

Applying the Theory of Reasoned Action to HIV Risk-Reduction Behavioral Interventions

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HIV/AIDS is increasing among adolescents, particularly African American adolescents. Engaging in unprotected sexual intercourse is the main route of transmission for HIV/AIDS among adolescents. Without a cure or vaccine available for HIV, the best way to curtail this disease is to prevent it. Hence, HIV risk-reduction interventions are needed to assist adolescents to reduce their risk for HIV infection. The best method for developing an effective HIV prevention intervention is to use theoretical models to design it. In this light, the Theory of Reasoned Action, and its extension the Theory of Planned Behavior, might be a solution. This chapter will describe HIV/STD risk behavior among teens, review the Theory of Reasoned Action/Planned Behavior, describe our use of these theories in designing HIV risk-reduction interventions, and the outcomes of those research studies.

THE RISK OF SEXUALLY TRANSMITTED HIV INFECTION AMONG ADOLESCENTS

Evidence from several sources indicates that adolescents are at high risk for sexually transmitted disease (STD), including HIV, which causes AIDS. Individuals 15 to 24 years of age accounted for 15% of the cumulative HIV infections confidentially reported as of December 2003 (Centers for Disease Control and Prevention [CDC], 2004a). From 2000 through 2003, the estimated number of HIV/AIDS cases in the U.S. increased among young people 13 to 24 years of age (CDC, 2004a). The HIV/AIDS epidemic has had an especially devastating impact on African American and Latino adolescents. For instance, in 2003, 15% of the

adolescents in the United States were African American, but 66% of reported AIDS cases were in African Americans (CDC, 2004b).

About 62% of adolescents have had sexual intercourse by the time they are in the 12th grade according to the 2003 Youth Risk Behavior Surveillance Survey (Grunbaum et al., 2004), a nationally representative survey of students in grades 9 to 12. Older students, that is, those in higher grades, were more likely to report sexual experience. Overall, there was little difference in the prevalence of sexual intercourse between boys and girls in grade 10 and higher. However, among 9th grade students, a greater percentage of boys (37%) as compared with girls (28%) reported sexual intercourse. Similar to many other national surveys (e.g., Kann et al., 1996; Sonenstein, Pleck, & Ku, 1989), a greater percentage of African American (67.3%) and Latino (51.4%) students compared with White (41.8%) students reported sexual experience.

Statistics on STD and unintended pregnancy provide clear evidence of the consequences of unprotected sexual intercourse among adolescents. Each year 1 in 4 sexually active adolescents—3 million adolescents—contracts a STD (Eng & Butler, 1997). Women and African Americans are especially at risk. For instance, data from a nationally representative sample of young people ages 18 to 26 years found that 4.2% tested positive for chlamydia (Miller et al., 2004). Women (4.7%) were more likely to be infected than were men (3.7%). The prevalence of chlamydia was highest among African American women (14.0%) and African American men (11.1%); lowest prevalence rates were among Asian men (1.1%), White men (1.4%), and White women (2.5%). This survey also revealed that among young people 18 to 23 years of age, those who initiated sexual intercourse at younger ages had a greater risk of testing positive for an STD (Kaestle, Halpern, Miller, & Ford, 2005).

Despite recent drops in the adolescent birth rate, substantial morbidity and social problems still result from the approximately 870,000 pregnancies that occur each year among girls 15 to 19 years of age (Ventura, Abma, Mosher, & Henshaw, 2003). Nationwide, 4.2% of students in grades 9 to 12 were pregnant or had gotten someone pregnant in 2003 (Grunbaum et al., 2004). The prevalence of pregnancy was higher among African American (10.4%) and Latino adolescents (7.3%) than among their White counterparts (2.8%). In addition, studies of sexual behavior seem to suggest that failure to use condoms is a pervasive risk behavior among adolescents—more common than anal sex or having multiple partners.

Taken together, these data suggest that adolescents are at risk for sexually transmitted diseases, including HIV. Interventions to reduce HIV risk-associated sexual behavior are urgently needed for adolescents, particularly African American adolescents. Efforts to find a cure or a vaccine for HIV have not been successful. However, HIV can be prevented by changes in personal sexual behavior. The important question is how to effect changes in HIV risk-associated sexual behavior. To answer that question, one can consider the use of the Theory of Reasoned Action, and its extension the Theory of Planned Behavior.

The identification of the correlates and predictors of HIV risk-associated sexual behaviors, particularly condom use, is central to efforts to develop and implement effective interventions to change such behaviors. Interventions that are

based on a systematic understanding of the causes of behavior they seek to change and are based on a solid theoretical foundation are most likely to be effective. Systematic understanding of the causes of behavior flows from a theoretical model of behavior and empirical tests of theory-based hypotheses. The Theory of Reasoned Action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975), and its extension the Theory of Planned Behavior (Ajzen, 1985; 1991), provide a conceptual framework within which to consider condom use. Following is a description of the Theory of Reasoned Action and the Theory of Planned Behavior.

The Theory of Reasoned Action/Theory of Planned Behavior

Our HIV risk-reduction research has drawn upon the Theory of Reasoned Action (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975), and its extension the Theory of Planned Behavior (Ajzen, 1985, 1991; Madden, Ellen, & Ajzen, 1992). According to these theories, specific behavioral intentions are the determinants of behaviors. Consider, for instance, condom use. Based on these theories, it might be predicted that condom use among adolescents is a function of their intentions to use condoms. The theories further hold that a behavioral intention is determined by attitudes toward the specific behavior, subjective norms regarding the behavior, and perceived behavior control over the behavior. Perceived behavioral control reflects past experience as well as anticipated impediments, obstacles, resources, and opportunities. It has affinity with the Social Cognitive Theory construct of perceived self-efficacy (Bandura, 1982, 1986, 1989; O'Leary, 1985). If people believe that they have little control over performing a behavior because of a lack of requisite skills or resources, their intentions to perform the behavior may be low, even if they have favorable attitudes or perceive supportive subjective norms regarding it (Ajzen & Madden, 1986). Thus, people intend to perform a behavior when they evaluate that behavior positively, when they believe significant others think they should perform it, and when they feel confident in their ability to perform the behavior. The theory holds that the relative predictive power of attitude, subjective norm, and self-efficacy can vary from behavior to behavior and from population to population.

