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DENIAL AND AIDS RISK-BEHAVIOR:
EFFECTS OF A DISSONANCE INTERVENTION
WITH COLLEGE STUDENTS

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Laura Christine Baker

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DENIAL AND AIDS RISK-BEHAVIOR: EFFECTS OF A DISSONANCE INTERVENTION WITH COLLEGE STUDENTS

By

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ABSTRACT

DENIAL AND AIDS RISK-BEHAVIOR:
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AIDS prevention authorities have emphasized the need for theory-based interventions. Aronson, Fried, & Stone (1991) reported that induced cognitive dissonance decreased denial and increased college students' intentions to use condoms. This study replicated Aronson et al.'s (1991) dissonance induction procedure but assessed outcome by self-reported risky sexual behavior. Undergraduates (119 women, 52 men) completed a measure of AIDS risk-behavior and two questionnaire measures of denial. They later participated in a 2 x 2 design (simulated videotaped endorsement of safe sex vs. no endorsement, high vs. low awareness of past risky behavior) and were re-assessed at a 1-month follow-up. Denial was found to be unrelated to self-reported AIDS risk-behavior. Contrary to Aronson et al.'s hypothesis, participants in the dissonance condition (endorsement + high awareness) did not show greater reductions in AIDS risks.

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Introduction

Psychologists are increasingly being called upon to lend themselves to the challenge of preventing HIV and AIDS. Twelve years into the epidemic, the only current means of containing the spread of HIV is radical, population-wide behavioral change. Thus far, prevention programs have had limited success in curtailing the increasing incidence of HIV infection in growing risk populations, such as heterosexual youth (Cantania et al., 1992). The recalcitrance of these groups to changing their HIV risk behaviors poses a serious and unparalleled challenge to researchers to design and implement effective interventions. Cited by researchers as a special problem are the apparent perceptions of invulnerability to HIV in heterosexual youth, which may decrease motivation to take precautions. The present intervention focuses on clarifying the relationship between adolescent denial and sexual risk-taking behavior while trying to increase HIV prevention awareness and practice.

The Problem of HIV

AIDS is by now a well publicized social epidemic. In 1987, the Center for Disease Control (CDC) estimated that between 1 and 2 million Americans had already been infected with the Human Immunodeficiency Virus (HIV), the virus believed to cause AIDS (Selik, 1990). In 1991, death related to HIV infection increased 15.3%, and prospective data for 1992 placed HIV as the 8th leading cause of death in the United States (NCHS, 1991, cited in Centers for Disease Control, 1993). In the absence of a cure for AIDS, the long-term

prognosis for individuals testing HIV positive is very bleak (Piemme & Bolle, 1990). Of patients diagnosed with AIDS, 80% will die within three years (Perdew, 1990). Population-wide behavioral change toward safer sexual practices seems to be the primary present means of HIV prevention. Thus, behavioral change has been the focus of massive prevention efforts aimed recently at the broader population.

Despite prevention efforts and widespread public knowledge of HIV prevention (Memon, 1990), the findings from several reviews of the AIDS prevention literature remain pessimistic (Bell et al., 1990; Fisher & Fisher, 1992; Memon, 1990). AIDS is on the rise in many sectors of the population, particularly in heterosexuals (Owen & Mylvaganam, 1991). Cantania et al.'s (1992) national survey of AIDS risk factors and preventative behavior in a mainly heterosexual U.S. sample concluded that prevention programs have worked only to a very moderate degree among certain sectors of this population. Other studies (for a review, see Fisher & Fisher, 1992) aimed at exploring the effectiveness of specific HIV prevention programs have yielded only modest success as measured by knowledge, attitudes, and reported behavioral changes. While these works indicate that prevention efforts aimed at the general population have had a mixed or minimal impact on self-reported attitude and behavior change toward contracting HIV, the effect of prevention on actual behavior change in the adult heterosexual population is still unknown. It is clear that much more is needed to effect the type of sexual behavior change that will make a difference in the spread of HIV.

Heterosexual Youth

One sector of the population, young heterosexual people, has been relatively unaffected by recent prevention efforts, and continues at high risk for contracting HIV (e.g., Caron, Davis, Wynn, & Roberts, 1992). In 1991, the CDC reported that one-fourth of HIV infected people were between ages 20 and 29, most of them having contracted HIV in their teens and early 20's. Teenagers and heterosexuals have been two of the fastest growing HIV infected populations (Centers for Disease Control, 1991), and AIDS cases in adolescents have increased 77% between 1991 and 1993 (Hein, 1993). These alarming trends seem modest estimates, since they are only projections in the face of the unknown true epidemiology, and because the early stages of infection most often go undetected. This population, (roughly 13 to 25 years of age) has been the recent focus of much AIDS intervention and prevention policy (e.g., Aggleton, 1991; Petosa & Weissinger, 1990). Studies conducted to date on the AIDS knowledge, attitudes, and risk behavior of adolescents and college students imply that AIDS education is still not being incorporated by the majority of these individuals.

Several studies have demonstrated continued sexual risk-taking in young heterosexual people; such as having multiple partners and low rates of condom use, despite their generally high knowledge about HIV. For instance, one cross sectional study (Fisher & Misovich, 1990) surveyed college students' knowledge of AIDS and their behavioral responses to AIDS during 1986, 1987, and 1988. A comparison of the average number of partners reported across the three years yielded a reliable finding that the average number of partners actually *increased* between 1986 and 1988. Thus, further into the spread of the disease these college students exposed themselves more to infection. In 1988, 64% of the students reported having unprotected

vaginal intercourse in the last year, while 70% had engaged in oral sex without condoms. Furthermore, a discrepancy was found between the students' reported sexual behavior and their reported efforts to reduce the number of partners due to AIDS, indicating a response bias toward under-reporting one's own high risk behavior.

Another study (Caron et al., 1992) surveyed university freshmen and sophomores in 1987 and 1988 using an open-ended questionnaire that asked: "What are your thoughts about AIDS", "Who do you think is at risk of getting AIDS?", and "Do you think AIDS has had or will have an effect on your dating or sexual behavior?". Only 42% reported having changed sexual behaviors, and only 9% indicated they had changed to using condoms. While 14% indicated they did so by becoming "more selective" in choosing partners, the students apparently used subjective criteria in becoming more selective that have little relevance to actual risk factors. The authors of this study pointed out the discrepancy between the participants' perceptions of change and their actual low rates of protective behavior.

Several other studies of college students have found similar rates of risky sexual behavior (Burnette, Redmon, & Poling, 1988; Freimuth, Edgar, & Hammond, 1987; Gray & Saracino, 1989; Kauth, Christoff, & Sartor, 1993). In summary, research indicates that despite media campaigns and the increased energy being focused on large scale interventions with this growing risk population, heterosexual youth still engage in HIV risk-behavior. One hundred percent condom use, HIV testing, and abstinence, all necessary to ensure the prevention of HIV, appear very rare among young heterosexual people.

Models of HIV Prevention

In the light of these failures, HIV prevention educators and researchers have been called upon to develop theory-driven models of HIV prevention to guide future interventions (Leviton, 1989). Fisher and Fisher (1992) noted that pleas to devise theory driven models of HIV prevention far outweigh the conceptually-driven, empirically testable interventions. While it is true that multifactorial models of HIV prevention, for instance the Health Belief Model (Janz & Becker, 1984), the AIDS Risk Reduction Model (Cantania et al., 1989), and the Theory of Reasoned Action, (Azjen & Fishbein, 1980), best approximate the complexity of 'real world' factors, empirical tests of the multiple factors in these models have yielded confusing and inconsistent results (Brown, DiClemente, & Reynolds, 1991; Montgomery et al, 1989).

One model of HIV prevention, the Information-Motivation-Behavioral Skills Model (IMB; Fisher & Fisher, 1992) is unique in being conceptually driven, empirically testable, and broad enough to encompass other more specific models of HIV prevention. This model proposes three factors or determinants in the adoption of HIV preventive behaviors: (a) information regarding the dangers of HIV and ways to prevent HIV, (b) motivation to adopt HIV preventive behaviors, and (c) behavioral skills necessary in negotiating and implementing HIV protective behaviors. Alone, each factor is considered a necessary but insufficient condition in making HIV relevant behavioral changes, while the combination of all three is sufficient for HIV prevention. Tests of this model in a homosexual male population and a mainly heterosexual college population have shown that each factor has independent predictive power in overall HIV preventive behavior (Fisher & Fisher, 1992).

A review of studies has shown that information and behavioral skills are modified more easily than are actual behavioral practices (Fisher & Fisher, 1992). The first factor of the IMB, information, is relevant in that prevention depends first and foremost on the awareness of the threat of HIV, the modes of transmission, and ways to decrease one's risk for contracting HIV. Nevertheless, conclusions from the prevention literature indicate that lack of information does not seem to account for the continuing risk behavior seen in this population. The high risk behavior shown by many young heterosexual college-aged people continues in spite of the contradiction between their knowledge about prevention and their risk-taking behavior (Burnette et al., 1988; Caron et al., 1992; Fisher & Misovich, 1990; Keller et al., 1991; Skurnick, Johnson, Quinones, Foster, & Louria, 1991). In a review of HIV prevention efforts, Memon (1990) concluded that knowledge of high risk behavior among youth has been found to be either unrelated or negatively related to safer sex precautions (Corby, Wolitski, Thornton-Johnson, & Tanner, 1991; DiClemente, Forrest, & Mickler, 1990; Segest, Mygind, Harris, & Bay, 1991). Thus, young people are generally well-informed about the nature and transmission of HIV, and information alone does not seem to predict prevention behavior. The third factor of the IMB model, behavioral skills, has been shown to be relatively high in various samples and has been shown to be amenable to improvement (Fisher & Fisher, 1992).

Adolescent Denial

The second factor of the IMB model, motivation, seems to be importantly related to HIV prevention in young people (Fisher & Fisher, 1992). While many suggested motivational factors have been discussed (e.g., misperception of the efficacy of adaptive behaviors, the stigma of AIDS, and the perceived subjective social norm of HIV prevention) the important

motivational issue that surfaces repeatedly in the HIV prevention literature is denial (Fisher & Fisher, 1992; Hayes, 1991; Siegel & Gibson, 1988). Many authors have suggested that denial of one's own risk for HIV is a common barrier to HIV prevention, especially in young people (Fisher & Fisher, 1992; Hayes, 1991; Siegel & Gibson, 1988), and several of the models of HIV prevention include a factor such as "perceived susceptibility to threat" (Health Belief Model, Janz & Becker, 1984). Indeed, it is difficult to find a single article in the literature on HIV prevention that does not implicate the role of denial (Leviton, 1989), low "perception of vulnerability" (Siegel & Gibson, 1988), "perceived susceptibility" (Janz & Becker, 1984), "misperception of risk" (Hayes, 1991), "optimistic bias" (Weinstein, 1980, 1982), "beneffectance" (Greenwald, 1980), or the "illusion of invulnerability" (Janoff-Bulman, 1989). Despite diverse theoretical roots, all of these terms describe the phenomenon of selectively attending to reality in order to minimize one's own sense of risk. Although these terms may be largely interchangeable, "denial" has been selected in the interests of clarity for the following discussion.

