
Inducing Hypocrisy as a Means of Encouraging Young Adults to Use Condoms

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This experiment applied a new twist on cognitive dissonance theory to the problem of AIDS prevention among sexually active young adults. Dissonance was created after a proattitudinal advocacy by inducing hypocrisy—having subjects publicly advocate the importance of safe sex and then systematically making the subjects mindful of their own past failures to use condoms. It was predicted that the induction of hypocrisy would motivate subjects to reduce dissonance by purchasing condoms at the completion of the experiment. The results showed that more subjects in the hypocrisy condition bought condoms and also bought more condoms, on average, than subjects in the control conditions. The implications of the hypocrisy procedure for AIDS prevention programs and for current views of dissonance theory are discussed.

At this writing, more than 100,000 deaths in the United States are attributed to the human immunodeficiency virus (HIV) that causes AIDS. The Centers for Disease Control estimates that approximately 40,000 new cases of HIV infection are developing each year, and unless effective prevention techniques are discovered soon, these numbers could rise dramatically during the next 10 years.

Initially, the AIDS epidemic moved through high-risk groups such as the gay and intravenous-drug-using communities. Research evidence suggests that gay males responded with risk-reduction behavior (Coates, Stall, & Hoff, 1990), and there is also evidence of behavior change among intravenous-drug-using samples (see Des Jarlais & Friedman, 1990). Behavior change among sexually active heterosexual adolescents and young adults, however, has been more difficult to achieve (e.g.,

Kegeles, Adler, & Irwin, 1988). A recent congressional report announced that the number of active AIDS cases among adolescents climbed 77% between the years 1989 and 1991. Clearly, effective intervention techniques targeted for sexually active teens and young adults are needed because, once again, a new high-risk group appears to be emerging from those who were less at risk only 2 years ago (Baum & Temoshok, 1990).

Adopting safer sexual behavior (e.g., condom use) is still the most efficient way to prevent the transmission of HIV among sexually active teens and young adults. To encourage safer sex, most intervention efforts have relied on educating these groups about AIDS and how to prevent it. The assumption of this approach seems to be that simply providing young people with information about AIDS should be enough to motivate behavior change. The motivation, however, is based on the element of fear. Educational campaigns seem to rely on scaring young people with the dire consequences

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of unsafe sex as a means of encouraging safer sexual behavior.

Unfortunately, the solution is not that simple. Over the past several years, systematic research by social psychologists has shown that fear does not always trigger rational, problem-solving behavior. When people are frightened, they tend to go into denial—to convince themselves that such a frightening thing as AIDS is unlikely to happen to them (Fisher & Misovich, 1990). As a result, people might underestimate their vulnerability (e.g., the “illusion of invulnerability”; Fisher, Misovich, & Kean, 1987) or overestimate how much they practice safer sexual behaviors (e.g., Aronson, Adler, & McDougall, 1988). These distortions are not easy to counteract, because simply presenting people with actuarial data proving vulnerability does not dispel this fallacious thinking (Snyder, 1978). Such reactions may account for otherwise puzzling behavior, such as the commonly reported unprotected sexual behavior among uninfected partners of individuals who have been diagnosed as HIV positive (Weisse, Nesselhof-Kendall, Fleck-Kandath, & Baum, 1990).

Currently, there are few AIDS interventions that reliably motivate changes in sexual behavior. Recent reviews suggest that most techniques are atheoretical or, because of their research design, provide only a best guess about what aspect of the program caused the observed results (e.g., Becker & Joseph, 1988; O’Keeffe, Nesselhof-Kendall, & Baum, 1990; see Fisher & Fisher, 1992). In recognition of this problem, a recent science directorate from the American Psychological Association encouraged AIDS behavioral researchers (a) to employ more experimental or quasi-experimental designs to investigate their interventions and (b) to “capitalize” on the fundamentals of “social marking techniques” that have successfully motivated behavior change in other health domains (Coates & Sanstad, 1992).

The research reported in this article is responsive to both recommendations. Marketing techniques, to the degree that they are based on principles of persuasion, constitute a major area of study in social psychology. One of the most powerful and relatively permanent persuasion techniques has come from social psychological theory and research on cognitive dissonance (Festinger, 1957). The effect of dissonance motivation on “self-persuasion” has been used successfully to change attitudes and behavior in such domains as energy conservation (Gonzales, Aronson, & Costanzo, 1988; Pallack, Cook, & Sullivan, 1980), weight reduction (Axsom & Cooper, 1981), and the cessation of adolescent smoking (Chassin, Presson, & Sherman, 1990).

Our application of dissonance and self-persuasion to the prevention of AIDS takes advantage of an existing hypocrisy—the fact that most college students believe

they should systematically use condoms to prevent AIDS but do not always behave according to this belief. As a means of encouraging condom use, our procedure attempts to create feelings of hypocrisy by inducing subjects to make a public commitment to the systematic use of condoms. By itself, this commitment would not be expected to cause much dissonance, because advocating safer sex is helpful to others and is consistent with positive self-expectations for decent and reasonable behavior. But suppose subjects are then made mindful of the fact that they themselves do not use condoms regularly; the resulting inconsistency between their public commitment and the increased awareness of their current risky sexual behavior should cause dissonance. To reduce dissonance, subjects are expected to begin to practice what they preach—that is, to change their sexual behavior, effectively bringing their practice of safe sex in line with their preachings about the importance of condom use for AIDS prevention (see Thibodeau & Aronson, 1992).

In the initial investigation of the induction of hypocrisy, Aronson, Fried, and Stone (1991) used self-reported intentions as a measure of condom use. The results showed that the induction of hypocrisy made subjects more aware of their past failures to use condoms, effectively cutting through the denial processes that most people use to avoid acknowledging their risk for AIDS. But there was a ceiling effect on the measure of future condom use—all subjects in the experiment pledged relatively high intentions to use condoms in the future. It seems that, after exposure to AIDS information, pledging high intentions to use condoms more frequently in the future is too easy and socially desirable. As a result, almost everyone in the first experiment was able to claim high intentions regardless of experimental condition. Interestingly enough, despite the apparent ceiling effect on the measure of future intentions, the data from follow-up interviews suggested that subjects from the hypocrisy condition were using condoms more often 3 months after the experiment than subjects in the three control conditions.

