THE IMPACT OF A PROSPECT THEORY-BASED INTERVENTION ON SELECTED COLLEGE STUDENTS' SAFER SEX-RELATED INTENTIONS AND BEHAVIORS

DISSEMINATION

Presented in Partial Fulfillment of the Requirements for
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School of The Ohio State University

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ABSTRACT

The theoretical foundation of this study is derived from Kahneman and Tversky's prospect theory (1979). Seminal constructs are what Kahneman and Tversky describe as a decision maker's "reference point" which contributes to whether a decision situation is evaluated from either a gain, loss, or a neutral decision "frame." Because, as prospect theory postulates, the value of gains or losses follows a nonlinear, actually "S"-shaped function, decision makers who evaluate a decision framed as a loss will tend to make decisions that are risk-tolerant while decision makers who evaluate their decision in the realm of gains will be more risk-averse.

This study explored the applicability of prospect theory's "S"-shaped value function to sexually transmitted disease prevention efforts through a safer sex intervention designed around a series of differently framed brochures on safer sex. Based on the premise that safer sex is a risky practice in that those initiating it run the risk of offending a partner or impairing sexual functioning or pleasure, five primary hypotheses were developed to determine whether subjects exposed to a negatively framed brochure on safer sex would respond more favorably on post-intervention questionnaire items related both to their intentions to practice safer sex and to their actual practice of safer sexual behaviors than subjects exposed to a brochure designed with a positive frame or to a brochure presenting no arguments at all.
The intervention was conducted with a convenience sample of 231 students enrolled in one of four sections of two college undergraduate sexual health-related courses at the Ohio State University in the Spring and Fall of 2000. Subjects were randomly assigned to one of three levels of the intervention; hence the unit of analysis was the individual subject.

The researcher utilized a pre-test post-test comparison group design which, when conducted among randomly assigned subjects whose experiences during the study period were similar, would allow the effects of the treatment to be detected through changes in the dependent measures for subjects exposed to different levels of the treatment that were distinct from changes in the dependent measures common to all of the subjects in the sample. Data were collected before the intervention began, immediately after the intervention and then ten weeks later at a second post-test. Of the five primary research hypotheses, each designed to detect, in conjunction with the study instrument, different manifestations of a treatment effect, analysis of variance results indicated that there were no statistically significant differences between the mean of the safer sex intention or behavior scores of subjects exposed to a brochure emphasizing what could be lost by not practicing safer sex and the mean of the safer sex intention or behavior scores of subjects exposed to a brochure emphasizing what can be gained or maintained by practicing safer sex or a brochure presenting information on safer sex with no frame at all. Follow-up analyses designed to explore whether increases in the safer sex intentions and behaviors of all of the subjects from baseline to the ten week post-test may have obscured more subtle but significant treatment effects suggested that while there were significant increases in some
subjects' safer sex intention scores, a decrease in sexually active subjects' safer sex behavior scores from the initial to the ten week post-test suggested that, at least for behavioral measures, the lack of detectable treatment effect was not due to greater gains in safer sex behavior for the sample as a whole.

In light of these findings, the researcher concludes that while the application of prospect theory to safer sex interventions seems as if it could be advantageous, i.e. prospect theory could be easily incorporated into already existing interventions in a way that was so non-intrusive and cost-effective that even a small treatment effect could be justified, in practice, there are a number of challenges that must be addressed before the application of the theory is likely to produce any results. Effective application of the theory to safer sex behavior requires, not only reconsideration of how the notions of reference point and gains and losses are manifested as individuals actively weigh the prospects presented by different behavioral options, but also consideration of characteristics of groups of individuals as a whole that might increase or decrease the likelihood that the application of prospect theory would have beneficial effect.
For Paula
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CHAPTER 1
INTRODUCTION

Rates of sexually transmitted disease (STIs) in the US are on the rise (US Department of Health and Human Services, 2001). While this fact is in itself concerning, a concomitant fact increases its significance: we live in the era of HIV infection. Not only have the consequences of having unprotected sex increased exponentially, the media attention devoted to making sure that everyone is aware of those consequences has increased by at least one order of magnitude as well (Stine, 1997). And still sexually transmitted disease is on the rise. It doesn't seem to make sense. Once again we see the premise behind nearly one hundred years of health education efforts, that if people have sufficient knowledge about health risks they will make the "right" health choices, refuted (Bandura, 1994). Rising STI rates in the face of HIV infection seem to demonstrate that if there is a logic behind the sexual decisions many people are making, it isn't a logic we're familiar with. The question becomes, why do people, after having been exposed to, in fact often saturated with, information about the consequences of unsafe sex, still choose to engage in risky sexual behavior?

Questions such as these, about what is logical, what is rational, about how people make decisions and why, have been the focal point for a long tradition of study.
From the mathematician Nicholas De Bernoulli posing in 1713 what has become known as "the St. Petersburg Paradox," asking why people don't maximize utility infinitely as formal logic would suggest (Plous, 1993), to any number of other scholars, some from traditions as diverse as political science and economics, individuals have tried both to define what "rational" choice really means and to justify why, in an unnerving number of instances, people don't seem to be following it (Kleindorfer et al., 1990). Scholars in health education have drawn from this long tradition. From Sociology's Social Cognitive Theory to Business Marketing's Diffusion of Innovation Theory, health educators have attempted to find theoretical foundations with which to build interventions that maximize health positive decisions, minimize health hazardous decisions, and increase health supportive behavior (Glanz, 1990).

Theoretical Foundation

In their work on decision making under risk and uncertainty, the psychologists Kahneman and Tversky expand on the traditional utility theory of decision making by postulating that, when faced with a decision that involves uncertain outcomes, decision-makers evaluate options in terms of potential gains or losses (1979, 1981, c.f. 1986, 1988). These gains and losses are identified as such by their position relative to a reference point that is based on individuals' perceptions of their current status. The units of gain or losses, what Kahneman and Tversky define as the "value" of an outcome, are not equivalent but rather, when plotted, take on an S-shaped function whose median is a neutral reference point. This S-shaped function is steeper in the
negative realm, meaning that losses are experienced more intensely than gains, and the outer reaches of both ends of the curve level off significantly suggesting that increases of gain or loss are no longer met by similar increases in value, meaning that above a certain point equivalent units of gain or loss do not yield the same emotional impact.

What this pattern of decision-making suggests is that people will be more likely to choose risky behavioral options when the outcome of these options is framed in terms of relative disadvantages or losses, and conversely, that they will be more likely to reject risky behavioral options when the outcome is framed in terms of relative advantages or gains (Kahneman & Tversky, 1979, 1981, see also Bazerman, Kliendorfer, et al., 1990, Plous, 1993). Kahneman and Tversky hypothesize that a decision maker's reference point is based on how he or she frames the decision situation; hence both the frame and the ensuing reference point are subjective, psychologically determined, and flexible. The psychologists argue that frames are also manipulable, and demonstrate, through numerous studies, how manipulation of the frame of a given situation can alter subjects' tendencies to take or to avoid risks even though there has been no change in the probability or value of the potential outcomes in that situation (1979, 1981).

Statement of Problem

Once armed with both accurate information about how to prevent STI transmission and with an appreciation of the dire consequences that can result from having unsafe sex, one would think that making the decision to abstain from unsafe sex would be the only rational option. Still, what baffles many health educators, is
that, considering rising STI and unintentional pregnancy rates in the US, many individuals (and an alarming number of them are our youth) are not practicing safer sex. It appears that traditional health education efforts, those based on building program participants' knowledge and even their skills, may not be enough to prepare them to resist risky behavioral options. Kahneman and Tversky's prospect theory addresses the question of how people make the decision to accept or reject risks, but there have been few studies which have applied prospect theory to the decision involved in practicing safer sex. The overall purpose of this study is to do just that.

**Study Significance**

Kahneman and Tversky's framing postulate, if applied to health communication, seems as if it might enable health educators to frame their messages in ways that will support participants' adoption or rejection of behaviors that will foster health. In their article "The effect of message framing on breast self-examination attitudes, intentions, and behavior" (1987) Meyerowitz and Chaiken report on a study that suggests just that. After exposing female students to pamphlets discussing breast self-exam (BSE) from either a positive, negative or neutral frame, the researchers found that female students exposed to the negative frame pamphlet scored higher on items related to their attitudes toward BSE than those exposed to the positive or to the neutral frame brochures $F(3,75) = 2.80, p < .05$. The researchers also found that, while short of $p < .05$ significance, students exposed to the negative frame brochure were more likely to perform BSE at four months post-intervention than students exposed to a neutral or to a positive frame $F(3, 74) = 2.36, p < .08$. Other
studies' results are mixed. While some researchers have addressed the topic of safer sex, none have adapted Chaiken and Meyerowitz's pioneering method of using a brochure-based intervention to manipulate the decision frame through which subjects assess their options. Applying their methods and design to the subject of sexual decision-making could make a significant contribution to the literature.

**Rationale**

Considering the issues that we're currently struggling with in health education, why so many Americans are choosing to take the risk of having unsafe sex, (and why they're doing this even when there is a plausible alternative, safer sex, which while not without possibility of failure still is extremely effective) (Stine, 1997) examining whether a prospect theory-based safer sex intervention might be effective seems a worthwhile task. On a theoretical level, advantages of establishing that subjects do make decisions in the way prospect theory suggests would be that the theory then might bring us further in understanding why the behaviors described by models of health behavior, most notably Hochbaum's Health Belief Model (1958), may present themselves. On a practical level, finding that individuals may be influenced to take or to avoid risks which either support or threaten health simply by how a health education message is presented, even if the influence is relatively small, still gives us information on how more effectively to motivate behavior change and to do so with little to no extra expenditure of time or other resources.

What is interesting is that it does appear as if common attitudes and behaviors related to HIV transmission and prevention do follow what would be predicted by
prospect theory. Take for example Kahneman and Tversky's nonlinear function for probability (1979). This tendency to overweight small probabilities while under-weighting medium and large ones could very well account for why so many individuals actively fear contagion with HIV from low risk activities such as rendering first aid, while seeming to disregard much greater risk by practicing unsafe sex. The certainty and pseudo-certainty effects could, perhaps, predict another familiar phenomenon, individuals' distrust in the efficacy of barrier protection products such as latex condoms. The same seems to be true with individuals choosing to be tested for HIV. The window period, the period of time between infection with HIV and the development of detectable antibodies or viral protein components, seems to inspire far more distrust in the accuracy of HIV antibody and antigen test results than it actuality warrants.

Study Intervention

The intervention for this study centers around two safer sex brochures written to correspond to the loss and gain and neutral decision frames described by Kahneman and Tversky in their prospect theory of decision making. A third brochure is written without any argument framing. This will be referred to as a neutrally framed brochure. Because the intervention served a pedagogical purpose within each of the courses, all participants received a safer sex brochure. The frame of each of the brochures is constructed through a series of arguments presented on one panel of the otherwise identical brochures. The argument panel of the loss or negatively framed brochure offers five consequences of not practicing safer sex. Examples of these
consequences include that persons who don't practice safer sex cannot know for sure whether they have contracted a blood or sexual fluid-borne STI and that persons who don't practice safer sex cannot know for sure whether they are putting their sexual partner(s) at risk for the same. The argument panel of the gain or positively framed brochure emphasizes positive consequences of the correct and consistent practice of safer sex. Examples of these consequences include that persons who practice safer sex can be confident that they have not contracted a blood or sexual fluid-borne STI and that they aren't putting their sexual partner(s) at risk for the same. The argument panel for the neutrally framed brochure will be left blank.

For the intervention, after being randomly assigned one of the three safer sex brochures, subjects are asked to read, consider, and respond to the brochure in writing. Response prompts include the following: "list as many tips on what not to do with a condom (male and female) as you can remember" and "list as many of the brochure's arguments on why it's a good idea to practice safer sex as you can recall."

After reading and considering their brochures and responding to the prompts, subjects are told to store their brochures with the course supplies that they regularly bring to class. On two occasions in the next ten weeks of class (at week four and week eight) subjects are again asked to read, consider and respond to their brochure in writing. After their initial exposure to the brochure, subjects also complete one to two sections of the study questionnaire.
Study Purpose

The purpose of this study is to determine whether subjects exposed to a negatively framed brochure on safer sex will respond more favorably on post-intervention questionnaire items related both to their intentions to practice safer sex and, if appropriate, to their actual practice of safer sex behaviors than subjects exposed to brochures designed with negative or neutral frames, as would be consistent with the framing effect posited by Kahneman and Tversky's prospect theory (1979), when, as is done in this study, the practice of safer sex is constructed as a risk-tolerant behavioral alternative. Two secondary purposes are to characterize the sexual behavior and experiences of subjects at baseline, and to establish whether, apart from the intervention, subjects respond more favorably from the initial post-test to the ten week post-test on questionnaire items related to their actual practice of safer sex behaviors.

Hypotheses: Objective One, Intervention Effects

H1: Immediately after receiving the intervention, the mean safer sex intention scores of sexually active subjects exposed to a brochure stressing what can be lost by failing to practice safer sex will be significantly higher than the mean safer sex intention scores of sexually active subjects exposed to a brochure stressing what can be gained or maintained by practicing safer sex or to a brochure with no arguments at all.

H2: Ten weeks after receiving the intervention, the mean safer sex intention scores of sexually active subjects exposed to a brochure stressing what can be lost by failing to
practice safer sex will be significantly higher than the safer sex scores of sexually active subjects exposed to a brochure stressing what can be gained or maintained by practicing safer sex or to a brochure with no arguments at all.

H3: Immediately after receiving the intervention, the mean safer sex intention scores of intercourse-abstinent subjects exposed to a brochure stressing what can be lost by failing to practice safer sex will be significantly higher than the mean safer sex intention scores of intercourse-abstinent subjects exposed to a brochure stressing what can be gained or maintained by practicing safer sex or to a brochure with no arguments at all.

H4: Ten weeks after receiving the intervention, the mean safer sex intention scores of intercourse abstinent subjects exposed to a brochure stressing what can be lost by failing to practice safer sex will be significantly higher than the safer sex intention scores of intercourse abstinent subjects exposed to a brochure stressing what can be gained or maintained by practicing safer sex or to a brochure with no arguments at all.

H5: Ten weeks after receiving the intervention, the mean scores of sexually active subjects exposed to a brochure stressing what can be lost by failing to have safer sex will be significantly higher on questionnaire items related to their actual practice of safer sex in the previous thirty days than the mean safer sex scores of subjects exposed to a brochure stressing what can be gained or maintained by practicing safer sex or to a brochure with no arguments at all.
Hypotheses: Objective Two, Additional Safer Sex Behavior and Intention Changes

H₆: The mean ten week post-test safer sex scores of sexually active subjects will be significantly higher than the mean baseline safer sex scores of sexually active subjects.

H₇: The mean ten week post-test safer sex intention scores of sexually active subjects will be significantly higher than the mean initial post-test safer sex intention of sexually active subjects.

H₈: The mean ten week post-test safer sex intention scores of sexually abstinent subjects will be significantly higher than the mean initial safer sex scores of the same.

Additional research questions

Along with the additional hypotheses, two additional research questions are also explored. The first additional research question addresses changes in subjects' relationship/activity statuses for all subjects as a group over the course of the study. The second addresses changes in each subject's relationship/activity status over the same timeframe.

Question 1: Will the total number of subjects who occupy risk-averse sexual relationship/activity statuses be greater at ten week post-test than the total number of subjects who occupy risk-averse sexual relationship/activity statuses at baseline?
Question 2: From baseline to ten week post-test, will more subjects maintain or shift toward risk-averse sexual relationship/activity statuses than will maintain or shift toward risk-tolerant sexual relationship/activity statuses?

Study Design

This study uses what Campbell and Stanley (1963) describe as a pre-test post-test comparison group design. After completing pre-test questionnaires on sexual behaviors in the last three months, study participants will be randomly assigned to one of three treatment groups, those who receive a positively framed brochure on safer sex, those who receive a negatively framed brochure on safer sex and those who receive a brochure on safer sex that has no arguments at all. Immediately after reading their respective brochures, subjects will respond to questionnaire items related to their intentions to practice safer sex. Ten weeks later, subjects will complete a follow-up questionnaire comprising items related to their post-intervention intentions to practice and actual practice of safer sex. To avoid the subject matter of the courses influencing subjects' responses to baseline sex behavior questions or to the intervention, base line data and interventions will be competed on the first day of class, before any course instruction. A strength of this design is that it accounts, through the use of a pre-test, for the effect on post-test scores of experiences common to all three treatment groups, an especially important design feature for a safer sex intervention held in sexual health-related undergraduate courses.
**Study Sample**

The study sample will comprise a convenience sample of 231 college students enrolled in one of two sexual health-related undergraduate courses in the Spring and Fall of 2000 at a large Midwestern university. Subjects will be randomly assigned to treatment levels; hence the unit of analysis for the study will be the individual subject. While the results of this study will not be generalizable beyond the individuals who participate in the study itself, findings from this study can be used to contribute to a developing body of literature derived from similar studies on the effect of message framing on health behavior.

**Instrumentation**

Through the process of expert review and field testing, a valid and reliable 5-section, 129-item instrument was designed for this study. The primary independent variable in the study is level of intervention or which of the three versions of the study brochure participants are exposed to. The primary dependent measures in the study are subjects' immediate post-intervention safer sex-related behavioral intention scores (as measured in Section Three and Four of the instrument described below), subjects' 10 week post-intervention sexual behavior scores (as measured in Section One and Two of the instrument described below), and subjects' progress toward the consistent practice of safer sex as identified by differences in baseline and 10 week post-intervention scores on the behavioral measure above.

For the purposes of this study, participants' intentions to practice safer sex and their actual practice of safer sexual behaviors will be operationalized as the sum of
positive responses to questionnaire items related to intentions or behaviors minus the sum of neutral and/or negative responses to items related to the same. Subjects' movement toward the consistent practice of safer sex behaviors including abstinence will be operationalized as the difference between baseline- and ten week follow-up scores on items related to actual sexual behavior, scores which will be arrived at as described above. In an attempt to account for the gradual nature of health behavior change processes including the adoption of safer sex, the instrument includes a series of questions that identify preparatory safer sex-related behaviors, signaling progress toward the adoption of safer sex.

**Limitations of the Study**

As with most research in the social sciences, the findings in this study are limited in their generalizability. The convenience sample used in this study may very well not be representative of college undergraduates at large or even of participants in a particular college course. To enhance replicability of the study, thus compensating for the non-random sample by allowing the study to be replicated with other populations, the sampling and data collection process as well as the intervention and data analysis will be carefully documented. While every effort has been made to insure that study instruments are valid and reliable, the data collected are still derived from self report and therefore may be biased by subjects' desire to answer questions as they want to be perceived or as they want to perceive themselves. The results of this
study are also limited by the efficacy of the intervention method and the breadth of the sample. Finally, the ten week follow-up period in this study, while used to avoid subject mortality, is not meant to indicate lasting behavior change.

**Basic Assumptions**

Assumptions in this study include the following: that participation in sexual activity is preceded, in most cases, by a decision to do so; that subjects, unless having been previously diagnosed with a chronic STI, perceive themselves to be free of STIs and hence can employ a reference point of positive sexual health status; that study subjects responded truthfully to questionnaire items related to their intentions to practice safer sex and to their actual sexual behavior; that lasting behavior change is achieved through a process in which intentions to practice behaviors, while not sufficient to effect behavior change, are essential; that the pre-test post-test comparison group design used in this study allows the researcher to separate the influence of the treatment from participation in the course at large; and that, as Harris (1994) writes, systematic observation of unique samples provides, through the process of replication, indirect evidence of external validity.

**Definitions of Terms**

*Unsafe sex*

Constitutive: Unsafe sex is defined as any sexual encounter between persons who do not know each other’s current sexual health status and current sexual health
practices that would allow the blood, semen, vaginal secretions or breast milk of one individual to come in contact with the genitalia or mucous membrane of another.

Operational: For the purposes of this study, unsafe sex is operationalized as penis-to-vagina, penis-to-anus, mouth-to-vagina, and mouth-to-genital penetration with or without ejaculation between persons who do not know their partner(s)' sexual health status and do not use appropriate barrier precautions.

Safer sex

Constitutive: Safer sex is defined as sexual activity that does not allow any potentially infected blood, semen, vaginal secretions, or breast milk from one person to come in contact with the genitalia or mucous membrane of another.

Operational: For the purposes of this study, safer sex is operationalized in one of two ways: either individuals abstain from sex as abstention is described below or always use effective barriers against the transfer of blood, semen, vaginal secretions and breast milk to another person's genitalia and/or mucous membranes when engaging in penis to vagina, penis to anus, mouth to vagina, and mouth to penis sexual penetration with or without ejaculation, or individuals ascertain that they and their sexual partner(s) do not currently have an STI (including a chronic STI) and are not currently and have not participated in any sexual activities that would allow their genitalia or mucous membranes to come in direct contact with potentially infected blood, semen, vaginal secretions and breast milk of another since ascertaining their sexual health status.

1 All operational definitions provided here are based on subjects' self-reported activities.
Sexual abstinence

Constitutive: Sexual abstinence is defined as non-participation, whether insertive or receptive, in penis to vagina, penis to anus, mouth to vagina, and mouth to penis sexual penetration with or without ejaculation.

Operational: For the purposes of this study, sexual abstinence is defined as an individual not having penis to vagina, penis to anus, mouth to vagina, and mouth to penis sexual penetration with or without ejaculation with another person, whether protected or unprotected. To be considered sexually abstinent, individuals need not abstain from mutual masturbation and other sexual activities that do not bring the blood, semen, vaginal secretions or breast milk of one individual in contact with the genitalia or mucous membrane of another. An individual who abstains from the sexual activities listed above with one person but who continues to engage in one or more of these sexual activities with another will not be considered abstinent. He or she will, instead, be considered to be reducing the number of his or her sexual partners.

Sexual partner

Constitutive: A person with whom one engages in insertive or receptive penis-to-vagina, penis-to-anus, mouth-to-vagina, and mouth-to-penis sexual penetration with or without ejaculation.

Operational: For the purposes of this study, a sexual partner is someone with whom a person engages in insertive or receptive penis-to-vagina, penis-to-anus, mouth-to-vagina, and mouth-to-penis sexual penetration with or without ejaculation. Someone with whom one engages in sexual activity that is not listed above, such as someone with whom one engages in mutual masturbation only, is, for the purposes of
this study, not considered a sexual partner.