Despite the frequent references to "denial" in the HIV literature, authors have been unclear as to its exact nature. While adolescent denial is widely held and accepted as a fact (Quadrel, Fischoff, & Davis, 1993), few authors who mention "denial" as a barrier define specifically what they mean. For instance, denial as a construct can be used to describe a global, pervasive defensive style, a developmental cognitive stage, a specific transient reaction to an aversive idea, or something in between. Lazarus (1983) has made distinctions as to the nature and scope of defensive denial, endorsing the different types of denial proposed by Weisman (1972). Lazarus supported the view that denial is not a singular psychic entity, but a defensive

goal that may consist of diverse processes that combine to produce varying degrees of distortion and disavowal of facts. He also emphasized the fluid nature of various denial states, arguing that denial may be operating more or less pervasively in individuals depending on their global defensive styles as well as reactions to specific defensive needs. Denial may also be more consciously accessible, as in self-reports of perceived risk, or it may manifest itself as an unconscious style of responding, more accessible through projective or semi-projective measures. Therefore, the measurement of adolescent denial as it relates to HIV risk-taking may be an important dimension to consider.

The "invulnerable adolescent" has been a long-standing stereotype of youth, and has generated many theories and studies of denial in adolescents (for a more comprehensive discussion, see Quadrel, Fischoff, & Davis, 1993). Indeed, there is considerable empirical support for the notion of adolescents' perception of relative invulnerability, indicating that young peoples' perceptions of susceptibility to threats tend to be unrealistic. For example, Weinstein (1980) had undergraduates rate the likelihood of 42 positive and negative events happening to them relative to their peers. He found that they significantly overrated the likelihood that good things would happen to them and underrated the likelihood that bad things would happen to them relative to their peers' chances of encountering the same events. Weinstein's students also perceived themselves as much more likely to experience positive events than negative events, and generally rated themselves as much less likely to experience extremely negative events, such as "attempting suicide", than milder negatives, such as "deciding you chose the wrong career".

Several studies have demonstrated a specific optimistic bias in college students' perceptions of their risk for contracting HIV. Freimuth, Edgar and Hammond (1987) had students rate themselves and others on a 6-point continuum for the probability that they had already been exposed to AIDS. They found that 80% rated their likelihood at one of the two lowest anchor points: 0 or 10%. When broken down by number of partners, they found that those with more partners did rate themselves at increased risk, but those with multiple partners still rated their risk as "very low". Poppen (1993) asked undergraduates to rate their own likelihood of experiencing several events, including getting AIDS, and also the likelihood that these events would happen to a same-sex peer. The results demonstrated an optimistic bias with regard to AIDS, with respondents rating peers consistently more likely than themselves to get AIDS. In an unpublished pilot study, I (1992) administered Weinstein's (1980) items to undergraduates, along with one additional item "Getting AIDS". All items, including the latter, showed an optimistic bias similar in magnitude to that of Weinstein (1980). The average student in this sample indicated he or she was 46% less likely than the "average student" to contract AIDS.

While there is evidence that young people show an optimistic bias both regarding general risks and specifically with regard to HIV risk, I am unaware of any studies that have measured the relationship between optimistic bias for events in general and HIV risk behaviors. Thus, the widely held notion that perceived invulnerability is a contributing factor in HIV risk has not been established empirically. An empirical test of the relationship between the degree of general optimistic bias or denial and specific AIDS risk behavior seems warranted. Given the empirical support for denial of HIV risk in heterosexual youth and the logical association

between perceived risk and motivation, I expect to find a positive relationship between denial and sexual risk taking.

Overcoming Denial through Interventions

Despite widespread implications that adolescent denial is a factor in the spread of HIV, few researchers have attempted relevant interventions. Archer (1989) proposed a radical program for overcoming denial regarding HIV and arresting the spread of infection. He suggested that if voluntary programs continue to fail, involuntary measures should be imposed. These would include mandatory HIV screening, parole and monitoring of HIV-infected individuals, threats of making one's HIV status public knowledge, and tougher laws to prosecute individuals who infect others. However, these measures are not only invasive, but may even be more likely to increase, rather than decrease, denial about AIDS. According to Protection-Motivation Theory (Rogers, 1975), when a feared stimulus is made salient (in this case, AIDS risk is viewed without denial), a person will respond with either fear control or danger control. Which is chosen depends upon the amount of anxiety and the actor's subjective perception of being able to cope with the threat. Therefore, Archer's radical program may move people toward fear control (e.g., denial strategies) rather than toward danger control (e.g., precautions). Thus, in addition to its ethical limitations, the intervention does not take motivational aspects of denial into consideration.

A more scientific approach, based in motivational theory, that has been proposed for overcoming denial of HIV risk is the induction of cognitive dissonance (Aronson, Fried, & Stone, 1991; Stone, Aronson, Crain, & Fried, in press). Dissonance theorists posit that when made aware of inconsistencies between their beliefs and behaviors, people are motivated to change one or the other to see themselves as more consistent. This motivating force has

been very powerful, and dissonance induction has been used as a technique in "self-persuasion" for a variety of behaviors (e.g., smoking, environmental concerns). The application of dissonance induction to HIV prevention rests on the assumption that most people believe that they should practice HIV protective behaviors, but do not follow through behaviorally. However, contradictions between one's beliefs and behavior may, and often do, continue without dissonance as long as the inconsistency remains outside of awareness via denial.

Despite their original application of cognitive dissonance induction for HIV prevention, Aronson, Fried, and Stone (1991) provided no explicit rationale for the way that cognitive dissonance overcomes denial. Since these two concepts -- cognitive dissonance and denial -- originated in divergent theoretical traditions, there has been no thoroughly integrated consideration of how the two processes interact. Therefore, the following discussion will highlight the relevant features of each concept and propose a brief theoretical model of the way these two may interact in a dissonance intervention.

Dissonance theory (Festinger, 1957) posits that inconsistencies between one's conscious attitudes and behavior create a state of discord or affective dissonance. This dissonance creates a powerful motivation to resolve the inconsistency through one of two means: either the person will may change these beliefs to coincide with existing behavior, or act in accord with her or his beliefs. However, Festinger acknowledged that changing the behavioral component to align with one's beliefs is usually the easier resolution,.

According to the cognitive arrest theory as described by Dorpat (1985), denial can be understood as an arrest of information processing that prevents a painful affective response. Dorpat proposed a microanalysis of this process, which identified four phases of denial: (a) preconscious appraisal of danger,

(b) painful affect, (c) cognitive arrest, and (d) screen behavior. Briefly, a threatening stimulus (i.e., thought, impulse, etc.) produces a negative feeling, which leads to a rapid arrest in processing the stimulus and a refocusing on less threatening stimuli. The process of denial is very rapid and often automatic. The general result is that the meaning of the threatening stimulus is ignored, distorted, or negated. Perhaps even more relevant to the interface of denial and cognitive dissonance is the function of "screen behavior", described by Dorpat as "the ideas, fantasies, affects, and overt behaviors activated by the subject's need to fill in the gaps formed in the cognitive arrest phase and to support its defensive aims" (p. 14). Thus, information indicating that an individual is vulnerable to HIV might create anxiety, which leads to the arrest of information processing and a refocusing on information that negates the threatening message (i.e., "I am not at risk). Risky sexual behavior may well be one form of screen behavior which functions to negate the threatening message.

According to this theory, a person's tendency to deny threatening information will then depend upon several factors, including the anxiety or discomfort produced by the information (i.e., HIV risk), the strength and pervasiveness of the defense, and the ease with which the stimulus (i.e., HIV risk) can be successfully denied.

Thus, both theories include accounts of denial that can be integrated. Denial may be operating in people who know that they should practice safe sex but do not. Clearly, cognitive strategies such as denial that negate the reality of one's behavior keep one from acknowledging a discrepancy between one's behavior and beliefs. This prevents dissonance arousal, and, therefore, reduces the motivation to change. With specific regard to HIV prevention, denial of the discrepancy that one should take precautions, but does not,

prevents dissonance arousal. It follows that by challenging one's denial of HIV risk by pointing out the hypocrisy between one's HIV beliefs and one's actions will likely increase dissonance. According to the theory, dissonance as a motivating state stirs the person to resolve the inconsistency through one of two means: either the person will change his or her beliefs to coincide with existing behavior, or may act in accord with these beliefs. As an HIV prevention tactic, dissonance arousal would hopefully provide a motivational impetus to change the behavior in accord with one's beliefs.

To date, however, only two empirical applications of this theory are known to the author. Aronson, Fried, and Stone (1991) used dissonance induction as a method to "overcome denial" of the sexual risk-taking of undergraduates. Using a two-by-two experimental design, 80 university students (40 male, 40 female) were divided equally into four conditions: either a High or Low "Mindful" condition, and either a "Preach" or "No Preach" condition. "High Mindful" participants were asked to "describe fully" the past situations in which they failed to use condoms; "Low Mindful" participants were not asked to recall a time when they failed to use condoms. Half of each group went on to participate in the "Preach" or "No Preach" condition. "Preach" participants were asked to compose a short speech about condom use from a list of facts and then present their speech in front of a video camera. They were under the impression that the tape would be shown to high school students as part of an AIDS prevention program. "No preach" participants were asked to compose a speech from the same facts, but were simply asked to rehearse the speech to themselves. All were then asked to give retrospective accounts of their sexual behavior and intentions for future condom use, and were followed up three months later and assessed for their recent condom use.

The authors predicted that participants in the High Mindful/Preach condition (dissonance condition) would increase their intentions to use condoms to decrease the cognitive dissonance implicit in the discrepancy between their actual behavior and their intended behavior. Despite several methodological limitations, the results essentially confirmed their hypothesis: participants in the "hypocrisy" condition improved the most between measures of actual and intended condom use. However, too few participants completed the follow-up measures to analyze the differences in reported condom use as a result of the manipulation.

In the replication study by Stone et al. (in press), the authors tested 72 heterosexual college students (32 male, 40 female), using the same two-by-two design. They included the same procedure for the dissonance intervention, but improved on the dependent measures, which included a behavioral measure of condom purchase after the study, and a 90-day follow-up telephone assessment of self-reported sexual behavior. This study found similar results: namely, that both intended risk behavior decreased and condom purchase increased most in the dissonance condition. However, at follow-up, no significant differences in reported condom use were found between conditions.

Despite this innovative application of dissonance theory, these two studies suffered from several methodological problems. The main omission from my standpoint is that they implicated denial without obtaining an actual measure of denial. In a future study, it would be important to get a direct index of denial as well as a measure of change in behavior.

Another problem with both studies was the highly subjective measures of self-reported sexual behavior. For instance, both studies used an interview question "In the past, how often did you use condoms to protect yourself

from the AIDS virus during intercourse?", and respondents were asked to mark a vertical line on a scale with points between "not enough" and "enough". Their second study included a series of discrete questions of dubious psychometric value. A future study would be improved by using a more comprehensive and reliable measure for assessing sexual risk.