A valuable feature of the theory is that it directs attention to the basis of people's attitudes, subjective norms, and perceived behavioral control. Different types of salient beliefs underlie each of these constructs, and the theory holds that the nature of the beliefs can vary from population to population. Attitudes toward behavior are seen as reflecting salient behavioral beliefs about the consequences of performing the behavior weighted by evaluations of those outcomes. Thus a person who holds strong beliefs that positively valued outcomes will result for using condoms will have a positive attitude toward using condoms. Conversely, a person who holds strong beliefs that negatively valued outcomes will result from using condoms will have a negative attitude toward using condoms. Subjective norms are seen as reflecting salient normative beliefs about whether specific reference persons or groups would approve or disapprove of the behavior weighted by motivation to comply with those referents. Thus, a person will hold a positive subjective norm when he/she believes that certain referents (e.g., girlfriend or

boyfriend) think he or she should use a condom, and is motivated to meet the expectations of those referents. Conversely, a person will perceive less normative support to use condoms when s/he believes these referents think he or she should not use condoms or who is less motivated to comply with those referents who approve condom use. Perceived behavioral control is determined by salient control beliefs about obstacles, impediments, resources, and opportunities weighted by evaluations of the extent which the factor would inhibit or facilitate the behavior. The salient beliefs specific to a behavior in a population can be identified through qualitative research, including elicitation surveys, focus groups, and interviews with members of the population.

For those who are interested in behavior change interventions, it may be possible to change behavioral intentions and therefore behavior by targeting the salient beliefs in a population that underlie attitudes, subjective norms, and perceived behavior control. In the case of condom use, perhaps the most obvious is the behavioral belief concerning prevention, that the use of condoms can prevent pregnancy, STD, and HIV infection (Jemmott, Jemmott, Spears, Hewitt, & Cruz-Collins, 1992). Another key consideration has been *hedonistic beliefs* (Jemmott, Jemmott, Spears et al., 1992) or beliefs about the consequences of condom use for sexual enjoyment. Several studies have tied such beliefs to condom use or intentions to use condoms (Catania et al., 1989; Hingson, Strunin, Berlin, & Heeren, 1990; Jemmott & Jemmott, 1992a; Valdiserri, Arena, Proctor, & Bonati, 1989). A third type of behavioral beliefs is partner reaction beliefs, whether people believe their partners would react favorably to their effort to use condoms (Jemmott & Jemmott, 1992b). The key referents for condom use often include sexual partners. Other referents who are sources of normative influence, at least in the case of adolescents, include peers, parents, and other family members (Fox & Inazu, 1980; Furstenberg, 1971; Handelsman, Cabral, & Weisfeld, 1987; Hofferth & Hayes, 1987; Milan & Kilmann, 1987; Morrison, 1985; Nathanson & Becker, 1986). Several types of control beliefs are relevant to perceived behavioral control regarding condom use. Availability beliefs concern confidence that condoms will be available when needed. Impulse control concerns the person's confidence that they can control themselves enough to use condoms when sexually excited. Perhaps most emphasized in HIV prevention research are negotiation beliefs which concern the person's confidence that they can persuade their sexual partners to use condoms. Technical skills concern the person's ability to use condoms with facility, and without ruining the mood.

The Theory of Planned Behavior does not include many variables that traditionally have been studied in attempts to understand preventive health behavior (i.e., SES, education level, and family structure). Attitudes, subjective norms, and perceived behavioral control are viewed as the sole determinants of intentions and behaviors. The effects on intentions and behaviors of other variables are seen as mediated by their effects on the attitudinal component, the normative component, the perceived control component, or all three. In this way, the theory can accommodate variables that are external to it (Ajzen, 1991; Fishbein & Middlestadt, 1989). Consider ethnicity, for instance. Different ethnic groups might vary in how strongly they hold particular beliefs and in the strength of the relation between

such beliefs and intentions. In this view, attitudes and beliefs may be more important predictors than normative beliefs for one ethnic group, whereas normative beliefs may be more important predictors than attitudes and beliefs in another ethnic group (Jemmott & Jones, 1993). Other external variables that are not in the theory but have been linked to heightened sexual activity include low socioeconomic background, low parental education, residing in a female-headed household, and residing in households with a large number of children (Brown, 1985; Hofferth & Hayes, 1987; Hogan, Astone, & Kitagawa, 1985; Hogan & Kitagawa, 1985); age and sexual experience (CDC, 1998a & b; DiClemente et al., 1996; Jemmott & Jemmott, 1990); race and ethnicity (CDC, 1998a & b); gender (e.g., CDC, 1998b; Leigh, Morrison, Trocki, & Temple, 1994); involvement in a steady relationship (Plichta, Weisman, Nathanson, Ensminger, & Robinson, 1992; Soskolne, Aral, Magder, Reed, & Bowen, 1991), and alcohol and drug use (e.g., Hingson et al., 1990; Jemmott & Jemmott, 1993; MacDonald, Zanna, & Fong, 1996).

One important external variable in our research is a behavioral intervention, which is designed to have an impact on salient behavioral beliefs. The Theory of Planned Behavior holds that interventions and other external variables affect specific behavioral intentions and behaviors by influencing attitudes toward those behaviors, subjective norms regarding them, or perceptions of control over them. In other words, the effects on intentions and behaviors of other variables are seen as mediated by their effects on the attitudinal component, the normative component, the perceived control component, or all three. In this way, the theory can accommodate variables that are external to it (Ajzen, 1991; Fishbein & Middlestadt, 1989).

