from pre-intervention at all subsequent assessments, $t(62) = 14.51, p < .0005$. In addition, the mean frequencies for male adolescents continued to decrease from the postassessment to the 6-month follow-up, $t(62) = 8.18, p < .005$. No significant differences were present between the 6- and 12-month follow-up points, indicating that the reduction from pre-intervention was well maintained 1 year after the intervention for male adolescents. For the female adolescents, however, no significant changes across time emerged.

On the unprotected anal intercourse measure, frequencies were substantially lower at all subsequent assessments than at pre-intervention, $t(132) = 14.51, p < .0005$, with greater change for male participants, who were also significantly higher than female participants at pre-intervention. This measure is depicted in Figure 2.

Within-group interaction of Group $\times$ Time. Using Wilks's criterion, significant multivariate differences were present for the interaction of Group $\times$ Time: Wilks's lambda = .62, $F(18, 117) = 3.99, p < .0005$. Bonferroni-adjusted univariate tests revealed significant Group $\times$ Time interactions on the log$10$-transformed frequency of condom-protected intercourse, $F(18, 117) = 6.02, p < .005$, unprotected oral intercourse, $F(18, 117) = 3.25, p < .05$, and unprotected anal intercourse, $F(18, 117) = 3.29, p < .05$. Condom-protected intercourse frequency is depicted in Figure 3.

Post hoc comparisons revealed that participants who received information only were significantly lower in condom-protected intercourse frequency after intervention than before, $t(88) = 2.01, p < .05$, and remained lower throughout the following year than at pre-intervention (all $p$'s < .005). In addition, they were significantly lower at the 6-month follow-up than at postintervention, $t(88) = 8.09, p < .01$, with no significant change from the 6- to the 12-month follow-up, indicating that participants who received information alone decreased their condom use over the following year. By contrast, BST partici-
Table 3
Means and Standard Deviations by Group and Gender for Log$_{10}$($X + 1$) Sexual Practice Frequencies in the Previous 8 Weeks