Furthermore, in both studies, the measure of past sexual behavior was obtained *after*, instead of before, the manipulation. The result in the first study was that the condom use measure means varied dramatically depending on the condition. While this is a clear illustration of the effects of hypocrisy induction, a baseline measure of past condom use was not obtained. Because the index of attitude change in the first study was derived by subtracting the score on past condom use at Time 1 from the score on intended condom use immediately after the manipulation, this was a major flaw. A more reliable estimate of the magnitude of change associated with the hypocrisy condition would be gained by assessing past condom use before the manipulations, and comparing this score with another measure after the manipulation. A final methodological consideration was the small samples of both studies.

Summary and Hypotheses

To summarize, two sets of issues are raised by the research on HIV and denial. The first regards the extent to which denial or optimistic bias as defensive styles correlate with HIV risk-taking in young heterosexuals. While optimistic bias regarding risk for contracting HIV has been demonstrated empirically, the link between denial in general and risk-taking remains unconfirmed. Given the repeated suggestion in the literature that this may play a role in prevention, along with the logical association between

general perception of risk and motivation to adopt precautionary behaviors, denial appears importantly related to risk taking in this cohort.

A second set of questions arises from the literature on the induction of cognitive dissonance to overcome denial of HIV risk. Following Aronson, Fried, and Stone's (1991), and Stone et al.'s (in press) findings, it is anticipated that most participants who undergo a dissonance induction will decrease their dissonance by adopting behaviors or intentions to practice safe sex. Thus, challenging one's denial through cognitive dissonance should bring the discrepancy into awareness, and motivate the person to act in accord with their beliefs. The current study aims to implement a dissonance intervention that will overcome individuals' denial of HIV risk and motivate individuals to act in accord with their stated beliefs. Given these research questions regarding the relationship between denial and HIV risk behavior, the following hypotheses were tested:

1) Measures of denial will be positively related to HIV behavioral risk-taking.

2) HIV behavioral risk-taking will decrease at follow-up in participants who participated in the dissonance intervention relative to those who did not.

Study Overview

The present study replicated essential features of Aronson et al.'s (1991) hypocrisy research, while improving on their methodology and using a more direct measure of defensive denial. A similar two-by-two factorial design was used to measure the effect of two variables on adoption of safe sex practices: public endorsement of HIV prevention versus no public endorsement, and participants' high versus low level of awareness of their own past HIV-risk behavior. The four resulting conditions were: (a) Endorsement + High Awareness (Dissonance condition), (b) Endorsement + Low Awareness, (c) No Endorsement + High Awareness, and (d) No Endorsement + Low Awareness. This was both a within- and between-subjects design, in that the four groups were compared for sex-risk changes between the experimental manipulation and a one month follow-up.

Instead of using predictions of future condom use as the dependent measure like Aronson et al. (1991), the present participants were followed-up one month after the manipulation to secure retrospective self-report measures of changes in their actual risk behavior. Based on empirical findings that found that shorter time spans were recalled more accurately than longer (e.g., three months) time spans (Kauth, St. Lawrence, & Kelly, 1991), a one-month follow-up interval was selected. In addition, two direct measures of denial and optimistic bias were obtained. One assessed the extent to which participants characteristically use the defenses of denial, repression, and negation (Ihilevich & Gleser, 1986). The other measure assessed "optimistic bias" in the prediction of future events (Weinstein, 1980). The latter included the item "Contracting AIDS", so that the degree of optimistic bias regarding AIDS and other events may be assessed. These two measures were thought to address both the unconscious (or implicit behavioral) and

consciously accessible aspects of denial in order to measure the way denial relates to sexual risk taking. A self-report measure that taps participants' knowledge, attitudes, and actual risk behaviors with respect to AIDS was obtained at both the initial session and follow-up to measure change in these dimensions between our intervention and follow-up assessment. The change in subjects' scores on this measure between manipulation and follow-up was the dependent variable.

Method

Subjects

One hundred and eighty-three undergraduate students were recruited from the Introductory Psychology subject pool at Michigan State University. A goal sample size of 180 was determined by conducting a power analysis on a similar design by Aronson, Fried, and Stone (1991), using an effect size (ω^2) of .06, and setting power at .80 (Keppel, 1991). However, due to attrition and time constraints, 177 (51 male and 121 female) complete and scorable protocols were obtained in this study's initial phase. Only one person declined to participate due to the nature of this study.

Participation was in exchange for partial research credits as part of a course requirement for Introductory Psychology. No attempt was made to balance groups according to ethnicity, race, or sexual orientation. Of all initial phase participants, 171 returned for the follow-up phase and all completed scorable test protocols. Comparison of the the six non-returnees with the 171 returnees indicated no differences between the two groups. A power estimate for the final sample was .75 (Keppel, 1991).

Setting and Apparatus

The study took place in a research room roughly 10 x 18 feet, surrounded by six 4 x 6 foot cubicles. Four cubicles with tables were used for participants to complete the pre-test measures, and two remaining cubicles were set up for the mock videotaping. The latter were equipped with video cameras, cue cards, and materials for composing speeches. Video cameras did not have film, but appeared working to the participants. At least one experimenter was stationed at a central table to facilitate handing out measures and helping participants sign up for follow-up sessions. Due to restricted space, approximately half of the No Endorsement participants

completed measures in a medium-size classroom (capacity approximately 50) with several tables and study carrels. At follow-up, all subjects completed the Time 2 measures in groups of 10 in medium-sized classrooms.

Measures

The Defense Mechanism Inventory (Ihilevich & Gleser, 1986) combines objective and projective methods. It provides 10 open-ended vignettes to illustrate different conflict situations and the respondent is required to choose, from a list of five responses, the one most and least like her or his own tendency to respond in each of four areas: in reality, impulsively, in thought, and in feeling. The DMI yields a score on five defensive clusters: Turning Against the Self, Turning Against the Object (identification with the aggressor, displacement), Projection, Reversal (REV; negation, denial, reaction formation, and repression), and Principalization (intellectualization, isolation, and rationalization. Cramer (1988) reviewed six studies assessing these scales' reliability and found that both the one to eight week test-retest stabilities, as well as the internal consistency coefficients, averaged about .78.

Because I was most interested in the role of denial, repression, and other "thought blocking" defensive processes in keeping one's own AIDS risk out of awareness, the DMI scale most relevant to the present study was Reversal. This scale also has the best evidence of concurrent and criterion validity with other measures of defense and psychopathology, particularly with the construct "denial" as measured by other tests (Cramer, 1988). Also relevant were consistently positive correlations found between the Reversal scale and inaccurate self-evaluations. Furthermore, this Reversal scale has been shown sensitive to changes after therapeutic and experimental interventions similar to the intervention planned in the present study (Cramer, 1988).

A subset of Weinstein's (1980) questions was used to assess the magnitude of optimistic bias in estimating the likelihood of positive and negative events in one's own future compared with one's peers. Although the number and the content of these questions have changed somewhat with subsequent studies, the evidence that participants show a optimistic bias (favoring oneself) in estimating the likelihood of future events has been consistent. Weinstein (1982) found that stability coefficients for a second set of 41 items varied only from .88 to .98 between pilot and subsequent testing one semester later. In the present study, a shortened version of the original Weinstein items will be administered. The 24 selected items, reproduced in Appendix A, were chosen from the original pool based on pilot findings that these items were those which correlated the most highly with participants' own total scores. The 12 positive items and the 12 negative items were averaged to yield separate optimistic bias scores for positive and negative events. Optimistic bias for positive items was shown by a positive score, while optimistic bias for negative items was shown by a negative score.

Largely adapted from Weinstein (1980), the instructions for this scale read: "Compared to other (MSU) students, same sex as you, what do you think are the chances that the following events will happen to you? The choices range from no chance (100% less), to less likely than average, through average, to much more likely than average. Circle the percentage that corresponds to the likelihood of each event." Students were then asked to circle a percentage value, on a Likert type scale, which ranged between 100% less and 500% more.

A dependent measure, the "HIV Prevention Survey" was compiled from items and subscales used by several other HIV measures. This self-report measure assesses several dimensions of AIDS-relevant behavior,

including: knowledge and misconceptions about AIDS, attitudes about AIDS, prevalence of sexual behaviors, and changes in sexual behavior in response to the AIDS epidemic. Its Knowledge subscale was taken directly from the Knowledge subscale of The College Health Survey (CHS) described by DiClemente, Forrest, and Mickler (1990). It consists of 21 questions about the transmission of AIDS (15 of these questions tap general knowledge of transmission, and 6 tap misconceptions about transmission through casual contact). It was selected over several other HIV knowledge scales because its content is more specifically aimed toward knowledge of HIV transmission than toward general facts about AIDS (e.g., what the drug AZT does). Respondents could respond either "agree", "disagree", or "don't know" to each item. In the present study, the knowledge subscale total score equaled the number of questions out of 21 answered correctly. Internal consistency was reported to be between .72 and .75 for the "general knowledge" and "misconceptions about casual contact" items, respectively (DiClemente, Forrest, & Mickler, 1990).

The Attitude subscale of the HIV Prevention Survey was adopted directly from the Attitude subscale of Goh's (1993) Attitudes Toward AIDS Scale (ATAS). It consists of 25 attitudinal statements about AIDS, which respondents rate according to a 5-point Likert type scale depending on how much they agree with the statement. Respondents endorse each item "strongly agree", "agree", "neutral", "disagree", or "strongly disagree", scored 5, 4, 3, 2, and 1 respectively (reversed for negatively worded items) following Goh's scoring. This scale was selected because it contained items relevant to respondents' own endorsement of AIDS precautions (e.g., "There is no need for the average person to become concerned about AIDS"). It was found to

have an average Cronbach's alpha coefficient of internal consistency of .81, and a two-to-three week test-retest reliability coefficient of .74 (Goh, 1993).

A final subscale of the HIV Prevention Survey, the HIV risk behavior scale, was created by the author to tap the prevalence of past HIV risk behaviors, changes in response to HIV concerns, and intentions to change future risk behaviors. It was devised by compiling items from several measures of HIV risk behavior, in particular the College Health Survey (CHS) as described by DiClemente, Forrest, and Mickler (1990), the Fourth Annual HIV/AIDS Survey (Special Office of AIDS Prevention, 1991), and the Michigan Department of Public Health's Women's Survey (1992).

Several considerations influenced my decision to create this new measure. First, I was unable to find a comprehensive measure of HIV behavior having established reliability and validity. The prevention literature is rife with studies in which each author creates his or her own measure to assess sexual behavior. Most of these studies assess sexual behavior using from three to ten questions (e.g., "Do you think you have changed your sexual practices because of AIDS?"), which are used to categorize participants into discrete outcome or risk groups. Because the responses to the questions regarding HIV preventive behavior are analyzed item by item, they do not compose discrete scales with reliability and validity coefficients.

However, because sexual behavior is the dependent measure in this study, I wanted to get a more specific and comprehensive sampling of risk behaviors for each subject. I began by compiling items regarding HIV behavior from the scales mentioned until it seemed I had obtained a fairly thorough sampling of HIV-relevant behaviors for this population. These items generally addressed frequency of condom use, number of partners in a

given period, previous HIV testing, and active vs. passive attempts to screen potential sex partners, with more specific questions under each section. Next, I organized these questions to yield estimates of these behaviors for two time periods: the past year, and the past month. The past year was chosen because it is a commonly used time referent in HIV literature and provides a baseline of sexual behavior for each subject that is less prone (than the one month period) to situational factors. The past month was chosen as a time domain in order to get a comparison between the month prior to the intervention and the month after the intervention. The 57 questions on this scale, reproduced in Appendix B, are a mixture of multiple-choice and completion items.