*Mutually monogamous sexual partner*

Constitutive: One of the persons in a relationship of two people who only engage in sexual activity with each other.

Operational: For the purposes of this study, a mutually monogamous sexual partner is a partner with whom, in the absence of evidence to the contrary, the subject has exchanged and both have maintained a verbal agreement to engage only with each other in unsafe or safer sex as it is defined above.

*Primary sexual partner*

Constitutive: The sexual partner who a person in a non-monogamous relationship identifies as the main person that he or she engages in either safer or unsafe sexual activity as it is described above.

Operational: For the purpose of this study, a primary partner is one whom the subject, after reviewing the definition and subsequent examples of a primary partner given prior to completing the study questionnaire identifies as his or her primary sexual partner.

*Non-monogamous, non-primary sexual partner*

Constitutive: A sexual partner with whom a person has not agreed to be in a sexually exclusive relationship and who is not considered, from the perspective of the person defining the status of the relationship, to be a primary partner as the term is defined above.

Operational: For the purpose of this study, a non-monogamous, non-primary sexual partner is one with who the subject has not exchanged a verbal agreement to
maintain monogamy and whom the subject, after reviewing the definition and subsequent examples of a primary partner given prior to completing the study questionnaire, does not identify as a primary partner.

*Sexually Transmitted Infection (STI)*

Constitutive: Any infectious, pathogenic condition that is transmitted primarily through sexual contact with an infected source.

Operational: For the purpose of this study, an STI is defined as any one of the following: syphilis, gonorrhea, Human Papilloma Virus (HPV), chlamydia, scabies and pubic lice, Nongonococal Urethritis (NGU), sexually transmitted herpes, whether genital or oral, sexually transmitted hepatitis, and sexually transmitted infection with the Human Immunodeficiency Virus (HIV). Because sexual transmission is difficult to exclusively establish, vaginitis will not be considered an STI. Perinatal cases of these infections will not be considered.

*Key Constructs*

*Reference point*

Constitutive: A reference point is an individual's perception of his or her current status as it is applied to the evaluation of potential outcomes in a decision situation involving risk or uncertainty.

Operational: For the purpose of this study, an individual's reference point will be of positive sexual health status unless he or she reports either currently having an STI or having a chronic STI.
**Decision frame**

Constitutive: The frame of a decision is the decision maker's evaluation of options as involving either gains or losses in a decision situation involving uncertainty or risk.

Operational: For the purpose of this study, a brochure that stresses the positive outcomes (gains) of practicing safer sex is positively framed while one which emphasizes the negative consequences of not practicing safer sex (losses) is negatively framed and one which offers no arguments is neutrally framed. (c.f. footnote 1 above)

**Risk**

Constitutive: Risk is generally defined as the possibility of suffering harm or loss (Morris, 1969). Within decision making theory, risk is differentiated from another construct, "uncertainty," in that risk refers to a known and quantifiable possibility of loss as would be represented, for example, in an odds ratio (Knight, 1921). For the purpose of this study, the definition that the researchers Meyerowitz and Chaiken present in their 1987 article, that risk is a voluntary behavior that has, inherent in it, the possibility of present or future loss of status, will be used.

Operational: For the purpose of this study, risk will be operationalized as any penis-to-vagina, penis-to-anus, mouth-to-vagina, and mouth-to-penis sexual penetration with or without ejaculation between persons who knowingly and willingly engage in the behavior and who either do not use an effective barrier against the transfer of blood semen vaginal secretions and breast milk or who do not ascertain that they and their sexual partner(s) do not currently have an STI (including a chronic STI) and are not currently and have not in the last twelve months participated in any sexual
activities that would allow their genitalia or mucous membranes to come in direct contact with the potentially infected blood, semen, vaginal secretions, and breast milk of another since ascertaining their sexual health.

*Risk-tolerant*

Constitutive: A person is considered to have been risk-tolerant in a decision when, upon being presented with a choice between a certain outcome and one which entails a possibility of loss (though this possibility is known and quantifiable) he or she selects the latter option.

Operational: For the purposes of this study, a person is considered to be risk-acceptant when he or she practices unsafe sex as it is defined above.

*Risk-averse*

Constitutive: A person is considered to have been risk-averse in a decision when, upon being presented with a choice between a certain outcome and one which entails a possibility of loss (though this possibility is known and quantifiable) he or she selects the certain outcome.

Operational: For the purposes of this study, a person is considered to be risk-averse when he or she practices safer sex as it is defined above.

*Loss*

Constitutive: The act of being deprived of or failing to win (Morris, 1969).

Operational: For the purposes of this study, loss will be defined as any outcome that decreases an individual's position in relation to his or her perceived positive sexual health status.
*Gain*

**Constitutive:** To become the owner of, to acquire, to obtain, to get (Morris, 1969).

**Operational:** For the purposes of this study, gain will be defined as any outcome that increases or maintains an individual's position in relation to his or her current perceived positive sexual health status.
The Development of Prospect Theory

In 1979, the psychologists Kahneman and Tversky published the first of what was to become a decade of articles on prospect theory, an adaptation of classical expected utility theory, the theory underlying much of decision making scholarship to that point and beyond (Plous, 1993). Kahneman and Tversky's adaptations of the theory were, like many before them, designed to explain why persons violated axioms of rational decision making, or made apparently irrational choices, sometimes even consistently (Bazerman, 1990). In the case of Kahneman and Tversky, one particularly perplexing problem was why individuals' preferences whether to accept a certain outcome or to take a risk, would sometimes reverse with the way the decision problem or gamble was presented, even when no change in probability or outcomes occurred (Kliendorfer, et al., 1990). According to expected utility theory's axiom of invariance, the context in which a problem is presented should not affect the option that the decision maker chooses, yet violations of this sort are regularly observed. The following is an example used by Kahneman and Tversky to demonstrate just such an error: Imagine that you face the following pair of concurrent decisions. First examine both decisions, then indicate the options you prefer.
In the preceding example, 84% of the 150 subjects given the problem chose option A in the first decision, yet 87% reversed their preference for the certain outcome and chose option D in the second decision, clearly demonstrating the tendency of decision makers to violate the invariance principle of expected utility theory.

In Kahneman and Tversky's 1979 article, "Prospect theory: An analysis of decision under risk," the scholars expanded on the traditional utility theory of decision making by postulating that, when faced with a decision that involves uncertain outcomes, decision-makers first go through a process of editing the decision problem and then follow up with evaluation of the result (1981). According to Kahneman and Tversky, during the editing process decision makers simplify the problem after consciously or unconsciously establishing a particular perspective on the problem, what the scholars define as the decision maker's "reference point." Much like the adage of viewing a glass of water as half-full or half-empty, while the perspective that the decision maker takes does not impact the specific quantities involved, this reference point does impact how the decision maker behaves toward that quantity. Kahneman and Tversky posit that, while the reference point adopted by the decision
maker is often based on his or her sense of present status, a number of factors can influence where the reference point is established including factors external to the decision maker such as how the problem is presented (1981). Whatever determines this reference point, however, once in place it marks the neutral point or point of zero value above and below which the next operation, evaluation, takes place.

Once the initial process of problem editing is completed, Kahneman and Tversky hypothesize that decision makers evaluate options in terms of gains and losses relative to the reference point established above (1981). This is where prospect theory's second major revision of expected utility comes in. The units of gain or loss involved in the valuation of prospects, what Kahneman and Tversky define as the "value" of an outcome, are not equivalent but rather, when plotted, take on an S-shaped function whose median is the neutral reference point. This S-shaped function is steeper in the negative realm, meaning that loss units are experienced more intensely than the same units of gains, and the outer reaches of both ends of the curve level off significantly suggesting that increases of gain or loss are no longer met by similar increases in value, meaning that above a certain point, equivalent units of gain or loss do not yield the same emotional impact (1979).

The final major revision of expected utility theory incorporated in prospect theory is a nonlinear function for probability. Though not nearly as pronounced as the curvature of the concave and convex functions for gains and losses, the function for probability deviates from a true diagonal line enough to account for another apparent anomaly of many decision makers' evaluations of prospects, that outcomes of low probability are often over-weighted or treated as more likely to occur than strict
probability suggests. The nonlinear function also accounts for the opposite effect, the under-weighting of high probabilities, though this latter effect is not as pronounced as the former (1979).

By introducing these revisions on expected utility theory, Kahneman and Tversky were able to account, not only for decision makers' tendencies to be risk averse, but also for violations in the invariance principle that had been demonstrated through framing effects (Plous, 1993). While another offshoot of expected utility theory called Regret Theory could account for the risk aversion demonstrated in many decision situations, regret theory predicts consistent risk aversion. With prospect theory, Kahneman and Tversky were able to more finely predict loss aversive behavior (Kliendorfer, 1992). The "S"-shaped curve suggests that decision makers will be more likely to reject risky behavioral options when the outcome is framed in terms of relative advantages or gains, and conversely, they will be more likely to choose risky behavioral options when the outcome of these options is framed in terms of relative disadvantages or losses (Kahneman & Tversky, 1981).

Prospect theory's flexible reference point, "S"-shaped value function and nonlinear function for probability can account for a number of other apparent deviations from maximization of utility commonly observed among decision makers. The impact that context can have on decision makers' choices as seen in the examples from Kahneman and Tversky and from Bazerman, above, demonstrates one such effect, commonly described as the "framing effect" (Plous, 1993). Other departures from expected utility theory include what are called the "endowment effect" and the "certainty" and "pseudo certainty" effects (Plous, 1993). The "endowment effect"
describes decision makers' propensity to assign a higher value to what they perceive that they own than they do to the same object or entity when it is not perceived to be a part of their belongings or "endowment." As Quattrone & Tversky (1988) describe, negotiators often struggle with the "endowment effect" as members of opposite sides of a conflict tend to evaluate their concessions as worth more than their opponents', even if the concessions are the same. In another example of loss aversion due most probably to the endowment effect, Quattrone & Tversky (1988) describe what in elections is often called "the incumbent advantage." The authors argue that voters will often choose to re-elect an official whose performance is familiar rather than taking the risk of electing someone whose performance is not known since the former choice involves a loss of something known, which is perceived as more valuable than the possibility of gain from an unknown. Finally, Plous (1993) points out how advertisers often capitalize on the "endowment effect" by offering consumers 30 day trials with products, long enough for the consumers to develop a sense of ownership of the product, thus increasing its perceived value and making the amount the consumer pays for the item seem to be less than the value that the consumer perceives it is worth.

While, according to expected utility theory, the absolute value of something should not be affected by ownership status, prospect theory's notion of losses and gains with their unique value functions can explain why one would be reluctant to give up (or to lose) something if he or she were only compensated according to the value of that same entity when perceived as a gain. This same "S"-shaped value function accounts for decision makers' tendency to accept what would otherwise be an unacceptable risk as when bettors, facing the prospect of returning home from the race
track with depleted funds (i.e. losses) will stake money on the last bet even though it presents odds that, if not evaluated in terms of the day's losses, would be unacceptably low (Kliendorfer, 1992).

Another propensity of decision makers that is contrary to expected utility theory but predicted by prospect theory is called the "certainty effect." Exemplified by Zeckhauser through a decision making situation involving Russian roulette, subjects were asked how much they would be willing to pay to remove a single bullet from the cartridge of a gun they would then use in Russian roulette (Plous, 1993). Contrary to what expected utility would predict, what researchers found was that people were willing to pay considerably more to remove the only bullet from a gun than to remove one of a number of bullets in the gun, though the former case reduces risk no more than the latter. Researchers found the same effect when they presented subjects with options to reduce their insurance premiums in return for partial, probability-based policies where chances of recovering after a loss were commensurate with the premium paid (Kliendorfer, 1993). Subjects consistently undervalue options that reduce but do not alleviate risk even when those options are equivalent to reductions, which do lead to zero risk. A related effect, called the "pseudo certainty effect" describes decision makers' willingness to choose options that only appear to alleviate risk by reducing risk to zero in one area though a related, concomitant area still represents risk. If, when presenting probabilistic insurance, researchers reduced coverage in one area such as fire but not in another, such as earthquake, decision
makers were more likely to accept the offer though the risk was, in effect, not reduced from the risk they rejected with similar premium reductions in the certainty case (Kliendorfer, 1992).

Kahneman and Tversky's prospect theory is able to account for a number of anomalies, which expected utility theory cannot. Whether watching decision makers accept rebates for cash that they would reject if presented as credit card surcharges, or whether watching consumers seek insurance at all when premiums could never equal actuarial costs if the industry was to survive, unlike normative theories of choice, descriptive models such as prospect theory attempt to account for how humans do make decisions, including why systematic violations of the axioms of expected utility theory persist (Plous, 1993).

Theoretical Applications Within Health Education

As the preceding examples suggest, principles of prospect theory can be applied to any number of decision making situations, from persons making the decision to buy or sell goods to decisions involving insurance coverage or matters of personal as well as public health. One widely cited example of the framing effect is, in fact, presented through a problem involving a hypothetical public health decision:
Imagine that the US is preparing for the outbreak of an unusual Asian disease, which is expected to kill 600 people. Two alternative programs to combat the disease have been proposed. Assume that the exact scientific estimate of the consequences of the programs are as follows:

If Program A is adopted, 200 people will be saved.
If Program B is adopted, there is a 1/3 probability that 600 people will be saved and a 2/3 possibility that no people will be saved.

Which of the two programs do you favor?

Now consider the same scenario but with the following outcomes:

If Program C is adopted 400 people will die.
If Program D is adopted there is a 1/3 probability that nobody will die, and a 2/3 probability that 600 will die.
Which of the two programs do you favor?

(Kahneman & Tversky, 1981, p. 453)

While both scenarios offer the same outcomes in terms of absolute lives saved and lost, subjects choose program A more often (72%) when options were presented as lives saved or gains, but reversed their preference, choosing option D more often (78%), when the same options were presented in terms of lives lost.

The example above highlights preference shifts due to framing effects thus demonstrating prospect theory's applicability to decision situations in the realm of public health. Another problem, used by McNeil, et al. (1982) explores whether a framing effect can be observed in a decision situation involving personal rather than public health. In their decision problem, McNeil et al. ask subjects to assess hypothetical treatment choices for patients with lung cancer:
Problem 1: Choose A or B. Option A, Surgery: Of 100 people having surgery, 90 live through the post-operative period, 68 are alive at the end of the first year, and 34 are alive at the end of 5 years. Option B, Radiation Therapy: Of 100 people who have radiation therapy, all live though the treatment, 77 are alive at the end of the first year, and 22 are alive at the end of 5 years.

Problem 2: Choose A or B. Option A, Surgery: Of 100 people having surgery, 10 die during surgery or the post operative period, 32 die by the end of the first year, and 66 die by the end of five years. Option B Radiation Therapy: Of 100 people having radiation therapy, none die during the treatment, 23 die by the end of one year, and 78 die by the end of five years.

(McNeil, et al., 1982)

When presented with the problem above, the researchers found that respondents more often chose option A, surgery, in Problem One but option B, radiation, in Problem Two, though the prognosis associated with the options in both problems are identical. What changes between Problem One and Problem Two is that the treatment results in the first are presented in terms of survival rates or gains, while in the second they are presented in terms of mortality statistics or losses. The effect of framing in this problem is also robust, with individuals choosing radiation 18% of the time with the survival frame to 44% of the time with the mortality frame. When researchers tested this problem on surgeons and other health care professionals faced with making such decisions in real life situations, the effects of framing were still robust.

The preceding problems suggest that prospect theory's framing postulate can be applied in the realm of personal as well as public health. While both of the health-related decision problems discussed so far involve simulated situations designed specifically to evoke violations of intransitivity should subjects have the propensity to
do so, their findings, and those like them, serve to sensitize decision makers to
decisional influences of which they may not be aware. An important example of a
study based on a simulated problem that ultimately provides important information for
real world decision makers is Levin and Chapman's 1993 study on resource allocation
for the treatment of AIDS and leukemia. After asking subjects first to evaluate
probabilities regarding risks and positive outcomes for the treatment of AIDS and
leukemia and then to allocate resources accordingly, Levin and Chapman found that
the framing effects observed were sensitive to the value the decision makers placed on
the group of individuals who were to receive the treatment. While fairly robust
framing effects were observed when subjects made decisions about treatment for
individuals with leukemia or those who contracted HIV through legal or more socially
acceptable venues such as blood transfusions, no framing effect was seen when the
treatment recipients were described as "people who inject drugs" or "gay or bisexual
men." The authors concluded that subjects' apparent indifference to risky options
involving people who use IV drugs and gay and bisexual men was a result of their
indifference to the welfare of people in those populations in general. In this way, the
results of a framing effect study based on a simulated health decision making problem
provided important information both for those who study decision making, that the
lack of an observed framing effect may not mean that the theory does not stand, and
for those who make decisions in real world situations, that individuals' preconceptions
or prejudices may impact their decision making processes even before they begin to
assess outcomes and probabilities.
Still, while, as Rothman et al. (1997) suggest, framing effects (or a significant lack thereof) are commonly observed when decision makers are presented with hypothetical situations involving the assessment of explicit probabilities of stated outcomes, results are not quite so clear when studies move from shifting subjects' decisions about simulated health-related situations to shifting subjects' decisions to take or to reject risks involving their actual health behaviors. The authors argue, however, that message framing can and does have an influence on personal health behavior, and one that can be operationalized and tested at that, as long as the nature of the behavior, the decision maker's willingness and ability to accept the framed message, and factors such as previous experience and/or the social context that shape the value decision makers place on the behavior, are considered.

Rothman et al (1997) divide health behaviors that are commonly addressed in health promotion into three categories: those that are performed to treat or to facilitate recovery from disease; those that are performed to detect disease; and those that are performed to prevent disease. Examples of studies in the first category include Lauver and Rubin's (1990) use of message framing to promote follow-up visits for women who received abnormal PAP results. In this particular study, the recommendation to seek treatment and more definitive diagnosis of persistent abnormalities in PAP results through a procedure called a colposcopy was presented to women in either a loss- or a gain-framed format. The authors' hypothesis was that, since the risky behavioral option in the case of follow-up treatment was not to have the treatment, women who received information presented through the gain frame, thus eliciting risk-aversion, would be more likely to follow through with the procedure. The results of the study,
however, were not conclusive as the majority of women who received the recommendation, whether that recommendation was framed in terms of losses or gains, returned for the procedure anyway, thus providing insufficient variability between the groups to observe a treatment effect. Other studies of treatment decisions apply the framing postulate to cancer treatment decisions much as in the lung cancer treatment hypothetical above, but do so in retrospective studies following surgeons whose tendencies are to present options in terms of gains or losses.

While there are a few studies dedicated to exploring the effect of message framing on real life treatment decisions, the potential for ethical conflict inherent in such studies limits how much they can do. The majority of studies on the use of message framing to promote health-supportive behavior fall into Rothman et al's (1997) second category, the promotion of disease detection behaviors. Examples of such studies include using framed messages to promote HIV antibody testing (Kalichman & Coley, 1995), mammography (Banks, et al 1995), breast self exam, (Meyerowitz & Chaiken, 1987; Meyerowitz, Wilson, and Chaiken, 1991), blood cholesterol screening (Maheswaran & Meyers-Levy, 1990), and skin cancer screening (Block & Keller, 1995). The results of most of these studies reveal fairly robust framing effects. For example, in Kalichman & Coley's 1995 intervention to promote HIV antibody testing among African American women, researchers found that loss-framed messages designed to highlight what program participants stood to lose by not undergoing an HIV antibody test were three times as likely to have sought HIV antibody testing within the two weeks following the intervention than participants in either of the study's other two treatment groups. In another example of framing used to
promote a disease detection behavior, researchers found that subjects exposed to loss-framed messages on BSE were significantly more likely to have performed BSE within the two months following the intervention than subjects exposed to gain-framed or neutrally-framed messages (Meyerowitz and Chaiken, 1987).

An important conclusion reached by many researchers of detection behavior studies (c.f. Rothman, et al 1997; Rothman, et al. 1996; Meyerowitz, et al 1991) is that the effectiveness of loss-framed messages in prompting subjects to participate in detection behaviors depends upon how the subjects perceive the behavior prior to the intervention. While, as Rothman et al. (1997) point out, any health behavior can be presented through either loss or gain frames (i.e. mammography can be seen as a procedure designed either to detect disease or to establish that a woman's breasts are healthy) the effect of loss framed messages on promoting future health behavior was evident only when subjects perceived that the procedure involved risk (the possibility of detecting disease) rather than gain (the possibility that one's health could be affirmed).

The question of how subjects perceive a health behavior, whether as involving gain or loss or certainty or risk, is central to studies involving message framing. Most studies in Rothman et al's (1997) second category, health screening behaviors, follow the generally accepted perspective that the purpose of health screening is to detect disease rather than to establish health. This perspective makes participating in health screening a risky proposition in so far as persons who prior to the screening perceive themselves to be healthy risk losing their perceived positive health status should screening detect that they have a disease. While Meyerowitz and Chaiken (1987)
acknowledge that for some, not participating in screening is the risk-tolerant alternative in that persons are risking the chance that undetected disease may be allowed to progress, the researchers point out that with most people, the most immediate loss is the one which carriers with it the most power to persuade, hence making the performance of BSE the risky alternative. Consistent with what is predicted by prospect theory, individuals who perceive screening as a risk behavior are more sensitive to loss-framed arguments than persons who perceive health screening as a health affirming behavior.

Just as most subjects conceptualize screening behaviors as risky behavioral options, the opposite seems to be true when subjects consider the behaviors in Rothman et al's (1997) third and final category, those that prevent illness and protect health. Studies of prevention behaviors ranging form the use of car seats for infants to the use of sunscreen, condoms, and even to adherence to exercise programs explore the impact of framing on behaviors that are not conceptualized as involving risk. While findings from these studies are not as conclusive as those observed from loss framing with disease detection behaviors, conveying information about health protective behaviors through gain frames does appear to be effective.

The Role of Message Framing in the Decision to Practice Safer Sex

The topic of the study addressed in this dissertation, whether message framing can promote adherence to safer sex practices, can be classified within the category of prevention/protective behaviors. Still, just as BSE is clearly a detection behavior but may not be conceptualized by all subjects as a risk-tolerant behavior, the question of
how subjects' initially conceive of protection behaviors for sexual health, whether as involving risk or not, is often unclear. Rothman & Salovey (1997) note a unique feature of safer sex behaviors, that subjects may not only conceptualize the risk involved in the behavior differently, they may actually assess the risk according to completely different reference points. While for some individuals, especially health educators, safer sex is seen as a risk-averse behavioral option in that it is practiced to avoid disease, for others, the decision to practice safer sex may be based on entirely different criteria such as potential gains and losses in sexual pleasure or in security within the relationship or in moral convictions (c.f. McDermott, 1998; Flora & Thoresen 1988).