On the basis of this result, Aronson et al. (1991) speculated that the future intentions reported by the subjects in the hypocrisy condition might have been more realistic or indicative of behavior than the intentions reported by the subjects in the other three experimental groups. That is, when subjects in the hypocrisy condition said they would use condoms in the future, they meant it; subjects in the other three conditions were somewhat less likely to follow through on their intentions. The current investigation of hypocrisy was designed to directly examine the effects of the procedure on AIDS-related behaviors.

AIDS researchers, however, cannot measure condom use in the most direct manner; that is, we cannot crawl

into bed with our subjects during their lovemaking. This limitation led us to develop an intermediate measure of condom use. Specifically, subjects were given an opportunity to purchase condoms at the completion of the experiment. Thus, if the induction of hypocrisy motivated subjects to change their sexual behavior, we predicted that subjects in the hypocrisy condition would be more likely to take advantage of the opportunity to buy condoms. Purchasing condoms is not identical to using condoms, but it is a crucial step between holding positive attitudes toward condom use and the practice of safer sex.

METHOD

Overview

Our model of hypocrisy required the manipulation of two factors: the knowledge that one has publicly preached a firmly held belief and the stark realization that one does not live up to that belief. In a 2×2 factorial design, we varied whether or not subjects made a public commitment to the use of condoms and the degree to which they were made mindful of their past failures to use condoms. The combination of these two factors created four conditions: (a) mindful and committed (hypocrisy), (b) commitment only, (c) mindful only, and (d) unmindful and uncommitted (an information-only control group). After participating in one of the conditions, subjects were interviewed about their past and future condom use and then were given an opportunity to purchase condoms and acquire AIDS information pamphlets.

Subjects

Subjects were recruited from a psychology subject pool advertisement for a study on "health and persuasion." The advertisement explicitly asked for students between the ages of 18 and 25 who had been heterosexually active within the previous 3 months. These criteria were specified to systematically eliminate subjects who were less at risk for AIDS and might have little use for condoms. Categorically, we screened out students who were not sexually active, students who were married, and female students who were having lesbian relationships. Subjects were reminded of these criteria during scheduling, and the information was also collected in a sexual behavior survey administered at the completion of the experiment.¹

In addition, we screened out subjects who had had their blood tested for HIV, because (a) it was likely that HIV-tested subjects had already been made mindful of their past risky sexual behavior, thus preexposing them to one of our experimental factors, and (b) HIV-tested subjects might have already experienced dissonance about their AIDS-related behaviors.² The final sample

consisted of 32 male and 40 female non-HIV-tested undergraduates between ages 18 and 25 ($M = 19.20$). The ethnicity of the sample was 70% Caucasian, 21% Asian, and 9% Hispanic. The entire sample reported having been heterosexually active within the 3 months prior to participating, and all reported their marital status as single. All subjects participated for partial course credit and were promised an additional \$4 during scheduling, ostensibly because the experiment "sometimes runs a little more than one hour." The extra money was actually related to the dependent measure, as explained in detail below.

Procedure

All subjects were assigned randomly to condition before they arrived in the lab. When they entered the "AIDS Research Program" office, the purpose of the study was introduced as "the development of an AIDS prevention and education program to be used at the high school level." The experimenter explained that the target of the prevention campaign was those students who were just becoming sexually active but were not yet knowledgeable about AIDS. Subjects were told that because high school students might be exposed to misinformation from their peers about sex and AIDS, it was important to teach sexually active students that "condoms are the easiest and most reliable way for them to prevent the transmission of AIDS during intercourse." All subjects were then introduced to one of the levels of the commitment manipulation.

Commitment Manipulation

To induce public commitment toward condom use, half of the subjects were asked to develop a persuasive speech about AIDS and safer sex and deliver it in front of a video camera. These subjects, those in the *commitment* condition, were led to believe that the experimenter was interested in finding the best communicator to get the message about safe sex to high school students. The experimenter explained that celebrities or athletes would not be effective communicators when it came to persuading high school students about a serious topic like AIDS. This belief was based on the "fact" that high school students knew that celebrities "like Madonna" were paid for endorsements and "did not really drink Pepsi." Consequently, the experimenter "thought" college students would be more credible with high school students because college students would be seen as "a little older and more experienced, yet not so different that they would lose their credibility." Subjects in the commitment condition were then told that the main purpose of the AIDS prevention program was to make a videotape of college students discussing AIDS and safer sex.³ Subjects developed their own presentation, using a

standardized menu of facts about AIDS, and were encouraged to outline the speech on paper. Subjects were then led to an adjoining room to rehearse and videotape the advocacy. After the videotaping, subjects returned with the experimenter to the research office, where they filled out a short AIDS knowledge questionnaire.

The other half of the subjects (*no commitment*) were induced to develop a persuasive message using the same menu of information, but these subjects did not deliver the speech to a videocamera. Subjects in the no-commitment condition were led to believe that the purpose of developing their speech was to test a hypothesis about the relationship between developing persuasive material and memory for content-related information. After outlining their speech, these subjects completed a short AIDS knowledge questionnaire, ostensibly to see whether the procedure helped them remember more facts about the AIDS epidemic.

Mindfulness Manipulation

After completing their respective levels of commitment, subjects were introduced to the levels of the mindful manipulation. Subjects in the *mindful* condition were told that to make the program completely effective, it would be helpful to know more about why condoms are difficult for most people to use. The experimenter explained that if more were known about the circumstances that made condom use difficult or impossible, this information could be included in the prevention program to “help high school students deal more effectively with these situations.” Subjects were then given a list of “some circumstances that we came up with that might make it difficult to use condoms.” Actually, this list consisted of the top 10 responses generated by subjects in the earlier hypocrisy experiment by Aronson et al. (1991). Subjects were directed to read the list carefully and then make a separate list of the circumstances surrounding their own past failure to use condoms. Subjects were instructed to use the examples from the experimenter’s list and “any other examples you can think of that are not on our list but may have occurred for you in the past.”

Subjects in the *unmindful* condition were not exposed to the list of circumstances. These subjects went directly from the commitment manipulation to the dependent measures without any direct reference to their past condom use.