They were first administered to a pilot group of 180 undergraduates similar to the present sample to estimate the internal consistency of the items, and to identify subscores based on factor analytic results. This pilot sample's responses were combined with those of the 171 participants who completed Time 1 protocols from the actual study. A principal components analysis with orthogonal rotation was conducted on all continuous and dichotomously scored (0-1) items for a total 351 participants which yielded 14 factors with eigenvalues equal to or greater than one. Next, items that loaded greater than .5 on each factor were examined for their content, and selected for inter-item reliability analysis. Items that tapped percentage of condom use were recoded to reflect the least risk (100% condom use) if the both the respondent and the most recent partner had been tested for HIV within the past six months. Next, all items were transformed into z-scores and assessed for internal consistency. Two final scales were selected: Overall sexual risk behavior (Overall Risk), and sexual risk behavior in the last month (Past Month Risk). The 19 Overall Risk items yielded an alpha coefficient of .87.

This scale contained questions that tap sexual risk factors such as lifetime number of partners, percentage of condom use in the past year and month, and careless choice of partners (Appendix B; items 4, 5, 9, 11, 12, 14, 15, 16, 17, 18, 21, 25, 27, 28, 30, 31, 32, 33, and 36). The Past Month Risk scale was comprised of 7 items with an alpha coefficient of .81. This scale was comprised of items that reflected sexual risk in the past month only, such as number of partners, percent condom use, and careless choice of partners (Appendix B; items 21, 25, 27, 28, 30, 31, and 33). The Overall Risk and Past Month Risk scale scores equaled the sum of the z-scores of the items comprising each scale.

Procedure

Administration.

Students were assigned to either the Endorsement condition or No Endorsement condition according to whether they had signed up for the study "Sex Attitudes and Personality 1" or "Sex Attitudes and Personality 2", based on the number of credits they preferred (3 or 4, respectively). Aside from number of credits, they knew of no difference between these studies at that time. At Time 1, each participant was given consent forms and identical packets of measures (described in the "Measures" section), which they completed individually in cubicles or in small groups depending on the space available. Each read a short description of the study and signed a consent form, reproduced in Appendix C, before completing the questionnaires. Respondents were assured of complete anonymity in their responses to questionnaire items, and told that numbers (similar to library barcodes) would be assigned to match their anonymous Time 1 protocols with measures taken at follow-up. Respondents took between 45 minutes to an hour to complete the measures.

After completing the questionnaires, half participated in the Endorsement manipulation and half in the No Endorsement manipulation, depending on previous assignment. Male and female experimenters were assigned randomly to male and female participants to reduce potential gender interaction effects. Experimenters had been trained to follow scripts, reproduced in Appendix D, to describe the procedure and rationale for both the Endorsement and No Endorsement manipulations. The purpose of standardizing the instructions was to increase the experimenters' consistency in providing directions and to ensure that information regarding the purported aim of the study (critical to the manipulation) was consistent across participants. Informal questioning of between 20 and 25 participants at follow-up revealed that these participants appeared to believe in the veracity of the explanation they were given regarding the Time 1 manipulation.

Endorsement vs. No Endorsement manipulations. Endorsement participants were taken by the experimenter into a videotaping cubicle and advised that they were to participate in making an educational video for area high school students as part of an "AIDS Education Project". They were then instructed to write a short (1-2 paragraphs) speech on AIDS and sexual precautions from a provided list of facts about AIDS, and told they had 10 minutes to compose the speech before presenting it "on tape". The experimenter then answered any questions regarding the taping, and instructed the subject to inform the experimenter when she or he was ready to begin taping. Each was reassured that only the best part of this speech would be used in the final video, and that the experimenters will contact him or her to obtain consent before any part of the videotape would be used.

The HIV speech was composed of a list of facts used in the study by Aronson, Fried, and Stone (1991; J. Stone, personal communication, June,

1993), which is reproduced in Appendix E. Participants were asked to include a number of statements from each category of facts. Each category contains at least three items from which to choose, differing enough to "personalize" the speech in an effort to buttress adherence to their own messages. Optional statements were provided, which include statements indicating the subject's personal beliefs in the importance of AIDS prevention. The instructions at the top of the page of the fact list (given in addition to the experimenter's verbal instructions) in the Endorsement condition are also reproduced in Appendix E.

After the speech preparation, the experimenter entered the room and pretended to videotape the subject's AIDS speech. Typical speeches lasted about two minutes. Participants in the Endorsement condition were rated by experimenters on a scale from one to five, indicating the degree of seriousness and thought with which the subject undertook the presentation. The mean rating for participants was 4.6 $\pm$ .75 (range: 2 to 5), indicating that experimenters viewed most participants as taking this task seriously.

In the No Endorsement conditions, participants prepared a short speech from the same list of facts given in the endorsement condition, but did not undergo the mock videotaping. The experimenter instructed participants in this condition to compose a short speech from the facts given, and spend 10 minutes memorizing their own composition. The instructions at the top of the page for this condition read:

What would you tell a peer or a younger teenager to help them realize the risks of getting AIDS? Please put together a short written message (1-2 paragraphs) using the information provided below. Below is a list of some of the points about AIDS and condom use we would like you to include in your essay. We have provided 7 facts about HIV/AIDS from which you should **choose at least three** to use in your essay. In addition to any three facts, there

are also three main points we would like you to make at the conclusion of the speech which are outlined below. Please conclude with a summary statement of your choice.

After participating in either the Endorsement or No Endorsement manipulations, half of the participants from each group was assigned randomly to either the High Awareness or Low Awareness manipulations.

High Awareness vs. Low Awareness manipulations. In the High Awareness conditions, participants were asked to recall and write a narrative about a situation in which they did not practice safe sex and identify the reasons from a list provided. Instructions at the top of the page read:

It would be helpful for us to know your ideas about why condoms are difficult for people to use. Please recall an incident when you engaged in one of the following unsafe sex behaviors, and write a short description of the incident and reasons you failed to use condoms. Listed are frequently given reasons for not using condoms - please include any of these that have applied to you in the past. Feel free to include any other reasons not listed or describe the situation below.

To aid participants in the recall of a particular instance, decrease the probability of self-deception, and help standardize the dissonance information, the Appendix F list of risky sexual behaviors and common reasons for not using condoms was provided for reference. Also enclosed in the packet of measures was a brochure from MSU's Olin Health Center describing HIV information, counseling, and testing services on campus that students could keep for future reference. After completing the manipulation, participants were instructed to sign up for a follow-up testing approximately one month from the date of initial testing. At this time, matching numbers were applied to the test protocols and to the participants' research cards, in order to match their Time 1 protocols with their follow-up data. Participants

were told that they would receive their participation credits when they returned for the follow-up.

In the Low Awareness manipulations, students were simply not given the form asking them to recall a situation when they engaged in risky sexual behavior. These students were merely given the same brochure describing the campus HIV testing facilities. Participants in these manipulations proceeded directly to sign up for the follow-up session after videotaping, and followed the same procedures for obtaining a research number.

Follow-up.

Each participant was contacted by telephone one week prior to the scheduled follow-up sessions and reminded of their previously scheduled appointment. Telephone contactors were blind to the subject's experimental condition. At these follow-up sessions, participants were instructed to again complete the 24 Weinstein items and the HIV Prevention Survey. After finishing the packet of measures, participants brought their research numbers (on back of their research cards) to the experimenter and received credit for participation in the study. Experimenters assigned participants' research numbers to their follow-up packets in order to match Time 1 and follow-up protocols.

After completing all the follow-up measures, participants were given a written debriefing which explained that the videotaping had not been real and explained the purpose of the deception. At the bottom of the debriefing sheet, participants were given information about how to contact the experimenter if they had any further concerns or questions about the study. They were then given another opportunity to find out about the HIV testing and information services on campus.

Results

Demographic and Sexual Behavior Variables

Demographic information for the sample is presented in Table 1. The mean age for the total sample was 18.7, and males were slightly older (M = 19.4) than females (M = 18.4). The sample was mainly Freshman (64.3%), female (69.6%) and Caucasian (88.3%). Sexual orientation was not directly addressed by the HIV measure, and 50 respondents were unclassified. Of the 121 respondents who indicated gender and gender of partners in the past year, 120 were classified as exclusively heterosexual, and one was classified as exclusively homosexual. None reported bisexual sexual activity in the past year. Respondents were classified as Virgins (26.9%) or Non-Virgins (73.1%) depending on whether they reported having ever had sexual intercourse, and Celibate (23.4%) or Non-Celibate (76.6%) depending on whether they reported having had sex or oral sex in the past year, regardless of previous sexual activity.

Information about the sexual behavior of the Non-Virgin participants only is presented in Table 2. While the male subsample was slightly older than the female subsample, no significant gender differences were found between age at first intercourse or mean number of partners. Chi-square analyses yielded a significant association between gender and relationship types, but not between gender and HIV testing or 100% condom use.

Means and standard deviations for all independent and dependent measures are presented in Table 3. Males had significantly higher scores (M = 84) than females (M = 43.5) on the Weinstein positive items, indicating that, on average, they rated favorable events as much more likely to happen to

TABLE 1

Demographic Information for Total Sample

	FEMALES (n = 119)	MALES (n = 52)	TOTAL (N = 171)
AGE (M + SD):*	18.4 ± 0.8	19.4 ± 1.4	18.7 ± 1.1
SEXUAL ACTIVITY:			
Virgins	n = 31 (18%)	n = 15 (9%)	n = 46 (27%)
Non-virgins	n = 88 (52%)	n = 37 (22%)	n = 125 (73%)
Celibate (no sex or oral sex in past year)	n = 30 (18%)	n = 10 (6%)	n = 40 (23%)
Non-Celibate (sex or oral sex in past year)	n = 89 (52%)	n = 42 (25%)	n = 131 (77%)

CLASS LEVEL:

Freshman	n = 110 (64%)	Senior	n = 7 (4%)
Sophomore	n = 33 (19%)	Other	n = 2 (1%)
Junior	n = 19 (11%)		

ETHNICITY:

African-American	n = 7 (4%)	Asian-American	n = 6 (4%)
Caucasian	n = 151 (88%)	Hispanic	n = 4 (2%)
Other	n = 2 (1%)		

SEXUAL ORIENTATION:

Heterosexual	n = 120 (70%)	Unknown	n = 50 (29%)
Homosexual	n = 1 (0.6%)		

Note. One male subject did not report his age.
*p<.001, two-tailed, t = -5.9, *df* = 168