Designing HIV Risk-reduction Interventions: Application of the Theory Reasoned Action/Planned Behavior

The Use of Focus Groups in Designing Interventions

Designing effective HIV risk-reduction interventions using the Theory of Reasoned Action/Planned Behavior as a framework first requires conducting open-ended elicitation interviews to identify the salient beliefs regarding the behavior of interest in the specific target population. This procedure also provides an opportunity to spend time with the population, taking time to get to know them and understand them. This will include assessing their knowledge, attitudes, beliefs, concerns, skills, needs and resources. This can be accomplished via elicitation surveys, focus groups, or individual interviews. This qualitative research is conducted with samples of 15–20 individuals from the population under investigation, half of whom have performed or intend to perform the behavior under investigation and half of whom have not performed the behavior. These individuals are asked to provide information regarding three types of beliefs. First, to assess salient behavioral beliefs, they are asked to describe any positive or negative outcomes of performing the behavior. Second, to assess normative beliefs, they are asked to describe any individuals or groups to whom they might listen, who are either in favor of or opposed to their performing the behavior. Third, to

assess control beliefs, they are asked to describe any factors that might affect how hard or easy it is to perform the behavior. The collected information is then content analyzed to identify the relevant attributes or outcomes of the behavior and the relevant social referents. This phase is very crucial because it will provide valuable information that will assist in the development of measures and an intervention that is tailored to the salient beliefs about the behavior in the specific population.

Designing the intervention. We designed our interventions (Jemmott, Jemmott & Fong, 1992, 1998; 1999; Jemmott, Jemmott, Braverman, & Fong, 2005) to change behavioral beliefs about the consequences of protective and risky sexual behaviors and control beliefs about factors that would facilitate or thwart adolescents' performance of such behaviors. We used information gathered from elicitation surveys and focus groups conducted with members of the study population to identify these potential mediators of behavior change. In addition, we took into account the reactions of participants in pilot tests of the intervention. We reasoned that it is necessary to give adolescents not only information, but also skills and confidence in their ability to act safely. Another consideration was the kinds of activities that would be developmentally appropriate, especially for younger adolescents. We reasoned that adolescents would benefit most from short activities that involve active participation, concrete concepts, sufficient variation to keep their interest, and sufficient repetition to ensure integration of the most important beliefs about reducing sexual risk behaviors. In addition, we imbedded in the interventions themes such as "Be Proud! Be Responsible!" that emphasize personal pride and responsibility for not only oneself, but also one's family and community.

Overview of the Curriculum

The first curriculum we developed was called "Be Proud! Be Responsible! Strategies to Empower Youth to Reduce Their Risk for AIDS." It involved the use of audiovisuals, role-playing, skill-building activities, group discussion and other interactive activities designed to influence: (a) HIV risk-reduction knowledge, (b) behavioral beliefs about the consequences of condom use for sexual enjoyment, and (c) behavioral skills and self-efficacy regarding practicing abstinence and using condoms. In addition, it encouraged the adolescents to make proud and responsible decisions to protect themselves and their community. It consisted of six 50-minute modules. A typical module has several developmentally appropriate activities. This included videos, small group discussions, experiential exercises, and role-play scenarios. Each activity was of short duration (i. e., most lasted 25 minutes or less) and most were active exercises in which the adolescents got out of their seats and participated. In this way, it was possible to maintain interest and attention, which might fade if lecturing or lengthy group discussions were used. The activities were designed to provide information and to build skills in entertaining ways.

Curriculum activities are also designed to help participants recognize that faulty reasoning and decision making can increase their risk of HIV infection. The activities help the participants understand the adverse consequences of participating in unsafe sexual activity and the positive consequences of safer sexual practices, including abstinence. The participants engage in activities to increase comfort with condom use and to allay common concerns about the negative effects of condom use on sexual enjoyment and spontaneity. Participants handle condoms and learn to use condoms correctly. The current generation of young people has had substantial exposure to television, movies, and videos, and is accustomed to learning through such media. Throughout the curriculum culturally relevant videos depicting adolescents in various realistic situations are included to increase variety in the methodology, increase interest, repeat information in an entertaining way and permit a visual mode of learning. These videos evoke feelings, thoughts, attitudes, and beliefs about HIV infection, AIDS, and sexual risk behavior while highlighting prevention skills. The adolescents also participate in role-playing scenarios that allow them to observe, analyze, and practice the skills of negotiating abstinence or condom use in a variety of circumstances. The facilitator and the other participants provide constructive feedback and support during and after each role-play scenario. The later modules build on material presented in earlier modules and introduce new material. The initial modules focus more on information and motivation, whereas subsequent modules focus more on skill building. Closure activities review information in fun and interactive ways.

HIV Risk-Reduction Randomized Controlled Trials: Application of the Theory of Reasoned Action/Planned Behavior

Our research on inner-city African American adolescents documented early initiation of sexual intercourse, negative hedonistic beliefs regarding condom use, and the protective effect of parental strictness (Jemmott & Jemmott, 1990, 1992a). We also reported evidence on the utility of the Theory of Reasoned Action, Theory of Planned Behavior, and Social Cognitive Theory for understanding sexual risk behavior among inner-city African American adolescents and women (Jemmott & Jemmott, 1991; Jemmott & Jemmott, 1992b; Jemmott, Jemmott, & Hacker, 1992; Jemmott, Jemmott, Spears et al., 1992). This research showed that condom use intentions were associated with hedonistic beliefs about the effects of condoms on sexual enjoyment, normative beliefs regarding partners' and mothers' approval, and control beliefs regarding technical skill at using condoms, and self-efficacy to use condoms. This work supported the development of HIV/STD risk-reduction interventions evaluated in a series of randomized controlled trials.