Dependent Measures

To test the effectiveness of our manipulations, we employed both self-report and behavioral measures of condom use. The self-report measures were two interview questions, asked by the experimenter, designed to measure subjects’ past use and future intent to use con-

doms. The two questions were “In the past how often did you use condoms to protect yourself from the AIDS virus during intercourse?” (scale anchors were *not enough* and *enough*) and “In the future what percentage of the time will you use condoms to protect yourself from the AIDS virus during intercourse?” (scale anchors were *0%* and *100%*). For each question, subjects were handed a slip of paper that contained a 17-cm horizontal line and asked to mark a vertical line between the anchors that best represented their response to the interview question. These questions were similar to those used in the first hypocrisy experiment (see Aronson et al., 1991, for a full description).

To collect the behavioral evidence required to test the hypothesis, it was necessary to channel subjects’ dissonance-reducing behavior into a measurable route while they were in our laboratory. If subjects were experiencing dissonance because they were confronted with the reality that, in the past, they had not taken their own good advice about using condoms, we suspected that one way for them to reduce the dissonance would be to obtain condoms immediately. However, simply giving subjects free condoms would be too easy; we feared that most subjects would simply grab a handful of condoms because it is hard to pass up a free gift. Therefore, it was necessary to provide subjects with an opportunity to obtain condoms at some cost—but not at so great a cost as to inhibit purchase. We accomplished this by having subjects purchase condoms ostensibly provided by a third party with the \$4 they earned for participating in the research.

After the short interview questions, subjects were told that the session was completed. The experimenter signed the participants’ credit slip and gave them four \$1 bills for participating. Subjects were asked to fill out a receipt for the social science business office, but before they had an opportunity to begin, the experimenter said:

Before you start that, let me tell you that the AIDS educators from the Health Center sent over some condoms and pamphlets on AIDS when they heard about our prevention program. They wanted us to give our subjects an opportunity to buy condoms for the same price they are sold at the health center—10 cents—and this way you don’t have to go across campus and stand in a long line. I need to go next door and prepare for the next subject, so go ahead and finish this receipt; you can leave it here on the table. And if you want to buy some condoms or take some pamphlets, just help yourself to anything on that desk; that dish has some spare coins so you can make change. OK? Thanks again for coming in today.

The experimenter then left the room and entered an adjoining room, closing the office door to leave the subject alone in the lab.

The condoms were located on a desk across the room, in a clear plastic container. For each subject, the container held 140 condoms, 10 each of 14 brands. A sign on the container reminded subjects that the condoms were 10 cents each; a bowl of loose change and an envelope of \$1 bills were clearly available next to the condom "fishbowl." To assess the number of condoms taken, the condom "fishbowl" was recounted and refilled after each subject left the office. Next to the condoms were 10 different informational pamphlets on AIDS (e.g., information on HIV testing, modes of transmission, etc.). The pamphlets were organized in stacks of 10 with each stack holding 5 copies of one pamphlet (for a total of 50 pamphlets). A sign on the wall read "Due to dwindling supplies, please only take 1 from each stack." Similar to the condom fishbowl, the stacks of pamphlets were recounted after each subject left the office to determine how many of each pamphlet were taken.

Leaving subjects alone in the office and closing the door served two purposes: (a) It allowed the procurement of condoms and pamphlets in total privacy so that subjects could buy condoms and take pamphlets without the presence of the experimenter to impede or enhance this behavior, and (b) when subjects opened the office door to leave, that served as a signal for the waiting experimenter to continue the procedure.

As each subject was leaving, the experimenter appeared in the hallway, claiming to have forgotten to have subjects complete one questionnaire. With subjects' permission (no one refused), both reentered the office, and subjects completed a survey of their recent sexual behavior.

The sexual behavior survey contained items designed to measure the frequency of subjects' sexual activity during the previous year. Specifically, the survey questions asked for categorical responses concerning the frequency of sexual intercourse during the last year, number of sexual partners during the last year, frequency of sexual intercourse during the last month, and number of partners during the last month. Subjects were also asked to estimate how frequently they used condoms and to estimate how many condoms they had used during the last month. Following the questions concerning sexual behavior, a question asked "Has your blood ever been medically or officially tested for the HIV (the AIDS virus)?" Finally, subjects completed some demographic questions concerning their age, ethnic identity, sexual lifestyle, and marital status (reported above). After subjects placed the confidential questionnaire in an envelope, the experimenter began the debriefing session.

Follow-Up Interviews

To further examine the effectiveness of the experimental treatments on subsequent sexual behavior, we

conducted telephone interviews with the subjects approximately 90 days after the experiment. The interviews were conducted by two female research assistants who were unaware of subjects' experimental condition. In greeting subjects, the interviewer introduced herself as a research assistant with the "University of California AIDS Research Program." The interviewer then reminded subjects of their participation in the study and gently asked whether they could answer some brief questions concerning their sexual behavior since the study (no subject who was contacted refused, although some requested that the interview take place at a more convenient time). The survey instrument was the same one used to collect the sexual behavior information immediately at the completion of the experiment. However, to increase the sensitivity of the measures, the response formats for some questions were changed from categorical to continuous. For example, subjects were asked to estimate the number of times they had had intercourse, the number of partners, and the number of condoms they had used since the study. At the completion of the survey, subjects were thanked for their time, and the interviewer answered any questions about the experiment or the follow-up survey.

RESULTS AND DISCUSSION

Behavioral Effects of Hypocrisy

The primary measure of the induction of hypocrisy was the condom-purchasing behavior of our subjects. First, we examined the percentage of subjects in each condition who purchased condoms. A Gender \times Commitment \times Mindful log-linear ANOVA revealed a significant main effect for the mindfulness factor, $\chi^2(64) = 5.87, p < .02$, and a significant Commitment \times Mindfulness interaction; $\chi^2(64) = 3.79, p < .05$. As seen in Figure 1, the interaction showed that significantly more subjects in the hypocrisy condition bought condoms (83%) compared with subjects who only made the commitment (33%), $\chi^2(64) = 9.28, p < .003$, subjects who were only made mindful of past risky behavior (50%), $\chi^2(64) = 4.23, p < .04$, and subjects who only learned AIDS information (44%), $\chi^2(64) = 5.94, p < .01$.