<table>
<thead>
<tr>
<th>Variable</th>
<th>Pre (and SD) for behavior skills training intervention</th>
<th>Post</th>
<th>6-month FU</th>
<th>12-month FU</th>
<th>Pre (and SD) for educational intervention</th>
<th>Post</th>
<th>6-month FU</th>
<th>12-month FU</th>
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</thead>
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<tr>
<td>No. of different sex partners</td>
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<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>Male</td>
<td>1.1 (1.9)</td>
<td>0.8 (0.6)</td>
<td>0.6 (0.6)</td>
<td>0.4 (0.5)</td>
<td>1.3 (1.6)</td>
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<td>0.7 (0.9)</td>
<td>0.9 (0.7)</td>
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<td>0.2 (0.5)</td>
<td>0.2 (0.5)</td>
<td>0.4 (0.7)</td>
<td>0.4 (0.6)</td>
<td>0.3 (0.5)</td>
<td>0.5 (0.6)</td>
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<tr>
<td>Combined</td>
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<td>0.3 (0.6)</td>
<td>0.3 (0.6)</td>
<td>0.8 (1.2)</td>
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<td>0.5 (0.6)</td>
<td>0.7 (0.6)</td>
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<tr>
<td>Log$_{10}$(X + 1) for:</td>
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<td></td>
<td></td>
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<tr>
<td>Unprotected vaginal intercourse</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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<td>Male</td>
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<td>0.08 (0.2)</td>
<td>0.3 (0.3)</td>
<td>0.2 (0.2)</td>
<td>0.08 (0.2)</td>
<td>0.13 (0.3)</td>
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<tr>
<td>Female</td>
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<td>0.04 (0.1)</td>
<td>0.04 (0.1)</td>
<td>0.04 (0.1)</td>
<td>0.06 (0.2)</td>
<td>0.06 (0.1)</td>
<td>0.08 (0.2)</td>
<td>0.14 (0.3)</td>
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<td>Combined</td>
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<td>0.06 (0.2)</td>
<td>0.06 (0.2)</td>
<td>0.15 (0.2)</td>
<td>0.13 (0.2)</td>
<td>0.08 (0.2)</td>
<td>0.14 (0.3)</td>
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<td>Condom-protected vaginal intercourse</td>
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<tr>
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<td>0.12 (0.2)</td>
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<td>0.09 (0.2)</td>
<td>0.10 (0.3)</td>
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<tr>
<td>Combined</td>
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<td>0.14 (0.2)</td>
<td>0.15 (0.2)</td>
<td>0.16 (0.2)</td>
<td>0.17 (0.3)</td>
<td>0.12 (0.2)</td>
<td>0.10 (0.2)</td>
<td>0.12 (0.3)</td>
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<td>Unprotected oral intercourse</td>
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</tr>
<tr>
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<td>0.03 (0.1)</td>
<td>0.02 (0.1)</td>
<td>0.01 (0.1)</td>
<td>0.12 (0.2)</td>
<td>0.04 (0.1)</td>
<td>0.09 (0.2)</td>
<td>0.04 (0.2)</td>
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<tr>
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<td>0.01 (0.1)</td>
<td>0.01 (0.1)</td>
<td>0.01 (0.1)</td>
<td>0.01 (0.1)</td>
<td>0.01 (0.0)</td>
<td>0.01 (0.1)</td>
<td>0.01 (0.1)</td>
</tr>
<tr>
<td>Combined</td>
<td>0.03 (0.1)</td>
<td>0.01 (0.1)</td>
<td>0.01 (0.1)</td>
<td>0.01 (0.1)</td>
<td>0.06 (0.1)</td>
<td>0.02 (0.1)</td>
<td>0.05 (0.1)</td>
<td>0.03 (0.1)</td>
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<tr>
<td>Unprotected anal intercourse</td>
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<tr>
<td>Male</td>
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<td>0.00 (0.0)</td>
<td>0.00 (0.0)</td>
<td>0.00 (0.0)</td>
<td>0.13 (0.2)</td>
<td>0.04 (0.1)</td>
<td>0.05 (0.1)</td>
<td>0.04 (0.2)</td>
</tr>
<tr>
<td>Female</td>
<td>0.01 (0.1)</td>
<td>0.00 (0.0)</td>
<td>0.00 (0.0)</td>
<td>0.00 (0.0)</td>
<td>0.01 (0.1)</td>
<td>0.00 (0.0)</td>
<td>0.01 (0.1)</td>
<td>0.01 (0.1)</td>
</tr>
<tr>
<td>Combined</td>
<td>0.01 (0.1)</td>
<td>0.00 (0.0)</td>
<td>0.00 (0.0)</td>
<td>0.00 (0.0)</td>
<td>0.07 (0.1)</td>
<td>0.02 (0.1)</td>
<td>0.03 (0.1)</td>
<td>0.03 (0.1)</td>
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<tr>
<td>Male</td>
<td>0.03 (0.1)</td>
<td>0.07 (0.2)</td>
<td>0.09 (0.2)</td>
<td>0.04 (0.2)</td>
<td>0.05 (0.1)</td>
<td>0.11 (0.3)</td>
<td>0.05 (0.2)</td>
<td>0.09 (0.2)</td>
</tr>
<tr>
<td>Female</td>
<td>0.01 (0.0)</td>
<td>0.00 (0.0)</td>
<td>0.00 (0.0)</td>
<td>0.00 (0.0)</td>
<td>0.01 (0.0)</td>
<td>0.01 (0.0)</td>
<td>0.01 (0.0)</td>
<td>0.01 (0.1)</td>
</tr>
<tr>
<td>Combined</td>
<td>0.02 (0.1)</td>
<td>0.03 (0.1)</td>
<td>0.04 (0.1)</td>
<td>0.02 (0.1)</td>
<td>0.03 (0.1)</td>
<td>0.06 (0.1)</td>
<td>0.03 (0.1)</td>
<td>0.05 (0.2)</td>
</tr>
<tr>
<td>% condom-protected intercourse occasions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>62.3 (38.3)</td>
<td>90.6 (27.2)</td>
<td>76.7 (30.8)</td>
<td>59.5 (45.0)</td>
<td>72.0 (35.3)</td>
<td>57.6 (44.3)</td>
<td>55.0 (41.8)</td>
<td>58.3 (49.2)</td>
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<tr>
<td>Female</td>
<td>69.9 (34.1)</td>
<td>86.7 (33.5)</td>
<td>69.9 (33.8)</td>
<td>53.5 (45.9)</td>
<td>71.6 (36.2)</td>
<td>62.1 (41.1)</td>
<td>58.0 (44.5)</td>
<td>51.7 (39.9)</td>
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<tr>
<td>Combined</td>
<td>66.8 (37.9)</td>
<td>82.9 (30.7)</td>
<td>72.8 (35.3)</td>
<td>67.4 (39.7)</td>
<td>71.5 (36.2)</td>
<td>62.1 (41.1)</td>
<td>58.0 (44.5)</td>
<td>51.7 (39.9)</td>
</tr>
</tbody>
</table>