Ironically, if Meyerowitz & Chaiken's (1987) argument that the immediacy of a consequence determines its salience and hence the subject's reference point is applied in identifying the risk involved in the decision to practice or not to practice safer sex, the alternative that poses the most immediate risk could very well be seen as practicing safer sex in that it involves, at the very least, the risk of reducing the pleasure of the sexual experience (Meyerowitz & Chaiken, 1987; Rothman and Salovey, 1997).

As scholars such as Green & Kreuter (1991) suggest, health messages are most effective when presented in culturally sensitive and culturally accessible ways. Though to a health educator, the most salient risk in a given situation might be a potential risk to one's health, to a teenager, for example, the riskiest option may be that which involves the most resistance to perceived peer norms or that which involves the most direct communication or the most sexual skill. Stall, et al.'s 1988 review of
factors associated with the practice of safer and unsafe sex do suggest that health, while sometimes a consideration involved in the decision not to practice unsafe sex, does not seem to be as important as other such non health-related factors as pleasure, peer acceptance, image management and anxiety reduction in the decision to practice safer sex. McDermott (1998), referring to a study by Flora & Thoresen (1988), asserts that there are a "myriad" of "sources driving sexual behavior. Considering the number of potential reference points that could be employed in a decision situation involving sex highlights an advantage inherent in prospect theory, that unlike health-driven theories such as the health belief model (Hochbaum, 1958) where positive health status is assumed to be the highest value, prospect theory can be adapted to incorporate a variety of salient values, once these values are identified. (McDermott, 1998)

The problem remains, however, that perceived risks must be correctly identified before any application of prospect theory can be made and thus before we can begin to evaluate the efficacy of the theory when applied to health education interventions. It seems as if there are at least two ways to address the problem of identification of individual's or target group's perceived salient outcomes and hence applicable reference points. The first way would be to engage in some sort of information-gathering process that would allow researchers to identify and then to rank subjects' safer sex-related concerns. While Meyerowitz and Chaiken (1987) did conduct a pilot study to explore subjects' concerns about performing BSE and hence to support the assumption that short term risks were most salient in the decision-making situation, with an activity such as sexual intercourse that is not typically health-
directed, the range of perceived risks and potential outcomes could appear overwhelming. Still, those familiar with the application of value expectancy theories such as theory of reasoned action (Fishbein, 1967) expect to dedicate energies to identifying and prioritizing values and concerns. Processes for systematic identification of issues are fairly accessible, and some, such as Carter et al's influenza vaccine study (1990), are described through the process of carrying out other health education-related programming concerns.

A second way to address the problem of identifying the initial reference point around which message frames should be manipulated is to establish the reference point for the subjects, such as was done when Meyerowitz and Chaiken (1987) provided subjects with brochures written to highlight positive, negative and neutral message frames. The potential problem when this approach is applied to the practice of unsafe sex is that the decision situation presented in the pedagogical effort may very well not reflect the process that the intervention participant will actually engage in when attempting to avoid unsafe sex with a prospective sexual partner. As Fishbein et al. (1967) emphasize again and again (and others have since then, (c.f. Bandura, 1994; Bandura 1990)) skills need to be learned in contexts as close as possible to those in which the skills will be practiced. The importance of matching the context of skill practice to the context where the actual skill will be needed becomes clear when we consider how one element of the decision context, for example, the change of relationship status from a prospective monogamous partner to a stranger or to one's spouse, may drastically alter the dynamics of the situation (Bandura, 1994; 1990). The positive side, however, is that by establishing the reference point for the subjects, the
researcher can actually manipulate the message frame thus meeting criteria for a true experiment (Campbell & Stanley, 1963). The study comprised by this dissertation incorporates both approaches. Central to the study is an intervention which establishes the reference point for the behavior, that of safer sex as a health-protective measure. Still, the study instrument also contains a list of issues subjects consider when making the decision to engage in or to avoid unsafe sex and directions for subjects to rank order them. Chi-square analysis between actual behavior and reported values or perspectives can then be computed.

The research design and methods used in the study intervention are drawn from Meyerowitz and Chaiken's (1987) BSE study, one of the earliest studies involving health behavior and message framing. Just as in the BSE study, where despite initial intuitions to the contrary, the ostensibly health-protective behavior was identified as risk-tolerant, so in the present study, the practice of safer sex is identified as risk-tolerant. The design of the intervention itself, i.e. the use of brochures with differently framed argument panels followed by an immediate post-test reflecting intentions and then later a longer term post-test assessing behavior also replicates Meyerowitz and Chaiken's 1987 study.

Review of Literature Related to Instrumentation and Measurement

The most substantial literature on the measurement of sexual behavior was developed during large cohort studies of gay men in the late eighties and early nineties. Designing instruments to address the sexual activities and key constructs associated with HIV risk behavior for gay and bisexual men, study participants were
asked whether they had engaged in any of 22 to 25 sexual activities ranging from unprotected insertive anal intercourse to mutual masturbation (Robert & Rosser, 1990). Response options to this list of activities were typically dichotomous (McKusick, et al., 1990) though sometimes Likert-type frequency scales were used (Robert & Rosser, 1989). The lessons learned from the design and large scale use of these instruments (in the MAC trials in the eighties, for example, cohorts of 300 men followed for multiple years were not unusual (Stall, et al., 1988)) are invaluable. Still, a review of this literature and of associated literature on the measurement of sexual behaviors among other groups suggests that the precision of population- and study-specific instruments is favored over standardized formats. It is for this reason that, while drawing from the extensive experience encapsulated in the MAC cohort studies and studies like them, the instrument to be used in this study will be designed especially for that purpose.

One of the defining features of instruments measuring sexual behavior is how comprehensive or behavior-inclusive researchers choose for them to be. In McKusick et al.'s 1990 study, for example, the researchers chose to use only unprotected insertive and receptive anal intercourse as their primary dependent measures, later reducing the two activities to one category after finding that behavior patterns between the two did not differ significantly. Studies such as McKusick's et al.'s then, did not address issues of sexual behavior in general. The focus of the study was on unsafe sex exclusively, so much, in fact, that some studies excluded from analysis all subjects who had not been sexually active during the period from which data were drawn (Adib, 1991; Stall, et al., 1988). Later studies, as mentioned above, listed a battery of "safer" and "unsafe"
sexual activities practiced by gay men. The advantage of this approach was that factors that seemed to support the practice of safer as well as unsafe sex were addressed. The drawback of this approach, however, was that lists of twenty-plus activities were difficult to manage. A common solution to this difficulty was to summate or in some other way collapse data derived from subjects' responses to the list of activities so as to form an index of sexual behavior for each subject (c.f. Robert & Rosser, 1989; Estrand & Coates, 1990; Adib, 1991).

Ironically, one of the greatest challenges in designing an instrument to measure sexual health-related behavior is how to identify which sexual activities to classify as safer and which to classify as unsafe. Taking the example of the role of monogamy in "safer sex," while most researchers agree that relationship status, especially mutual monogamy, is an important factor in the practice of safer or unsafe sex (c.f. Zapka, et al., 1990; Cantania, 1991), in some studies the practice of unprotected sex within an mutually monogamous relationship is considered safer sex behavior right along with the consistent use of condoms (Joseph, 1987) while in other studies the practice of mutual monogamy is considered unsafe sex (Adib, 1991). Researchers in the latter group choose to exclude unprotected intercourse in mutually monogamous relations from the safer sex category because many relationships characterized as monogamous were very short term and hence didn't decrease the likelihood of STI transmission. One study attempted to resolve the issue of long term mutual monogamy versus serial monogamy by asking subjects to consider as mutually monogamous relationships those that had lasted one year or more (Robert & Rosser, 1990). In the instrument to be used for this study, mutual monogamy is defined as a relationship in which two
people both agree to engage in sexual activity only with each other and then do so unfailingly. The issue of how the subject defines mutual versus serial monogamy is avoided by asking subjects who report that they are in mutually monogamous relationship to enter the length of their current relationship and the number of similar relationships they have had in the last year and in their lifetime.

Another important issue in the design of instruments drawing data on sexual behavior, or really any health behavior, from self report is how long to make the recall and follow-up periods. In their review of literature on safer sex behavior among gay men, Stall, et al. (1988) note that many studies ask subjects to report on behaviors in different recall and follow-up periods, making comparisons between studies difficult. Typical follow-up periods in the HIV prevention literature drawn from longitudinal studies of large cohorts of gay men are one, six, and twelve months. Typical recall periods are one and three months (Stall, 1988). The assumption is that the most accurate reports are based on one month recall, but the most representative reports (i.e. those least likely to be skewed by situational factors including recency of intervention participation) are drawn form one year. Some studies combine two optimal periods by collecting data annually on subjects' sexual behaviors in the last month (Stall, 1988). Because college students' level of sexual activity may very well be influenced by what is going on in the academic calendar at any time, a one month recall period comprising a school break may elicit a very different pattern of sexual behavior than one comprising time when school is in session. In order to avoid this potentially confounding factor, a three month recall period will be used.

A review of literature on the measurement of sexual behavior highlights two
other important considerations for instrument design. The first issue is that not all sexual behavior reported by a subject may be the result of a clear decision to do so on his or her part. Gathering information about the use of intoxicants either prior to or during sex is common practice in almost all instruments measuring sexual behavior. Another issue more often discussed in relation to the sexual behavior of youth and/or college students is the role that coercion can play in the practice of sex. While even a thumb nail account of the role of coercion in the decision to have sex, especially unsafe sex, is beyond the scope of this study, questions on whether subjects have coerced or have been coerced into having sex as well as questions on intentions to learn to be more assertive when being pressured to have sex have been included.

Finally, one of the most important contributions to instrumentation in sexual behavior research is the notion of behavior change as a process that leads to but comprises much more than the consistent practice of safer sex. As smoking cessation studies based on Prochaska's "stages of change" first pointed out, progress in the adoption of a health-supportive behavior or the elimination of a behavior that is deleterious to health can't be effectively measured through dichotomous variables (Grimely, 1997). Prochaska et al. went on to identify distinct stages and processes of change that were then applied to a number of behaviors including the practice of safer sex (1994). While again, determining exactly where subjects stand in relation to these stages is beyond the scope of this study, the notion that behavior change is developed through a process has been preserved and operationalized through items asking subjects about their practice of behaviors which lead to or support their practice of safer sex.
Summary

Kahneman and Tversky's prospect theory seems as if it could very well be used to enhance the effectiveness of health education interventions designed to promote the consistent practice of safer sex. Studies such as Linville et al.’s (1993) involving judgments about the efficacy of condoms suggest that subjects are sensitive to framing effects. Studies involving other health-protective or illness-preventative behaviors have also demonstrated increased adherence to the behavior, though the effects of this are clearly mediated by subjects' value of and prior experiences with the behavior and/or illness addressed. What follows is a discussion of a safer sex intervention designed to explore whether prospect theory's framing effect can positively impact the safer sex intentions, attitudes and behaviors of a convenience sample of college undergraduates.
CHAPTER 3
RESEARCH METHODS

Introduction

The theoretical foundation of this study is derived from Kahneman and Tversky's prospect theory (1979). Seminal constructs are what Kahneman and Tversky describe as a decision maker's "reference point" which contributes to whether a decision situation is evaluated from either a gain, loss, or a neutral decision "frame." (Constitutive and operational definitions of key terms are presented in Chapter 1 of this dissertation.) Because, as prospect theory postulates, the perceived value of gains or losses follows a nonlinear, actually "S"-shaped function, decision makers who evaluate a decision framed as a gain will tend to make decisions that are risk-averse while decision makers who evaluate a decision framed as a loss will be more risk-tolerant (Kliendorfer, et al., 1990). This study will explore the applicability of prospect theory's framing effect and nonlinear value function to a safer sex intervention through a series of differently framed brochures on safer sex.

Study Purpose

The purpose of this study is to determine whether subjects exposed to a negatively framed brochure on safer sex will respond more favorably on post-
intervention questionnaire items related both to their intentions to practice safer sex and to their actual practice of safer sex behaviors than subjects exposed to a positively or neutrally framed brochure, as would be consistent with the framing effect posited by Kahneman and Tversky's prospect theory (1979), when, as is done in this study, the practice of safer sex is constructed as a risk-tolerant behavioral alternative. Two secondary purposes are to characterize the sexual behavior and experiences of subjects at baseline, and to establish whether, apart from the intervention, subjects respond more favorably from the initial post-test to the ten week post-test on questionnaire items related to their intentions to practice and to their actual practice of safer sex behaviors.

**Hypotheses: Objective One, Intervention Effects**

**H₁:** *Immediately after receiving the intervention*, the mean safer sex intention scores of sexually active subjects exposed to a brochure stressing what can be lost by failing to practice safer sex will be significantly higher than the mean safer sex intention scores of sexually active subjects exposed to a brochure stressing what can be gained or maintained by practicing safer sex or to a brochure with no arguments at all.

**H₀₁:** *Immediately after receiving the intervention*, there will be no significant difference between the mean safer sex intention scores of sexually active subjects exposed to a brochure stressing what can be lost by failing to practice safer sex and the
mean safer sex intention scores of sexually active subjects exposed to a brochure stressing what can be gained or maintained by practicing safer sex or to a brochure with no arguments at all.

H₂: Ten weeks after receiving the intervention, the mean safer sex intention scores of sexually active subjects exposed to a brochure stressing what can be lost by failing to practice safer sex will be significantly higher than the safer sex scores of sexually active subjects exposed to a brochure stressing what can be gained or maintained by practicing safer sex or to a brochure with no arguments at all.

H₀₂: Ten weeks after receiving the intervention, there will be no significant difference between the mean safer sex intention scores of sexually active subjects exposed to a brochure stressing what can be lost by failing to practice safer sex and the mean safer sex intention scores of sexually active subjects exposed to a brochure stressing what can be gained or maintained by practicing safer sex or to a brochure with no arguments at all.

H₃: Immediately after receiving the intervention, the mean safer sex intention scores of intercourse-abstinent subjects exposed to a brochure stressing what can be lost by failing to practice safer sex will be significantly higher than the mean safer sex intention scores of intercourse-abstinent subjects exposed to a brochure stressing what can be gained or maintained by practicing safer sex or to a brochure with no arguments at all.
H₀₃: Immediately after receiving the intervention, there will be no significant difference between the mean safer sex intention scores of intercourse-abstinent subjects exposed to a brochure stressing what can be lost by failing to practice safer sex and the mean safer sex intention scores of intercourse-abstinent subjects exposed to a brochure stressing what can be gained or maintained by practicing safer sex or to a brochure with no arguments at all.

H₄: Ten weeks after receiving the intervention, the mean safer sex intention scores of intercourse abstinent subjects exposed to a brochure stressing what can be lost by failing to practice safer sex will be significantly higher than the safer sex intention scores of intercourse abstinent subjects exposed to a brochure stressing what can be gained or maintained by practicing safer sex or to a brochure with no arguments at all.

H₀₄: Ten weeks after receiving the intervention, there will be no significant difference between the mean safer sex intention scores of intercourse abstinent subjects exposed to a brochure stressing what can be lost by failing to practice safer sex and the mean safer sex intention scores of intercourse abstinent subjects exposed to a brochure stressing what can be gained or maintained by practicing safer sex or to a brochure with no arguments at all.

H₅: Ten weeks after receiving the intervention, the mean scores of sexually active subjects exposed to a brochure stressing what can be lost by failing to have safer sex will be significantly higher on questionnaire items related to their actual practice of
safer sex in the previous thirty days than the mean safer sex scores of subjects exposed to a brochure stressing what can be gained or maintained by practicing safer sex or to a brochure with no arguments at all.

$H_{05}$: *Ten weeks after receiving the intervention*, there will be no significant difference between the mean scores of *sexually active* subjects exposed to a brochure stressing what can be lost by failing to have safer sex on questionnaire items related to their actual practice of safer sex in the previous thirty days and the mean safer sex scores of subjects exposed to a brochure stressing what can be gained or maintained by practicing safer sex or to a brochure with no arguments at all.

**Hypotheses: Objective Two, Additional Safer Sex Behavior and Intention Change**

$H_6$: The mean *ten week post-test* safer sex scores of *sexually active* subjects will be significantly higher than the mean *baseline* safer sex scores of *sexually active* subjects.

$H_{06}$: There will be no significant difference between the mean *ten week post-test* safer sex scores of *sexually active* subjects and the mean *baseline* safer sex scores of sexually active subjects.

$H_7$: The total number of subjects who report having *risk averse* sexual relationship/activity statuses will be higher at *ten week post-test* than the total number of subjects who report having *risk averse* sexual relationship/activity statuses at *baseline*. 
**H₀⁷:** There will be no difference between the total number of subjects who report having *risk averse* sexual relationship/activity statuses at *ten week post-test* than the total number of subjects who report having *risk averse* sexual relationship/activity statuses at *baseline*.

**Additional Research Questions**

Question 1: Will the total number of subjects who occupy risk-averse sexual relationship/activity statuses be greater at ten week post-test than the total number of subjects who occupy risk-averse sexual relationship/activity statuses at baseline?

Question 2: From baseline to ten week post-test, will more subjects maintain or shift toward risk-averse sexual relationship/activity statuses than will maintain or shift toward risk-tolerant sexual relationship/activity statuses?

**Study Design**

This study uses what Campbell and Stanley (1963) describe as a *pre-test post-test comparison group design*. The target population is college students enrolled in one of two undergraduate sexual health-related courses at the Ohio State University in the Spring and Fall of 2000. Subjects will be randomly assigned to treatment levels; hence the unit of analysis for the study will be the individual subject. While subjects for this study constitute a convenience sample, (\(N = 231\)) what distinguishes this design from what Campbell and Stanley (1963) describe as the nonequivalent control group design...
is that the units of analysis are not intact groups but instead are individual subjects, each of whom will be randomly assigned to different levels of the treatment.

The primary independent variable in the study is level of intervention or which of the three versions of the study brochure participants are exposed to. The primary dependent measures in the study are subjects' immediate post-intervention safer sex-related behavioral intention scores (as measured in Section Three and Four of the instrument described below), subjects' 10 week post-intervention sexual behavior scores (as measured in Section One and Two of the instrument described below), and subjects' progress toward the consistent practice of safer sex as identified by differences in 10 week pre- and post-intervention scores on the measures above.

**Threats to validity**

Campbell and Stanley (1963) identify eight threats to the internal validity of an experiment, meaning potentially confounding variables, which may be mistaken for a treatment effect, and four threats to the external validity, or generalizability, of an experiment. The eight threats to internal validity are history, maturation, testing, instrumentation, statistical regression, selection bias, experimental mortality, and selection-maturation interaction. The four threats to external validity are interaction effects of testing, interaction effects of selection biases and the experimental variable, reactive effects of experimental arrangements, and multiple treatment interference. A discussion of the potential impact that these threats of validity could have on the present study and what will be done to minimize this impact follows.

Threats to internal validity represent the most serious threats to the credibility
of a study in so far as they may be mistaken for treatment effects and thus render the results of a study inconclusive at best and misleading or even baldly wrong at worst. When discussing threats to internal validity associated with a number of experimental designs, however, Campbell and Stanley give the pre-test post-test control group design very high marks. The fact that, with the particular study proposed here, all levels of treatment will be administered simultaneously and in the same classroom, and that subjects in all levels of treatment will be assessed simultaneously as well, decreases threats to internal validity even more.

The first concern, the threat to validity called history, refers to factors that occur between the pre- and post-test and which may impact subjects' responses, without being part of the actual treatment. While initially, measuring the potential treatment effects of an intervention on sexual behavior with students who have chosen to enroll in sexual health-related courses may seem a terrific threat to validity, the ability to compare responses among groups who have all participated in the course prevents this from actually being the case. While it is anticipated that a significant part of any perceived treatment effect in this study will be the effect of students participating in the course rather than participating in the intervention, this effect should be observed equally across all groups, whereas true treatment effects should be seen only in differences in scores between groups assigned to different treatment levels. Also, having one researcher administer all levels of treatment simultaneously in one classroom clearly minimizes what Campbell and Stanley (1963) describe as "intra-session history," the potential effects of teacher differences, classroom differences, events occurring in one classroom but not the other, etc.
Just as it is anticipated that there will be a considerable effect from history, so there may very well be an effect from testing as well. Considering that, after students complete a pre-test asking about their sexual attitudes, intentions, and behaviors, things that they may never have tried to report much less assess, they participate in a short intervention on safer sex followed by attendance, for ten weeks, in a sexual health-related course (all the while, perhaps, reconsidering their responses on their pre-test) their post-test scores will almost inevitably be impacted. The issue again, however, is that all groups should experience this sensitization to the same extent; an effect that is seen equally among all groups will not, by definition, appear as an effect seen between groups.

The virtue of randomly assigning subjects to level of the treatment is that it helps to differentiate a number of confounding influences from the effects of the treatment. The threat to internal validity of maturation is avoided in this same way, since subjects in equivalent groups should mature or tire or evolve in similar ways, as are the threats of selection and selection-maturation interaction. The one caution here, however, is that random assignment and use of comparison groups clearly will not be as effective when used with smaller sample sizes.

Because valid and reliable pen-and-paper instruments will be used to measure any treatment effects, and because these instruments will be administered simultaneously to all groups, threats to validity through instrumentation will also be minimized. Because subjects will be randomly assigned to treatment levels and hence have not been selected or assigned because of particularly extreme scores on any variable, regression effect should also not be too much of a concern. If, however, the
researcher were to perform analyses on subgroups or "strata" of study participants who have been divided according to similar characteristics, such as recent participation in safer or unsafe sex, regression may become a threat to validity. Careful work to insure the reliability of the instruments used to measure treatment effects should help to mitigate this effect.

Finally, a threat of particular concern in research, the threat of experimental mortality, must be addressed. One advantage of administering the intervention and pre- and post-tests to students enrolled in a college course is that the chances of subjects remaining accessible to the researcher through the intervention and for follow-up evaluation are much better than the chances would be, for example, with a group of subjects chosen randomly from the student population. Clearly, however, using a convenience sample of students enrolled in sexual health-related courses means that the sample is not representative, a concern that will be addressed in the discussion of external validity. Still, considering the sensitive topic of this particular study and the very personal nature of the questions, administering the intervention to students who have elected to take a course dealing with just such issues greatly increases the chances that subjects will consent to participate. Since some mortality, however, is to be expected because students drop the course due to schedule changes or academic demands, etc. baseline data from those for whom no post-test is available can be analyzed to see if these individuals differ significantly from those who complete the post-test.