In addition to purchasing more often, a significant Commitment \times Mindfulness interaction, $F(1, 64) = 3.80, p < .05$, revealed that subjects in the hypocrisy condition bought more condoms, on average ($M = 4.95$), than subjects who made the commitment ($M = 2.28$), $F(1, 64) = 4.18, p < .04$, and subjects who were only made mindful ($M = 2.40$), $F(1, 64) = 3.65, p < .05$. Although the means were in the predicted direction, subjects in the information-only condition ($M = 3.50$) purchased only slightly fewer condoms than subjects in the hypocrisy condition, $F(1, 64) = 1.87, p < .23$.

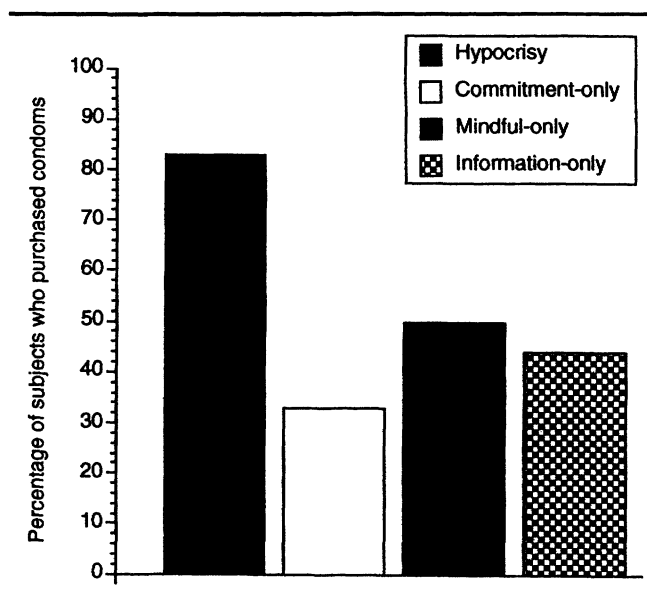


Figure 1 Percentage of subjects in each condition who bought condoms.

The condom-purchasing data strongly supported the hypothesis—subjects in the hypocrisy condition were more likely to buy condoms at the completion of the experimental session. Furthermore, when they purchased condoms, subjects in the hypocrisy condition bought more condoms, on average, than subjects in the three control conditions. Importantly, there were no gender differences: The purchasing behavior of males and females was not significantly different.

In addition to the purchase of condoms, subjects were given the opportunity to take AIDS information pamphlets. This measure was included to determine whether subjects in the hypocrisy condition were motivated to learn more about AIDS than subjects in the other experimental conditions. Few subjects took the AIDS pamphlets (only 25% of the total sample), and a Gender \times Commitment \times Mindfulness log-linear ANOVA revealed only a very marginal Gender \times Commitment interaction for the percentage of subjects who took pamphlets, $\chi^2(64) = 2.36, p < .11$. The interaction indicated that females who made a commitment were more likely to take pamphlets (35%) than males who made a commitment (19%), but males who did not make a commitment were more likely to take pamphlets (31%) than females who did not make a commitment (15%).

A significant Gender \times Commitment interaction was found for the number of pamphlets acquired, $F(1,64) = 3.99, p < .05$. Females who made a commitment obtained more pamphlets ($M = 1.5$) than males who made a commitment ($M = 0.39$), but males who made no commitment obtained more pamphlets ($M = 0.94$) than females who made no commitment ($M = 0.30$). Overall, the pamphlets were acquired by only a small percentage of subjects, and mostly by females who made the public

commitment and by males who did not make the public commitment.

When viewed together, the measures of condom purchasing and pamphlet acquisition can be seen as an indication of the preventive effectiveness of each treatment. That is, if the experimental treatments motivated subjects to take their risk for AIDS more seriously, subjects would be more likely to take preventive action by purchasing condoms or at least acquiring more information about AIDS. Condom purchasing is more clearly related to adopting safer sexual practices and perhaps also reflects a very high level of concern about risk for AIDS. At the same time, acquiring additional AIDS information may also reflect a realistic intention by subjects to make behavioral changes eventually. The hypothesis would predict that subjects in the hypocrisy condition should demonstrate the most concern about their AIDS-related behaviors. Overall, more subjects in the hypocrisy condition should therefore have been planning preventive action, as indicated either by taking pamphlets, by purchasing condoms, or by acquiring both condoms and pamphlets at the completion of the experiment.

To examine this hypothesis, the data were categorized to reflect those subjects in each condition who either (a) only purchased condoms, (b) only acquired AIDS information pamphlets, or (c) acquired both condoms and pamphlets. These three categories were combined to derive a composite index of concern for AIDS preventive action. A Gender \times Commitment \times Mindfulness log-linear ANOVA on the concern index revealed a main effect for the mindfulness condition, $\chi^2(64) = 6.46, p < .01$, and the predicted Commitment \times Mindfulness interaction, $\chi^2(64) = 4.37, p < .04$. Figure 2 indicates that fully 94% of the subjects in the hypocrisy condition showed some concern about their risk for AIDS—only 1 subject out of 18 in the hypocrisy condition did *not* make an effort to acquire either condoms or pamphlets. Significantly more concern was shown by subjects in the hypocrisy condition than by subjects who only made a public commitment to use condoms (44%), $\chi^2(64) = 7.28, p < .007$; subjects who were only made mindful of their past risky sexual behavior (61%), $\chi^2(64) = 4.39, p < .03$; and subjects who only learned AIDS information for a test (56%), $\chi^2(64) = 5.31, p < .02$. This pattern was not qualified by the gender of the subjects.