TABLE 2

Sexual Risk-Behavior Variables: Non-Virgin Subsample

VARIABLE	FEMALES (n = 88)	MALES (n = 37)	TOTAL (N= 125)
AGE (M ± SD):*	18.44 ± .88	19.51 ± 1.5	18.76 ± 1.2
MEAN AGE 1ST TIME INTERCOURSE (M ± SD):	15.88 ± 1.36	16.40 ± 1.8	16.04 ± 1.5
MEAN NUMBER OF SEX PARTNERS (SEX AND ORAL SEX) (M ± SD):	4.28 ± 3.7	7.24 ± 13.2	5.16 ± 7.9
RELATIONSHIP TYPES: **			
Steady - no outside partners	n = 46 (52.3%)	n = 18 (48.7%)	n = 64 (51.2%)
Steady - some outside partners	n = 19 (21.6%)	n = 3 (8.1%)	n = 22 (17.6%)
Sexually active (no steady)	n = 7 (7.95%)	n = 12 (32.4%)	n = 19 (15.2%)
Successive monogamous	n = 11 (12.5%)	n = 4 (10.8%)	n = 15 (12%)
100% CONDOM USE PAST YEAR:	n = 25 (28.4%)	n = 16 (43%)	n = 41 (32.8%)
HIV TESTED:			
Respondent	n = 17 (19.3%)	n = 14 (37.8%)	n = 31 (24.8%)
Most recent partner	n = 23 (26.13%)	n = 8 (21.6%)	n = 31 (24.8%)
Both respondent and most recent partner	n = 8 (9.1%)	n = 3 (8.1%)	n = 11 (8.8%)

*$p < .001$, two-tailed, $t = -4.90$, $df = 123$

**$p < .05$, X^2 (3, N = 120) = 12.7

TABLE 3

Means and Standard Deviations of Independent and Dependent Variables

	FEMALES (n = 119)	MALES (n = 52)	TOTAL (N = 171)
HIV INFORMATION SCORE:	18.0 ± 2.0	18.0 ± 2.1	18.0 ± 2.0
HIV ATTITUDE SCORE: **	103.1 ± 8.5	97.0 ± 9.2	101.2 ± 9.1
HIV OVERALL RISK SCORE:	0.140 ± 10.8	-0.848 ± 9.8	-0.161 ± 10.5
HIV PAST MONTH RISK SCORE:			
Time 1	0.273 ± 5.2	-0.865 ± 4.5	-0.073 ± 5.0
Time 2	0.132 ± 5.1	-0.478 ± 5.1	-0.054 ± 5.1
WEINSTEIN ITEMS:			
Average of positive items*	43.5 ± 60.6	84.00 ± 97.2	55.8 ± 75.7
Average of negative items	-23.6 ± 25.6	-27.0 ± 28.0	-24.6 ± 26.3
DMI: REVERSAL	36.3 ± 8.5	36.3 ± 6.8	36.3 ± 8.0

* $p < .001$, two-tailed, $t = -3.31$, $df = 169$
** $p < .001$, two-tailed, $t = 4.22$, $df = 169$

them than did females. Females had significantly higher scores on the HIV Attitude Scale ($\underline{M}$ = 103) than males ($\underline{M}$ = 97), indicating that females had more supportive views of people with AIDS, as well as more proactive attitudes toward preventing AIDS. No significant gender differences were found on the DMI Reversal scale, Weinstein negative items scale, HIV Information Scale, Overall Risk scale, or Past Month Risk scales at Time 1 and Time 2.

Hypothesis 1

To test the hypothesis that denial is positively correlated with sexual risk-taking, Pearson correlations were computed between the three measures of denial and the measure of Overall Risk for the total group. Results of this analysis are presented in Table 4.

A test of the overall significance of this set of correlations, the Bartlett Chi-square test, was significant. Failing to support this hypothesis, the measure of Overall Risk did not associate significantly with measures of denial for the total group. The -.29 correlation ($\underline{p} < .001$) between scores for the positive and negative Weinstein items indicated that, as expected, people who rated positive events as more likely to happen to them than the average peer also rated negative events as less likely to happen to them. The weak ($\underline{r} = -.15$, $\underline{p} < .05$) negative correlation between the scores for the positive Weinstein items and the Reversal scale indicated an inverse relationship between optimistic bias for positive events and Reversal. Thus, these two denial indicators seem to be, if anything, oppositely related.

Because the mean scores for the Weinstein positive items were significantly different for females and males (Table 3), post hoc correlations between these scales were computed separately by gender. The results of these

TABLE 4

Intercorrelations Between Denial Variables and Overall Risk for Total Group

TOTAL GROUP

(N = 171)

	REVERSAL	WPOS	WNEG
REVERSAL			
Weinstein POS (WPOS)	-.154•		
Weinstein NEG (WNEG)	-.093	-.285••	
OVERALL RISK	.066	-.135	.110

Note. Bartlett X^2 (6, N = 171) = 26.5, p < .001
• p < .05
•• p < .001

separate analyses are presented in Table 5, and show quite different patterns for females and males. The Bartlett chi-square statistic for females was significant. In females, a modest negative correlation (r = -.26) obtained between Weinstein positive items and Overall Risk. Contrary to the expectations, an optimistic bias for positive events was *inversely* related to risk-taking in females.

The Bartlett Chi-square statistic for males was non-significant, and therefore significance levels of individual correlations are interpreted with caution. No correlation was found between any measures of denial and the measure of Overall Risk in males. A substantial correlation (r = -.42) obtained between the positive and negative Weinstein items for males only. Notably, the pattern of intercorrelations between denial measures is different from that of females.

A final correlation was run between the Overall Risk score and the specific Weinstein item "Getting AIDS" to see if an optimistic bias for contracting AIDS was related to increased risk-taking. Contrary to the expected direction, the resulting positive correlation was significant (r = .27, p <.0005), indicating that subjects who rated themselves more likely to contract AIDS engaged in more risky behavior. Thus, contrary to the original hypothesis, there seemed to be a generally more realistic than unrealistic appraisal of one's own risk for HIV.

TABLE 5

Intercorrelations Between Denial Variables and Overall Risk By Gender

FEMALES
(n=119)

	REVERSAL	WPOS	WNEG
REVERSAL			
Weinstein POS (WPOS)	-.264**		
Weinstein NEG (WNEG)	-.118	-.179	
OVERALL RISK	.113	-.187*	.095

Note. Bartlett X^2 (6, n = 119) = 21.0, p < .005
* p < .05
** p < .005

MALES
(n = 52)

	REVERSAL	WPOS	WNEG
REVERSAL			
Weinstein POS (WPOS)	.008		
Weinstein NEG (WNEG)	-.033	-.424[a]	
OVERALL RISK	-.085	-.048	.139

Note. Bartlett X^2 (6, n = 52) = 11.0, p = ns. Because overall test of significance is non-significant, significance levels of individual correlations are unreliable. [a] p < .005.

Hypothesis 2

To test the hypothesis that those in the dissonance condition would register larger decreases in sexual risk-taking in response to the intervention, a 2 x 2 x 2 x 2 (Endorsement x Awareness x Gender x Celibacy) repeated measures Analysis of Variance on the Past Month Risk scores for Time 1 and Time 2 was attempted. Although neither gender nor celibacy were originally included in the hypothesis, both were included to test possible interactions and to reduce variability. It seemed that gender might interact with the conditions based on observed gender differences in attitudes toward AIDS prevention, and celibate students might show a floor effect for change in sexual behavior. Cell totals for the four conditions, broken down by gender and celibacy, are presented in Table 6. Unfortunately, random assignment to groups resulted in one empty cell in the matrix (Male, Celibate, No Endorsement/Low Awareness), and therefore it was necessary to run repeated measures ANOVAs for Endorsement x Awareness x Gender, and Endorsement x Awareness x Celibacy separately.

The results of the repeated measures ANOVA for Endorsement x Awareness x Gender showed no main effects or interactions for any of the variables. One non-significant trend was observed for the interaction between the Endorsement conditions and the difference between risk scores at Time 1 and Time 2, $F(1, 163) = 3.51$, $p < .063$. Despite the non-significant overall F-test, a comparison was conducted between the means of the Time 1 and Time 2 risk scores for the Endorsement and No Endorsement conditions as a further test of the original hypothesis, following Winer, Brown, and Michel's guidelines for planned comparisons (1991, p. 342). The comparison was also non-significant, indicating that those in the Endorsement conditions

TABLE 6

Breakdown of Sample Size by Endorsement, Awareness, Gender, and Celibacy

	ENDORSEMENT/HIGH AWARENESS			ENDORSEMENT/LOW AWARENESS		
	Male	Female	Total	Male	Female	Total
Celibate	4	7	11	4	7	11
Non-Celibate	9	16	25	10	18	28
Total	13	23	**36**	14	25	**39**

	NO ENDORSEMENT/HIGH AWARENESS			NO ENDORSEMENT/LOW AWARENESS		
	Male	Female	Total	Male	Female	Total
Celibate	2	9	11	0	7	7
Non-Celibate	11	29	40	12	26	38
Total	13	38	**51**	12	33	**45**

were not more likely to decrease risk between Time 1 and Time 2 than those in the No Endorsement conditions.

Next, a repeated measures ANOVA for Endorsement x Awareness x Celibacy. Again, no significant main effects or interactions for any of the variables were found.

Given the lack of significant findings, I decided to explore factors that might have masked the expected results. To check for violations of the test assumptions, Cochran's test for homogeneity of variance (Winer et al., 1991) was performed on the four groups for Past Month Risk scores, and revealed no significant differences between variances at either Time 1 or Time 2 ($C_{.95}$ [4, 36] = .29, p = ns; $C_{.95}$ [4, 36] = .28, p = ns, respectively).

Second, the Table 7 data showed that the means of the Time 1 risk scores differed markedly between groups, which may have affected the analysis. Therefore, I decided to re-run the ANOVAs using difference scores rather than repeated measures. Difference scores were calculated between Time 1 and Time 2 raw scores for each item in the Past Month Risk scale, and these difference scores were transformed into z-scores. Next, these z-scores were summed across all seven items to produce a difference score for each subject. I then performed an Endorsement x Awareness x Gender and an Endorsement x Awareness x Celibacy ANOVA on the difference scores. Again, no significant main effects or interactions for any of the variables were found. In the Endorsement x Awareness x Gender ANOVA, a nearly significant trend was observed for an Endorsement main effect (F[1, 163] = 3.38, $p < .068$), with No Endorsement participants showing decreased risk, and Endorsement students showing increased risk.