Note. Pre = preassessment; post = postassessment; FU = follow-up.
pants increased the frequency of condom-protected vaginal intercourse from postintervention to the 6-month follow-up, \( t(115) = 6.70, p < .05 \). Rates of condom-protected vaginal intercourse were decreasing 1 year after the intervention, \( t(115) = 12.14, p < .001 \), although both follow-up assessments remained higher than at pre-intervention (both \( p < .001 \)).

Figure 1 presents the data for the frequency of unprotected oral intercourse. Post hoc comparisons revealed that the education group was higher at pre-intervention, both groups were comparable and lower at postintervention, and by the 6-month follow up, EC participants were again significantly higher than BST participants and remained higher through the 12-month follow-up (all \( ps < .05 \)).

Post hoc comparisons on the frequency of unprotected anal intercourse revealed no significant differences, despite the univariate significance.

Within-group interaction of Group \( \times \) Time \( \times \) Gender. Using Wilks's criterion, we found that the multivariate interaction terms were significant (Wilks's lambda = .90), \( F(18, 1123) = 2.27, p < .005 \). Significant Bonferroni-adjusted univariate differences were present for the frequency of the log_{10}-transformed unprotected vaginal intercourse depicted in Figure 1, \( F(3, 132) = 2.87, p < .05 \), and unprotected anal intercourse depicted in Figure 2, \( F(3, 132) = 2.91, p < .05 \) (see also Table 2). Post hoc comparisons indicated that BST male adolescents were significantly lower in their frequency of unprotected vaginal intercourse after the intervention than before, \( t(39) = 5.19, p < .05 \), and remained lower throughout the following year than at pre-intervention, \( F(1, 65) = 5.19, p < .05 \), but increased by the 6-month follow-up assessment over the immediate postintervention level \( F(1, 65) = 5.12, p < .05 \), and remained stable across the next 6 months. EC male adolescents did not significantly lower their frequencies of unprotected vaginal intercourse by postintervention or through the year following the intervention (all \( ps > .05 \)).

Outcome for the female adolescents was considerably different, perhaps because they were considerably lower at pre-intervention. BST female adolescents remained at stable low levels across the following year, whereas EC female adolescents increased steadily as time went by and were significantly higher at
the 12-month follow-up assessment, $F(5, 88) = 5.43, p < .01$, and also were significantly higher than female adolescents who received the BST intervention by the 1-year follow-up, $t(92) = 2.50, p < .01$.

Although the measure of unprotected anal intercourse (Figure 2) achieved univariate significance, the only significant post hoc finding was that EC male adolescents remained significantly higher than BST male or female adolescents in either condition at each assessment from pre-intervention through the 12-month follow-up. By postintervention, all BST participants had ceased engaging in unprotected anal intercourse and did not resume the practice over the year following the intervention.

**Proportion of intercourse occasions that were condom-protected.**

A composite variable was computed to represent the proportion of intercourse occasions that were condom-protected ([frequency of condom-protected intercourse]/[frequencies of unprotected + condom-protected intercourse occasions]) X 100 and is depicted in Figure 5.

A 2 (Group) X 2 (Gender) X 4 (Time) univariate repeated measures ANOVA yielded a significant Group X Time interaction, $F(7, 80) = 4.83, p < .05$. None of the other main effect or interaction terms was significant. Planned comparison tests revealed that BST participants were significantly higher (82.9% of intercourse occasions were condom-protected) than EC participants (62.1%) at postintervention, $t(86) = 4.83, p < .05$, and remained significantly higher throughout the following year (all $ps < .01$). By the 6- and 12-month follow-up assessments, participants in the educational intervention were reporting less condom use than at pre-intervention, $F(3, 132) = 6.46, p < .05$. Both groups evidenced a decline from postintervention to the 1-year follow-up in the percentage of intercourse occasions that were condom-protected, although BST participants remained significantly higher than participants who received information alone, $F(1, 134) = 5.94, p < .05$. BST male adolescents were significantly higher than BST female adolescents in condom use immediately after intervention, $F(1, 134) = 8.23, p < .005$, a difference that dissipated by the 6-month follow up. BST female adolescents were higher than BST male adolescents by the 1-year follow-up when BST male and EC male adolescents were no longer significantly different. To summarize, 1 year after the program, sexually active BST female adolescents were using condoms significantly more often, male adolescents were com-
parable regardless of their intervention, and EC female adolescents were significantly lower than BST female or male adolescents in either group in the proportion of condom-protected intercourse occasions.