The threats to external validity, or the generalizability of results to other populations, are perhaps the weakest part of this proposed study. While random
assignment suggests that the groups within the classroom are equivalent, there is no way to say, with a convenience sample, that the groups in the classroom could be considered to be representative of college students as a whole or even of the student body of this university or students who enroll in these classes. While not using a pre-test may help to avoid the pre-test becoming a threat to external validity, the data the pre-test offers on characteristics of the sample seems more important at this initial point. Though the effect of the pre-test could be estimated by using what Campbell and Stanley (1963) describe as the Solomon four design, where each level of treatment is divided into pre-tested and not pre-tested groups, achieving sufficient sample sizes within each level would mean drawing subjects from other classrooms on the campus and hence jeopardizing what is a strength of this design, its internal validity.

Other potential threats to external validity include any historical conditions affecting subjects, in this case, perhaps, news items referencing increasing rates of STIs in the population could very well interact with the treatment making the results difficult to generalize to groups who did not experience the same historical events. Interaction of treatment and maturation, such as whether subjects participated in the intervention or took the post-test during finals week and hence might be tired, could also threaten generalizability if later groups participated when they were not tired. The very fact that students know that they are participating in a study may impact how they respond to the intervention and subsequent testing, making results difficult to generalize if later students are not involved in a study when they are exposed to the treatment. The effect of differential mortality can also limit the populations to whom we may generalize. In order to minimize, at least somewhat, these threats to external
validity, descriptive data will be gathered so as to characterize the subjects involved. To enhance replicability of the study, thus compensating for the non-random sample by allowing the study to be replicated with other populations, the sampling and data collection process as well as the intervention and data analysis will be carefully documented.

The Intervention

The intervention for this study will be based on three versions of the same safer sex brochure. One version will be what is called a positively framed version, one will be what is called a negatively framed version, and one will be what is called a neutrally framed version. In the cover and all inside panels but one, the three versions of the brochure will look the same. The only difference between the three versions will be a code on the back designating which of the three levels of treatment the brochure represents and an inside panel which for the positively framed group will list five benefits of having safer sex and for the negatively framed group will list five things that may be lost if the student does not have safer sex. The panel on the third brochure will be blank.

For the intervention, after being randomly assigned one of the three safer sex brochures, subjects are asked to read, consider, and respond to the brochure in writing. Response prompts include the following: "list as many tips on what not to do with a condom (male and female) as you can remember" and "list as many of the brochure's arguments on why it's a good idea to practice safer sex as you can recall."
After reading and considering their brochures and responding to the prompts, subjects are told to store their brochures with the course supplies that they regularly bring to class. On two occasions in the next ten weeks of class (at week four and week seven) subjects are again asked to read, consider and respond to their brochure in writing. The brochure used in the intervention is an adaptation in both design and content of two safer sex brochures: *Condoms, Contraceptives, and STDs: Does your birth control protect you from sexually transmitted disease?* (1994) produced by the American School Health Association (ASHA) and *The Safer Sex Condom Guide* (1992) produced by the Gay Men's Health Crisis (GMHC). The section titled "The right way to use a condom" and the passages on the male and female condoms and dental dams are quoted directly from the ASHA brochure. Much of the section titled "Condom Facts" is quoted directly from the GMHC brochure. The term "rubber" however, used in the latter brochure, has been substituted for the word "condom" throughout the present study materials. These brochures were chosen as models because they present accurate information on safer sex, they are written for sexually active younger adults, and they are sensitive to the perspectives of a variety of readers, including individuals who are gay, lesbian or bisexual and/or individuals who are members of under-represented racial or ethnic communities. Neither brochure takes an explicit moral or religious stance, and the ASHA brochure discusses abstinence as well as alternatives to unsafe sex. These brochures are also widely disseminated on college campuses and as such represent a standard in the field.
Conditions of Study

On the first day of class, the researcher will distribute study packets containing the study questionnaire, the study brochure copied in a different color for visibility, and an article on safer sex and college students. The article is included for subjects who choose not to participate in the study as an alternative means to address the pedagogical objectives that participation in the study would otherwise meet. Subjects who finish early will also be encouraged to read and to consider the article. The questionnaire will be preceded by the cover sheet, described above, which will be used to match pre- and post-intervention responses. Study packets will also include a circular adhesive label which subjects will use to "seal" the packet once they have completed their responses.

After study packets are distributed, the researcher will read the study administration script out loud, point to the list of important definitions and to the article in the study packet, and insure that subjects are aware that the instrument collection box is in the back of the classroom by the door.

Once these initial administrative tasks are finished, subjects will be asked to complete a pre-test consisting of Section One, Two and Five of the study instrument. Subjects will be told that after they complete the pre-test, they can then read and respond to the safer sex brochure in their packet and that, once they have, read, considered and responded to the brochure, they can complete a post-test consisting of Sections Three and Four of the study instrument. Subjects are told that they have one
hour to may complete the intervention and may do so in the classroom or outside. Subjects are told that those who choose not to participate in the study may return a blank instrument or return nothing.

Once the intervention hour has passed, subjects are asked to store their brochures with the course supplies that they regularly bring to class. On two occasions in the next ten weeks of class (at week four and week seven) subjects are again asked to read, consider and respond to their brochure in writing. en weeks after the initial intervention, the instrument will be administered again. The instrument administration script will be read, and subjects will be told that they have 25 minutes to complete the instrument and can do so in or out of the classroom. Subjects' attentions will be drawn to the questionnaire collection box at the backdoor of the classroom.

Data Collection

The data collection procedure will be as follows: for the first ten minutes of the first day of the specified course, the instructor will attend to administrative duties including taking roll. Beyond needing to complete these administrative tasks on the first day of class, attending to administration first will help to avoid having students who have trouble finding the classroom on the first day of class entering the classroom after the intervention has begun.

To insure that subjects' baseline responses are not influenced by participation in the sexual health-related courses, the intervention will be held on the first day of class before the course introduction. Subjects will be told that the data are being collected for a study on college students' sexual health practices and on their responses
to a brochure on safer sex. The instructor will leave the room when the questionnaire is administered to insure that students do not perceive pressure to participate. Because students with little sexual experience or students who choose not to participate may be inadvertently identified by how quickly they complete the questionnaire, an article will be provided at the end of the questionnaire and students will be encouraged to read it as soon as they complete their questionnaire.

As described above, subjects will be randomly assigned to one of three treatment levels. This random assignment will take place by giving alternating packets designating level of treatment to subjects as they have seated themselves in the classroom. So as to avoid the influence of peer pressure impacting subjects' choices whether or not to participate in the intervention, everyone in the room will receive a packet. Subjects will be told that if they choose not to participate, they may leave their questionnaire blank. Subjects will also be told that candid, honest responses will be the most helpful. To support compliance with candid responses, subjects will be told that they will have an opportunity to hear generally, about how their class responded to selected items on the questionnaire and that honest answers would be most meaningful. Finally, the proctor will demonstrate procedures used to insure that responses are anonymous and reinforce the fact that participation is entirely voluntary.

Once the initial script is read, subjects will be told to complete Sections One, Two and Five of the questionnaire. Since subjects who are not presently or have never been sexually active will take less time to complete the questionnaire than others, the proctor will suggest that subjects who are not completing the questionnaire or who finish early go on to read the article attached to the back of their intervention packet.
Subjects will be told (and this is also written on the cover sheet) that reading the attached article will allow them to consider the subject matter addressed in this study, a related article has been included at the end of this questionnaire for their perusal.

Once subjects have completed the pre-test, read the brochure, responded to immediate post-test prompts about the brochure content, and then completed Section Three or Four of the instrument, the study post-test, subjects will be told to store the brochure with their other course materials and then to tape the completed questionnaire closed with the sticker given to them and to insert it into a ballot-like box located at the door of the classroom.

On the last day of instruction for the quarter, ten weeks after the initial intervention was held, subjects will again complete the study questionnaire. Graduating seniors will be given their post-test with their early final. Non-graduating students who do not complete the post-test with the rest of the class will be given an opportunity to do so on the day of the final exam.

Sample and Sampling Method

The study population will be college students enrolled in one of four sections of two sexual health-related courses at the Ohio State University in the Spring and Fall of 2000. The sample is a convenience sample \((N = 231)\) comprising students attending the first day of the course in the quarter that data are collected and who agree to participate in the study. Agreement and consent are implied by participation after being informed about the nature, purpose and procedures of the study. Subjects will be randomly assigned to levels of the intervention. Prior to the intervention, packets for
the three levels of the intervention, each consisting of a study brochure and questionnaire, will have been stacked in succession (i.e. one for level one followed by one for level two followed by one for level three, and so on.)

Data on those choosing not to participate will not be collected, but since subjects will be randomly assigned, non-participation should occur equally among all three treatment groups. To determine whether there are any significant differences between those who participate in the pre-test and intervention but are not available for follow-up and those who are available for the whole study, data on those who complete pre-tests and participate in the intervention but who do not complete the post-test can be compared to those who did complete the follow-up.

Based on characteristics of students enrolled in previous sexual health-related courses at the same institution, the sample will comprise 2/3 female students and 1/3 male. Spring quarter, approximately 40% of these students will be graduating seniors. Although some academic units such as Family Relations and Human Development suggest that students take the human sexuality survey course, no students are required to do so. Students in Family Relations and Human Development typically comprise 2-3% of the enrollment in any given course. An average of 5% of those enrolled in the course are graduate or professional students. Because the course typically has a considerable waiting list, students who get spaces are more likely to be of upper class standing, to have a disability or disabilities, or to be recognized as scholars or athletes and hence given priority scheduling.
**Instrumentation**

*Description*

The study instrument is divided into five sections. Section One gathers demographic data as well as data on subjects' sexual health status, lifetime sexual experiences, and recent influences on sexual decision processes. Section Two of the instrument gathers data on the sexual behavior and relationship status of subjects who have had oral, vaginal, or anal sex in the last three months. Section Two also gathers information on subjects' sexual-health related interactions with their most recent sexual partners. Section Three of the instrument requests information on subjects' safer sex-related intentions with current sexual partners. For those subjects who have never had or do not currently have a sexual partner, Section Four requests information on subjects' safer sex-related intentions with prospective sexual partners. Subjects who have never had vaginal, oral or anal sex will be instructed to skip sections Two and Three. Subjects who have previously had vaginal, oral or anal sex but not in the last three months will be instructed to skip Section Three. Finally, Section Five of the instrument gathers information on subjects' safer sex-related knowledge, attitudes and beliefs. A copy of the study instrument is provided in Appendix D of this dissertation.

Because the topic of the study and hence the information requested in the study instrument is sensitive in nature, all data will be collected anonymously. In order to link pre- and post-test responses on the study instrument without requesting subjects' names, a cover sheet asking subjects to provide the following information will be used to identify pre- and post-test questionnaires completed by the same persons: the number of sisters and then of brothers that the subjects has; the first letter of the street
name of the subject's permanent home address; the last digit of the subject's local telephone number; the month that the subject was born; and the first letter of the subject's mother's maiden name.

Section One of the instrument is twenty-two items long and comprises four separate scales. Items related to demographic data include fill-in questions on the subject's age, number of previous male sexual partners, and number of previous female sexual partners and "select the most fitting category" items for questions related to subject's sex (whether male or female) self-identified race, and rank in school. The second scale, comprising questions related to subjects' sexual health history, asks whether subjects have ever been diagnosed with any of eight STIs listed. The response choices given for these items are "yes" and "no." The last two items of the scale ask subjects whether they have ever been exposed to an STI not listed, and if so, whether the STI is chronic. The purpose of this second scale is to identify subjects who may not approach sexual decision-making situations with a reference point or a perception of status quo as positive health status. The third scale requests information on subjects' lifetime sexual experiences, and the fourth scale explores recent influences on subjects' sexual decision-making processes. Both of these scales comprise factors which, should the intervention appear to be differentially effective within treatment groups or not to be effective at all, can be used to identify factors which may account for variability in the dependent measures. For clarity sake, definitions of the key terms "safer sex" and "relationship status" are provided on the first two pages of the instrument, right after the instrument cover sheet.
One challenge with instrument design in this study is making key definitions such as relationship status clear to subjects. Just as difficulties in defining something like sexual orientation have been avoided by asking subjects simply to provide information on their sex and then the number of female and male sexual partners they have had, so relationship status will be handled descriptively as well. Choices provided include the following: a mutually monogamous partner or one with whom the subject has agreed that both will have sex only with each other; a primary partner or the person with whom the subject has sex the most often although their relationship is not mutually monogamous; and finally, an "other" partner or a sexual partner who is neither the subject's primary or mutually monogamous partner. A similar, descriptive definition of safer sex is provided as well:

Safer sex means sexual activity that does not put participants at risk for contracting a sexually transmitted infection (STI). STIs can be transmitted when the blood, semen, vaginal secretions, and breast milk of one person comes in contact with the skin or mucous membranes of another. STIs can also be transmitted through mouth-to-genital and genital-to-genital contact.

There are three ways to practice safer sex. The first way is to abstain from all activity that might allow an STI to be transmitted. Activities such as deep massages or "outercourse" between persons who are clothed are examples of sexual activities that don't pose a risk for STI transmission.

The second way to practice safer sex is to always use a barrier like a condom or a dental dam when engaging in sexual activities that might pose a risk for STI transmission. Remember, practicing safer sex means using a condom or dental dam for oral sex as well as for vaginal and anal sex.
The third way to practice safer sex is to engage in any activity that might pose a risk for STI transmission only with a mutually monogamous partner and only after both partners have determined that neither one of you has contracted an STI from previous sexual partners.

Other scales used in the instrument are presented either in Likert-type format, such as the frequency with which a subject has done something in the last thirty days, a "select the most fitting category" format, such as self-identified race and relationship status, or questions on intention with possible responses of "yes," "no," "I already do this," or "not applicable." Likert-type responses for frequency lead respondents to choose something other than "middle of the road" responses by not incorporating a middle option. Frequency intervals are "always," "most of the time," "occasionally," and "never." Items in Section Five will be in multiple choice and true and false format.

Section Two of the instrument comprises 26 "select the most fitting response" items related to sexual behavior in the last three months and more specifically to subjects' current partners, if applicable. Section Three and Four address safer sex-related intentions and comprise 32 and 25 items respectively. Section Five on knowledge and attitudes comprises 24 items. Again, for the purposes of analysis, ordinal data gathered by the instrument will be treated as interval.

The 129 items of the instrument cover nine pages front and back. The section number is included at the top of each page, and section titles are presented at the beginning of each section. New sections always begin at the top of a page, and instructions, except for those differentiating between question-types in Section Five, are presented at the tops of pages as well. Important instructions, such as those
informing a subject to skip questions or sections, are underlined. Except where
subjects are asked to fill in a number such as with item #21 in Section One, which asks
subjects to fill in the number of sexual partners they have had in the past three months,
subjects respond by circling their choice. As for the time taken to complete the
instrument, the study field and pilot tests suggest that the study pre-test, comprising
sections One, Two, and Five of the instrument, takes subjects ten to fifteen minutes to
complete. The immediate post-test, consisting of either Section Three or Four
(depending on the subject's sexual experience and current relationship status) takes
between five and ten minutes to complete. The ten week post-test will require 20 to 25
minutes to complete.

_Instrument design_

The instrument used in this study was designed specifically to gather data
necessary to address the study's five hypotheses with a college sample. The instrument
design process was divided into five steps. The first step consisted of defining the
study's purpose, research questions, and constitutive and operational definitions of
seminal constructs. The second step was to define the study's primary and secondary
independent and dependent variables. As mentioned above, factors apart from the
effect of the intervention, such as age at first intercourse or number of previous sexual
partners, which, however, might account for significant portions of the variance in
dependent measures, were also identified and incorporated into the instrument. This
second step was approached twice during the design process: once in the beginning as
the study design was being drafted and then once again after the study was formally
proposed and then revised. The third step of the design process was to construct items and scales to measure the dependent variables identified in the previous stage. The content of most of the items used in the study instrument was identified through literature review, classroom experience, and previous, informal discussions with experts and individuals similar to those of the target population. At this point, an initial instrument was drafted and administered to one hundred students on the first day of a human sexuality course. While this initial draft of the instrument was almost entirely revised before the study field test was even begun, the process allowed descriptive data on the population to be gathered and then used in the final study design.

*Instrument validity*

Once a draft of the instrument had been completed, the process of confirming construct, content, and face validity began. The instrument was reviewed by a panel of seven persons who have expertise with either the study content, the target population, or the area of instrument design in general. Panel members were provided with a summary of the study, its statement of purpose, problem, research questions, hypothesis, and the constitutive and operational definitions of key terms, a draft of the study brochure, and a letter describing their role as members of the review panel and provided questions about the instrument which addressed each of their fields of expertise. Questions focused specifically on prospect theory, instrument design, the language arts, sexual health, college students, drug and alcohol use, and gay, lesbian and bisexual populations. Panel members were also asked to evaluate construct
validity or whether the items seemed as if they comprehensively and representatively measured their related constructs, and if the format, comprehensibility, and inclusivity of the items and of the instrument as a whole were satisfactory.

Instrument reliability

The challenges inherent in constructing an instrument that is discriminating enough to reflect variability inherent in dependent measure while general enough to allow data to be categorized usefully puts a great deal of strain on instrument reliability. The following reliability scores, calculated for each scale, suggest that the instrument was stable but not without room for improvement. The highest reliability scores were for Section Three and Four of the instrument, which solicited information on subjects' intentions to practice safer sex behaviors in the future. Cronbach's Alpha produced a reliability coefficient of .85 for Section Three and .87 for Section Four. That these were the higher of the instrument's reliability coefficients is logical since consideration of future behaviors does not, for the most part, involve all of the contingencies and challenges (both for the instrument and the subject) that are involved in reporting on actual behavior.

The reliability coefficient for Section 2 was .67 which, while below the goal of .8 or higher, was within the limits of acceptability (.6) set by scholars such as Fraenkel and Wallen for scales used in education. Though this coefficient increased to well within the .7 range with the deletion of three items, the items that impacted the reliability of section two scores most negatively were items that were central to identifying the risk averse or tolerant behavior, as opposed to items accounting for
preparatory steps to do the same. Because of the importance of these items and that the reliability coefficient for the scale was above the cut off point of .6, they were included in the calculation of safer sex scores.

*Data Analysis*

The primary objective of this study is to establish whether subjects exposed to a negatively framed safer sex brochure respond more favorably on post-test questions related to their safer sex behavior and intentions than subjects exposed to a positively or neutrally framed brochure. The primary independent variable in this study is a nominal, multichotomus variable with three levels of treatment. The dependent measures are ordinal in nature and consist of scores based on subjects' responses to Likert-type items related to subjects' safer sex intentions immediately after the intervention, their safer sex intentions ten weeks later, and their actual practice of safer sex behaviors as reported for the ten weeks preceding the ten week post-test. The calculation of these scores is discussed below.

Since the study hypotheses involve the comparison of mean scores derived from ordinal level data between groups receiving one of three levels of treatment, the primary statistical tool for this study will be the one-way analysis of variance (ANOVA) with level of treatment as the independent variable and subjects' safer sex scores as the dependent measure. As is often the custom in evaluations of behavioral interventions, a significance level of 0.05 has been chosen. Tests to insure that the distribution of mean scores is normal and that their variance is equivalent will also be performed. Histograms and box plots will be generated to supplement these tests.
While some researchers express concern about analyzing ordinal data with parametric statistical tools such as the ANOVA (c.f. Kennedy, 1985 who argues that the assumption of interval or ratio level data for a statistic should not be violated) others note that this violation is commonplace in research in education and has minimal effects on study results (Gardner, 1975). Since two other assumptions underlying the use of parametric tests are met, i.e. that the data are normally distributed and that the scores of the population from which the sample has been derived have equal variances, and since the only other assumption violated is that data have been derived from random sampling, the greater descriptive capacity that parametric tests offer justifies their use. Ordinal level data will then be analyzed via parametric tests such as ANOVA and T-tests as if it were interval. It will be made clear that all results derived from this use of parametric analyses are not generalizeable. If the results of any of the initial ANOVAs suggest that there are significant differences between groups experiencing the different levels of treatment, these differences will be further explored through appropriate post hoc procedures (Kennedy & Bush, 1985).

An additional objective of this study is to determine whether subjects' safer sex intention and behavior scores and their sexual relationship/activity statuses point to an increase in sexual health-protective or risk-averse behaviors for all subjects over the course of the study. Safer sex intention and behavior scores generated from the baseline or the initial post-test and the ten week post-test will be analyzed via paired-samples t tests to determine if there are statistically significant increases in the scores. Again, a significance level of .05 has been chosen.
Along with this comparison of safer sex behavior and intention scores over the course of the study, subjects' responses to items 1.5, 1.20, 2..1 of the instrument will be used to create a new, categorical variable identified as "sexual relationship/activity status." Values for this variable include the following" "sexually abstinent," "mutually monogamous," and "sexually active with a primary partner," and "sexually active with a non mutually monogamous and non primary partner." Frequencies of subjects within each of these status categories will be generated for baseline and ten week post-test behavior and then compared to establish if more subjects occupy risk-averse rather than risk-tolerant statuses at post-tests. Risk-averse statuses are abstinent and sexually active in a mutually monogamous relationship. Risk-tolerant statuses are sexually active with a primary or a non-primary, non-monogamous partner(s). Sexual relationship/activity status values will also be used to determine whether, at the ten week post-test, more subjects maintained or moved to risk-averse statuses than maintained or move to risk-tolerant statuses. This will be accomplished by comparing individual subjects' statuses at baseline and at the ten week post-test.

Finally, in order to characterize the sexual behavior and experiences of subjects at baseline, the following descriptive statistics on interval and ordinal data related to subjects' baseline behaviors will be calculated: means, standard deviations, interquartile ranges, minimum and maximum values, and outliers, kurtosis and skewness. Frequencies, including medians and modes, will be generated for categorical data. Bar graphs and histograms will be used to supplement frequency charts.
Coding and analysis

Data will be entered and analyzed via Statistical Package for the Social Scientist (SPSS) software for Microsoft Windows 10 (2000). Pre- and post-tests will be linked by cover sheet. Likert-type questions will be coded with per item points of -1 for unsafe intentions or behavior, +1 for safer intentions or behavior, and 0 for items that do not apply to the responding subject. Reverse coding will be used when necessary.