Finally, a categorical analysis was undertaken to determine if there were small but important changes in behavior between subjects in different

TABLE 7

Means of Past Month Risk Scores for Time 1 and Follow-up by Endorsement, Awareness, Gender, and Celibacy

	TIME 1			FOLLOW-UP		
	MALE	FEMALE	TOTAL	MALE	FEMALE	TOTAL
ENDORSEMENT/HIGH AWARENESS						
Celibate	-5.19	-4.54	-4.78	-4.96	-4.96	-4.96
Non-Celibate	-1.89	4.32	2.08	-0.82	3.40	1.88
Total	-2.91	1.62	**-0.01**	-2.09	0.86	**-0.21**
ENDORSEMENT/LOW AWARENESS						
Celibate	-4.93	-3.94	-4.30	-1.41	-4.50	-3.37
Non-Celibate	0.81	0.40	0.54	2.51	1.46	1.83
Total	-0.83	-0.82	**-0.82**	1.39	-0.21	**0.36**
NO ENDORSEMENT/HIGH AWARENESS						
Celibate	-5.19	-5.19	-5.19	-4.96	-4.96	-4.96
Non-Celibate	0.27	1.35	1.05	-1.34	1.28	0.56
Total	-0.57	-0.20	**-0.29**	-1.90	-0.20	**-0.63**
NO ENDORSEMENT/LOW AWARENESS						
Celibate	-----	-5.19	-5.19	-----	-4.96	-4.96
Non-Celibate	7.11	2.29	1.88	6.42	1.66	1.34
Total	0.99	0.70	**0.78**	0.63	0.26	**0.36**

Note. A one-way ANOVA with the four groups for Time 1 means was non-significant. Repeated measures ANOVAs (Gender x Endorsement x Awareness) and (Celibacy x Endorsement x Awareness) were non-significant for all main effects and interactions.

conditions that were not detectable by the previous analyses. Therefore, participants' raw scores for items on the Past Month Risk scale were summed for Time 1 and Time 2. Participants whose Time 2 scores were less than their Time 1 scores were classified as "decreased risk". Likewise, participants whose Time 2 scores were greater than their Time 1 scores were classified as "increased risk", and those whose Time 1 and Time 2 scores were the same were classified as "same risk". A Chi-square test of independence was performed by improvement classification and by condition. Results of this analysis are presented in Table 8. Again, no significant association was found between improvement and experimental condition, $X^2(6, \underline{N} = 171) = 10.77$, $\underline{p}$ = ns.

TABLE 8

Number and Percentage of Sample by Improvement Category and Condition

	SAME RISK	INCREASED RISK	DECREASED RISK	TOTAL
ENDORSEMENT /HIGH AWARENESS	21 (12.3%)	5 (3.0%)	10 (5.9%)	36 (21.1%)
ENDORSEMENT /LOW AWARENESS	19 (11.1%)	14 (8.2%)	6 (3.5%)	39 (22.8%)
NO ENDORSEMENT /HIGH AWARENESS	28 (16.4%)	9 (5.3%)	14 (8.2%)	51 (29.8%)
NO ENDORSEMENT /LOW AWARENESS	17 (9.9%)	11 (6.4%)	17 (9.9%)	45 (26.3%)
TOTAL	**85 (49.7%)**	**39 (22.8%)**	**47 (27.5%)**	

Note. X^2 (6, N = 171) = 10.8, p = ns.

Discussion

Denial has been implicated widely in the continuing HIV risk behavior of young people. The present study attempted to elucidate the relationship between denial and sexual risk-taking, and also to implement an intervention to overcome denial.

Our data on demographics and sexual behavior suggest that this sample of college students was fairly HIV-conscious. The average score on the information subscale was 18 out of 21 (86%), indicating considerable knowledge about HIV transmission. While females scored significantly higher than males on the attitude scale, the average score of 101 (out of a possible 125) indicated generally positive attitudes towards people with AIDS and AIDS prevention. More than one-fourth of the group were virgins, which may reflect the young age of the sample (18.7 ± 1.1). Although most (73%) acknowledged having had sexual intercourse, this proportion is low compared to other studies of similar age-groups (Bruce & Moineau, 1991; Fisher & Misovich, 1990). Of the sexually active group, nearly one-third reported using condoms 100% of the time during the past year, and nearly one-fourth had been tested for HIV. Almost 10% of these respondents reported that both they *and* their most recent partner had been tested for HIV. More than half also claimed involvement in monogamous relationships. Thus, compared to other samples of college students (e.g., Burnette et al., 1988; Fisher & Misovich, 1990; Memon, 1990), this group claimed to practice relatively safer sex.

The first hypothesis, that denial would be positively correlated with HIV risk behavior, was rejected. No relationship was found for the total group between the measures of denial and the measure of Overall Risk

constructed for this study. Among females, a modest *negative* correlation obtained between the Weinstein positive items and the measure of Overall Risk. Thus, contrary to the hypothesis, less optimistic patterns of responding were associated with higher rates of HIV risk behavior. In addition, Reversal was not found to be related to HIV risk-taking in either males or females. One explanation may be the low scores and lack of variance on the Reversal scale, indicating moderate levels of denial in our college sample. However, the finding that neither measure of denial was positively associated with risk may also call into question the nature of denial in adolescent risk-taking. For instance, denial of the possibility of contracting HIV may not be an issue, while denial of the implications of that risk is (Lazarus, 1983). Furthermore, Leviton (1989) suggested that "classic denial" may not be as much a problem in HIV prevention as situational strategies such as avoidant thinking or inattention to HIV-relevant information.

The post-hoc finding that the Weinstein item "Getting AIDS" had a significant positive correlation with the Overall Risk score indicated that those in our sample who rated themselves as more likely to contract AIDS actually reported more risk behavior than those who rated themselves as less likely to contract AIDS. This finding was similar to previous studies that found a relationship between actual and perceived risk (Freimuth et al., 1987; Poppen, 1993). Nevertheless, while some of those who rated themselves as less likely than average to contract AIDS may have assessed their risk accurately, the group as a whole showed an optimistic bias. For instance, in the present study, the group average for the Weinstein item "Getting AIDS" was -52.63, indicating that the average group member felt about 53% less likely than average to contract AIDS. Furthermore, while the Overall Risk scores were normally distributed around the mean, responses to this

Weinstein item were negatively skewed and bimodally distributed. The most frequent response to the "Getting AIDS" item was "100% less", followed in frequency by the response "0 %"(Average), with the majority of responses falling in-between. Only 10 (6%) participants rated their chances of contracting HIV as greater than average. Thus, while half of the participants were at or above the average on the risk measure, almost all of the subjects rated themselves at or below the average for risk. It appears that while there may be a realistic basis for ratings of HIV risk, these ratings are still optimistically biased in magnitude.

Post-hoc analyses by gender revealed different patterns of relationships between measures. Notably, while females showed a significant negative correlation between the Weinstein positive items and Overall Risk, males did not. Given that the Overall Risk score was not significantly different for females and males, the lack of findings for males may be due to the fact that they had significantly higher scores on the Weinstein positive items. A scatterplot of the Weinstein positive items by Overall Risk revealed that males and females had a similar scatter, except that males had many more outliers at the high end of the Weinstein positive items, possibly reflecting a tendency for these items to tap gender-biased expectations for academic and economic achievement.

Another gender difference was manifest in the substantial negative correlation between the Weinstein positive and negative items for males ($\underline{r}$ = -.424), but not for females ($\underline{r}$ = -.179). If optimistic bias is presumed to be operating as a uniform defensive process, one would expect a significant negative correlation between the positive and negative items regardless of gender. Separate scatterplots of these variables for males and females again revealed a more limited range for the Weinstein positive items in females.

Thus, if Weinstein items selected for this study were gender biased, then differences in those correlations may have been due to differences in the perceived likelihood of the events happening to male and female students. Future studies should consider potential gender differences in selecting measures of optimistic bias.

Surprisingly, the Weinstein positive items and the DMI Reversal scale correlated negatively for females, but not for males. Contrary to expectation, female students who rated positive events as more likely to happen to them were generally lower on Reversal. However, a slight negative association was also found between the Weinstein negative items and Reversal in females, indicating the opposite: those who showed an optimistic bias for negative events scored higher on Reversal. Thus, the patterns of correlations between optimistic bias for negative and positive events and Reversal in females appear contradictory. Furthermore, very little association was found between Weinstein positive or negative items and Reversal for males. One possibility for the lack of predicted association between optimistic bias and Reversal is that they may tap different aspects of the "denial' construct. However, given the seeming gender bias on the Weinstein positive items, it is uncertain whether the measure of optimistic bias did in fact measure the intended construct.

The second hypothesis, that the dissonance intervention would be most effective in reducing risk behavior, was also not supported. This was unexpected given the previous findings of Aronson, Fried, & Stone (1991) and Stone et al. (in press) who used a similar procedure. The predicted outcome was that there would be a significant interaction between the Endorsement and Awareness conditions, such that those in the Endorsement/High Awareness condition would show the greatest reduction

in risk behavior, followed by the other three conditions. Factorial ANOVAs done for both repeated measures and difference scores yielded no significant main or interaction effects for any variables. Nearly-significant trends were observed for Past Month Risk scores between the Endorsement and No Endorsement conditions, by both the repeated measures and difference score analyses ($p < .063$ and $p < .068$, respectively). However, comparisons of these means revealed a slight paradoxical trend; namely, that the average participant in the No Endorsement conditions decreased risk behaviors, while the average Endorsement participant actually increased risk behaviors. While this may have been due to a paradoxical effect of the Endorsement conditions, it seems more likely to be a spurious finding given the near-random character of the other results.

Because of the lack of significant findings with ANOVA, I also performed a Chi-square test of independence between the category of change (increased risk, decreased risk, & same risk) by experimental condition. Raw scores, rather than z-scores, were used to compare Time 1 and Time 2 risk scores. This allowed determination the direction of change in risk behavior, however small, regardless of the relative group ranking of the score. The Chi-square was non-significant, indicating that there was no significant association between any one change category (e.g., decreased risk) and any particular experimental condition (e.g., dissonance). Thus, the repeated lack of findings, despite different statistical methods, left little room to doubt that the intervention was ineffective in changing behavior. Table 8 revealed that almost half (49.7%) of all participants obtained exactly the same score on the Past Month Risk scale at both Time 1 and Time 2. Curiously, at Time 2 almost as many participants showed "increased risk" (22.81%), as participants who showed "decreased risk" (27.49%). The proportion of participants who

fell into each category appeared almost to be chance, confirming our finding that the intervention seemed to have little effect.

Several methodological limitations of this study may have contributed to the lack of significant findings. First, no manipulation check was done to see if those in the dissonance condition experienced dissonance. Thus, the lack of findings may have been due to a failure in the administration of the intervention. Another methodological consideration is that, given the administration of the HIV questionnaire prior to participating in the manipulations, there might have been a certain amount of cognitive dissonance generated in all conditions. The choice to administer the measures prior to the intervention was made to minimize biases in recall on the Time 1 risk measures, but may have created an equally problematic trade-off. Because the measures included both an attitudes scale and HIV behavior scale, all subjects expressed their attitudes toward AIDS prevention and then immediately answered questions about their own sexual behavior. If dissonance was produced in participants regardless of the experimental condition, one might expect a more or less uniform decrease in risky sexual behavior in all participants. Our findings did not confirm this, since the majority of participants either remained the same or increased their risk at follow-up. A further possibility is that the questionnaire produced dissonance in participants across conditions, but was more or less related to an unknown third variable (e.g., self-monitoring) that was not assessed.

A third potential methodological problem was the time-span being studied. A one-month comparison was chosen for reasons of increased accuracy in the reporting of sexual behavior, and to increase the probability that subjects would return for follow-up. However, the one-month span may have been too short. First, the Past Month index of sexual risk may not have

been an accurate representation of the student's Overall level of risk-taking. A potential problem with such a brief period is that the risky behavior targeted by the intervention may have been of such low-frequency that was unlikely to have occurred during the month prior to the intervention, introducing a random element that looked like positive or negative change. For instance, participants in steady long-distance relationships may have erratic sexual contact that may not be at all related to changes in risk behavior. Therefore, a one-month increase or decrease in behavior may well reflect situational rather than intentional factors. Meaningful changes in behavior may not have been adequately addressed by this study.