**Paper-and-pencil measures.** To assess whether the intervention was associated with changes in the paper-and-pencil measures, we calculated a 2 (Group) × 2 (Gender) × 4 (Time) repeated measures MANOVA. Significant main effect and interaction findings are reported in Table 4. None of the remaining main effect or interaction terms (group, Group × Gender, Gender × Time, or Group × Gender × Time) achieved significance on the multivariate test. Significant multivariate results were followed by Bonferroni-adjusted univariate tests to identify the specific variables on which significant differences were present. Significant univariate results were followed by planned comparisons. Means and standard deviations for both groups by gender and for the combined groups are contained in Table 5.

**Main effects caused by gender differences.** The multivariate test revealed significant between-subject differences for gender, $F(6, 204) = 5.28, p < .0005$. Bonferroni-adjusted univariate ANOVAs identified significant differences between male and female adolescents in AIDS Knowledge Test scores, $F(1, 209) = 12.78, p < .0005$; CAS scores, $F(1, 209) = 10.74, p < .001$; and response efficacy ratings, $F(1, 209) = 40.19, p < .0005$. For each of these variables, male participants were consistently lower than female participants. No differences for gender were found on the self-efficacy or personalization of risk measures.

**Main effects caused by time.** There was a significant multivariate difference for time: Wilks's lambda = .63, $F(18, 204) = 3.08, p < .0005$. Significant univariate main effects were found for time on the AIDS Knowledge Test, $F(3, 207) = 4.35, p < .001$, and personalization of risk measure $F(3, 207) = 7.21, p < .0005$. Planned comparisons indicated that knowledge and perceptions of risk increased at postintervention for the pooled groups. Both were expected findings because each group had the same educational session. No significant univariate differences for time were present for the CAS or the self and response efficacy measures.

**Interaction of Group × Time.** Using Wilks's criterion, we found that the multivariate test also revealed a significant
Group × Time interaction: Wilks’s lambda = .75, F(18, 204) = 2.08, p < .01. Bonferroni-adjusted univariate differences were present for the AIDS Knowledge Test, F(1, 200) = 8.18, p < .005; self-efficacy, F(1, 200) = 11.79, p < .0005; and response efficacy ratings, F(1, 200) = 5.64, p < .01. Planned post hoc comparisons were then computed for the measures that achieved univariate significance.

No significant between-group differences were present on the AIDS Knowledge Test at pre-intervention, but the BST group was significantly higher at postintervention and at the 6- and 12-month follow-up points (all ps < .01). The EC group remained unchanged from pre-intervention through the 12-month follow-up assessment (all ns) and significantly lower than the BST group at each postintervention assessment (all ps < .001). Thus, the BST intervention produced greater increases in knowledge and the increment sustained across a 12-month follow-up period, despite the fact that both groups received the same information provision session.

On the self-efficacy measure, there were no significant between-group differences at preintervention. Postintervention, the BST group evidenced higher self-efficacy beliefs than the education participants, t(202) = 3.63, p < .001. By the 6- and 12-month follow-up assessments, the two groups were no longer significantly different because of an increase in the EC group that equaled the earlier increase by BST participants. The BST group also exhibited higher response efficacy at postintervention than before, t(202) = 8.04, p < .01. By the 6-month follow-up assessment, the EC group increased its response efficacy ratings and there were no significant between-group differences in response efficacy at either follow-up point.

In summary, changes on the paper-and-pencil measures indicated the BST intervention produced greater increases in knowledge that maintained over the following year and more immediate increases in self- and response efficacy. Delayed increases in self- and response efficacy were evidenced by EC participants, who were more comparable to the BST participants on both measures by the 1-year follow-up assessment. Thus, it appears that both interventions influenced self- and response efficacy, but there was desynchrony in the rate of change produced by the different intervention models.
Intervention Impact on Onset and Maintenance of Adolescents' Sexual Activity

Public concerns about the potential detrimental effects of providing sex education to minors are a sensitive and volatile public policy issue, yet we are aware of no research that has directly measured the effects of different program formats to assess their longitudinal impact on rates of sexual activity or the onset of adolescents' sexual activity.