Data from questionnaires will be included in the analysis when the sexual relationship status of the participant and the level of intervention he or she experienced could be established and the subject completed at least one-third of the scale in question. Missing data will be substituted by the median score for the scale from which the data are missing. So as not to draw attention to those who choose not to participate in the study, participants will be told that they may turn in blank questionnaires. The number of blank questionnaires received will be recorded.

It should be noted that three items that were intended to be included in safer sex calculations for their respective chapters were ultimately discarded. Items Five and Six in Section 4 were discarded when it was discovered that the items overlooked the possibility that some subjects who had no current sexual partner intended to choose, as prospective sexual partners, only persons who had never had anal, vaginal or oral sex with another person had who had no risk for HIV.\(^1\) Item Four in Section Three was

\(^1\) An answer of "no" on the dichotomous, "yes" and "no" response options for Section 4, items Four and Five of the Spring 2000 study instrument ("I intend to ask any prospective partner to go to the doctor to be checked for STIs before we have sex for the first time" and "I intend to ask any prospective partner to have an HIV antibody test before we have sex for the first time") could indicate that the subject did not intend to follow safer sex behaviors or, at the other extreme, a "no" response could
discarded from all calculations when it was discovered that one of its response options was inadvertently deleted from post-test copies of the instrument.²

Safer Sex Scores

The primary dependent measures in this study will be calculated for each individual per each applicable section of the instrument by summing the points received for each item response and dividing that sum by the total number of questions in the section minus the number of questions that subject answered with a response of "not applicable." Possible scores range from -1 to 1, with -1 representing the least safe sexual behaviors or intentions possible and 1 being the most safe. Zero indicates a "not applicable" response. In the interest of interpretive ease, once calculated, scores will be converted to a scale consisting of positive, whole numbers ranging from 1 to 200.

At the end of the study, subjects who were not sexually active at baseline and at the ten week post-test will have two safer sex scores, one each for Section Four at baseline and at post-test. Section Four addresses subjects' safer sex-related intentions with prospective sex partners. Subjects who have had anal, oral or vaginal intercourse with another person in the three months preceding the intervention and the ten weeks preceding the final post-test will have four safer sex scores, one score for Section Two, sexual behaviors in the last 30 days, at pre-test, one score for Section Two, at

². On post test copies of the study instrument, Item Four in Section Three read as follows: "I intend to start abstaining from all unprotected anal or vaginal sex with my primary sexual partner." Response options were " 1. Yes;  2. No;  4. Partner type does not apply;  5. Sexual activity does not apply." Response option 3, "I already do this" was inadvertently omitted.
post-test, one score for Section Three, intentions with current partners, at
pre-test and one score for Section Three at post-test. Subjects who were sexually
active at pre-test but not at post-test or vice versa receive three safer sex scores, one
for Section Two, sexual activities in the last 30 days, and Section Three, intentions
with current partner, and one for Section Four, intentions with prospective partners.
CHAPTER 4
RESEARCH RESULTS AND DISCUSSION

Study Sample

Sample size

Data for this study were collected from four different sections of two different sexual health-related courses taught at The Ohio State University in the Spring and Fall of 2000. Before combining the data from the separate classes, the mean responses of each class on selected demographic and sexual behavior-related variables were compared using ANOVA for ordinal and interval data and analysis via Chi-square for categorical data. Analysis with ANOVA revealed no significant differences between the means of each of the four separate classes on current age $F(3, 226) = 2.084, p = .103$, age at first intercourse $F(3, 213) = 1.072, p = .362$, number of female sexual partners to date $F(3, 228) = .718, p = .542$, and number of male sexual partners to date $F(3, 229) = 1.135, p = .336$. Table 4.1 presents these ANOVA findings.
<table>
<thead>
<tr>
<th>Current Age of Participant</th>
<th>Sum of Squares</th>
<th>df</th>
<th>Mean Square</th>
<th>$F$</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
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<td>Between Groups</td>
<td>60.347</td>
<td>3</td>
<td>20.116</td>
<td>2.084</td>
<td>.103</td>
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<tr>
<td>Within Groups</td>
<td>2181.136</td>
<td>226</td>
<td>9.651</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>2241.483</td>
<td>229</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age at First Intercourse</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>13.520</td>
<td>3</td>
<td>4.507</td>
<td>1.072</td>
<td>.362</td>
</tr>
<tr>
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<td>210</td>
<td>4.206</td>
<td></td>
<td></td>
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<tr>
<td>Total</td>
<td>896.678</td>
<td>213</td>
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<td></td>
<td></td>
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<tr>
<td>Number of Lifetime Male Partners</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Between Groups</td>
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<td>25.014</td>
<td>1.135</td>
<td>.336</td>
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<tr>
<td>Within Groups</td>
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<td>226</td>
<td>22.030</td>
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<td></td>
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<tr>
<td>Total</td>
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<td>229</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Number of Lifetime Female Partners</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>130.700</td>
<td>3</td>
<td>43.567</td>
<td>.718</td>
<td>.542</td>
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<tr>
<td>Within Groups</td>
<td>13647.658</td>
<td>225</td>
<td>60.656</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td>13778.358</td>
<td>228</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of Mutually Monogamous Relationships</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Between Groups</td>
<td>142.902</td>
<td>3</td>
<td>47.634</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Within Groups</td>
<td>4170.409</td>
<td>224</td>
<td>18.618</td>
<td>2.559</td>
<td>.056</td>
</tr>
<tr>
<td>Total</td>
<td>4313.311</td>
<td>227</td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Table 4.1. ANOVA of age and sexual experience by course.
The only distinction between the classes that approached significance at the \( p = .05 \) level was the number of mutually monogamous sexual relationships as reported to date by subjects within each class \( F(3, 227) = 2.559, p = .056 \). While the least significant difference (LSD) test's post hoc pairwise comparisons of the means found a statistically significant difference at the \( p = .05 \) level between the group means of two classes and a third, post hoc comparisons with the more conservative Bonferroni test found no statistically significant differences. The difference identified by the LSD test was between Class A with a mean number of lifetime sexual partners of 3.8 (standard deviation of 9.40) and Classes C and D, with means for lifetime sexual partners at 1.8 (standard deviation of 1.75) and 1.6 (standard deviation of 1.39) respectively. As Class A's standard deviation suggests, however, the difference between the classes' means was largely the result of extreme scores elevating the Class A mean.

Analyses with Chi-square (Kruskal-Wallis Test) of selected categorical level variables between the four classes revealed no significant differences on self-identified sex, \( (3, 229) 5.59, p = .133 \), self-identified race \( (3, 231) 3.71, p = .294 \), sexual experience \( (3, 231) .930, p = .818 \), and sexual activity in the last three months \( (3, 224) 2.40, p = .494 \). Table 4.2 presents these results.

There was, however, a statistically significant difference between the four classes on academic standing \( (3, 225) 18.506, p < .000 \). Significantly more seniors were enrolled in the Spring quarter courses and more juniors and sophomores were enrolled in the Fall quarter courses. Considering that these courses typically have substantial waiting lists for enrollment and that seniors have registration priority over other students, fewer sophomores and juniors are able to get class spaces for Spring
quarter because of the number of seniors attempting to enroll in the course. In the Fall when there are fewer senior students seeking elective courses, juniors and sophomores are more likely to get seats. Gathering data in both the Spring and the Fall allowed for a more balanced sample in terms of academic standing.

<table>
<thead>
<tr>
<th></th>
<th>female/male</th>
<th>race</th>
<th>academic rank</th>
<th>intercourse experienced</th>
<th>intercourse recently</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Square</td>
<td>5.590</td>
<td>3.714</td>
<td>18.506</td>
<td>.930</td>
<td>1.505</td>
</tr>
<tr>
<td>df</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td>Asymp. Sig.</td>
<td>.133</td>
<td>.294</td>
<td>&lt;.000</td>
<td>.818</td>
<td>.681</td>
</tr>
</tbody>
</table>

Table 4.2. Chi-Square analysis of age and sexual experience by course section.

Since demographic characteristics such as age, self identified sex, and self-identified race, and sexual behavior-related characteristics such as sexual experience and recent sexual activity did not vary with statistical significance between the four classes, and since having students representing different academic ranks contributed to a more representative sample, the data from the four classes were combined, creating a study sample of 231 subjects.

Of the 231 subjects in the sample, complete pre-, initial post-, and ten week post-test sets were collected from 191 (83%) subjects. Because the intervention, pre-test and initial post-test were administered on the first day of class, prior to any
instruction, some of the students who participated on the first day did not necessarily complete or even enroll in the course and therefore did not complete ten week post-test questionnaires \((n = 20)\). Unmatched post-tests, on the other hand, resulted from students who did complete the course but were either absent on the first day of class or chose not to participate at the initial session \((n = 20)\).

For the most part, the characteristics of class members who did not complete either a pre-test, an initial post-test or a ten week post-test were similar to the characteristics of class members for whom there are complete data. The mean responses of each of the two groups on selected demographic and sexual behavior-related variables were compared using independent samples \(t\) tests for ordinal and interval data and analysis with Chi- for categorical data. The results of the \(t\) tests revealed no significant differences between those for whom there is and there is not complete data on current age \(t(228) = .686, p = .494\), age at first intercourse \(t(212) = -1.240, p = .216\), number of lifetime female sexual partners, \(t(227) = -.488, p = .626\), and number of lifetime male sexual partners \(t(228) = -.754, p = .451\). Table 4.3. presents the results of these comparisons. Analyses with Chi-square (Kruskal-Wallis Test) revealed no significant differences on self-identified sex, \((229) .811, p = .368\), sexual experience \((231) .080, p = .777\), and sexual activity in the last three months \((224) 1.012, p = .314\). Table 4.4 presents the results of these comparisons.

The one statistically significant difference between those for whom there is and is not complete data was race \((231) 4.470, p = .034\). While persons who identified themselves as Asian represented 5.2% of the sample, 10% or 4 of the unmatched data sets were completed by persons who identified themselves as Asian, and while persons
who identified themselves as African American represented 13% of the sample, 20% or 8 of the unmatched data sets were completed by persons who identified themselves as African American. So as to maximize the diversity of the sample as much as possible, while subjects for whom there was incomplete data were excluded from matched pairs analyses, data from these individuals was included in descriptive and applicable treatment analyses.

| Age | .686 | 228 | .494 |
| Age at First Intercourse | -1.240 | 212 | .216 |
| Number of Male Partners | -0.754 | 228 | .451 |
| Number of Female Partners | -0.488 | 227 | .626 |
| Number of Monogamous Relationships | -1.373 | 226 | .171 |

Table 4.3. T tests (two-tailed) of age and sexual experience by whether completed or did not complete both the initial and the ten week post-tests.
As for individuals choosing not to participate in the study, although everyone introduced to the study was given the option of submitting a blank questionnaire, none chose to do so. Individuals who did not want to participate were also given the option of leaving the classroom and returning after a specified time. So as to avoid any perception of pressure to participate, it was not noted who did and did not complete questionnaires.

Data from questionnaires were included in analysis when the sexual relationship status of the participant and the level of intervention he or she experienced could be established and the subject completed at least one-third of the scale in question. Whereas items answered as "not applicable" were not included in the numerator of each participant's safer sex score equation, missing data was replaced by the item median for the group as a whole and included in the numerator when calculating safer sex scores. The group median rather than the group mean was used to

<table>
<thead>
<tr>
<th>Chi-Square</th>
<th>female/male</th>
<th>race</th>
<th>academic rank</th>
<th>intercourse experienced</th>
<th>intercourse in the last 3 months</th>
</tr>
</thead>
<tbody>
<tr>
<td>.811</td>
<td>.368</td>
<td>.034</td>
<td>.546</td>
<td>.777</td>
<td>.314</td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>.368</td>
<td>.034</td>
<td>.546</td>
<td>.777</td>
<td>.314</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.4. Chi-Square analysis of age and sexual experience by whether completed or did not complete both initial and ten week post-tests.
replace missing data after analyses revealed extreme scores in a number of instances, making the mean a less reliable indicator of the characteristics of the group as a whole.

Since usable data was determined on a section-by-section basis, the sample sizes of some sections vary. Because level of intervention was indicated on pre-tests, the information from those subjects who completed only ten week post-tests was included in descriptive data but not in analyses related to the intervention. Finally, data from several subjects whose ages may have allowed them to be identified by other class members were excluded from analyses of demographics done by class. These individuals were, however, included in both the analysis of demographics for study participants as a whole \((N = 231)\) and in all analyses related to the treatment.

*Sub-samples*

Within the larger study sample, study participants were divided at pre-test, initial post-test, and ten week post-test into two sub-groups: those who had had anal, oral or vaginal sex in the preceding three months; and those who had never had anal, oral or had not done so in the preceding three months. The data collected from the two subgroups captured four separate time frames: subjects' sexual behavior in the three months prior to the intervention; subjects' sexual behavior in the ten weeks prior to the post-test; subjects' intentions to practice safer sex as recorded immediately after the intervention, and subjects' intentions to practice safer sex as recorded at ten week post-test. Table 4.5 presents the sub-sample sizes \((n)\) for each combination of subject and time frame.
Baseline behavior (pre-test) & Initial post-test intentions & Ten week post-test intentions & Ten week post-test behavior \\
Intercourse-experienced & $n = 173$ & $n = 142$ & $n = 144$ & $n = 172$ \\
Intercourse-abstinent & $n = 68$ & $n = 68$ & \\

Table 4.5. Number of participants ($n$) in each of the study sub-samples.

173 intercourse-experienced subjects completed pre-test questionnaire items related to their sexual behavior in the three months preceding the intervention. At the ten week post-test, 172 subjects completed the same scale for behaviors in the preceding academic quarter. 142 sexually active subjects completed initial post-test questionnaire items related to their intentions to practice safer sex, and 144 completed the same scale at the ten week post-test. 68 subjects completed questionnaire items related to their safer sex intentions in the ten weeks after the intervention, and 68 subjects completed the same scale for intentions after the ten week post-test.

**Characteristics of the Sample**

*Age, self-identified sex, self-identified, and academic rank*

The mean age of subjects was 21.5 (standard deviation 3.13). The oldest was 47 and the youngest was 18. 152 or 66% identified themselves as female, 77 or 33%
identified themselves as male, and 2 or 1% did not specify. None of the subjects circled both male and female or wrote in another descriptor for sex.

As mentioned previously, 30 subjects or 13% of the entire sample identified themselves as African American, and 12 subjects or 5% identified themselves as Asian or Pacific Islander. 180 subjects or 78% identified themselves Caucasian, 5 or 2% identified themselves as Hispanic, and 4 or 2% identified themselves as "Other."

Seven or 3% of the subjects identified their academic rank as Freshman, 48 or 20% identified as Sophomore, 44 or 19% identified as Junior, 117 or 50% as Senior, and 9 or 5% as Graduate students or "Other." See Table 4.6 for a summary of basic demographic characteristics of the responding sample.
Table 4.6. Demographic and sexual experience-related characteristics of the responding sample at pre-test.
Sexual experience

Of the 231 subjects participating in the study, 15 subjects (6.3%) reported at pre-test that they had never had anal, oral or vaginal intercourse. Twenty-four other subjects (12.6%) reported at pre-test that although they had had anal, oral or vaginal intercourse at least once in their lifetimes, they had not been sexually active for the three months preceding the intervention. At the ten week post-test, 11 subjects (4.8%) reported that they had never had anal, oral or vaginal intercourse and an additional 34 (14.5%) reported that although they had had anal, oral or vaginal intercourse at least once in their lifetimes, they had not been sexually active for the ten weeks following the study intervention.

Sexual health status

Twenty-two subjects or 9.5% of the sample reported having been diagnosed at some point in their lives with a sexually transmitted infection (STI). Subjects were specifically queried about previous diagnosis with any of the following: herpes, gonorrhea, syphilis, Human Papilloma Virus (HPV), Human Immunodeficiency Virus (HIV), Pelvic Inflammatory Disease (PID), hepatitis, or chlamydia. Subjects reported 23 instances of diagnosis with one of the preceding STIs, though three subjects reported that they had been diagnosed with more than 1 of these STIs, including one subject who had been previously diagnosed with 4 STIs. Subjects were also asked about diagnosis with an STI not otherwise specified, and 5 more diagnoses were included. None of these 5 diagnoses resulted in chronic infection. No subjects reported having been diagnosed with hepatitis or HIV.
While diagnosed STIs can be a direct indicator of sexual health status, especially if the infection is chronic, incidence of coerced sex and sex while under the influence of recreational drugs including alcohol can offer indirect information on the sexual health status of a population through the potential for these factors to impair negotiation about and implementation of safer sex. (McDermott, 1998; Keller, 1991) For this reason, subjects were asked at pre-test whether, in the preceding three months, they had been coerced or had coerced another into having sexual intercourse after the person being coerced said "no" at least one time, and whether, in the preceding three months, they had decided to have sex, and more specifically, unsafe sex, because they were under the influence of recreational drugs including alcohol. Of the 211 subjects who responded to questions about coercion, 11 subjects, or 5.2% of the sample reported having, in the preceding three months, coerced someone into having sex, and 18 subjects or 8.5% reported having been coerced into having sex in the same time period. As for sexual interactions while under the influence of recreational drugs including alcohol, 48 or 22.9% of the 209 subjects who answered the question reported that they had had sex because they were under the influence of alcohol or other drugs at least once in the last three months, and 27 or 12.9% reported that they had had unsafe sex at least once in the preceding three months because they were under the influence of alcohol or other drugs.

Age at first intercourse

For the subjects in the sample who responded to the questionnaire item about age at first intercourse, the group mean was 16.8 (standard deviation 2.05). Both the
The median and the mode were 17. The youngest reported first intercourse experience was 12 years old, while the oldest was 26. Fifty-five subjects (26%) reported having had intercourse for the first time when between the ages of 13 and 15. Two subjects reported having had intercourse for the first time before the age of 13, while 74 or 35% reported having had intercourse for the first time after the age of 18. The mean age for first intercourse for women in the study was 16.85 (standard deviation 2.06). The mean age for first intercourse for men was 16.64, also with a standard deviation of 2.06. See Table 4.7 for a statistical summary of the age at first intercourse data along with data shedding light on other important variables related to intercourse-experienced subjects' sexual histories. Findings on these other variables are discussed below as well.

---

1. Subjects were not given directions about differentiating between consensual and nonconsensual sexual interactions when reporting age at first intercourse. In Ohio, the age of consent for intercourse is 14. Ten or 5% of the subjects reported that they had had sexual intercourse for the first time before they had reached 14 years of age.
<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>Median</th>
<th>Standard deviation</th>
<th>Minimum and maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age at first intercourse</td>
<td>16.8</td>
<td>17</td>
<td>3.2</td>
<td>18 - 47</td>
</tr>
<tr>
<td>Number of male partners of females</td>
<td>4.7</td>
<td>3</td>
<td>4.8</td>
<td>0 - 30</td>
</tr>
<tr>
<td>Number of female partners of males</td>
<td>8.9</td>
<td>5</td>
<td>8.0</td>
<td>0 - 56</td>
</tr>
<tr>
<td>Number of male partners of males</td>
<td>0.61</td>
<td>0</td>
<td>3.24</td>
<td>0 - 20</td>
</tr>
<tr>
<td>Number of female partners of females</td>
<td>0.09</td>
<td>0</td>
<td>0.49</td>
<td>0 - 4</td>
</tr>
<tr>
<td>Number of mutually monogamous</td>
<td>2.2</td>
<td>2</td>
<td>4.4</td>
<td>0 - 52</td>
</tr>
<tr>
<td>relationships</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Number of sex partners in the last</td>
<td>1.2</td>
<td>1</td>
<td>1.0</td>
<td>0 - 09</td>
</tr>
<tr>
<td>three months</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.7. Statistical summary of intercourse-experienced subjects' sexual histories.
Number of sex partners

Of the 228 subjects responding to questionnaire items related to the number of persons with whom they had had intercourse at least once in their lifetimes, 15 or 6.9% reported having had only one sex partner in their lifetimes. Of these 15 subjects, 3 described their partner as also having only one partner in their lifetimes (i.e. the study participant); thus, 1.4% of the sample represented couples where neither had had a sexual partner previous to their relationship.

Of the subjects who reported having had intercourse with more than one partner in their lifetime, the mean number of male partners reported by female subjects was 4.7. The median was 3. The mean number of female partners reported by males was 8.9. The median, however, was 5. The most female partners reported by a male subject was 56, and the most male partners reported by a female subject was 30. Three (1.4%) subjects reported having had exclusively same sex partners (two male subjects and one female subject) and 8 (3.7%) subjects reported having had both male and female partners (2 male subjects and 6 female subjects). The most male partners reported by a male subject was 20, and the most female partners reported by a female subject was 4. Whether sexually oriented to the same or to the opposite sex or to both, for those who reported having had sex in the last three months, the mean number of partners in the last three months was 1.38 (standard deviation .980). The median was 1 with the maximum being 9. Again, see Table 4.7 for a statistical summary of sexually active subjects' sexual histories.
Number of mutually monogamous relationships

As for the number of mutually monogamous sexual relationships within subjects' lifetimes, of the 216 subjects who reported having had sexual intercourse at least once in their lifetimes, the mean number of mutually monogamous sexual relationships was 2.2 (standard deviation 4.5). The median was 2. These figures did, however, differ quite a bit between males and females. For female subjects, the mean number of mutually monogamous relationships was 2.1 (standard deviation 1.6). The median number of mutually monogamous relationships for females was 2, and the maximum was 10. The next highest numbers of total monogamous relationships reported by a female were 8 and 6 respectively.

For male subjects, the mean number of mutually monogamous relationships was 2.9, though this figure, with its standard deviation of 7.3, does not characterize the male sample as a whole particularly well. The median, a better indicator of typical numbers of mutually monogamous relationships for males, was 1.

Of the top four maximum numbers of female sexual partners reported by a male, 56, 52, 45 and 36 respectively, two were also the maximum numbers of mutually monogamous relationships as reported by a male. These were 52 and 36. So, though the respondent who reported having the most female sex partners at 56, reported having had a total of only 4 mutually monogamous relationships, the second and fourth highest counts for partners, 52 and 36, were also the highest counts for relationships. In both cases, these figures were provided by the same respondents. The
next highest number of mutually monogamous relationships reported by a male was 14. This respondent also listed his total number of female sexual partners as 14. See Table 4.8 for a comparison of the largest numbers of reported sexual partners and relationships.