Interventions Focusing on Adolescents

Intervening with Black male adolescents. Our initial intervention study was a field experiment designed to test the effectiveness of "Be Proud! Be Responsible!" on African American male adolescents (Jemmott, Jemmott, & Fong, 1992). The study also addressed an important practical question regarding

the implementation of HIV interventions with inner-city African American male adolescents. It might be hypothesized that a Black male educator would be a good role model for African American male adolescents. Hence, the second issue the study addressed was whether intervention effects would be enhanced if the facilitator was a Black man as opposed to a Black woman. The participants were 157 African American male adolescents from Philadelphia who volunteered for a "Risk-Reduction Project" designed to reduce important risks faced by African American youth, including unemployment, pregnancy, and AIDS. They were recruited from a local medical center, community-based organizations, and a local high school and assigned randomly to an HIV risk-reduction condition or a control condition on career opportunities and to a small group of about 6 boys led by a specially trained male or female Black facilitator. Few participants reported *ever* sharing needles (4%), *ever* having receptive anal intercourse (2%), having sexual relationships with males exclusively (2%), or having sexual relationships with both males and females (1%). Their chief HIV risk was from sexual relationships with women. Although the mean age of the sample was only 14.6 years, about 83% of the adolescents reporting having had coitus at least once. About 21% of respondents who had coitus in the past 3 months reported that they *never* used condoms during those experiences, and only 30% reported *always* using condoms.

Adolescents in the HIV risk-reduction condition received a 5-hour intervention involving videotapes, games, and exercises aimed at increasing AIDS-related knowledge, weakening problematic beliefs and attitudes toward HIV risk-associated sexual behavior, and increasing skill at negotiating safer sex. To control for Hawthorne effects, to reduce the likelihood that effects of the HIV risk-reduction intervention could be attributed to nonspecific features, including group interaction and special attention, adolescents randomly assigned to the control condition also received a 5-hour intervention. Structurally similar to the HIV risk-reduction intervention, it involved culturally and developmentally appropriate videotapes, exercises, and games, but regarding career opportunities. This control intervention was designed to be both enjoyable and valuable. Although career opportunity subjects did not learn about AIDS, given the high unemployment among inner-city Black adolescents, the goal was to provide information that would be valuable to them as they plan their future.

Adolescents in both conditions completed questionnaires before, immediately after the intervention, and 3 months after the intervention. Analyses of covariance, controlling for pre-intervention measures, revealed that adolescents who received the HIV risk-reduction intervention subsequently had greater AIDS knowledge, less favorable attitudes toward risky sexual behavior, and reduced intentions for such behavior compared with adolescents in the control condition. Responses to debriefing questions on the post-intervention questionnaire indicated that participants in the two conditions were equally involved in their respective activities and felt that they had a valuable and enjoyable experience. Of the original participants, 150 (96%) completed follow-up questionnaires 3 months after the intervention. Adolescents in the HIV risk-reduction condition reported less risky sexual behavior in the 3 months post intervention than did those in the control condition. For instance, they reported having coitus less frequently and

with fewer women, they reported using condoms more consistently during coitus, and fewer of them reported engaging in heterosexual anal intercourse. Moreover, the AIDS-intervention participants still had greater AIDS knowledge and weaker intentions for risky behavior in the next 3 months than did the other participants. The study revealed scant evidence that the use of Black male facilitators would enhance intervention effects on Black male adolescents. Although analyses on the post-intervention questionnaire revealed a Condition x Gender of Facilitator interaction such that the HIV risk-reduction intervention caused a greater increase in AIDS knowledge among participants who had a male facilitator than among those who had a female facilitator, this interaction was not evident on other post-intervention measures or at the 3-month follow-up. In fact, the effects of the HIV risk-reduction intervention on attitudes and sexual behavior measured at the 3-month follow-up were significantly stronger with *female* facilitators than with male facilitators.

Intervening with Young Inner-city Black Adolescent: Testing the Generality of Effects. Jemmott, Jemmott, and Fong (1999) conducted a second study using the "Be Proud! Be Responsible!" curriculum, this time focusing on male and female African American adolescents. The study was designed not only to test the efficacy of the curriculum, but also to pursue further, practical questions about how interventions are implemented with inner-city African American adolescents. The study was designed to test whether intervention effects varied depending on whether the facilitator was African American or White, whether the gender of the facilitator and the gender of the adolescent were matched or different, whether the adolescents in the small group were homogeneous or heterogeneous on gender, and theoretically and practically important combinations of these factors. The participants were 506 7th and 8th graders (mean age, 13.1 years) recruited from the public junior high schools and elementary schools of Trenton, New Jersey for a study designed to discover ways to reduce important health risks that African American youths face. About 55% of respondents reported having experienced coitus at least once, and about 31% of all respondents reported having coitus in the past 3 months. About 25% of those reporting coitus in the past 3 months indicated that they never used condoms during those experiences, whereas 30% indicated they always used condoms during those experiences.

The adolescents were assigned randomly to either an HIV risk-reduction condition or a control condition and to a small group that was either homogeneous or heterogeneous in gender and that was led by a specially trained male or female facilitator who was African American or White. Adolescents in the HIV risk-reduction condition received the "Be Proud! Be Responsible!" curriculum. As in our previous intervention study, participants in the control condition also received an intervention. However, instead of an intervention on career opportunities, this control group received an intervention targeting behaviors (e.g., dietary and exercise habits and cigarette smoking) that affect the risk of certain health problems other than AIDS. These health problems, including cardiovascular disease, hypertension, and certain cancers, are leading causes of morbidity and mortality among

African Americans (Gillum, 1982; Ibrahim, Chobanian, Horan, & Roccella, 1985; Page & Asire, 1985). Structurally similar to the HIV risk-reduction intervention, the general health promotion intervention also lasted 5 hours and used culturally and developmentally appropriate videotapes, exercises, and games to reinforce learning and to encourage active participation.