Impact on rates of sexual activity for adolescents who were

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Table 4
Results of Univariate Repeated Measures Analyses of Variance Tests on the Significant Multivariate Main Effects and Interaction Terms for the Paper-and-Pencil Measures

<table>
<thead>
<tr>
<th>Variable</th>
<th>Gender</th>
<th></th>
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<td>.0005</td>
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<td>ns</td>
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<tr>
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<tr>
<td>Response efficacy</td>
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<td>ns</td>
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<td>Personalization of risk</td>
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</table>

Note: Bonferroni-adjusted α, .10/5 = .02. All nonsignificant main effects and interactions were omitted.
The percentage of youths in the educational or skills training condition who were sexually active in the 8 weeks preceding recruitment was not significantly different (EC = 42.4%, BST = 35.9%), $\chi^2(1, N = 225) = 1.57$, ns. Both groups showed a modest, nonsignificant decrement at postintervention (EC = 36.3%, BST = 31.0%), suggesting neither program accelerated rates of sexual activity. One year after the program ended, however, marked differences were present between the two conditions. At the 1-year follow-up, 42.5% of participants in the educational program were sexually active, in comparison with 27.1% of participants who received education alone with the more sexually explicit BST and this difference was statistically significant, $\chi^2(1, N = 225) = 4.15, p < .05$. Thus, rates of sexual activity were 57% higher among youths who received education alone than among youths who also were equipped with specific skills for self-managing sexual behavior.

Impact on the onset of the sexual activity for youths who were abstinent on entry. Youths who reported no sexual activity before entering their respective interventions were examined separately to assess whether either intervention delayed the onset of sexual activity to a greater extent. One year after the program, 31.1% of participants who received information alone had become sexually active, whereas only 11.5% of participants who received information and the more sexually explicit skills training reported engaging in any sexual activity. This difference was statistically significant, $\chi^2(1, N = 113) = 6.29, p < .01$, and is clinically meaningful, as the rates of onset were nearly 3:1 between the two conditions after 1 year. The sexually explicit content had not promoted increased sexual activity; instead it deferred onset of sexual activity to a greater degree than information provision alone.

### Participant Evaluations of the Program

All experimental participants completed anonymous questionnaires to evaluate their satisfaction with the intervention. On a 7-point scale from 1 (very low) to 7 (very high), participants assigned the program a mean rating of 6.8. Participants also rated their comfort with the project staff ($M = 6.7$) and comfort with the group format ($M = 6.5$). All participants indicated that they would recommend participation to their friends, 92% thought that the meeting time was convenient, and 95% found the project location convenient. Participants also rated the personal value of the intervention components using the same 7-point scale with the following rankings: learning how HIV-AIDS is affecting my community ($M = 6.7$), learning how HIV is and is not transmitted ($M = 6.6$), learning about high and lower risk activities ($M = 6.6$), learning how to use condoms correctly ($M = 6.5$), practicing how to refuse pressures ($M = 6.5$), learning how to talk about safety and sex ($M = 6.6$), learning how to share what I learned with others ($M = 6.6$), and talking to the Rap Team ($M = 6.2$).

### Discussion

In the present study, 246 African American adolescents were randomly assigned to either an informational program or to an intervention that combined information with specific skills.
training in condom use, social competency skills, and cognitive competency skills. Their outcomes in lowering the youths' risk for HIV infection, evaluated postintervention and through a 1-year follow-up period, indicated significantly greater benefit by participants in the skills training intervention. Program outcome was confirmed by multiple measures including reported frequency of sexual behaviors over two month retrospective periods, AIDS risk knowledge, self- and response efficacy, and behavioral skill in simulated risky situations. The present study is the first to conduct such a lengthy follow-up of program outcome or to examine gender differences, as previous HIV risk reduction research with ethnic minority adolescents targeted only male adolescents (Jemmott et al., 1992; Schincke, Gordon, & Weston, 1990). In addition, this study examined the impact of different interventions on the onset of sexual activity and examined reductions among youths who were already sexually active.