<table>
<thead>
<tr>
<th>Male</th>
<th>Number of sexual partners</th>
<th>Number of Monogamous relationships</th>
<th>Female</th>
<th>Number of sexual partners</th>
<th>Number of Monogamous relationships</th>
</tr>
</thead>
<tbody>
<tr>
<td>35</td>
<td>7</td>
<td>16</td>
<td>16</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>36</td>
<td>14</td>
<td>18</td>
<td>18</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>36</td>
<td>20</td>
<td>20</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>52</td>
<td>24</td>
<td>24</td>
<td>9</td>
<td></td>
</tr>
<tr>
<td>56</td>
<td>56</td>
<td>30</td>
<td>30</td>
<td>10</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.8 The five largest numbers of sexual partners and mutually monogamous relationships reported by male and female participants.

Sexual relationships styles

Of the subjects who reported that they had been sexually active for the three months prior to the pre-test and for whom data on sexual relationship status at pre-test was available, 120 subjects or 57.7% reported that they were sexually active in mutually monogamous relationships, 24 subjects or 11.5% reported they were sexually active with a primary but not mutually monogamous partner, and 28 subjects or 13.5% reported that they were sexually active with a partner or partners who were neither
their mutually monogamous or primary partner. The mean length of each mutually monogamous relationship was 21.6 months (standard deviation 27.69). The median length was 14 months. The minimum was 0 months and the maximum was 228. At the ten week post-test, 118 subjects or 58.1% of the sexually active subjects for whom data were available, were in mutually monogamous relationships, 23 or 11.3% were in primary relationships and 14 or 6.9% were in relationships with persons who were neither their mutually monogamous nor their primary partner.

**Sexually active subjects’ baseline safer sex scores and behaviors**

As outlined in Chapter 3 of this dissertation, the primary dependent measures for this study were safer sex scores. These scores were calculated for each individual per each scale of the instrument by summing the points received for each item response and dividing that sum by the total number of questions in the section minus the number of questions that the subject answered with a response of "not applicable." The range of possible scores was 1 to 200, with 1 representing the least safe sexual behaviors or intentions possible and 200 being the most safe.

At baseline, the mean safer sex behavior score of sexually active participants was 93 (standard deviation 36). The median was 94. The minimum score was 12, and the maximum was 169. At the ten week post-test, the mean safer sex behavior score of sexually active participants was 87 (standard deviation 35). The median was 88, and the minimum and maximum scores were again 12 and 169 respectively.

---

2. Those who had more than one sexual partner in the three months preceding and/or the ten weeks after the intervention were asked to provide information on the last person they had had anal, oral or vaginal
Safer sex behavior

Along with safer sex scores, other indicators of safer sex behavior include how often an individual uses condoms or other barriers when engaging in penetrative sex, whether individuals are familiar with the sexual history of their partner(s), whether individuals have talked with their sexual partner(s) about safer sex, and whether individuals have reliable information on their own sexual health statuses. Of the 169 sexually active participants who answered about condom use for anal or vaginal sex with their most recent partner, 28 or 12.1% reported "always" using condoms, 18 or 10.7% reported "often" using condoms, 35 or 20.7% reported "occasionally" using condoms, and 62 or 36.7% reported "never" using condoms. The remaining 26 subjects (15.4%) indicated that condom use for them was "not applicable." For barrier use with oral sex among the same group, 2 participants (1.2%) reported "always" using condoms or some other barrier for oral sex, another 2 (1.2%) participants reported "often" using barriers for oral sex, and 6 (3.6%) reported "occasionally" using barriers. 134 (79.8%) responded that they "never" used condoms or other barriers during oral sex. Of the 10 subjects who reported having had anal or vaginal intercourse with their partners only once, 8 reported having used condoms and 2 reported that they had not. Of the 14 subjects who had had oral sex with their partner only once, 2 reported having used condoms and 12 reported that they had not. Table 4.9 summarizes these results.
<table>
<thead>
<tr>
<th><strong>Condom/Barrier use with anal or vaginal sex</strong></th>
<th><strong>Frequency</strong></th>
<th><strong>Percent</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>always</td>
<td>28</td>
<td>12.1</td>
</tr>
<tr>
<td>most of the time</td>
<td>18</td>
<td>10.7</td>
</tr>
<tr>
<td>occasionally</td>
<td>35</td>
<td>20.7</td>
</tr>
<tr>
<td>never</td>
<td>62</td>
<td>36.7</td>
</tr>
<tr>
<td>n/a</td>
<td>26</td>
<td>15.4</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Familiar with partner's sex history</strong></th>
<th><strong>Frequency</strong></th>
<th><strong>Percent</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>131</td>
<td>73.2</td>
</tr>
<tr>
<td>No</td>
<td>37</td>
<td>20.7</td>
</tr>
<tr>
<td>Missing</td>
<td>11</td>
<td>6.1</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Partner familiar with participant's sex history</strong></th>
<th><strong>Frequency</strong></th>
<th><strong>Percent</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>129</td>
<td>72.1</td>
</tr>
<tr>
<td>No</td>
<td>41</td>
<td>22.9</td>
</tr>
<tr>
<td>Missing</td>
<td>9</td>
<td>5.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Partner examined for STIs</strong></th>
<th><strong>Frequency</strong></th>
<th><strong>Percent</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>62</td>
<td>34.6</td>
</tr>
<tr>
<td>No</td>
<td>37</td>
<td>20.7</td>
</tr>
<tr>
<td>Don't know</td>
<td>55</td>
<td>30.7</td>
</tr>
<tr>
<td>Not applicable</td>
<td>16</td>
<td>8.9</td>
</tr>
<tr>
<td>Missing</td>
<td>9</td>
<td>5.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Participant examined for STIs</strong></th>
<th><strong>Frequency</strong></th>
<th><strong>Percent</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>88</td>
<td>49.2</td>
</tr>
<tr>
<td>No</td>
<td>72</td>
<td>40.2</td>
</tr>
<tr>
<td>Not applicable</td>
<td>11</td>
<td>6.2</td>
</tr>
<tr>
<td>Missing</td>
<td>8</td>
<td>4.5</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Partner HIV ab/ag test</strong></th>
<th><strong>Frequency</strong></th>
<th><strong>Percent</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>39</td>
<td>21.8</td>
</tr>
<tr>
<td>No</td>
<td>41</td>
<td>22.9</td>
</tr>
<tr>
<td>Don't know</td>
<td>54</td>
<td>30.2</td>
</tr>
<tr>
<td>Not applicable</td>
<td>36</td>
<td>20.1</td>
</tr>
<tr>
<td>Missing</td>
<td>9</td>
<td>5.0</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th><strong>Participant HIV ab/ag test</strong></th>
<th><strong>Frequency</strong></th>
<th><strong>Percent</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes</td>
<td>31</td>
<td>17.3</td>
</tr>
<tr>
<td>No</td>
<td>110</td>
<td>61.5</td>
</tr>
<tr>
<td>Not applicable</td>
<td>28</td>
<td>15.7</td>
</tr>
<tr>
<td>Missing</td>
<td>10</td>
<td>5.6</td>
</tr>
</tbody>
</table>

Table 4.9. Frequency and percentages describing participants' safer sex behaviors at pre-test.
Concerning discussion between partners about each other's sexual histories, 73.2% of the sexually active subjects reported having talked to their most recent partner about their partner's sexual health history, and 72.1% reported having talked to their most recent sexual partner about their own sexual health history. As for the accuracy of the information shared about sexual health status, 49.2% of the subjects responded that they had been examined by a doctor for STIs and 34.6% reported that their partners had done the same. 17.3% reported that they had had a medical test to detect HIV antigen or antibody since they last had unprotected sex or shared injection drug needles, and 21.8% reported that their most recent sexual partner had been tested since he or she last had unprotected sex or shared injection drug equipment. 20.1% responded that their partner had no risk for HIV infection. Finally, 60.9% of the sexually active subjects reported that they had talked with their most recent partner about safer sex. Again, Table 4.9 summarizes these results.

Hypothesis Tests and Results

Primary hypotheses

The primary objective of this study was to determine whether subjects exposed to a brochure stressing what can be lost by failing to practice safer sex would respond more favorably on post-intervention questionnaire items related both to their intentions to practice safer sex and to their actual practice of safer sex than subjects exposed to a brochure stressing what can be gained or maintained by practicing safer
sex or to a brochure with no arguments at all. To accomplish this purpose, five study hypotheses were developed, each addressing one of the combinations of sub-sample and time-frame presented above. The hypotheses therefore solicit responses from two separate groups, those who were sexually active in the three months preceding the study and those who were not, about any of the following that apply: sexual behavior in the three months prior to the intervention; sexual behavior in the ten weeks prior to the post-test; intentions to practice safer sex as recorded immediately after the intervention, and intentions to practice safer sex as recorded at ten week post-test. See Table 4.6 above for a breakdown of participant and timeframe combinations.

As outlined in Chapter 3 of this dissertation, the primary independent variable for this study was level of treatment, that is whether subjects were exposed to a negatively, positively, or neutrally framed brochure. The primary dependent measures for this study were individually calculated safer sex scores. The possible scores range from 1 to 200, with 1 representing the least safe sexual behaviors or intentions possible and 200 being the most safe.

In order to explore whether there were statistically significant differences between the mean scores of any of the three treatment groups for each of the five hypotheses, a series of one-way ANOVAs were performed. Of the five ANOVAs performed, none identified a statistically significant difference between the treatment received and safer sex scores. The following are the results of these ANOVAs. Basic descriptive statistics are also included. In order to facilitate comparisons between

---

3 For the sake of brevity, the brochure with no arguments at will be identified as "neutrally framed."
groups, Table 4.10 presents a descriptive summary of the combined safer sex scores, Table 4.11 presents a descriptive breakdown of safer sex scores at each intervention level, and Table 4.12 presents ANOVA results. Each of these tables is organized by hypothesis.
<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Mean safer sex score</th>
<th>Median safer sex score</th>
<th>Standard deviation</th>
<th>Minimum and maximum scores</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hypothesis 1</strong>&lt;br&gt;Initial post-test intentions--sexually active subjects</td>
<td>128</td>
<td>133</td>
<td>41</td>
<td>23 - 200</td>
</tr>
<tr>
<td><strong>Hypothesis 2</strong>&lt;br&gt;Ten week post-test intentions--sexually active subjects</td>
<td>129</td>
<td>135</td>
<td>43</td>
<td>20 - 200</td>
</tr>
<tr>
<td><strong>Hypothesis 3</strong>&lt;br&gt;Initial post-test intentions--abstinent subjects</td>
<td>151</td>
<td>164</td>
<td>39</td>
<td>32 - 200</td>
</tr>
<tr>
<td><strong>Hypothesis 4</strong>&lt;br&gt;Ten week post-test intentions--abstinent</td>
<td>161</td>
<td>173</td>
<td>41</td>
<td>50 - 200</td>
</tr>
<tr>
<td><strong>Hypothesis 5</strong>&lt;br&gt;Ten week post-test behavior--sexually active subjects</td>
<td>87</td>
<td>88</td>
<td>35</td>
<td>12 - 169</td>
</tr>
</tbody>
</table>

Table 4.10. Descriptive summary of combined safer sex scores for each hypothesis.
<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Intervention level</th>
<th>Mean safer sex score</th>
<th>Median safer sex score</th>
<th>Standard deviation (SD)</th>
<th>Minimum and maximum scores</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Loss</td>
<td>124</td>
<td>136</td>
<td>44.6</td>
<td>23 - 191</td>
</tr>
<tr>
<td></td>
<td>Gain</td>
<td>133</td>
<td>136</td>
<td>41.1</td>
<td>43 - 192</td>
</tr>
<tr>
<td></td>
<td>No frame</td>
<td>129</td>
<td>131</td>
<td>37.6</td>
<td>52 - 200</td>
</tr>
<tr>
<td>2</td>
<td>Loss</td>
<td>148</td>
<td>157</td>
<td>42.0</td>
<td>32 - 200</td>
</tr>
<tr>
<td></td>
<td>Gain</td>
<td>153</td>
<td>165</td>
<td>35.8</td>
<td>75 - 200</td>
</tr>
<tr>
<td></td>
<td>No frame</td>
<td>151</td>
<td>162</td>
<td>40.1</td>
<td>73 - 200</td>
</tr>
<tr>
<td>3</td>
<td>Loss</td>
<td>124</td>
<td>138</td>
<td>45.9</td>
<td>20 - 188</td>
</tr>
<tr>
<td></td>
<td>Gain</td>
<td>136</td>
<td>140</td>
<td>42.6</td>
<td>39 - 196</td>
</tr>
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<td></td>
<td>No frame</td>
<td>129</td>
<td>128</td>
<td>39.2</td>
<td>50 - 200</td>
</tr>
<tr>
<td>4</td>
<td>Loss</td>
<td>166</td>
<td>176</td>
<td>36.7</td>
<td>109 - 200</td>
</tr>
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<td></td>
<td>Gain</td>
<td>160</td>
<td>165</td>
<td>38.6</td>
<td>88 - 200</td>
</tr>
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<td></td>
<td>No frame</td>
<td>159</td>
<td>186</td>
<td>48.0</td>
<td>50 - 200</td>
</tr>
<tr>
<td>5</td>
<td>Loss</td>
<td>85</td>
<td>92</td>
<td>32.6</td>
<td>12 - 160</td>
</tr>
<tr>
<td></td>
<td>Gain</td>
<td>87</td>
<td>84</td>
<td>36.0</td>
<td>12 - 167</td>
</tr>
<tr>
<td></td>
<td>No frame</td>
<td>89</td>
<td>92</td>
<td>36.3</td>
<td>18 - 169</td>
</tr>
</tbody>
</table>

Table 4.11. Descriptive breakdown of safer sex scores at each intervention level.
<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>Sum of squares</th>
<th>df</th>
<th>Mean square</th>
<th>F</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>1</strong></td>
<td><strong>Between Groups</strong></td>
<td>2014.318</td>
<td>2</td>
<td>1007.159</td>
<td>.594</td>
</tr>
<tr>
<td><strong>Within Groups</strong></td>
<td>2355.83</td>
<td>139</td>
<td>1694.847</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>218158.97</td>
<td>141</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>2</strong></td>
<td><strong>Between Groups</strong></td>
<td>293.155</td>
<td>2</td>
<td>146.578</td>
<td>.095</td>
</tr>
<tr>
<td><strong>Within Groups</strong></td>
<td>1000032.01</td>
<td>65</td>
<td>1538.954</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>100325.17</td>
<td>67</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>3</strong></td>
<td><strong>Between Groups</strong></td>
<td>3336.094</td>
<td>2</td>
<td>1668.047</td>
<td>.919</td>
</tr>
<tr>
<td><strong>Within Groups</strong></td>
<td>255874.97</td>
<td>141</td>
<td>1814.716</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>259211.07</td>
<td>143</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>4</strong></td>
<td><strong>Between Groups</strong></td>
<td>611.530</td>
<td>2</td>
<td>305.765</td>
<td>.178</td>
</tr>
<tr>
<td><strong>Within Groups</strong></td>
<td>96149.359</td>
<td>56</td>
<td>1716.953</td>
<td></td>
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<tr>
<td><strong>Total</strong></td>
<td>96760.889</td>
<td>58</td>
<td></td>
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<tr>
<td><strong>5</strong></td>
<td><strong>Between Groups</strong></td>
<td>538.498</td>
<td>2</td>
<td>269.249</td>
<td>.219</td>
</tr>
<tr>
<td><strong>Within Groups</strong></td>
<td>208029.08</td>
<td>169</td>
<td>1230.941</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>208567.58</td>
<td>171</td>
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</table>

Table 4.12. Hypothesis tests: ANOVA of safer sex scores by intervention level.
Primary Hypothesis Tests

H1: Immediately after participating in the intervention, the mean safer sex intention scores of sexually active subjects exposed to a brochure stressing what can be lost by failing to practice safer sex will be significantly larger than the mean safer sex intention scores of sexually active subjects exposed to a brochure stressing what can be gained by practicing safer sex or to a brochure with no arguments at all.

The safer sex intention scores of sexually active subjects at the initial post-test ranged from 23 to 200. The mean for the group as a whole was 128 (standard deviation 41). The median was 133. The mean of the safer sex intention score for subjects exposed to the negatively framed brochure was 124 (standard deviation 45). The mean scores for subjects exposed to the positively and neutrally framed brochures were 133 (standard deviation 41) and 129 (standard deviation 38) respectively. An ANOVA comparing the safer sex intention scores by level of intervention yielded no significant results $F(2, 139) = .594, p = .553$. The null hypothesis was therefore accepted. The initial safer sex intention scores of subjects exposed to the negatively framed brochure were not significantly larger than the scores of subjects exposed to the positively and neutrally framed brochures.

H2: Ten weeks after participating in the intervention, the mean safer sex intention scores of sexually active subjects exposed to a brochure stressing what can be lost by failing to practice safer sex will be significantly larger than the mean of the safer sex intention scores of sexually active subjects exposed to a brochure stressing what can be gained by practicing safer sex or to a brochure with no arguments at all.

The safer sex intention scores of sexually active subjects at the ten week post-test ranged from 20 to 200. The mean for the group as a whole was 129 (standard deviation 43). The median was 135. The mean of the ten week post-test safer sex intention scores for subjects exposed to the negatively framed brochure was 124
(standard deviation 46). The means of the ten week safer sex intention scores for subjects exposed to the positively and neutrally framed brochures were 136 (standard deviation 43) and 129 (standard deviation of 39) respectively. An ANOVA comparing these scores yielded no significant results $F(2, 141) = .919, \ p = .401$. The null hypothesis was therefore accepted. The ten week post-test safer sex intention scores of sexually active subjects exposed to the negatively framed brochure were not significantly larger than the scores of subjects exposed to the positively or neutrally framed brochures.

$H_3$: **Immediately after participating in the intervention, the mean safer sex intention scores of intercourse-abstinent subjects exposed to a negatively framed brochure stressing what can be lost by failing to practice safer sex will be significantly larger than the mean safer sex scores of intercourse-abstinent subjects exposed to a positively framed brochure or to a brochure with no arguments at all.**

The initial post-intervention safer sex intention scores of subjects who were intercourse-abstinent ranged from 32 to 200. The mean for the group as a whole was 151 (standard deviation 39). The median was 164. The mean safer sex intention score of subjects exposed to the negatively framed brochure was 148 (standard deviation 42). The means of the safer sex intention scores for intercourse-abstinent subjects exposed to the positively and neutrally framed brochures were 153 (standard deviation 36) and 151 (standard deviation 40) respectively. An ANOVA comparing these scores, immediately after the intervention, of sexual intercourse-abstinent subjects by level of intervention yielded no significant results $F(2, 65) = .095, \ p = .909$. The null hypothesis was therefore accepted. The initial post-test safer sex intention scores of
intercourse-abstinent subjects exposed to the negatively framed brochure were not significantly larger than the scores of subjects exposed to the positively or neutrally framed brochures.

**H₄:** Ten weeks after participating in the intervention, the mean safer sex intention scores of intercourse-abstinent subjects exposed to a brochure stressing what can be lost by failing to practice safer sex will be significantly larger than the mean safer sex intention scores of intercourse-abstinent subjects exposed to a positively framed brochure or to a brochure with no arguments at all.

The ten week post-intervention safer sex intention scores of intercourse-abstinent subjects ranged from 50 to 200. The mean of the scores for the group as a whole was 161 (standard deviation 41). The median was 173. The mean of the ten week post-intervention intention scores of intercourse-abstinent subjects exposed to the negatively framed brochure was 166 (standard deviation 37). The means of the intention scores for subjects exposed to the positively and neutrally framed brochures were 160 (standard deviation 39) and 159 (standard deviation 48) respectively. An ANOVA comparing the mean ten week post-test safer sex intention scores of intercourse abstinent subjects by level of intervention yielded no significant results $F(2, 56) = .178, \ p = .837$. The null hypothesis was therefore accepted. The ten week safer sex intention scores of intercourse-abstinent subjects exposed to the negatively framed brochure were not significantly larger than the scores of subjects exposed to the positively or neutrally framed brochures.

**H₅:** Ten weeks after participating in the intervention, the mean safer sex behavior scores of sexually active subjects exposed to a brochure stressing what
can be lost by failing to have safer sex will be significantly larger than the mean of the safer sex behavior scores of subjects exposed to a positively or to a neutrally framed brochure.

The ten week post-intervention safer sex behavior scores of sexually active subjects ranged from 12 to 169. The mean of the scores for the group as a whole was 87 (standard deviation 35). The mean of the ten week post-intervention sexual behavior scores of sexually active subjects exposed to the negatively framed brochure was 85 (standard deviation 33). The means of the safer sex behavior scores for subjects exposed to the positively and neutrally framed brochures were 87 (standard deviation 36) and 89 (standard deviation 36) respectively. An ANIOVA comparing these scores yielded no statistically significant results $F(2, 172) = .219, p = .804$. The null hypothesis was therefore accepted. The ten week safer sex behavior scores of subjects exposed to the negatively framed brochure were not significantly larger than the scores of subjects exposed to the positively or to the neutrally framed brochures.

**Secondary Hypotheses**

Once it was established that exposure to the negatively framed safer sex brochure did not appear to lead subjects to respond more favorably on questionnaire items related to their intentions to practice, and to their actual practice of, safer sex, the question became whether it might be that the effect of participation in the sexuality-related courses from which subjects were accessed was so great as interfere with what otherwise would have been a modest though significant treatment effect. To investigate this possibility, three additional hypotheses and two research questions
were developed. Each explores differences in safer sex behaviors or intentions for the entire sample \((N = 231)\) over the ten weeks of the study. The primary dependent measures for the first additional hypothesis are subjects' baseline and ten week post-test safer sex behavior scores. The primary dependent measures for the second and third additional hypotheses are sexually active subjects' safer sex intention scores at the initial and ten week post-tests, and intercourse-abstinent subjects' safer sex intention scores for the same time periods. The statistical test for the preceding three hypotheses will be the paired-samples \(t\) test. A \(p\) value of .05 will again serve as the threshold for statistical significance.