The timing of the intervention may have also been a confounding factor. The Time 1 intervention occurred in October, toward the beginning of the school year, and the follow-up in November. The first intervention was delayed until October, because it seemed likely that the frequency and nature of sexual behavior in students would change between the last month of summer and the first month of school. Nevertheless, there may be reason to expect that sexual contacts would increase as the term progressed, due to an increase in general social contacts. This seems especially likely for college Freshmen, who made up the majority (64.3%) of our sample. Thus, the increase in HIV risk in a large proportion of our sample (22.8%) may have been an artifact of the timing of the intervention.

Another possible shortcoming was the uncertain validity and reliability of the dependent measure constructed for this study. First of all, content validity was determined informally by sampling items from other HIV questionnaires. Given that none of these questionnaires were specifically designed for use with college students, it may have excluded some important risk behaviors in this population. For instance, there was no way

to determine from the current measure whether the participant's partners had engaged in high risk behavior, which may affect risks taken with partners. Including such items might have better differentiated those at higher and lower risk. Furthermore, this measure was not correlated with other measures of sexual behavior to establish concurrent validity, primarily because no other continuous HIV measures were available. Future studies might attempt to first establish reliability and validity indices for such a measure. Another difficulty with such a specific measure of sexual behavior (e.g., percentage of condom use in the past year) is that recall may vary between respondents and may also be affected by other variables such as social desirability. It is even possible that in a subset of respondents, social desirability may take the form of reporting increased HIV risk (e.g., number of partners). Furthermore, Kauth et al., (1991) and Stone et al., (in press) found that retrospective accounts of past sexual behavior were affected by the length of recall period and type of experimental manipulation, respectively. Because behavioral measures of sexual risk are not available, such distortions in self-report measures are often inevitable.

A final consideration is that the dissonance intervention might have produced cognitive dissonance, but that it did not produce a strong or lasting enough impression to alter sexual behavior. In the previous studies using a dissonance intervention, the primary dependent measures were intentions to use condoms and condom purchase. These variables may be more amenable to change through dissonance than is sexual behavior. The current dependent measure was based on a sampling of risk behaviors, including number of partners, HIV testing, condom use, and several other risk behaviors. It is possible that intentions and condom purchase may change, but risk behaviors are unaffected. While increased intentions to use condoms

is clearly a desirable outcome of HIV interventions, the actual practice of safer sex is most important. Perhaps the current findings reflect the fact that overall sexual practices may not change as a result of experiencing cognitive dissonance. While cognitive dissonance may have produced motivation to practice safer sex, this is only one of several variables likely to contribute to the decision to practice safer sex. Information, motivation, and behavioral skills are all necessary to practice safe sex according to the IMB model (Fisher & Fisher, 1992). Since information in our group was high, it would interesting to test whether a combination of cognitive dissonance and skills training in an intervention would have a greater effect.

In summary, neither of the hypotheses set forth in the present study were supported by the findings. Denial and sexual risk behavior, as measured in this study, were not found to be positively correlated. A cognitive dissonance induction was not found to produce a decrease in risk behavior relative to the other conditions. Because of the methodological limitations, carefully planned future studies are needed to clarify the relationship between denial and HIV risk.

APPENDICES

Appendix A

Life Events Scale

We are interested in knowing how you imagine your life in the future. ***Compared to other MSU students*** - same sex as you - **what do you think are the chances that the following events will happen to you?** The choices range from no chance (100% less), to less likely than average, through average, to much more likely than average. Circle the percentage that corresponds to the likelihood of each event.

EXAMPLE:
1. Winning an all expense paid vacation:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more
	(less likely than average)									(more likely than average)				

(THE SUBJECT FEELS HER/HIS CHANCE OF WINNING A VACATION ARE 60% GREATER THAN THE AVERAGE MSU STUDENT)

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1. In 10 years, earning > 80,000 a year:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more
	(less likely than average)									(more likely than average)				

2. Deciding you chose the wrong career:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more
	(less likely than average)									(more likely than average)				

3. Your work recognized with an award:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more

(less likely than average) (more likely than average)

4. Developing cancer:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more

(less likely than average) (more likely than average)

5. Owning your own home:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more

(less likely than average) (more likely than average)

6. Good job offer before graduation:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more

(less likely than average) (more likely than average)

7. Statewide recognition in your profession:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more

(less likely than average) (more likely than average)

8. Decayed tooth extracted:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more
	(less likely than average)									(more likely than average)				

9. Home doubles in value in 5 years:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more
	(less likely than average)									(more likely than average)				

10. Like postgraduation job:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more
	(less likely than average)									(more likely than average)				

11. Heart attack before age 40:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more
	(less likely than average)									(more likely than average)				

12. Having your car stolen:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more
	(less likely than average)									(more likely than average)				

13. Getting lung cancer:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more
	(less likely than average)									(more likely than average)				

14. Your achievements in newspaper:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more
	(less likely than average)									(more likely than average)				

15. Traveling to Europe:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more
	(less likely than average)									(more likely than average)				

16. Starting salary > $30,000:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more
	(less likely than average)									(more likely than average)				

17. Graduating in top third of class:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more
	(less likely than average)									(more likely than average)				

18. Having a drinking problem:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more

(less likely than average) (more likely than average)

19. Being fired from a job:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more

(less likely than average) (more likely than average)

20. Starting salary >20,000:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more

(less likely than average) (more likely than average)

21. Contracting AIDS:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more

(less likely than average) (more likely than average)

22. Being sterile:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more

(less likely than average) (more likely than average)

23. Not finding a job for 6 months:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more
	(less likely than average)									(more likely than average)				

24. Victim of burglary:

100% less	80% less	60% less	40% less	20% less	10% less	0% (AVERAGE)	10% more	20% more	40% more	60% more	80% more	100% more	300% more	500% more
	(less likely than average)									(more likely than average)				

APPENDIX B

HIV Prevention Survey

The following questions have to do with your own prevention behaviors in the past year or so. If you have not been sexually active, please complete this part as well as you can. In responding to these questions, please remember that your responses will be completely anonymous and confidential.

1. What health problems or illnesses do you worry about most? (Circle up to three responses):
   a. AIDS
   b. Alcoholism
   c. Arthritis
   d. Breast cancer
   e. Cancer (other than breast cancer)
   f. Diabetes
   g. Drug abuse
   h. Heart disease/Heart attack
   i. High blood pressure
   j. Pregnancy
   k. Sexually transmitted diseases (STDs)
   l. Tuberculosis
   m. none of the above

2. How old were you when you first had sex (intercourse)?_____
   (leave blank if you have never had sex)

3. How old were you when you first had oral sex (either gave or received)?_____ (leave blank if you have never had oral sex.)

4. In your lifetime, with how many different people have you EVER had sex or oral sex?_____

5. During the PAST YEAR, have you been sexually active (sex or oral sex)?
   a. yes
   b. no

6. Which one of the following BEST describes your situation during the **PAST YEAR**? (Circle one):

a. I'm in a steady relationship with one person. Neither of us has outside sexual partners.
b. I'm in a steady relationship but either my partner or I have some outside sexual partners.
c. I'm not in a steady relationship, but I'm sexually active.
d. I've been in and out of monogamous relationships
e. I'm not sexually active.

7. In the **PAST YEAR** have you had sex with:
a. nobody
b. men only
c. mainly with men, but also with some women
d. mainly with women, but also with some men
e. men and women equally
f. women only

8. In the **PAST YEAR**, have you had sex with a bisexual partner?
a. yes
b. no
c. don't know

9. In the **PAST YEAR**, with how many different people have you had sex (intercourse)?_____.

10. In the **PAST YEAR**, estimate how many **times** you think you had sex (intercourse) _____.

11. In the **PAST YEAR**, what percentage of the time did you use condoms during sex?
a. I haven't had sex during the past year
b. none
c. less than 25%
d. 25-50%
e. 50-75%
f. 75-99%
g. 100%

12. In the **PAST YEAR**, with how many different people have you had **oral** sex (given or gotten?)_____

13. In the **PAST YEAR**, estimate how many **times** you think you have had **oral** sex (given or gotten)? _____

14. In the **PAST YEAR**, what percentage of the time did you use condoms during **oral** sex?
    a. I haven't had oral sex during the past year
    b. none
    c. less than 25%
    d. 25-50%
    e. 50-75%
    f. 75-99%
    g. 100%

15. In the **PAST YEAR**, did you ever drink alcohol or use other drugs before or during sex?
    a. yes
    b. no
    c. can't remember

16. In the **PAST YEAR**, have you ever had sex or oral sex with someone you didn't know well because you were drunk or high?
    a. yes
    b. no
    c. can't remember

17. In the **PAST YEAR**, have you ever had sex with someone without using any protection because you were drunk or high?
    a. yes
    b. no
    c. can't remember

18. In the **PAST YEAR**, have you had anal sex without a condom?
    a. yes
    b. no

19. During the **PAST YEAR**, were any of your sex partners infected with HIV or AIDS?
    a. yes
    b. no
    c. don't know

20. Do you **CURRENTLY** have a steady partner?
    a. yes
    b. no

21. Have you been sexually active in the **PAST MONTH**?
    a. yes
    b. no

22. Which one of the following BEST describes your situation during the **PAST MONTH**? Circle one:
    a. I'm in a steady relationship with one person. Neither of us has outside sexual partners.
    b. I'm in a steady relationship but either my partner or I have some outside sexual partners.
    c. I'm not in a steady relationship, but I'm sexually active.
    d. I've been in and out of monogamous relationships
    e. I'm not sexually active.