Both male and female adolescents showed greater benefit from the skills training intervention, although the effects were manifested differently for the two sexes. Male adolescents were already engaging in sexual behavior at significantly higher rates than female participants. Male adolescents in the behavior BST intervention lowered their rates of unprotected vaginal, oral, and anal intercourse to a greater extent than male adolescents who received information only and maintained lower rates 1 year after the intervention. Female adolescents were significantly lower in all sexual behaviors than male adolescents at program entry and also showed differential outcome related to the type of intervention they received. Female participants who received information only were increasing their frequencies of unprotected intercourse after the intervention to a greater extent than female participants who received the skills training. The latter group maintained stable lower levels, in the case of unprotected vaginal intercourse or discontinued a practice entirely in the case of unprotected anal intercourse. By the 12-month follow-up, both male and female EC adolescents were engaging in more frequent unprotected vaginal intercourse than either gender who received skills training. Both male and female BST adolescents discontinued engaging in unprotected anal intercourse entirely and maintained their decrease throughout the following year. By contrast, male adolescents in the informational program reduced their rates of unprotected anal intercourse but remained higher than skills-trained male adolescents. Rates of unprotected oral intercourse were reduced for male adolescents in the skills training condition and remained low for female adolescents in both conditions, whereas they were highly variable across time for male EC adolescents, lowering immediately postintervention and then increasing and dropping at the follow-up assessments but remaining well above the frequencies of the other three groups.

Male and female adolescents in the skills training intervention increased condom use significantly after the intervention, although male adolescents gradually decreased in condom use by the 1-year follow-up whereas female adolescents remained stable. By contrast, both genders in the informational program steadily decreased condom use over time. Thus, the skills training intervention was more successful both in lowering risky behavior and in sustaining safer alternatives such as condom use for those youths who remained sexually active. The pattern of results, overall, suggests that brief informational presentations are not a futile exercise, although they are clearly not as beneficial as more sustained and intensive skills training approaches.

An unexpected finding from this study was the differential impact of the two program formats on maintenance of sexual activity by sexually active adolescents and on the onset of sexual activity by adolescents who were not sexually active when they entered the program. Rates of onset differed meaningfully between the two programs. One year later, 31% of EC youths who were abstinent on entry had initiated sexual activity, whereas only 11.5% of the abstinent youths who received the more explicit skills training were engaging in sexual activity. Only one study has previously addressed the impact of sex education in the schools on sexually activity onset (Kirby, Barth, Leland, & Fetro, 1991). This study is the first we are aware of that directly compares the impact of education with that of education plus sexually explicit skills training, and in doing so simultaneously addresses public concerns about the potentially deleterious consequences of providing youths with sexually explicit information and skills training. Clearly, the more explicit intervention did not promote increased sexual activity or accelerate onset of sexual activity. Instead, the skills training intervention appears to have both lowered rates of sexual activity among youths who were sexually active and deterred the onset of sexual activity for youths who were still abstinent at program entry. The magnitude of the difference is both statistically and clinically meaningful and has important implications for the design of educational programs and for public policy formation.

These results support Fisher and Fisher's (1992) model suggesting that effective interventions should attend simultaneously to informational, motivational, and behavioral competencies if they are to impact substantively on HIV risk behavior. Most HIV risk reduction research to date has documented increases in HIV-AIDS knowledge (cf. Walter & Vaughn, 1993) and statistically significant, but clinically modest, reductions in risky behavior. This study adds to the existing findings by an exhaustive examination of specific behaviors as well as overall rates and onset of sexual activity, by monitoring longitudinal follow-up for 1 year after the intervention, and by attending to gender differences.

A review of the limited number of effective intervention studies published to date reveals that they share in common several key elements: (a) a conceptual foundation grounded in social learning theory; (b) equal emphasis on abstinence and on lowering risk behavior rather than promoting abstinence as the only option; (c) involvement of participants in active, rather than passive, learning; (d) equipping youths to counter peer and social pressures into sexual activity; (e) offering alternatives to unprotected intercourse through abstinence, condom use, or avoiding risky situations; and (f) provision of specific skills training through modeling, rehearsal, and communication skills (Jemmott et al., 1992; Rotheram-Borus, Koopman, Haigner, & Davies, 1991; Walters & Vaughn, 1993). In addition, for programs to be most effective, they must also be developmentally appropriate and culturally relevant for their intended recipients (DiClemente, 1993).