The two additional research questions explore changes from the initial post-test to the ten week post-test in subjects' sexual relationship/activity statuses. These statuses include abstinence, monogamy, and non-monogamy and are described in more detail in Chapter 3 of this dissertation. The first additional question addresses whether, and if so how, relationship/activity statuses for all subjects have changed over the course of the study. The second addresses changes in each individual subject's relationship/activity status over the same timeframe. The results of the additional hypotheses and research questions are presented below. Tables 4.13 summarizes these findings.
<table>
<thead>
<tr>
<th>Hypothesis</th>
<th>$t$ value</th>
<th>df</th>
<th>Sig.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>6</strong></td>
<td>-2.199</td>
<td>141</td>
<td>.030</td>
</tr>
<tr>
<td>Sexually active subjects' initial intentions and ten week post-test intentions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>7</strong></td>
<td>-5.084</td>
<td>43</td>
<td>&lt;.000</td>
</tr>
<tr>
<td>Intercourse abstinent subjects' initial post-test intentions to ten week post-test intentions</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>8</strong></td>
<td>9.811</td>
<td>171</td>
<td>&lt;.000</td>
</tr>
<tr>
<td>Sexually active subjects' pre-test to ten week post-test behavior</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 4.13. Results of paired-samples $t$ tests for Hypotheses 6 - 8, exploring combined safer scores over the course of the study.
**H6:** The mean of sexually active subjects' safer sex behavior scores at the ten week post-test will be significantly larger than the mean of sexually active subjects' safer sex behavior scores at the pre-test.

At the pre-test, the mean of sexually active subjects' safer sex behavior scores was 93 (standard deviation 36). The median was 94. The minimum was 12 and the maximum was 169. The mean of the safer sex behavior scores for the same group at the ten week post-test was 87 (standard deviation 35). The median was 88. The minimum and maximum scores, at 12 and 169, were the same as those at the pre-test. To determine whether the difference between the safer sex behavior scores at the pre-test and the ten week post-test were statistically significant, a paired-samples \( t \) test was conducted. The result confirmed that there was a statistically significant difference between the mean of subjects' safer sex scores at pre-test and the mean of subjects' safer sex scores at ten week post-test \( t(171) = 9.811, p = <.000 \). Despite this identification of a statistically significant difference, the null hypothesis was still accepted because, ironically, the difference detected between the pre-test and ten week post-test behavior scores was that ten week post-test scores were significantly lower rather than higher, than those at the initial pre-test.

**H7:** The mean of sexually active subjects' safer sex intention scores at the ten week post-test will be significantly larger than the mean of sexually active subjects' safer sex intention scores immediately after the intervention.

The mean of sexually active subjects' safer sex intention scores immediately after the intervention was 128 (standard deviation 41). The median was 133. The minimum was 23, and the maximum was 200. The mean of sexually active subjects' safer sex intention scores at the ten week post-test was 129 (standard deviation 43).
The median was 135. The minimum score was 20 and the maximum was 200. To
determine whether the difference between these means was statistically significant, a
paired-samples $t$ test was conducted. The result established there was a statistically
significant difference between the mean of sexually active subjects' safer sex scores at
the initial post-test and the mean of scores for the same group at the ten week post-test
($t (141) = -2.199, p = .030$). This time, the significant difference detected between
the scores was as would be expected: the ten week post-test scores were significantly
larger than those of the initial post-test. The null hypothesis was therefore rejected.

**H$_5$: The mean of intercourse-abstinent subjects' safer sex intention scores at the
ten week post-test will be significantly larger than the mean of intercourse-
abstinent subjects' safer sex intention scores at the initial post-test.**

At the initial post-test, the mean of the safer sex intention scores for
intercourse-abstinent subjects was 151 (standard deviation 39). The median was 163.
The minimum was 32, and the maximum was 200. At the ten week post-test, the mean
of the safer sex intention scores for the same group was 161 (standard deviation 41).
The median was 173. The minimum score was 50 and the maximum was 200. To
determine whether the difference between the mean of the initial and ten week post-
test safer sex intention scores was statistically significant, a paired-samples $t$ test was
conducted. The results indicated that there was a statistically significant difference
between the means of the scores $t(43) = -5.084, p < .000$. The null hypothesis was
therefore rejected. Subjects' safer sex intention scores at the ten week post-test were
significantly larger than their safer sex intention scores at the initial post-test.
**Additional Research Questions**

**Question 1: Will more subjects at the ten week post-test report occupying risk-averse sexual relationship/activity statuses than subjects who reported occupying risk-averse sexual relationship/activity statuses at baseline?**

Of the 205 subjects responding at the pre-test to questionnaire items related to their sexual relationship/activity status in the three months preceding the intervention, 38 subjects or 18.5% reported that they were sexually abstinent, while another 118 subjects or 57.6% reported that they were sexually active in mutually monogamous relationships. When both of these relationship/activity categories are combined to form the subgroup of subjects occupying risk-averse statuses at the pre-test, the total is 156 or 76.1% of the responding sample. Of the 204 subjects responding at the ten week post-test to items related to their sexual relationship/activity status in the ten weeks after the intervention, 49 subjects or 24.0% reported that they were sexually abstinent and again, 118 subjects or 57.8% of the sample reported that they were sexually active in mutually monogamous relationships. Combining these figures results in a total of 167 subjects or 81.9% of the responding sample occupying risk-averse sexual relationship/activity statuses at the ten week post-test, a full 5.8% increase from the pre-test. The total number of subjects reporting risk-averse sexual relationship/activity statuses at the ten week post-test therefore was larger than the total number of subjects reporting risk-averse sexual relationship/activity statuses at baseline. Interestingly, while the number of persons reporting being sexually active with a mutually monogamous or primary sexual partner remained the same from the pre-test to the ten week post-test, the number of persons reporting sexual interactions
with non-monogamous, non-primary partners decreased, accounting for all of the 5.8% increase in subjects occupying the risk-averse status category. Table 4.14 below summarizes these results.

<table>
<thead>
<tr>
<th></th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Baseline</td>
<td>Post-test</td>
</tr>
<tr>
<td>Abstinent</td>
<td>38</td>
<td>49</td>
</tr>
<tr>
<td>Mutually monogamous Partner</td>
<td>118</td>
<td>118</td>
</tr>
<tr>
<td>Primary partner</td>
<td>23</td>
<td>23</td>
</tr>
<tr>
<td>&quot;Other&quot; partner</td>
<td>26</td>
<td>14</td>
</tr>
</tbody>
</table>

Table 4.14. Distribution of participants' sexual relationship/activity statuses at baseline and at the ten week post-test.

Question 2: From the pre-test to the ten week post-test, will more subjects shift toward risk-averse sexual relationship/activity statuses than will shift toward risk-tolerant sexual relationship/activity statuses?

Of the 181 matched pre- and ten week post-test sets, 12 or 6.7% indicated that the responding subjects made health-positive lateral shifts in sexual relationship/activity status during the course of the study in that they went from one health-protective status to another. Seven of these subjects went from a mutually monogamous sexual relationship to sexual abstinence and five went from sexual
abstinence to a mutually monogamous sexual relationship. Another 17 subjects or 9.4% percent of the sub-sample made shifts toward the health-positive end of the spectrum during the course of the study, moving from having sexual intercourse with a primary or "other" partner to having sexual intercourse with a mutually monogamous sexual partner or becoming intercourse-abstinent.

On the risk-tolerant side of the sexual relationship/activity continuum, between pre-test and the ten-week post-test, 23 subjects or 12.7% either maintained the same risk-tolerant sexual relationship/activity status or made lateral shifts between risk tolerant statuses. Another 10 subjects or 5.5% of the sub-sample reported that they had shifted from a risk-averse to a risk-tolerant status. These persons went from either intercourse-abstinence or a mutually monogamous sexual partnership to a non-monogamous sexual partnership. In the course of the study, more subjects shifted toward risk-averse sexual relationship/activity statuses during the course of the study (17 subjects) than shifted toward risk-tolerant sexual relationship/activity statuses (11 subjects). Considering that a the majority of respondents (75.1%) began the study occupying health-positive/risk-averse statuses, (i.e. being either intercourse-abstinent or sexually active in mutually monogamous relationships) that by the end of the study there was still more movement to risk-aversion than there was to risk-tolerance seems, although not statistically significant, at least promising. Table 4.15 summarizes these results.
Table 4.15. Respondents' pre- and post-test sexual relationship/activity statuses by frequency and percentage.

<table>
<thead>
<tr>
<th>Status</th>
<th>Frequency</th>
<th>Percent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maintain abstinence</td>
<td>25</td>
<td>13.8</td>
</tr>
<tr>
<td>Shift from monogamy to abstinence</td>
<td>7</td>
<td>3.9</td>
</tr>
<tr>
<td>Maintain monogamy</td>
<td>94</td>
<td>51.9</td>
</tr>
<tr>
<td>Shift from abstinence to monogamy</td>
<td>5</td>
<td>2.8</td>
</tr>
<tr>
<td>Shift from monogamy to non-monogamy</td>
<td>10</td>
<td>5.5</td>
</tr>
<tr>
<td>Shift from non-monogamy to monogamy</td>
<td>17</td>
<td>9.4</td>
</tr>
<tr>
<td>Maintain non-monogamy</td>
<td>23</td>
<td>12.7</td>
</tr>
</tbody>
</table>
Summary of Results

Of the five initial research hypotheses, each designed to detect, in conjunction with the study instrument, different potential manifestations of a treatment effect, none indicated that there was a statistically significant difference between the safer sex intention or behavior scores of subjects exposed to the negatively framed brochure and the safer sex intention or behavior scores of subjects exposed to the positively or to the neutrally framed brochures. After detecting no statistically significant treatment effect, three additional research hypotheses and two research questions were introduced to identify trends in the scores of all subjects over the course of the study. The rationale for these additional inquiries was to see if perhaps the effect of the course experience as a whole was so profound that any potential variation in safer sex intention or behavior scores of those exposed to the negatively framed brochure would in effect have been usurped.

The results of these additional hypotheses tests were mixed. The test of Hypothesis 7 indicated that intercourse-abstinent subjects' safer sex intentions did increase with statistical significance at the $p = .05$ level between the initial and the ten week post-test $t(43) = -5.084, p < .000$. Hypothesis 6, that sexually active subjects' safer sex intention scores would increase from the initial to the ten week post-test was also accepted, meaning that the null was rejected, though the margin was much closer than that of Hypothesis $6 t(142) = -.199, p = .030$. Unfortunately. Hypothesis 8, that sexually active subjects' safer sex behavior scores would increase from the pre-test to the ten week post-test was rejected, meaning the null was accepted, but not because of the lack of a statistically significant difference between the pre-test and ten
week post-test scores. The null hypothesis was accepted because of the direction of the
difference, with scores at the pre-test being significantly larger (more risk averse) than
those at the ten week post-test $t (172) = 9.811, p < .000)$. The conclusions to the pair
of additional research questions, also investigating whether increases in safer sex
behavior or intentions of subjects between the initial and ten week post-tests might
have obscured a treatment effect, did suggest that subjects, both as a group and
individually, shifted toward risk aversion in their sexual relationships/practices over
the course of the study.

The following discussion of results will first take a closer look at what the
analyses testing the initial hypotheses revealed about the distribution of safer sex
scores between each of the three treatment levels. The discussion will then focus on
what the analyses of the additional hypotheses and research questions suggest about
the possibility that an intervention effect was present but obscured by larger shifts
toward safer sex behavior and intentions among all the treatment groups. The
discussion will conclude by examining what both the initial and the subsequent
analyses suggest about the character of change toward risk-averse sexual behavior
among the subjects involved in this study.

The final chapter of this dissertation will be dedicated to summarizing the
discussion and presenting conclusions both about what led to the results presented
here and about what these results suggest about the usefulness of prospect theory for
safer sex interventions in the future. The chapter will end with a series of
recommendations for practice and further research.
DISCUSSION OF RESULTS

Limitations

Several of the research questions addressed in this study yielded important and provocative results that addressed both the sexual behaviors of the cohort of college students who participated in this study and the effectiveness of the study intervention in changing the risky sexual behavior of the same. Whether discussing the sexual health experiences and habits of the sample at baseline or discussing the effectiveness of the treatment as determined during the two post intervention data collection points, it is important to remember that these results, based on an intervention conducted with a convenience sample of college students, are not themselves generalizable. Instead, their value lies in their ability to support or to expand the findings of others and to mark potentially fruitful areas for future research.

The Primary Hypotheses

The primary purpose of this study was to establish whether subjects exposed to a negatively framed booklet on safer sex responded more favorably on initial post-test items related to their safer sex intentions and practices than subjects exposed to a positively framed booklet or to a brochure with no arguments at all. The first research hypothesis, that the initial safer sex intention scores of sexually active
subjects would be greater for those exposed to the negatively framed brochure, was rejected. There was no statistically significant difference between the safer sex intention scores of sexually active subjects exposed to the negatively framed brochure and sexually active subjects exposed to either the positively or to the neutrally framed brochures. As the ANOVA results testing Hypothesis 1 suggest, $f(2, 139) = .594$, $p = .553$, with between and within mean squares of 1007.1590 and 1694.847 respectively) the mean safer sex intention scores of the subgroups at each level of the intervention were fairly homogenous, especially when compared to the range of scores within each group. While the scores for subjects within each treatment group ranged from 23 to 200, the mean scores for each treatment group were all within nine points of each other and all within five points of the mean for the three groups combined. The mean score of those exposed to the positively framed brochure actually equaled the median for the group as a whole, emphasizing their homogeneity.\(^4\) The immediate safer sex intentions of sexually active subjects exposed to the negatively framed brochure were therefore not significantly more risk-averse than the immediate intentions of those exposed to the positively and neutrally framed brochures, suggesting that the framing effect did not appreciably influence subjects' intentions.

Still, that individual subject's scores within each treatment subgroup varied considerably at the immediate post-test does suggest that subjects' responded thoughtfully to questionnaire items about their safer sex intentions rather than answering all questions in the affirmative as might be the temptation when faced with

\(^{4}\) Though differences between the mean scores at each level of the intervention were so slight that they can be statistically attributed to chance, the mean scores of each group going from 124 for the positive
questions about future sexual health practices after reading a safer sex brochure. Actually, the safer sex scores of all but one of the subgroups at one of the data collection timeframes had ranges of over 100 points.

The second research hypothesis addressed the safer sex intention scores of the same sexually active group ten weeks after they participated in the intervention. Again, the hypothesis that the mean scores of subjects exposed to the negatively framed brochure would be larger than the mean scores of the other treatment groups was rejected, meaning that the null hypothesis was accepted. Though the mean scores between the three treatment groups varied slightly more than the scores of the group at the initial post-test, (the ten week post test subgroup means range 12 points, compared with the 9 point range of group means ten weeks earlier) the increase was so slight that the resulting $f$-ratio of .919 was still, at $p = .401$, well above the $p = .05$ significance level. Reinforcing findings pointing to the homogeneity of the scores between treatment levels, the mean score for those exposed to the positively framed brochure, 138, was again very close to the median for the combined groups, 135, and the mean score for the group exposed to the neutrally framed brochure, 129.38, was actually within one-one hundredths of a point of the combined groups' mean score of 129.39. The mean scores for each treatment level were also ranked the same as they had been at the initial post-test, with the negatively framed mean score being the smallest and the positively framed mean score being the largest. The subgroup means combined again formed a relatively clear diagonal on a means plot as well.

frame to 129 for the neutral frame and then 133 for the positive frame form an almost perfect diagonal on a means plot.
What the results of this hypothesis suggest is that exposure to the negatively framed brochure had no appreciable latent effect on subjects, at least not at the initial or ten week post-intervention point. Not only did the mean scores between the three treatment groups not vary with statistical significance, the pattern for the little difference that there was between the scores at the initial post-test was maintained at the ten week post-test as well.

The third research hypothesis was that, at the initial post-test, the mean safer sex intention scores of intercourse-abstinent subjects exposed to a negatively framed brochure would be larger than the mean scores of subjects exposed to the positively or neutrally framed brochures. Again, the results of the ANOVA testing the hypothesis suggested that there were no statistically significant differences between the group means, and thus the research hypothesis was rejected once again. One issue to note, however, is that the sample size of this sub-group, intercourse abstinent subjects, was, at 68, considerably smaller than the sample size of 139 available for the analysis of the first hypothesis, making a statistically significant difference for the former more difficult to demonstrate.

At the initial post-test, the mean safer sex intention scores of intercourse abstinent subjects at each level of the treatment were again fairly homogenous. In fact, the safer sex intention scores of intercourse abstinent subjects at the initial post-test were even slightly more homogenous than mean scores of the three treatment groups for sexually experienced subjects for the same time frame. While the range of the mean scores for the negative, positive and neutral treatment groups for sexually active subjects at the initial post-test was nine, the mean scores of the same treatment groups
within the intercourse-abstinent sub-sample was five. Combined with the fact that, at 150.8, the mean score of subjects exposed to the neutrally framed brochure was very close to the mean for the whole group at 150.6, the homogeneity of the means becomes clear. The median of 164 for the combined groups was, however, considerably larger than the subgroup or the whole group means. This gap between the mean and median scores highlights the presence of extreme scores which impact the means, again, making it more difficult for differences between the mean scores of the three separate treatment groups to approach significance. Still, considering that the ANOVA testing whether the initial post-test scores were significantly different had a resultant significance level of .909, the lack of treatment effect seems to be due to more than the impact of a smaller sample size and increased variability of scores within each treatment group. It appears that exposure to a negatively framed brochure on safer sex does not promote more positive responses on items related to intercourse-abstinent subjects' safer sex intentions than exposure to negatively or neutrally framed brochures. Ironically, as they were at both the initial and ten week post-test for sexually active subjects, the mean score for intercourse-abstinent subjects exposed to the negatively framed brochure at the initial post-test was, while not significantly different from the other group means, still the lowest, rather than the highest, of the three mean intention scores.

As for intercourse-abstinent subjects' safer sex intentions as a whole, the higher median score relative to the mean scores highlights the negatively skewed distribution of the scores as a whole. Although, again, the scores seem to vary enough to suggest that subjects are doing more than simply responding in the affirmative to every
positive sexual health option, the intention scores of those who are not sexually active do tend toward the high range of safer sex scores. Except for an odd two subjects whose scores were each 23, a total of nine points lower than the next lowest score, and more than twenty-five points lower than the next score with a frequency of more than one, most intercourse abstinent subjects do respond to questions about practicing safer sex with prospective partners more positively than those responding about safer sex intentions with a current partner or partners.

The fourth research hypothesis addresses the ten week post-test safer sex intention scores of the same intercourse-abstinent subjects. Again, the results of the ANOVA testing the hypothesis suggested that there were no statistically significant differences between the safer sex intention scores of the intercourse-abstinent subjects exposed to the negatively framed brochure and the intercourse-abstinent subjects exposed to the positively and neutrally framed brochures. As with the same subgroup's mean scores at the initial post-test, the range of the mean scores at the ten week post-test was again 5, highlighting not only how homogenous the scores of the three treatment groups were, but also how stable this homogeneity was through the ten weeks of the study. Two of the three mean scores were actually the same as they were at the initial post-test ten weeks earlier. The mean safer sex intention scores for sexually active persons at the initial post-test were 124 for those exposed to the loss frame brochure, 133 for those exposed to the gain frame brochure, and 129 for those exposed to the neutral frame brochure. At the final post-test ten weeks later, the mean scores for the different subgroups were again 124 for the loss frame and 129 for the neutral frame. Only the responses of those in the positive frame treatment group were
sufficiently different from the initial post-test to impact the sub-group's mean. Not surprisingly, the significance level associated with the $f$-ratio calculated from these scores was, at .837, very large. The scores of the three treatment groups were all well within the range of expected scores for the population as a whole. It appears that participation in the intervention again had neither an immediate nor a latent effect on subjects exposed to the negatively framed brochure.

The fifth and final initial hypothesis addressed the safer sex behavior scores as recorded at the ten week post-test of sexually active subjects exposed to each of the three levels of the intervention. With an ANOVA result of $f (2, 171) = 219, p = .804$, it becomes clear that there again was no treatment effect. Actually, with a range of only 4 points between the means of the three treatment levels, the range of mean safer sex behavior scores was the closest yet. On whole, the safer sex behavior scores were lower than those reflecting intentions, with the minimum being 12 and the maximum being 169. Still, since the behavior scale requests information not requested in the intention scales, the importance of the lower behavior scores relative to the intention scores cannot be determined.

Since none of the five ANOVAs generated to test the study hypotheses yielded statistically significant results, it appears that exposure to the negatively framed brochure, when compared to exposure to the positively and neutrally framed brochures, did not differentially increase subjects' safer sex scores in any of the five combinations of study sub-groups and timeframes. Not only was the negatively
framed brochure ineffective in promoting behavior change or intentions over the other frames, exposure to the positively framed brochure, an alternative possibility, did not impact scores significantly either.

*Intervention Moderating Factors*

After establishing that there was no treatment effect, the question becomes, why was the intervention unsuccessful? If we assume for the sake of discussion that, as studies such as Rothman et al's 1993 study on sunscreen use suggests, a prospect theory-based intervention can impact participants' willingness to take protective health measures, three explanations for the lack of treatment effect come to mind. The first is the possibility that, while the intervention itself was sound, characteristics of the participants made them unreceptive to framing effects. This possibility conjures up a common quip about new teachers: they go to college, get teaching jobs, painstakingly design the perfect lesson plans, and then on the first day of school, the wrong students walk in the door. Aggleton (1997) describes this phenomenon within HIV risk reduction communication when he writes that "too often in the past ...[participants' beliefs, experiences and local culture] have been ignored or marginalized at the expense of interventions that speak not to people and to communities as they really are but instead to people and communities as we might wish them to be." Without, as less experienced persons might, blaming participants for their lack of receptivity to framing-based interventions, there is the distinct possibility that something about the intervention participants led them to be less than receptive to framing effects.
A second possibility for why an otherwise effective treatment could be unsuccessful is that the application of the underlying theory was flawed. If, for example, the format of the intervention is such that it doesn't foster the engagement necessary for participants to register a framing effect, then the issue isn't that the theory is flawed. The issue is that the theory was not applied in a way that was consistent with promoting changes in behavior and intentions. In their 1997 review of message framing and health-based behaviors, Rothman and Salovey discuss this second possibility extensively.