After the interventions, the participants completed the post-intervention questionnaires. Adolescents in the HIV risk-reduction condition subsequently expressed stronger intentions to use condoms; had more favorable beliefs about the effects of condoms on sexual enjoyment and about the ability of condoms to prevent pregnancy, STD, and AIDS; had greater perceived self-efficacy to use condoms; and had greater knowledge about AIDS than did those in the control condition, controlling for pre-intervention measures of the particular dependent measure. Responses to debriefing questions indicated that participants in the HIV risk-reduction and general health promotion conditions did not differ in ratings of how much they talked during the interventions, liked the intervention activities, or learned from the activities.

Of the original participants, 489 (97%) took part in the 3-month follow-up and 469 (93%) took part in the 6-month follow-up. The effects of the HIV risk-reduction intervention on the motivational variables were sustained over the 6-month time interval. At both follow-ups, participants in the HIV risk-reduction intervention scored higher on intentions to use condoms, AIDS knowledge, hedonistic beliefs, and perceived self-efficacy to use condoms than did the participants in the health promotion condition. Although there were no significant effects of the HIV risk-reduction intervention on self-reports of unprotected coitus at the 3-month follow-up, at the 6-month follow-up adolescents who had received the HIV risk-reduction intervention reported fewer days on which they had coitus without using a condom in the past 3 months than did those who had received the health promotion intervention, controlling for pre-intervention self-reports.

There was evidence for the generality of the effects of the intervention across race of the facilitator, gender of the facilitator, gender of the participants, and gender composition of the intervention groups. Despite the relatively large number of interactions tested—which would have increased the likelihood of a Type I error—these factors did not moderate facilitators' reports of how the participants reacted to the intervention or participants' own reports of their reactions to the interventions: how much they liked it, how much they talked, and how much they felt they learned. In addition, these factors did not moderate effects of the intervention on AIDS knowledge, prevention beliefs, hedonistic beliefs, perceived self-efficacy, intentions, or self-reports of unprotected coitus. The effects of the HIV risk-reduction intervention were about the same irrespective of the race of the facilitator, the gender of the facilitator, the gender of the participants, and the gender composition of the intervention group. Our initial study on Black male adolescents (Jemmott, Jemmott, & Fong, 1992) also found that matching the gender of participant and facilitator did not enhance intervention effects. The lack of effects of race of facilitator may reflect the fact that the facilitators received common training in the intervention that was culturally appropriate. It may well be that if an intervention is culturally appropriate and the facilitators are well trained, the

characteristics of the facilitators are not important determinants of the efficacy of intervention implementation. This, of course, is an empirical question.

Testing Abstinence and Safer-Sex HIV Intervention Strategies. In another randomized controlled trial, we examined the efficacy of two types of HIV risk-reduction messages, abstinence and safer sex, delivered by two types of messengers, adult and peer facilitators, in reducing sexual risk behavior (Jemmott et al., 1998). The participants, 659 sixth- and seventh-grade Black adolescents (mean age = 11.8 years) from Philadelphia, were randomly assigned to 1 of 3 interventions and to a small group led by an adult facilitator or two peer co-facilitators. "Making a Difference!" was an abstinence intervention designed to encourage middle school students to delay initiation of sex, abstinence from sex, or reduce frequency of sex. "Making Proud Choices!" was a safer-sex intervention designed to encourage middle school students to use condoms if they have sexual intercourse. A health-promotion intervention served as the control. Each intervention consisted of eight 1-hour modules implemented over two consecutive Saturdays. About 98% of participants attended the second day of the interventions and 93% were retained at 12-month follow-up.

The "Making a Difference!" abstinence intervention participants were less likely to report having sexual intercourse in the 3 months after intervention than were control condition participants, but not at the 6- or 12-month follow-up. The "Making Proud Choices!" safer sex intervention participants reported more frequent condom use than did control condition participants at all follow-ups. The effects of the interventions did not vary significantly with adult facilitators and peer co-facilitators. However, there were interactions between pre-intervention sexual experience and the safer-sex intervention. Among adolescents who reported sexual experience at baseline, safer-sex intervention participants reported less frequent unprotected sexual intercourse at all follow-ups than did health control intervention participants. The efficacy of the abstinence intervention did not vary depending on participants' baseline sexual experience.

Reducing Risk Behavior and STD Rates among Adolescent Medicine Clinic Female Clients. In another randomized controlled trial, we focused on adolescent girls and the question of whether HIV risk-reduction interventions could reduce the incidence of STDs (Jemmott et al., 2005). We examined the efficacy of two types of risk-reduction interventions. An information-based HIV/STD intervention provided information necessary to use condoms, but did not provide skills practice. A skill-based HIV/STD intervention provides information and the opportunity for practice in the skills necessary to use condoms or to negotiate condom use. There was also a control condition that included a general health promotion intervention. The participants were 682 low-income African American and Latino adolescent girls recruited from the adolescent medicine clinic in Philadelphia (mean age = 15.5 years). The girls were randomized to one of the three interventions. The results revealed that only the skill-based intervention had significant effects on self-reported sexual risk behavior or STD rates. About 89% of participants were retained at 12-month

follow-up and skills-intervention participants reported less unprotected sexual intercourse and fewer sexual partners and were less likely to test positive for an STD as compared with health control intervention participants. Few studies have examined the effects of interventions on sexual behavior in conjunction with alcohol and drug use. This study found that the skills participants reported a significantly lower frequency of sexual intercourse while intoxicated compared with the health control and information interventions at 3-month follow-up and compared with the health control intervention at 6-month follow-up.