Reducing adolescents' HIV risk behavior is a formidable challenge (DiClemente, 1993). School-based prevention programs offer a number of advantages and can provide immediate
access to large numbers of adolescents within a relatively brief time. However, school-based programs are controversial in many areas of the country and programs such as the skills training intervention can be implemented in health centers, recreational programs, and community settings in areas where school-based programs are constrained from addressing these issues.

The findings also suggest that programs such as those reported here may be beneficial when they are introduced before the onset of sexual activity, before risky behavior becomes entrenched and more difficult to change. Where school-based programs exist, they are often implemented in high schools, which may be too late for maximum benefit. The present results suggest that programs can be introduced at younger ages without promoting unwanted sexual experimentation. In addition, most existing school-based and community programs targeting youths are relatively brief and rely on information provision. This may be insufficient to provide needed skills, reinforce newly implemented change efforts, or assist youths in confronting relapse temptations as they arise in their daily lives.

The experimental intervention included a number of components (risk education, technical competency skills in correct condom use, social competency, self-management and problem-solving skills, efforts to promote feelings of self-pride and responsibility) and developed social support among group members. The study’s design did not permit identification of the specific components that account for the observed changes and cannot rule out the possibility that uncontrolled effects may have contributed to the findings. Because risky behavior is probably influenced by a myriad of cognitive, interpersonal, and situational determinants, multifaceted intervention approaches will probably be needed (Kelly, St. Lawrence, Hood, & Brasfield, 1989a). Over the 3 years during which intervention groups were conducted, media reports also waxed and waned. Earvin “Magic” Johnson’s disclosure and Arthur Ashe’s death occurred during the course of this study and increased media coverage about HIV and AIDS for a time after these events. Such events may have been implicated in the program outcome but would not account for the observed differences between the two experimental interventions.

Contact time differed between the two conditions and may be implicated in the outcome differential between the two intervention approaches tested in this investigation. The intent in this study was to examine the kind of brief informational program youths were most likely to encounter against a more intensive skills training approach, resulting in different “dosages” between the two programs. Although this cannot be ruled out as a contributor to the observed differences, a separate study that replicated the interventions described here and controlled for contact time also found greater benefit from the skills training approach (St. Lawrence, Jefferson, Alleyne, & Brasfield, 1995).

One perplexing shortcoming was the failure of either intervention to have a noticeable impact on the youths’ perceptions of vulnerability. Although there was statistically significant change on this measure, its magnitude was small and does not appear clinically meaningful. The skill training condition included a session specifically intended to promote risk recognition through discussion with local HIV-positive adolescents. Observationally, the youths were engrossed during the session and by all appearances it was having the desired impact. By the postassessments, meaningful change was not apparent on the personalization of risk measure, although the youths had clearly made substantial behavioral changes. It is not possible to conclusively resolve this conundrum, but several possibilities can be suggested. Weinstein’s (1982, 1988) discussion of optimistic bias offers one possible explanation. Optimistic biases, erroneous beliefs that one’s personal risk is less than the risk faced by others (Weinstein, 1988), may result from incorrect information or cognitive distortions, or may have motivational origins, such as avoiding fear or anxiety. However, Weinstein suggests that personal experience and information should reduce optimistic bias, which did not happen here. When discussions were held with some of the participants after the 1-year follow up, we specifically asked about this issue. The youths’ responses suggested that they used some creative cognitive processing to minimize the impact of encountering HIV-positive youths. The youths on the Rap Team were apparently healthy and even attractive. Several participants specifically mentioned that they later decided that if these youths were seropositive and still apparently healthy, maybe HIV risk was overstated. Other youths cited “Magic” Johnson in a similar context (i.e., “Magic’s got it and he’s lookin’ good”). Perhaps for greatest impact, programs such as this may need to more explicitly and visually tie HIV infection to the later physical deterioration associated with AIDS. Another possibility is that the measure of risk vulnerability was insensitive to the impact of this component.

Given the urgency of escalating rates of HIV infection among adolescents and the scarcity of controlled studies regarding risk reduction with adolescents, the present results demonstrate the potential impact of a theoretically sound intervention model in lowering adolescents HIV infection risk behavior. Ultimately, preventing HIV infection will depend on innovative intervention strategies delivered on a broad scale through settings which can penetrate large numbers of adolescents. As stated compellingly by DiClemente (1993, p. 762) “without such efforts, adolescents will remain a generation in jeopardy.”

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