23. In the **PAST MONTH** have you had sex with:
    a. nobody
    b. men only
    c. mainly with men, but also with some women
    d. mainly with women, but also with some men
    e. men and women equally
    f. women only

24. In the **PAST MONTH**, have you had sex with a bisexual partner?
    a. yes
    b. no
    c. don't know

25. In the **PAST MONTH**, with how many different people have you had sex?_____

26. In the **PAST MONTH**, estimate how many times you think you have had sex (intercourse)?_____

27. In the **PAST MONTH**, what percentage of the time did you use condoms during sex?
    a. I haven't had sex during the past month
    b. none
    c. less than 25%
    d. 25-50%
    e. 50-75%
    f. 75-99%
    g. 100%

28. In the **PAST MONTH**, with how many different people have you had oral sex?_____

29. In the **PAST MONTH**, how many times have you had oral sex? (given or gotten)_____

30. Of all the times in the **PAST MONTH** that you've had **oral** sex, what percentage of the time did you use condoms?
    a. I haven't had oral sex during the past month
    b. none
    c. less than 25%
    d. 25-50%
    e. 50-75%
    f. 75-99%
    g. 100%

31. In the **PAST MONTH**, did you ever drink alcohol or use other drugs before or during sex?
    a. yes
    b. no
    c. can't remember

32. In the **PAST MONTH**, have you ever had sex or oral sex with someone you didn't know well because you were drunk or high?
    a. yes
    b. no
    c. can't remember

33. In the **PAST MONTH**, have you ever had sex with someone without using any protection because you were drunk or high?
    a. yes
    b. no
    c. can't remember

34. In the **PAST MONTH**, have you had anal sex without a condom?
    a. yes
    b. no

35. During the **PAST MONTH**, were any of your sex partners infected with HIV or AIDS?
    a. yes
    b. no
    c. don't know

36. Has a doctor or nurse **EVER** told you that you had a sexually transmitted disease like herpes, chlamydia, syphilis, or gonorrhea (which is sometimes called "the clap")?
    a. yes
    b. no

37. Did a doctor or nurse tell you that you had a sexually transmitted disease like herpes, chlamydia, syphilis, or gonorrhea in the **PAST YEAR**?
    a. yes
    b. no

38. What do you think are your chances of getting the AIDS virus? Would you say they are:
    a. high
    b. medium
    c. low
    d. none

39. Would you say that you have changed your sexual behavior because of AIDS?
    a. yes
    b. no (if no, skip to #41)

40. If you answered yes to # 39, which of the following ways have you changed your behavior because of AIDS? (circle all that apply):

    a. I stick to kissing and other low-risk sex play
    b. I don't have sex as much anymore
    c. I get to know partners before I have sex with them
    d. I have only one partner/ monogamous
    e. I have fewer partners now
    f. I stopped/ cut back using IV drugs
    g. I use condoms/ask my partners to use condoms during sex
    h. stopped having sex/ stayed celibate
    i. I require partners to be tested for HIV
    j. I use condoms/ ask my partner to use condoms during oral sex
    k. I / my partner withdraw(s) before ejaculating
    l. I ask partners their HIV status before getting in bed

41. When deciding on potential sex partners, which of the following do you do? (circle all that apply):

    a. Nothing - you can never really know.
    b. Ask if he/she has had sex with an IV drug user in the past.
    c. Ask if he/she has the AIDS virus.
    d. Guess if he/she has been exposed to the AIDS virus
    e. Ask how many partners he/she has had in the past.
    f. Take risks only with people who don't appear to be infected.
    g. Ask him/her to show you a blood donor/ HIV test card.
    h. Avoid sex with an unhealthy looking partner
    i. Ask him/her if he/she would be willing to have an HIV test.

42. How often do you keep condoms around so you will be prepared if a sexual situation comes up:
    a. never, because I do not believe in using condoms
    b. never
    c. sometimes
    d. most of the time
    e. all the time

43. Has your **most recent** partner/spouse/lover been tested for the AIDS virus?
    a. yes
    b. no
    c. don't know
    (if you answered "no" or "don't know", skip to # 46)

44. If so, how long ago was he/she last tested?
    a. within the last three months
    b. within the last 6 months
    c. within the last year
    d. more than 1 year ago
    e. more than 5 years ago
    f. don't know
    g. never

45. I am not going to ask you the results of your partner's test, but I would like to know if he/she found out what the results were?
    a. yes
    b. no
    c. don't know

46. In the last year, **have you requested** to have any of your partners/ spouse/lovers to get tested for the AIDS virus?
    a. yes
    b. no
    c. no, because he/she/they had already been tested

47. Have you ever been tested for the AIDS virus?
    a. yes
    b. no
    (if "no", skip to # 50)

48. When were you last tested?
    a. within the last three months
    b. within the last 6 months
    c. within the last year
    d. more than 1 year ago
    e. more than 5 years ago

49. I am not going to ask you the results of your last test, but I would like to know if you found out what the results were?
    a. yes
    b. no

50. Are you very likely, somewhat likely, or not likely to be tested for the AIDS virus in the next year?

a. very likely
b. somewhat likely
c. not likely

51. How confident are you to seek confidential testing?

a. not at all confident
b. not very confident
c. confident
d. extremely confident

52. How confident are you that you will be able to protect yourself from AIDS?

a. not at all confident
b. not very confident
c. confident
d. extremely confident

53. Could you give accurate information about how the virus is transmitted?

a. yes
b. no
c. not sure

54. Could you give accurate information about how the virus is *not* transmitted?

a. yes
b. no
c. not sure

55. Could you give accurate information about how to protect yourself?

a. yes
b. no
c. not sure

56. Could you give accurate information about where to go for more information?

a. yes
b. no
c. not sure

57. Could you give accurate information about who is at risk?

a. yes
b. no
c. not sure

THANK YOU FOR YOUR TIME.

YOU MAY NOW PUT ALL OF THE QUESTIONNAIRES BACK IN THE LARGE ENVELOPE AND RETURN THEM TO THE EXPERIMENTER. SHE OR HE WILL INSTRUCT YOU IN WHAT TO DO NEXT.

APPENDIX C

STUDY DESCRIPTION

We are interested in knowing how college students feel about health issues, in particular HIV and AIDS. This study has two parts: in part one, we will be asking you to fill out several questionnaires- some of which ask personal questions pertaining to your attitudes and practices of HIV prevention. You may then be asked to participate in a short videotaped speech (2-3 minutes) on HIV as part of an AIDS awareness program for area high school students. The first part of the study will take no more than one hour. For part two, we would like you to come back and fill out two questionnaires one month from now. The second part of the study will take no more than 1/2 hour, and the purpose of the study will be explained to you in more detail.

ALL OF YOUR RESPONSES WILL BE TOTALLY ANONYMOUS - please do not write any identifying information (e.g. name, student number) anywhere on the test materials. Your participation in this study is voluntary and you are free to discontinue the experiment at any time without penalty. If you have any questions or concerns you may ask the experimenter or contact Laura Baker at 485-9649. If you agree to participate in the study, please sign the attached consent form and begin.

APPENDIX D

VIDEOTAPERS' INSTRUCTIONS

Let me explain this part of the study to you. What we are doing is designing a health education program that we will use in area high schools. The part we are now putting together is the AIDS education segment, which will be a video with short clips of college students (meaning you) talking about AIDS prevention. We chose college students because there is lots of evidence that high school students see college students as role models, and listen to them much better than parents and other adults.

You should know heterosexual people between ages 16 and 25 are one of the biggest growing risk groups, so we want to make sure our program is effective. So we are conducting a study to find out which personality factors and attitudes towards AIDS in the college student role models (meaning you) are best at persuading high school students to practice safe sex. That is why we had you fill out the questionnaires.

For this part of the study, I am going to ask you to make a short speech (2-3 minutes) on AIDS from this list, and then I will videotape you giving the speech. Don't worry - it sounds harder than it is. It's OK if you mess up - we have found that it actually makes you more believable. We won't use any part of the video without getting your permission 1st - so you can censor anything later. Why don't you go ahead and read these instructions and then ask me any questions you have.

(HYPOCRISY CONDITION)

OK, one last thing before you go today. It would help us to know your thoughts about why condoms are hard for people to use. Please take a minute to fill out this last inventory, and think about a time that you took a risk with someone yourself and why. When you're done, take your stuff out to the researcher at the desk and sign up for the follow up session. OK? Thanks alot.

APPENDIX E

HIV Fact List

What would you tell a peer or a younger teenager to help them realize the risks of getting AIDS? We are creating a video for the Lansing high schools as part of a program on AIDS education. For our video, we are including taped segments of AIDS information given by college students, since high school students often look to older peers as models. Please put together a short message (2-3 minutes) that you will present on video as part of our program.

Below is a list of some of the points about AIDS and condom use we would like you to include in your speech. We have provided 7 facts about HIV/AIDS from which you should choose at least three to use in your speech. In addition to any three facts, there are also three main points we would like you to make at the conclusion of the speech which are outlined below.

A typical speech goes something like this: You introduce yourself as a student at MSU, talk about the facts, make the final three points given, then conclude with a summary statement (of your choice). The entire speech should last about 2-3 minutes. We can provide you with cue cards or you can memorize the speech, whatever you feel comfortable doing. And don't worry about making a mistake: research shows that you are more believable if you stumble over words or something like that.

When you are ready, let the experimenter know you are ready to tape.

Facts:

1. Over 70,000 people have died from the AIDS virus and AIDS researchers believe that anywhere from 1.5 to 4 million people in the United States might already be infected.

2. There is currently no cure for AIDS or vaccine to inoculate (protect) yourself against the AIDS virus like there is for polio or the flu. Most researchers agree that it will be years before a cure or vaccine is available.

3. AIDS is mostly transmitted between people through sexual intercourse or the sharing of needles during IV drug use. You cannot catch AIDS from casual contact like shaking hands, sneezing, or sharing a soft drink.

4. Most or the cases of AIDS have been among gay males and IV drug users, but AIDS is moving into the heterosexual population; it has already infected many people regardless of their race, gender, or age.

5. There is no way to tell if someone has the AIDS virus by looking at them. The only way to really tell that someone is infected with the AIDS virus is through an HIV blood test.

6. It takes from 5 to 10 years in some cases before the AIDS virus causes a person to develop the illnesses that cause death from AIDS. Once diagnosed, nearly all persons who have AIDS die within one year.

7. The best way to protect yourself from AIDS is to not have sexual intercourse or share needles with anyone. Even mutually monogamous relationships can be risky if neither partner has been tested for the AIDS virus. Sexual intercourse using a condom and spermacide is considered very safe. Anything else is risky.

Three Main Points- (be sure to include these after the factual statements)

1. If you are thinking about becoming sexually active, and since you cant tell who is infected with the AIDS virus, the easiest way to protect yourself if you have intercourse is to use a condom.

2. But remember this: If you choose to use condoms, you have to use one every single time you have intercourse because it may only takes one unsafe sexual experience for you to catch the AIDS virus.

3. Most people who don't use condoms think that it is OK because they don't know anyone with AIDS. But because of the AIDS virus, it is important to remember that having sex with someone new is like sleeping with all the other people your partner has slept with over the past 5 years.

Concluding statement (your choice):

APPENDIX F

High Awareness Condition

It would be helpful for us to know your ideas about why condoms are difficult for people to use. Please recall an incident when you engaged in one of the following unsafe sex behaviors, and write a short description of the incident and reasons you failed to take precautions below. Listed are frequently given reasons for not using condoms - please check any of these that have applied to you in the past. Feel free to include any other reasons not listed or describe the situation below.

Examples of unsafe sex behaviors :

__sexual intercourse without a condom

__oral sex without a condom

__sex with someone who has had multiple partners

__sex with someone who has had high risk partners

__sex with someone without knowing anything about his/her sexual history

__sex with an IV drug user

__sex under the influence of alcohol (which may have impaired judgment to take precautions)

Common reasons for not using condoms (Check all that apply):

__I have never had sex or oral sex

__conflicts with my religious beliefs

__ usually don't have any with me

__they impair sexual enjoyment

__they are embarrassing

__I don't know how to bring it up to my partner

__they're expensive

__I don't know how to use them

__I'm not at risk for any diseases

__both my partner and I have been tested for HIV

__they interfere with the sexual mood

__if I'm drunk or high I don't think of using condoms

__I use another form of birth control

__I'm afraid my partner will be offended

Describe incident and why precautions were not taken:

Enclosed is a brochure from Olin Health Center describing HIV information and testing services available on campus. Please keep it. If you have further questions or concerns about AIDS, or would like to have an HIV antibody test, you may contact Olin Health Center at 355-4510.

LIST OF REFERENCES

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