HIV Risk-reduction Interventions for Women

Reducing Risk Behavior and STD Rates among Black Women's Health Clinic Clients. Jemmott, Jemmott, and O'Leary (in press) have conducted a randomized controlled trial evaluating the effects of brief nurse-led HIV risk-reduction interventions for inner-city Black women. The objective was to identify effective interventions that can be implemented in clinics and other primary health care facilities. The efficacy of four theory-based interventions that contrasted two methods of intervention delivery—group versus individual—and two kinds of intervention content—information versus skill building—was tested. The participants were 564 Black women (mean age = 27.2 years) seeking care at the outpatient Women's Health Clinic of a large hospital in Newark, NJ. The participants were randomly assigned to 1 of 5 single-session interventions: 20-minute one-on-one HIV information intervention, 20-minute one-on-one HIV behavioral skill training intervention, 3.33 hour group HIV information intervention; 3.33 hour group behavioral skill-training HIV intervention; 3.33-hour health promotion control intervention. The study had excellent return rates, with 87% retained at 12-month follow-up. Generalized estimating equations analyses, controlling for baseline measures, revealed that considering the three follow-up periods together, the women who received the skill-training interventions compared with the control group were more likely to report using a condom the last time they had sexual intercourse, were more likely to report consistent condom use, and reported having unprotected sexual intercourse on fewer occasions. Although the interventions did not reduce STD incidence at 6-month follow-up, the women in the skill-training interventions were less likely to have a STD at 12-month follow-up than were those in the control group

Dissemination: Working with Community-based Organizations

Translating findings into community-based programs. Often the results of intervention research remain buried in the pages of scientific journals, where they are unlikely to come to the attention of the community people who could make the best use of them. Unfortunately, the ideal of translating research results into practical community-based programs is seldom realized. We attempted to address this issue by adapting our HIV risk-reduction interventions for use in a program implemented by a community-based organization, the Urban League of Metropolitan Trenton, New Jersey (Jemmott & Jemmott, 1992).(a or b?)

The AIDS prevention program drew upon our experiences with the Jemmott, Jemmott, and Fong (1992) study and the Jemmott, Jemmott, Spears et al. (1992) study and used many of the same activities. It was designed to be meaningful and culturally appropriate for the specific population of inner-city African American adolescent women who would receive it. Prior to implementing the program, individual and focus group interviews were conducted with adolescents from Trenton. These interviews suggested that many of the adolescents had a strong sense of identification with Africa. Posters used to advertise the program were colored red, black, and green (the Black liberation colors) and bore a map of Africa and the motto "Respect Yourself, Protect Yourself—Because You Are Worth It." When the adolescents completed the program they were given T-shirts with the phrase "Respect Yourself, Protect Yourself" and a map of Africa colored in red, black, and green on the front and the phrase "Because I am worth it" on the back.

The program was 6 hours long. Taking into account the constraints within which the community-based organization had to work, however, it was designed to be implemented in three 2-hour sessions, which included 30-minute pre-intervention and post-intervention assessments, rather than our usual one session. The first session focused on factual information about the cause, transmission, and prevention of AIDS and the risks faced by Black women of childbearing age in New Jersey. The second session focused on beliefs regarding partner reactions and hedonistic beliefs. The third session focused on skill building and self-efficacy to use condoms. Videotapes, games, and exercises were used to reinforce learning and to encourage active participation. The participants received the intervention in small groups of 6 to 10 adolescents led by a specially trained African American female health educator who was a native Trenton resident.

The participants in the program were 109 sexually experienced African American female adolescents (mean age = 16.8 years). About 72% reported that they had had coitus in the past 3 months. As in previous research on inner-city African American adolescents, the chief risky sexual behavior was the failure to use condoms. About 19% of those who had coitus in the past three months reported that condoms were never used on those occasions, and only 29% reported that condoms were always used on those occasions. Analyses revealed that the adolescents scored higher in intentions to use condoms, AIDS knowledge, hedonistic beliefs, prevention beliefs, and self-efficacy to use condoms after the intervention compared with before the intervention (Jemmott & Jemmott, 1992a). In addition, increased self-efficacy and more favorable hedonistic beliefs and beliefs regarding a sexual partner's support for condom use were significantly related to increased condom-use intentions, but increases in general AIDS knowledge and specific prevention-related beliefs were not.

An Effectiveness Trial with Community-Based Organizations (CBOs). On a broader scope, Jemmott, Jemmott, Hines, and Fong (2001) conducted a NIH-funded phase-IV trial involving 86 CBOs and 3,448 African American and Latino adolescents 13 to 18 years of age to test the effectiveness of the "Be Proud! Be Responsible!" curriculum when implemented by CBOs and to identify the amount of training they need to implement the intervention effectively. The study was a

cluster randomized controlled trial. One-half the CBOs were randomized to implement Be Proud! Be Responsible! HIV/STD risk-reduction and one-half were to implement a health promotion intervention, which served as the control. Across several measures, adolescents in CBOs that implemented "Be Proud! Be Responsible!" reported significantly greater condom use than did those in CBOs that implemented the health-promotion control intervention. GEE analyses revealed that during the follow-up period, the mean proportion protected sexual intercourse, the rated frequency of condom use, and the percentage consistent condom use ($P = .03$) were significantly higher among the adolescents from the CBOs in the HIV/STD risk-reduction condition than among those in the health-promotion control condition. This is the first behavioral intervention randomized controlled trial to report intervention-induced increases in condom use when interventions were implemented by CBOs.