Why would 17 of 18 subjects in the hypocrisy condition expend the time and effort at the end of the experiment to take preventive action? We believe this occurred because the hypocrisy manipulation produced cognitive dissonance (Festinger, 1957). In this situation, subjects experienced dissonance because although their public commitment about the importance of safe sex was consistent with their beliefs, the advocacy was inconsistent

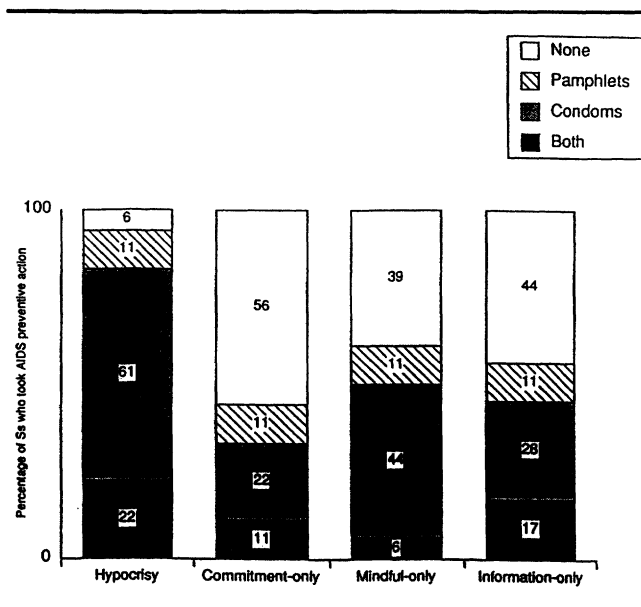


Figure 2 The index of concern, showing the percentage of subjects in each condition who bought condoms, took pamphlets, or did both.

with their past risky sexual behavior. The contradiction between their beliefs and behavior caused subjects to examine a firmly held belief about themselves—their self-view as competent and moral people with integrity, the kind of people who generally live up to their own positive standards for behavioral conduct (Aronson, 1968, 1992; Thibodeau & Aronson, 1992). The realization that they had violated the standards for sexual conduct with respect to AIDS prevention aroused dissonance, and subjects were motivated to reduce the discomfort. In this case, there was a clear route to dissonance reduction—behavior change through the adoption of safer sexual practices, such as condom use. Thus, in our view, the induction of hypocrisy motivated subjects to buy condoms because this behavior was the most efficient way to reduce the discrepancy between a positive self-concept and the standards for behavioral conduct.

Self-Reports of Future Intent to Use Condoms

Before they were given the opportunity to purchase condoms, subjects were interviewed by the experimenter about their past and future condom use. For the subjects' estimates of their future intentions to use condoms, a Gender \times Commitment \times Mindfulness ANOVA revealed a main effect for the commitment factor, $F(1, 64) = 8.70$, $p < .004$. Subjects who made the public commitment gave higher estimates of future intent to use condoms ($M = 15.1$ cm on the 17-cm line) than subjects who did not make the public commitment ($M = 12.1$). As can be seen in Table 1, estimates of future condom use were slightly higher for subjects in the hypocrisy condition ($M =$

15.50) than for those in the commitment-only condition ($M = 14.80$), although the difference was not significant, $F < 1$. The intentions of the subjects in the hypocrisy condition, however, were significantly higher than the intentions reported by subjects in the mindful-only ($M = 12.40$, $F = 4.61$, $p < .03$) and information-only conditions ($M = 11.80$, $F = 6.24$, $p < .01$). This main effect for public commitment replicates the pattern of data for the future intentions of subjects in the initial hypocrisy experiment reported by Aronson et al. (1991).

The relationship between subjects' reported intentions to use condoms and their actual purchase of condoms has implications for an important issue in AIDS prevention research. Many interventions have to rely on self-reported changes in sexual behavior as the primary measure of the effectiveness of the program. As has been discussed recently (see Catania, Gibson, Chitwood, & Coates, 1990), there are many reasons for questioning the validity of self-report measures of sexual behavior. The current data suggest that the validity of such measures may vary with the nature of the intervention. For example, although subjects who made the public commitment reported the highest intentions to use condoms in the future, only subjects in the hypocrisy condition (those who made the public commitment *and then* were reminded of their past condom use) actually followed through on their pledges by purchasing condoms (83% of subjects in the hypocrisy condition vs. 33% of subjects in the commitment-only condition purchased an average of 4.95 vs. 2.28 condoms, respectively). These data confirm the speculations by Aronson et al. (1991)—future intentions were more indicative of subsequent behavior for subjects in the hypocrisy condition than for subjects in the control conditions. More generally, these data show that high behavioral intentions to use condoms may not reliably predict whether people will expend the effort to acquire condoms for use during sex. Consequently, we encourage AIDS prevention researchers to use both self-report and behavioral measures to assess the effectiveness of any intervention technique.

Acknowledging Risk: Self-Reports of Past Condom Use

A second important issue to AIDS prevention is how people assess their risk for acquiring HIV (e.g., Bauman & Siegel, 1987; Catania, Kegeles, & Coates, 1990). Modification of sexual behavior, such as using condoms regularly, may depend on how well the intervention technique causes subjects to objectively examine their risk for AIDS. Aronson et al. (1991) reported that subjects in the hypocrisy condition gave significantly lower estimates of past condom use than subjects in the three control conditions. The relatively high mindfulness of subjects in the hypocrisy condition led the authors to conclude that the hypocrisy manipulation may cut

TABLE 1: Estimates of Past and Future Condom Use Collected During the Experiment

Interview Question	Experimental Condition			
	Commitment		No Commitment	
	Mindful (Hypocrisy)	Nonmindful (Commitment Only)	Mindful (Mindful Only)	Nonmindful (Information Only)
Estimates of past condom use				
Females	8.00	8.60	10.00	8.50
Males	14.00	11.13	6.13	11.63
Future intent to use condoms				
Females	15.10	14.50	12.00	10.00
Males	16.00	15.25	13.00	14.00
Improvement ^a				
Females	7.10	5.90	2.00	1.50
Males	2.00	4.13	6.88	2.38

NOTE: Higher numbers indicate higher estimates of past and future use of condoms and more indication of improvement.
a. The index of improvement is the difference between estimates of past use and future intent to use condoms.

through the denial mechanisms that prevent people from acknowledging their risk for acquiring HIV. The current experiment allowed us to replicate and extend this finding by comparing it with the observed behavioral data.