The CDC National Dissemination Project. Once effective interventions are identified there is always the possibility that they will remain buried in the scientific and medical literature, unavailable to those who would be in the best position to use them. The CDC initiated a dissemination project, "Research to Classrooms: Programs that Work," which identified HIV-prevention curricula with credible scientific evidence of effectiveness with adolescents and that are user friendly and brought them to the attention of educators. Our curriculum, "Be Proud! Be Responsible!" was among the first three curricula selected for dissemination across the nation by the CDC. The CDC sponsored several national train-the-trainer sessions for school, clinic, and CBO personnel. As of October 2000, two other curricula we have developed were selected for the dissemination project: "Making a Difference" and "Making Proud Choices"—the two HIV/STD curricula tested in the Jemmott et al. (1998) study.

Culturally Adapting Effective Theory-Based HIV Risk-reduction Interventions

Puerto Rican adolescents in Philadelphia. Villarruel, Jemmott, Jemmott, and Ronis (2006) tested the efficacy of "¡Cuidate!" (or "Take Care of Yourself") an adapted version of the "Be Proud! Be Responsible!" Curriculum for Latino adolescents. "¡Cuidate!" incorporated salient aspects of Latino culture, specifically familialism and gender-role expectations. We conducted a randomized controlled trial with 553 Latino high school students in Philadelphia who were randomized to "¡Cuidate!" or a culturally tailored general-health-promotion intervention. A unique feature of the trial is that half the students were monolingual in Spanish and received the interventions in Spanish, whereas the others received the interventions in English. GEE(explain acronym?) analyses over the 12-month follow-up period revealed that adolescents in "¡Cuidate!" were less likely to report sexual intercourse, multiple partners, and unprotected intercourse, and more likely to report using condoms consistently than were those who received the control intervention. There was some evidence that the efficacy of the intervention was greater with the adolescents who received the intervention in Spanish compared with those who received the intervention in English. Thus, the

intervention was more efficacious in increasing condom use at last sex and increasing the proportion of protected sexual intercourse compared with a health promotion intervention among Spanish speakers than among English speakers.

Xhosa adolescents in South Africa. Jemmott, Jemmott, and colleagues are currently conducting a randomized controlled trial of an HIV/STD risk-reduction intervention in South Africa with Xhosa-speaking sixth-grade adolescents. As part of this trial, we are translating the interventions into Xhosa and to be appropriate for Xhosa culture. This involves gathering information about common beliefs regarding HIV/AIDS among Xhosa people and any additional information that might be relevant to implementation of an HIV/STD risk-reduction intervention study. We implemented focus group sessions with sixth-grade adolescents, parents of sixth-grade adolescents, and teachers of sixth-grade adolescents. We held meetings with senior primary school principals from Mdantsane, an urban area, and Berlin, a more rural area. In the focus group sessions, adolescents provided feedback about health concerns. They also expressed an interest in talking to their parents about health-related issues. During these sessions, the adolescents recommended that the name of the project should be "Let Us Protect Our Future." In the parent focus group sessions, parents expressed a desire to talk to their children about preventing AIDS and other health problems. We developed the study questionnaire and conducted pilot questionnaire sessions with 63 sixth-grade adolescents from Mdantsane (urban) and Berlin (rural). We solicited their feedback and finalized the questionnaire.

We developed the two HIV/STD risk-reduction curricula and the general health-promotion curriculum, which will serve as the control. They are based on the information gathered in the focus groups, meetings, and questionnaire sessions, the input from South African consultants and co-investigators, and our previous experience in developing curricula for adolescents. Each curriculum consists of 12 one-hour modules to be implemented over 6 two-module sessions. Each curriculum is designed to be implemented by specially trained male and female adults from the community who will work in co-facilitator pairs. The curriculum includes take home assignments for the participants to complete with their parents. The goal of these homework assignments is to increase parent-child communication. The intervention implementation phase has been completed. The program is now in the follow-up data collection phase. The results of this project will contribute to the development of effective sustainable HIV/STD risk-reduction programs for South African adolescents.

CONCLUSION

There is ample evidence that adolescents are at high risk of sexually transmitted HIV infection. In this light, the results of our research are encouraging: they suggest that theory-based interventions can curb HIV risk-associated sexual behavior among adolescents in a variety of settings. Reductions in HIV risk-associated sexual behaviors were demonstrated across several populations of adolescents: male and female adolescents, younger and older adolescents, and African American and Latino adolescents. They were demonstrated across different facilitator

characteristics: male and female facilitators, African American and white facilitators, adult facilitators and peer co-facilitators. They were demonstrated in single-gender and mixed-gender intervention groups. Moreover, the findings cannot be explained as a simple result of Hawthorne effects (Cook & Campbell, 1979) among the adolescents who received the HIV risk-reduction interventions. Several studies included comparison groups that provided controls for Hawthorne effects so that the effects of the HIV interventions could not be attributed to special attention or group interaction. These studies also demonstrated that participants in HIV risk-reduction interventions reported less HIV risk-associated sexual behaviors than did those in structurally similar interventions that concerned other issues (e.g., Jemmott, Jemmott & Fong, 1992, 1998; Jemmott et al., 1999, 2005; Villarruel et al., 2006).

One important challenge of HIV sexual risk-reduction research has been the fact that, by its very nature, risky sexual behavior is private behavior and consequently must be assessed with self-report measures. Thus, these studies examined not risky sexual behaviors, but self-reports of risky sexual behaviors. There is the lurking possibility that the participants' reports of their sexual practices might have been unintentionally or intentionally inaccurate. On several grounds, however, confidence about the accuracy of self-reports in the studies is warranted. To reduce problems in memory, researchers have typically asked adolescents to recall their sexual behaviors over a relatively brief period, which would enhance their ability to recall their behavior (Kauth, St. Lawrence, & Kelly, 1991). It is more difficult to recall accurately behavior over a 12-month period as compared with the 2- or 3-month period typically used in studies of adolescents. To increase further the accuracy of recall, studies have provided participants calendars with the dates clearly marked. This makes salient to respondents the dates that are included when they are asked to recall their behavior over a specific temporal interval.