A Gender \times Commitment \times Mindfulness ANOVA for the estimates of past condom use revealed only a marginally significant three-way interaction, $F(1, 64) = 3.27$, $p < .07$. The nature of the omnibus interaction is highlighted by the simple crossover interaction between estimates of past condom use reported by males and females in the hypocrisy and mindful-only groups (see Table 1). Hypocrisy males reported a very high level of past condom use ($M = 14.00$) relative to hypocrisy females, who reported a moderate level ($M = 8.00$). Mindful-only females reported moderately high levels of past condom use ($M = 10.00$) relative to mindful-only males, who reported very low estimates of past condom use ($M = 6.13$). Thus, whereas hypocrisy females reported the lowest estimates of past condom use, replicating the findings of Aronson et al. (1991), males in the hypocrisy condition were significantly less mindful of their past risks for the HIV.

The differences between males and females on estimates of past condom use also affected the index of improvement reported by Aronson et al. (1991). In the current study, the difference between estimates of past and future condom use was analyzed by a $2 \times 2 \times 2 \times 2$ ANOVA, in which gender, commitment, and the mindful manipulation were treated as between-groups factors and the questions measuring past and future condom use were treated as a within-subjects repeated measure. A significant Gender \times Commitment \times "Improvement" interaction, $F(1, 64) = 5.66$, $p < .02$, revealed that making the commitment caused females to think more seriously about increasing their use of condoms (difference between past and future estimates; $M = 6.50$) relative to

males who made the commitment ($M = 3.06$) whereas males who did not make the commitment reported more improvement ($M = 4.63$) than females who did not make the commitment ($M = 1.75$).

Although these findings may imply that the effect of hypocrisy on denial is not as general as Aronson et al. suggested, the apparent lack of replication could also be due to an important difference between the two experiments. In the first experiment, subjects were made mindful of their past sexual behavior *before* they were introduced to the commitment variable; in the current experiment, subjects were made mindful of their past behavior *after* they had been introduced to the commitment variable. As a result, the inability of the current experiment to replicate the effect on denial reported by Aronson et al. could be due to an order effect for whether the mindful manipulation was introduced before or after the commitment manipulation.

To further investigate how the procedures affected the subjects' perceptions of their past sexual behavior, we analyzed their responses to the sexual behavior survey collected after they had the opportunity to purchase condoms. After responses to each survey question were converted to a 5-point scale, a Gender \times Commitment \times Mindfulness MANOVA showed a significant effect for the commitment condition, Wilks's lambda $F(7, 55) = 2.19$, $p < .04$.⁴ Pairwise comparisons of the means presented in Table 2 revealed that subjects in the mindful-only condition reported significantly longer sexual relationships, more sexual activity during the year and month prior to the experiment, and less frequent condom use than in both the hypocrisy and commitment-only conditions (all protected Fisher LSD $t_s = 1.99$, $p < .05$). Importantly, these estimates for the information-only group were not significantly different from the estimates of *any* of the other treatment groups. Taking these findings together, it appeared that subjects in the

TABLE 2: Sexual Behavior Survey Collected at the Completion of the Experiment

Question	Experimental Condition			
	Hypocrisy (n = 17)	Commitment Only (n = 17)	Mindful Only (n = 18)	Information (n = 17)
Current sexual relationship	2.65 _a	2.82 _a	2.55 _a	2.65 _a
Average length of sexual relationships	3.17 _a	3.82 _a	4.61 _b	4.29 _{ab}
Sex during the last year	4.00 _a	4.00 _a	4.83 _b	4.17 _{ab}
Partners during the last year	1.76 _a	1.88 _a	1.44 _a	1.47 _a
Sex during the last month	2.12 _a	2.35 _a	3.44 _b	2.82 _{ab}
Partners during the last month	1.05 _a	1.05 _a	1.00 _a	1.05 _a
Frequency of condom use	3.06 _a	2.71 _a	1.72 _b	2.12 _{ab}
Condoms used during the last month	1.82 _a	2.12 _a	1.83 _a	1.94 _a

NOTE: Scale values range from 1 to 5; larger numbers indicate more sexual activity or more frequency for each question. Means with different subscripts are significantly different at the .05 level.

hypocrisy, commitment-only, and mindful-only conditions were reconstructing their memories of past sexual behavior to be consistent with their activities during the experiment.⁵

One implication of these data is that the procedures led subjects to justify their past sexual behavior in such a way as to downplay their risk. For example, after exposure to AIDS information, subjects made mindful of their past failures to use condoms reported slightly longer past monogamous relationships and slightly fewer partners during the year and month prior to the experiment. Although these responses were not significantly different from those of the information-only group, the mindful-only group may have adjusted the recall of their sexual behavior to justify past failures to practice safe sex.

Similarly, subjects in the hypocrisy and commitment-only conditions may have adjusted their estimates of past sexual behavior to fit the content of their speeches. The means indicate that subjects who made the commitment slightly downplayed their risk for AIDS on the survey by reporting shorter monogamous sexual relationships, less sexual activity during the year and month prior to the study, and more frequent condom use. It is not difficult to understand why subjects who advocated the importance of safe sex to an impressionable audience might want to see themselves as shining examples of such behavior. In doing so, subjects who made the commitment slightly underestimated their risk by seeing themselves as monogamous but less sexually active and as using condoms more frequently.

Our procedures appear to have caused subjects to search for a way to avoid recognizing their own risk for AIDS—a somewhat disheartening possibility. However, denying their risk for AIDS was clearly not the case for the hypocrisy condition, where the manipulation encouraged 83% of the subjects to purchase significantly more condoms. The most compelling interpretation of the data is that our procedures caused subjects in the commitment and mindful conditions to seek some justifi-

cation for their past risky sexual behavior but that the hypocrisy manipulation apparently provided subjects with the motivation to face their risk head-on and take preventive behavioral action at the completion of the experiment.

Follow-Up Interviews

The behavioral data clearly showed that the induction of hypocrisy encouraged subjects to acquire condoms at the completion of the experiment. This measure, however, could be indicating more about condom purchasing than about condom use (e.g., Catania, Gibson, Chitwood, & Coates, 1990). From an AIDS prevention standpoint, the important question is, did these subjects subsequently use the condoms that they purchased? To examine this possibility, we conducted interviews with our subjects by telephone about their sexual behavior 3 months after they participated in the experiment.

The interviewers contacted 64 (89%) of the original 72 subjects, and 52 (81% of those contacted) reported having been sexually active since the study. In addition, the responses from 3 subjects proved to be highly influential outliers in the data; all reported having sexual intercourse over 90 times since the study and also reported using over 90 condoms during that time. We chose to drop the data from these 3 subjects because their scores were more than 5 standard deviations from the grand mean for each variable. As a result, the follow-up data reported here are based on 68% ($n = 49$) of the original sample that participated in the experiment.⁶

The means for all the follow-up questions are presented in Table 3. Of most interest to the current analysis are the condom use data. A log-linear Gender \times Commitment \times Mindful ANOVA of the percentage of subjects who reported using condoms during the 3 months after the study revealed a marginally significant Commitment \times Mindful interaction, $F(1, 48) = 2.45, p < .12$. Fully 92% of the subjects in the hypocrisy condition—11 of the 12 contacted—reported using condoms in the 3 months following the study. Although this frequency of condom

TABLE 3: Self-Reports of Sexual Behavior Collected 3 Months After Participation in the Study

	<i>Experimental Condition</i>			
	<i>Hypocrisy</i> (<i>n</i> = 12)	<i>Commitment Only</i> (<i>n</i> = 11)	<i>Mindful Only</i> (<i>n</i> = 14)	<i>Information Only</i> (<i>n</i> = 12)
Percentage of subjects reporting condom use	92%	55%	71%	75%
Average amount of sexual intercourse since the study	13.6	9.1	24.2	18.4
Average number of sexual partners	1.2	1.5	1.1	1.4
Frequency of condom use since the study	2.75	1.82	2.00	2.08
Number of condoms used since the study	5.83	3.91	9.00	7.41
Percentage of time condoms were used during intercourse	63%	46%	44%	65%

NOTE: Higher numbers indicate higher frequency or activity for each item.

use was significantly higher than the frequency reported by subjects in the commitment-only condition (55%, $F = 4.07$, $p < .04$), the hypocrisy group was not more likely to be using condoms than the mindful-only (71%, $F = 1.36$, n.s.) and information-only (75%, $F < 1$, n.s.) groups.

As a more direct measure of condom use, subjects were asked to estimate how often they used condoms and how many condoms they had used since participating in the study. Subjects in the hypocrisy condition reported a slightly higher frequency of condom use, although not a significantly higher frequency than any of the control groups, all F s < 1 . For number of condoms used since the study, the analysis revealed a marginally significant main effect for the mindful factor, $F(1, 48) = 2.59$, $p < .11$. Subjects who were made mindful reported using slightly more condoms ($M = 7.54$) than subjects who were not made mindful of their past failure to use condoms ($M = 5.74$). Again, none of the observed differences between the experimental groups were significant, all F s < 1 .

Finally, to adjust for the differences in sexual activity across the experimental groups, subjects' estimates of the number of condoms used were divided by their estimates of how much sexual intercourse they had had since participating in the study. This calculation produced a measure of the percentage of the time subjects had used condoms when having intercourse. A similar $2 \times 2 \times 2$ ANOVA revealed only a marginal Commitment \times Mindful interaction, $F(1, 48) = 2.58$, $p < .11$. Although hypocrisy subjects reported somewhat more condom use per act of intercourse ($M = 63\%$ of the time) than commitment-only ($M = 46\%$, $F < 1$, n.s.) and mindful-only ($M = 44\%$, $F = 1.21$, n.s.) subjects, information-only subjects ($M = 65\%$) also reported a high frequency of condom use as a percentage of acts of intercourse.

In sum, the follow-up interviews provided very little indication that subjects in the hypocrisy condition were using condoms more regularly than subjects in the control conditions 3 months after the experiment. The data showed that 92% of the subjects in the hypocrisy condition reported using condoms and that they reported a slightly higher frequency of condom use than subjects in the three control conditions. Nonetheless, the observed

differences between the hypocrisy group and the control groups were not very strong and, given their self-report nature, should be interpreted with caution.

Alternative Explanations and Theoretical Implications

We have suggested that the observed effects of hypocrisy on condom purchasing were caused by dissonance motivation. It is conceivable, however, that the effect of hypocrisy on condom purchasing might also be accounted for by a simple learning or priming explanation. That is, our experimental treatments might be viewed as systematically varying the amount of persuasive information subjects received. For example, subjects in the information-only condition received one source of persuasive material—the AIDS information. Subjects in the commitment- and mindful-only conditions were exposed to two sources of persuasion: Both groups learned AIDS information, and the commitment-only group used the information to persuade a high school audience, while the mindful-only group were then made mindful of their past failures to use condoms (cf. central-route persuasion; see Petty & Cacioppo, 1986). Subjects in the hypocrisy condition were supplied with three sources of influence—the AIDS information, the public commitment, and the personal reminder of their own risky behavior. Thus the model is additive rather than interactive—a linear model, based on priming or learning, would predict that the more persuasive appeals people are exposed to, the more likely they are to comply.

The obtained pattern of data, however, may not be additive. One way to examine the additive influence of the variables is through statistical procedures. If the effect of hypocrisy is due to the additive effect of the commitment and mindful factors, then the variance attributed to the main effect for each variable will account for most of the variance in the purchasing behavior (Cohen & Cohen, 1983). This is not the case. As reported in the analysis of the follow-up data (see Note 6), once the additive effects of the commitment and mindful factors are partialled from the indexes of purchasing behavior, the Commitment \times Mindful interaction still accounts for a significant proportion of the

variance in each measure of condom acquisition. Figure 1 shows that subjects who were provided with two sources of influence (i.e., the commitment-only and mindful-only groups) were no more likely to buy condoms than subjects who received only one source of influence (i.e., information only, both $F_s < 1$). Evidently, adding together two sources of influence was no more effective than simply educating subjects with facts and figures about AIDS. In sum, "more" was not necessarily "better"; a simple learning or priming explanation for the combined effect of the commitment and mindfulness factors does not offer a more parsimonious account of the condom-purchasing data.

Furthermore, it could be argued that the hypocrisy manipulation makes attitudes about AIDS and condom use more accessible, which leads subjects to purchase more condoms (e.g., Fazio, 1986). We cannot empirically rule out this explanation; in fact, we believe that making the link between an attitude and behavior (or, more specifically, between the self-concept and behavior) accessible is a necessary component of the hypocrisy effect. In our view, however, it is the motivation that results from this connection that causes subjects to take behavioral action. This supposition is not directly supported by the current data, but it has been demonstrated in a recent experiment by Fried and Aronson (1992).