We have employed several techniques to make it less likely that participants would minimize or exaggerate reports of their sexual experiences. In some studies, demand characteristics were reduced because the facilitators who implemented the interventions were not involved in any way in the data collection. Participants have been told that their responses would be used to help improve HIV-prevention programs for other youths like themselves, and that optimum programs would be created only if they answered the questions truthfully. Here, the attempt is to arouse the "social responsibility motive" to counteract any possible social desirability motive (e.g., Jemmott et al., 1998). In addition, participants have been assured that their responses would be kept confidential. Such assurances have been shown to increase frank responses to sensitive questions among adolescents (Ford, Millstein, Halpern-Felsher, & Irwin, 1997).

Another approach was to use indirect measures of sexual behavior that do not share the same problems as self-report measures. For instance, Jemmott et al. (2005, in press) utilized biologically confirmed STDs as an outcome. Some studies employed objective tests of whether the adolescents acquired the knowledge to perform safer behavior, for example, knowledge of how to use a condom (Jemmott et al., 1998).

Researchers have also addressed the issue of socially desirable responding statistically—by testing hypotheses about its impact. If participants' concern about how they would be viewed by others influenced their reports of their sexual behavior, the effects of HIV risk-reduction interventions should be stronger among participants who were higher in the need for social approval than among other participants. However, three studies examining this issue (Jemmott, Jemmott, & Fong 1992; 1998, Jemmott et al., in press) have found that the changes in reported behavior were unrelated to social desirability response bias (Crowne & Marlowe, 1964). Confidence in self-reported behavior is also based on studies demonstrating significant relations between self-reports of condom use and the incidence of clinically documented sexually transmitted infections among people who had sexual intercourse with partners known to have an STD (Warner, Stone, Macaluso, Buehler, & Austin, 2006).

Additional research is needed into interventions that stress abstinence from sexual intercourse. Although the correct and consistent use of latex condoms can sharply reduce the risk of HIV infection, abstinence is the only way to eliminate the chance of sexually transmitted HIV infection. Abstinence is a reasonable risk-reduction strategy for adolescents, especially young adolescents, who may not have the capacity to negotiate condom use or to grapple with the adverse consequences of unprotected sexual intercourse. There is a considerable body of research demonstrating that interventions emphasizing abstinence and condom use if adolescents choose to have sex can reduce HIV risk-associated behavior. There is far less evidence on the effectiveness of interventions stressing abstinence only, and most of the evidence comes from studies designed to prevent pregnancy. To our knowledge, only one HIV-intervention study has tested an abstinence intervention (Jemmott et al., 1998). It found that the abstinence intervention was effective at 3-month follow-up, but not at 12-month follow-up. We need a better understanding of what kinds of interventions are most effective in encouraging abstinence.

There is also a need for more research on the effects of behavioral interventions on health outcomes. We now know that behavioral interventions can influence sexual risk behaviors and mediators of such behaviors. The next generation of research must establish whether changes in self-reported sexual behavior translate into changes in health outcomes such as the incidence of sexually transmitted infections. At the same time, it should be recognized that reducing the incidence of STDs may not be a reasonable goal for every study. It is unlikely that the incidence of STDs will be changed in a short-term study conducted in a population with little sexual activity or in a community with a low prevalence of STDs. Populations with a high degree of sexual activity and a high prevalence of STDs are ideal for studying the effects of behavioral interventions on STD incidence. Such studies should be conducted with samples that are large enough and follow-ups that are long enough to provide excellent statistical power.

The argument here is not that STD incidence should replace the assessment of self-reported sexual risk behavior. Rather, STD incidence should complement self-reports of behavior. This is because the relation between unprotected sexual intercourse and STDs is not perfect. The presence of STD suggests that the

person has engaged in unprotected sexual activity, but the absence of a STD does not necessarily mean the person has practiced abstinence or safer sex. The test could be negative, not because the person practiced abstinence or used condoms, but because the person had unprotected sex with a partner who was not infected. A potential secondary advantage of testing for STDs should be noted. Such testing may encourage the adolescents to report their sexual behavior more accurately.

For theory to help drive intervention, it must focus attention on how to select the important factors we can influence from among many factors associated with the behavior. The Theory of Reasoned Action and its extension in the Theory of Planned Behavior seem particularly useful in this regard. Application of these models to understand a particular behavior will identify underlying beliefs that determine one's attitude, subjective norm, and perceived behavioral control, and thereby affect the likelihood of performing the behavior. It is therefore critical to assess the effect of interventions on the beliefs targeted and on other components of the model. The Theory of Reasoned Action and the Theory of Planned Behavior provide a basis for evaluating behavior change interventions because they provide hypotheses about how the intervention targeting a set of beliefs will affect the model component that those items compose (for example, attitude) and thereby affect intention and behavior. Often, the important beliefs affecting behavior are different for different related behaviors and for different populations. We found this to be true in our studies.

In conclusion, the studies discussed in this chapter demonstrate that behavioral interventions using the Theory of Reasoned Action/Planned Behavior can significantly influence HIV risk-associated sexual behavior, including condom use, frequency of intercourse, and number of sexual partners, and can influence STD incidence. Future research must extend these findings by exploring intervention effects in other populations, including men of color who have sex with men, men of color who have sex with women, and people in developing countries where HIV is having its most devastating impact. It is also essential that future studies include appropriately large samples to achieve adequate statistical power, that a core set of mediators and behavioral outcomes be assessed, and that objective outcomes such as STD incidence be included in the mix. Although the expense of such studies may be considerable, the alternative is to continue to conduct studies that despite great cost and effort are not fully capable of answering some of the questions that are now of central interest to the field. By conducting research along these lines, it may be possible to identify the most effective strategies to curb the further spread of sexually transmitted HIV infection worldwide.

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Prediction and Change of Health Behavior

Applying the Reasoned Action Approach

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