Fried and Aronson manipulated hypocrisy by having subjects make a public commitment to the importance of recycling and then reminding them that they do not always recycle. In the important control conditions, half the subjects in the hypocrisy condition were allowed to misattribute their dissonance arousal to characteristics of the laboratory (e.g., lighting, temperature, noise level) and then were asked to donate their time to a local recycling center. If the hypocrisy manipulation aroused dissonance motivation, then subjects who were allowed to misattribute their arousal to something about the laboratory would not be expected to volunteer time for the recycling center (e.g., Zanna & Cooper, 1974). The data supported this prediction; 68% of subjects in the hypocrisy condition volunteered for the recycling center, but only 32% of hypocrisy subjects volunteered when they were allowed to misattribute their dissonance arousal. Thus, although the current hypocrisy experiment on AIDS and condom use does not provide direct evidence of dissonance arousal, the study by Fried and Aronson (1992) clearly suggests that motivation is an important component of the effect of hypocrisy on behavior.

As a new twist on the forced-compliance paradigm, the hypocrisy hypothesis also has interesting implications for the causes of dissonance recently discussed in Cooper and Fazio's "New Look" formulation (Cooper & Fazio, 1984; Scher & Cooper, 1989). According to

Cooper and Fazio, dissonance has little to do with the subject's self-concept; it occurs because subjects assume responsibility for an unwanted aversive outcome. In the hypocrisy twist on the forced-compliance paradigm, subjects are induced to assume responsibility for producing a positive consequence—that is, subjects make a speech that clearly has positive consequences for the audience. When subjects are made aware of their past failure to live up to their own good advice, dissonance is aroused because the hypocrisy causes them to question their self-view as competent and moral people with integrity. The hypocrisy paradigm suggests that aversive consequences, although sufficient to cause dissonance, are not a necessary condition for dissonance to occur. Rather, any action that violates an important self-view has the potential to cause feelings of dissonance (Aronson, 1968, 1992; Thibodeau & Aronson, 1992).

Practical Implications

Although the follow-up data provided only suggestive evidence for long-term behavior change, the condom-purchasing data indicate that the induction of hypocrisy can encourage people to take steps toward practicing safer sex. As an intervention technique, we believe these procedures could be applied in many public educational environments. One approach that lends itself to the induction of hypocrisy is the use of "cooperative learning groups" in health or biology courses (e.g., the jigsaw technique; see Aronson, Stephan, Sikes, Blaney, & Snapp, 1978). To illustrate, students in groups could start by brainstorming on reasons for why it is important to practice safe sex or abstain from sex completely. This activity would be similar to the public commitment factor in hypocrisy. Next, making students mindful of their own sexual behavior could be accomplished by having a small discussion group work together to generate a list of the circumstances that make the use of condoms or sexual abstinence difficult. This method could produce active involvement in the learning process, along with increased awareness of risky sexual activity, which parallels our experimental procedures nicely. Needless to say, the effects of such an application have yet to be determined.

NOTES

1. Unfortunately, the screening criteria discouraged gay males from participating in the experiment. We felt this was necessary to prevent suspicion by the heterosexual participants about the true purpose of the study. Nonetheless, we believe that gay males would benefit equally from our procedures and encourage research to investigate this hypothesis.

2. If either assumption was correct, we believed that HIV-tested subjects would be significantly different from nontested subjects in their cognitive and behavioral responses to the experimental conditions. Consequently, we planned to examine the data from HIV-tested subjects separately from the data from those who did not report having an HIV test. However, only 25 HIV-tested individuals (12 males and 13

females) participated. Because the sample was small and unequally distributed across the commitment and mindful conditions (e.g., only 1 HIV-tested male participated in the hypocrisy condition), we chose not to analyze these data.

It is important to note that information regarding HIV testing was completely volunteered and collected confidentially in a sexual behavior questionnaire administered at the completion of the experimental session. Subjects were asked only whether they had been "blood-tested" for the HIV; we did not think it appropriate (or legal) to ask them for the results of their HIV test.

3. Only one subject refused to make a videotape and was excluded from participating.

4. The MANOVA analysis for the sexual behavior survey was based on 69 subjects' responses because 3 subjects failed to complete some items on the questionnaire.

5. On the sexual behavior survey, 33% of the sample reported they used condoms every time they had sex. To investigate whether subjects' past condom use was influencing their condom purchasing during the experiment, we examined the correlation between subjects' condom-purchasing behaviors and their self-reports of past condom use. Although the frequency of previous condom use did not correlate significantly with the subjects' condom-purchasing behavior ($r = -.16, p < .17$), there was a significant correlation for the number of condoms used in the month before participation ($r = .24, p < .04$). This suggests that subjects tended to purchase the same number of condoms they had used during the previous month; however, it is also possible that subjects were relying on the number of condoms they purchased during the experiment to estimate their use of condoms during the previous month. In sum, because the sexual behavior survey was administered after subjects had purchased condoms, and because the measures of previous condom use generally did not correlate with the condom-purchasing behavior, we do not believe the self-reports of previous condom use qualify our conclusions regarding the condom-purchasing data.

6. Within this follow-up subsample, the pattern of data for condom purchasing was examined to determine whether the subsample adequately represented the original full sample of participants. This analysis was conducted by examining the effect size of the Commitment \times Mindful interaction term for the condom-purchasing data collected at the completion of the experiment. After accounting for the variance due to the main effects for the commitment and mindful factors, the partial correlation of the Commitment \times Mindful interaction term for the percentage of subjects purchasing condoms was .22 ($pr^2 = .05, t[71] = 1.98, p < .05$) in the full sample and .31 ($pr^2 = .10, t[45] = 2.36, p < .03$) in the subsample. For the number of condoms purchased, the interaction effect size was .24 ($pr^2 = .06, t[71] = 2.08, p < .04$) in the full sample and .30 ($pr^2 = .09, t[45] = 2.72, p < .04$) in the follow-up subsample. As the interaction effects observed in the follow-up sample were only marginally different from those obtained in the original full sample of participants, we decided that the follow-up sample was a fair representation of the original sample and chose to analyze the follow-up data.

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