The third possible explanation for why a presumably effective treatment may appear to be ineffective takes an approach that is diametrically opposed to the previous two in that it assumes that the participants were receptive to framing effects, that the application of the theory was in a format that fostered understanding and assimilation, and that the participants exposed to negatively framed brochures really were more activated to practice safer sex. What this third possibility suggests is that the lack of significant difference in the safer sex scores of participants exposed to the negatively framed brochure was not because there was no treatment effect, but because no treatment effect could be detected. This is where the additional hypotheses described in the results section of this dissertation apply. If the effect of study participants enrolling in and taking the sexual health-related courses from which they were accessed was profound enough to leave no variability for additional treatment effect in the group receiving the negatively framed brochure, a treatment effect may have existed at one time and may even continue to exist. The issue is just that it was not
detected. The following discussion addresses each of these possibilities in the order they were presented here. For consistency, they are described as "intervention moderating factors."

Intervention Moderating Factors: Characteristics of the Sample

Sexual experience and relationships

The first possible explanation for why there was no treatment effect is that, while framing effects can, as Rothman et al's 1993 study suggests, differentially motivate those exposed to the negative frame to take protective health measures, characteristics of the participants may make them unreceptive to these framing effects. Rothman and Salovey (1997) describe this challenge. While acknowledging that studies applying message framing to health behaviors have had mixed results, the authors caution that these results are not necessarily an indication that message framing is ineffective, only that the context in which the message is offered, including the experiences and characteristics of the audience to whom it is presented, may impact whether the frame is adopted and the message internalized. (See also McDermott, 1998; Abraham & Sheeran, 1994)

In the present study, participants' levels of sexual experience varied widely. While nearly 20% of the participants reported at pre-test that they had not had anal, oral, or vaginal intercourse in the three months preceding the intervention, with 15 of these subjects reporting that they had never had anal, oral or vaginal intercourse, 25% of those who were sexually active reported being actively involved in non-monogamous sexual partnerships, with some reporting thirty to fifty-plus lifetime
partners and as many as nine partners in the preceding month. Although the majority of subjects in the sample were intercourse-experienced and in mutually monogamous relationships, the lengths of some of these relationships, the number of previous mutually monogamous relationships entered into by the subject, and the subject's age at first intercourse varied widely.

In terms of impact of sexual experience on the present study, differing sexual experiences among persons may impact the relevance and salience of considerations they weigh when evaluating the potential risks or benefits of safer sex. When weighing gains and losses associated with unprotected sex, for example, subjects who are intercourse-abstinent, may not be sensitive to arguments highlighting the increased risk that unsafe sex poses for infecting one's primary or prospective partner. They may also consider the positive arguments, such as that protected sex shows concern for a partner, very salient since the intercourse experience they contemplate may very well be with a new partner. On the other hand, a person who has practiced unprotected sex with the same partner for the duration of their relationship without apparent harm may not be as likely to consider information on the health risks associated with unsafe sex as relevant. As Rothman and Salovey (1997) point out, arguments that are not consistent with an individual's experience may make framing ineffective. Here the experience would be that unsafe sex does not result in health consequences, or at least not obvious ones. In either case, individuals' sexual histories and experiences may impact the relevance and salience of differing arguments when weighing prospects regarding safer or unsafe sex, regardless of how they are framed.
What may be even more important than the content of persons' considerations is how susceptible persons of differing sexual histories or experiences are to positive or negative frames at all. Rothman and Salovey (1997) point out that different groups may be more or less susceptible to loss or gain frames. Since, as a number of studies have demonstrated (Parsons, Halkitis, Bimbi, and Borkowski, 2000; Parsons, Siegel, & Cousins, 1997; Sheer, Welch, & Cline, 1995) teens and late adolescents including college students are less motivated by negative outcomes associated with behaviors, it would stand to reason that teens may not be as susceptible to loss frames as other persons. Another group identity-related sensitivity to framing outlined by Rothman and Salovey occurs when persons who are already practicing the undesirable behavior are confronted with loss-framed arguments.

Because persons have a need to avoid admitting that their choices may be flawed, information that might challenge the wisdom of beginning a behavior like smoking is not effective for persons already involved in the behavior. Applied to safer sex interventions, it might be that persons who are already sexually experienced, especially if they are sexually active in an ongoing relationship or another sexual pattern that presents risk, would be less open to synthesizing loss framed information. Considering that, of the 169 sexually active participants who answered about condom use for anal or vaginal sex with their most recent partner, only 28 or 12.1% reported "always" using condoms, the need to deflect loss framed arguments that could force participants to admit to the injudicious nature of their choices might be great.
Participants' perceptions of risk: accuracy of STI risk assessment

While a majority of sexually active subjects in this study reported that they were sexually active within mutually monogamous relationships, with an average of 2.2 lifetime mutually monogamous relationships at the data collection point among a group of participants with the mean age of 21.5, a tendency toward serial monogamy emerges. In terms of the present study, this pattern of serial monogamy is important because subjects who associate monogamy with safer sex might be more likely to incorrectly estimate their personal risk, believing that since they are involved in a mutually monogamous relationship, they are not at risk for STIs. As researchers such as Wenger, Kusseling, and Shapiro (1995) discovered in their sample of 700+ adults, many persons do seem to misunderstand the definition of safer sex and end up believing that they are engaging in safer sex when in fact they are having unprotected penetrative sex with partners whose sexual and drug using histories they do not know. While the researchers pointed out that the members of their sample who were college students were less likely to identify their behavior as safer sex when having unprotected sex with partners who were likely to have had numerous partners in the past, many of the subjects in this study did seem to perceive that their partners did not put them at risk for an STI even when the participants were not familiar with their partner's sexual or injection drug use history. Since to be effective, prospect theory requires subjects to be able to assess and internalize their risk of a negative consequence like STI infection, inaccurate risk assessment could easily moderate potential treatment effects.
To evaluate the accuracy of subjects' estimation of personal risk for an STI, the study instrument, while providing a response option that read "I [or my partner] have [or has] no risk for an STI" for four questions about safer sex behavior, also queried subjects about their partner's and their own sexual health histories and statuses so that their actual risk could be estimated by the researcher. The result was that 16.2% of the participants who responded that their partner had no risk for HIV infection also responded that they had not talked with their partner about his or her sexual health history, and none of those responding that they had no risk for an STI reported "always" using condoms with mutually monogamous partners, despite the fact that only 1.4% of the sample were sexually active in mutually monogamous relationships where neither partner had had a previous sexual partner. Participants' seem to underestimate their risk for STIs. Kelly et al (1990) and Aggleton (1997) both highlight the importance of helping program participants develop an accurate estimate of their personal risk.

Sexual health status

While scholars such as Rothman and Salovey (1997) assert that within a college population, researchers can assume that persons' initial reference points for health in general will be neutral or positive, with the prevalence of previously diagnosed STIs among the sample, this assumption may not be accurate for sexual health reference points. Since the purpose of this study and ones like it is to determine whether framing is effective, that some subjects may bring to an intervention a negative reference point concerning their sexual health status, threatens the validity of
findings. The question becomes, can a person who has previously been diagnosed with an STI, especially one that continues on in chronic form, ever adopt a prevention message communicated through a gain frame perspective?

In this study sample, 22 persons or 9.5% of the sample had been diagnosed at some point in their lifetimes with an STI. The most commonly diagnosed STI, with nine individuals being diagnosed, was infection with the Human Papilloma Virus (HPV) a common cause of cervical dysplasia and/or genital warts. HPV is highly transmissible, often asymptomatic, especially in females, and can, in some cases result in a long lasting infection and infectivity. Another four participants reported having been diagnosed with genital herpes, caused by a form of the Herpes Simplex Virus (HSV II), the symptoms of which may recur chronically. Though not everyone infected with HSV will continue on to have repeated outbreaks, many persons do. A complicating factor is that recent research has suggested that the virus is transmissible even when the individual has no symptoms. Though there has been progress in developing treatments that reduce the severity, length, and in many cases occurrence of HSV outbreaks, and some progress in treating HPV has also been made, persons who experience a chronic STI may not consider their sexual health status as positive or neutral, thus impacting how susceptible they might be to framing effects involving gains.

Again, Rothman and Salovey's (1997) assertions that personal experience is an important factor in whether a particular frame will be adopted and that frames leading persons to regret choices may be dismissed, suggest that STI history is an important factor. With 22 subjects or nearly 10% of this sample having already been diagnosed
with an STI, and with 13 of these subjects being diagnosed with an STI that may continue in chronic form, at least this portion of sample may not be bringing to the intervention the requisite neutral or "malleable" reference point. Combine this observation with the fact that many persons today understand that a number of STIs can exist in asymptomatic form, and the proportion of subjects who can adopt gain frame may be reduced even further. Since many of the arguments used in this framing study related to the security of knowing one does not have an STI, these arguments would at the least be ineffective and at the most be detrimental in leading subjects to adopt the assigned frame.

Recreational drug use and sexual coercion as moderating factors

As researchers such as Guo et al. (2002), Poulin and Graham (2001), McDermott (1998) and point out, a significant contributor to unsafe sexual activity is the recreational use of drugs including alcohol. Though recreational drug use should not, unless participants are impaired at the time of the intervention, prevent participants from processing and adopting messages framed to promote safer sex behavior, recreational drug use may have everything to do with the contexts in which participants apply framed information and choose whether or not to participate in unsafe sex. When asked about sexual interactions while under the influence of recreational drugs including alcohol, 48 subjects in this study, or 22.9% of the 209 subjects who answered the question, reported that they had had sex because they were under the influence of alcohol or other drugs at least once in the preceding three
months, and 27 or 12.9\% reported that they had had *unsafe* sex at least once in the preceding three months *because* they were under the influence of alcohol or other drugs.

Since a primary assumption of prospect theory is that individuals consider prospects and choose between them, if individuals are too impaired to consider consequences and options, the framing of a decision becomes moot. In this way, alcohol and drug use are very much potentially moderating factors in the effectiveness of the study intervention, at least where sexually active subjects' safer sex behavior scores are concerned. In many ways, the exercise of coercion on individuals may short circuit decision making in much the same way. Since, as mentioned, prospect theory is based on the assumption that individuals are able to make decisions and then act on them, as far as coercion serves to limit an individual's ability to do this, so coercion would serve to moderate intervention effect. With 11 subjects, or 5.2\% of the responding sample reported having, in the preceding three months, coerced someone into having sex, and with 18 subjects or 8.5\% reporting having been coerced into having sex in the same time period, coercive elements within the decision making context could have a very real effect on subjects' safer sex behavior scores.

*Intervention Format as a Moderating Factor*

A second possible explanation for why there was no difference in the safer sex intention or behavior scores of individuals exposed to the negatively framed brochure is that the format of the intervention was such that it did not engage participants enough for them to register the message frame. No matter how salient a theory may
be, and no matter how receptive intervention participants may be to the mechanisms of the theory, if the format of the intervention where the theory is applied is such that participants cannot or do not process the information, then the rest is moot.

Chaiken, Liberman and Eagly (1989) describe two ways that persuasive messages are processed by those receiving them. The first is called "systematic" processing and the second is called "heuristic" processing. As the names suggest, systematic processing involves attending to the details of a message while heuristic processing involves forming a broader notion, from the larger components of the discourse, as to its nature. Rothman and Salovey propose that, in order for the frame of a persuasive message to be "cognitively assimilated" or registered, at least if the message is negatively framed, those receiving the message need to process it "systematically." This systematic processing of information is most likely to occur if an individual is involved or interested in the information being presented, or if the information is new or unexpected to the receiver. This description of systematic processing and the conclusion that this level of processing is necessary for participants to register framing effects makes intuitive sense. Just as one would not expect a framing effect to emerge if participants did not read the framed material, so it makes sense that a framing effect might not emerge if participants read but did not really attend to the material presented. A very real possibility with a brochure-based intervention is that participants did not become involved in the material and so failed to really digest the information enough to register framing effects.

While Rothman and Salovey (1997) suggest that most health-based forms of information will be perceived by readers as important and thus will command in
readers the attention necessary for systematic processing to occur, if, as discussed above, subjects are not assessing risk accurately and may therefore not perceive themselves to be at risk for STIs, the information in the brochures might seem irrelevant. Still, even if subjects perceived themselves as potentially at risk, they might not perceive the information in the brochure as new or unexpected. Considering that the mean age of participants was 21.5, information on safer sex may be so mundane it is dismissed. The majority of these students have never known a world without AIDS or a world that did not promote safer sex in some form or another in just about every media available. Their reception of yet another safer sex brochure may have been less than eager.

Still, in order to avoid the potentially confounding factor of subjects not attending to or even reading the brochures, the intervention that this study was based on included response prompts for subjects to complete in writing which asked them to recall and consider the arguments presented in their brochures. These prompts were administered at three different points in the quarter, immediately after subjects read their brochures on the first day of class, four weeks later after subjects were asked again to review their brochures, and finally, during the eighth week of the quarter, again after subjects were asked to review their brochures. One of these response prompts was even designed to promote systematic processing by asking subjects to reflect on information in the brochure that they found surprising.

Other features of the intervention designed to engage and hold readers' attentions included using for the basis of the brochures similar brochures written for college students and sexually active persons. The artwork chosen for the brochure was
also striking and characteristic of artwork popular with young people at the time. As any number of health communication specialists assert, any sort of health communication must be written in terms of the values and skills of the intended audiences. The brochure was also designed to communicate as little blame as possible, thus avoiding denial reactions described above. Finally, included in the brochure were bulleted lists called "condom facts" which included information on pleasure enhancement, thus appealing to interests beyond sexual health. Though it is beyond the scope of this study to rule out the possibility that there was no treatment effect because the brochure-based intervention form was not sufficiently engaging to command systematic processing, at the least, the brochure met current standards in the field. The additional assignment of periodic response prompts designed to refocus subjects' attention on the brochure may have made the intervention stronger than most.

**Course Experience as a Moderating Factor**

Finally, a third possible explanation for why there appeared to be no difference in the safer sex scores or behaviors of individuals exposed to the negatively framed brochure was that the experience of enrolling in and completing the sexual health-related courses from which subjects were accessed could increase scores so radically that the variability that would otherwise have been available to demonstrate a differential impact of the intervention on those receiving the negatively framed brochure would be usurped.

To explore whether the class experience could have overwhelmed differences in the intentions and behaviors of those exposed to negatively framed brochures, three
additional hypotheses were developed. The first addressed changes in the safer sex behavior scores of the entire sexually active sample between the pre-test and the ten week post-test. The second and third addressed changes in the safer sex intention scores of sexually active and intercourse-abstinent subjects between the initial and the ten week post-tests. Along with these additional hypotheses, two research questions were also developed, both aimed at investigating the level of progress, if any, that subjects made toward more risk-averse sexual relationship/activity statuses between the initial and the ten week post-test. While a virtue of the pre-test post-test comparison group design used in this study is that treatment effects should be discernable beyond the effect of experiences shared by all of the subjects, there is the possibility that lesser but still statistically significant intervention effects could have been present had the greater effects of the course experience not impressed those exposed to the negatively framed brochure so dramatically that subjects could not be impressed by what would otherwise have been a persuasive frame. The results of the additional hypotheses could perhaps, if they demonstrated large enough gains in health-protective safer sex intentions and behavior in all of the study subjects over the course of the study, provide at least circumstantial evidence supporting the notion that were it not for the larger experience of participation in a ten week sexual health-related course, the intervention would have been effective. Since very few persons have the opportunity to take a ten week sexual health-related class, the more modest gains of a framing effect could still be every desirable.
**Additional Hypotheses**

As mentioned in the earlier presentation of the secondary study hypotheses, the results of the additional hypothesis tests were mixed. Given that the purpose of these additional hypotheses was to investigate whether a treatment effect may have been obscured by greater, overall increases in safer sex intentions and behavior of the whole sample, that the results were mixed does not bode well.

Still, the additional hypothesis tests do suggest that there was at least one fairly substantial increase in safer sex scores over the course of the study. The safer sex intention scores of intercourse-abstinent subjects increased from an initial post-test mean of 151.95 to a ten week post-test mean of 165.71, with a paired-sample $t$ test result of $t(43) = -5.084$, $p < .000$. The post-test intention scores of sexually active subjects also increase significantly at the $p = .05$ level, and the shifts from risk-tolerant to risk-averse sexual relationship/activity statuses between the pre-test and the ten week post-test on both the group and the individual level also attest to an increase in the safer sex intentions and behaviors for the sample as a whole.

The question then becomes, were these increases sufficient to interfere with the manifestations of a treatment effect? Hypothesis 7 addressing intercourse-abstinent subjects seems the most likely to demonstrate a change of that magnitude. With an increase between initial post- and ten week post-tests at a significance level of .000, this increase was fairly dramatic for health behavior change. Still, for the effect of the course as a whole to be large enough to usurp the variability in scores that would otherwise have been available to reflect a treatment effect with those exposed to the negative frame, the scores the entire sample ($N = 231$) would need to be very close to
the maximum score possible. The distribution of the ten week post-test safer sex scores among intercourse abstinent subjects does not suggest that this is the case. At 165.7 (standard deviation 34.9), the mean of the safer sex scores was still 34 points below the maximum possible score of 200. Since the actual maximum score for the group was 200, establishing that the maximum possible score was attainable, the lower mean score, combined with a 35 point standard deviation suggests that the effect of the course experience on intercourse abstinent subjects as a whole did not usurp variability that might otherwise have been reflected in a treatment effect. Despite having a mode of 200, the 150 point range of safer sex intention scores for intercourse abstinent subjects, combined with the fact that 50% of the scores were under 170 points, suggests that even after the increase in scores ostensibly due to the participation in the ten week courses, there was still sufficient variability remaining for a treatment effect to have manifested itself.

Since the greatest of the increases in safer sex scores demonstrated by the additional hypotheses still left sufficient variability for a treatment effect to have manifested itself, and since the analyses for Hypothesis 7 detected a reduction, not an increase in safer sex behavior, the post hoc inquiry into whether that the experience of the course itself usurped variability that would otherwise have demonstrated a treatment effect seems to have established that this was not the case.

These additional findings, especially when combined with the earlier findings in this study about the consistency, not just the homogeneity, of subjects' safer sex intentions and behaviors over time, suggest that the safer sex behaviors and intentions of the sexually active subjects in this study were exceptionally persistent, if not
resistant to change. The additional findings also suggest, however, that the intentions of intercourse abstinent subjects did change over the course of the quarter, as did the intention scores of sexually active participants, though less significantly level. It begins to appear that while the prospect-theory based intervention had no significant effect, the changes in intercourse active subjects' safer sex behavior scores and the changes in the intercourse abstinent subjects' safer sex intention scores are consistent with the risk-aversion and perhaps even the risk tolerance predicted by prospect theory's S-shaped value function.

While any combination of participants' experiences, beliefs, level of interest or willingness to adopt the frame of the brochure assigned to them could potentially lessen or even undermine a framing effect, prospect theory was at its inception, based on observations about how decision makers actually made decisions in the face of risk, in fact how they violated the principles of rationality embodied in Utility Theory. Prospect theory, and other modifications of utility theory like it, was at its inception, descriptive in nature. While the results of the intervention were not consistent with what would be predicted by prospect theory, the finding that, after participating in ten weeks of a three credit hour college course addressing sexual health, intercourse abstinent subjects registered the most statistically significant gain \( (p < .000) \) in safer sex intentions while intercourse active subjects actually registered an actual decrease in safer sex behavior \( (p < .000) \) is consistent with what would be predicted by prospect theory. Perhaps the courses themselves in combination with reference points determined by students' sexual experiences, functioned to sensitize and consistently reinforce those who were abstinent to their position in the realm of gains thus fostering
increased risk aversion as represented by increased safer sex intention scores at the end of the study. If the opposite were also true, that the course functioned to sensitize and consistently reinforce to those who entered the classes having had sexual experiences that did or might have led to the transmission of STIs, would prompt them to perceive their sexual health in the realm of losses and thus become more risk-tolerant, then the apparently illogical result of decreased safer sex behavior scores in the face of ten weeks of participation in sexual health related courses would make more sense. Though it is not within the scope of this study to determine whether students' reactions to the courses based on their own experiences created a framing effect, the explanation is at the least plausible.
The purpose of this study was to determine whether the framing effect of Kahneman and Tversky's prospect theory, when applied to a brochure-based safer sex intervention, would positively impact the safer sex-related intentions and behaviors of subjects exposed to the negative or loss frame brochure. Subjects constituted a convenience sample of 231 college undergraduates who attended one of four sections of two sexual health-related courses held at the Ohio State University in the Spring and Fall of 2000.

The mean age of the subjects was 21.5 (standard deviation 3.13). 152 or 66% were female, and 77% reported that their academic status was junior or higher. At pre-test, 15 of the subjects reported that had never had anal, oral or vaginal intercourse while another 24 or subjects reported that they had not been sexually active in the three months prior to the intervention. 52 subjects reported that they were sexually active in non-monogamous partnerships. The average number of mutually monogamous relationships experienced per participant was 2.2. 15 subjects reported having only one sex partner in their lifetime.
For the study intervention, on the first day of each class, subjects were randomly assigned to read, consider and respond in writing to one of three differently framed brochures on safer sex. The negatively framed brochure highlighted the potential losses associated with the failure to practice safer sex. The gain frame brochure used the same argument content but presented it in terms of what persons could gain or maintain if they consistently practiced safer sex. The third brochure presented no arguments at all. Because the intervention topic was germane to the contents and objectives of both of the courses, there was no control group. All participants were exposed to brochures about safer sex. At the fourth and eighth weeks of the quarter, subjects were again asked to read, consider and respond to their respective brochures in writing.

The study instrument was author-derived and measured the safer sex intentions and behaviors of intercourse-active subjects and the safer sex intentions of those who were intercourse-abstinent. Demographic information and information on subjects' sexual histories was also collected. Before reading their respective brochures, subjects were asked to complete a pre-test. Subjects completed an initial post-test immediately after reading the brochure and responding to prompts. Subjects completed a second post-test on the last day of the course, ten weeks after the intervention.

Of the 231 college students participating in this study, 181 completed the study intervention, the pre-test, and the initial and ten week post-test measures. Five separate analysis of variances performed on data addressing subjects' safer sex intentions and, for sexually active subjects, safer sex behavior, yielded no significant differences between
the scores of subjects exposed to a negatively framed safer sex brochure and subjects exposed to positively or to neutrally framed brochures.

To investigate whether this lack of treatment effect might be due to the greater influence on subjects' sexual intentions and behavior of the sexual health-related nature of the courses from which the convenience sample of subjects was accessed, data on subjects' safer sex intentions and behaviors from pre-test to the ten week post-test were also analyzed. The results of this secondary analysis revealed that intercourse-abstinent subjects' intentions to practice safer sex did become significantly more health-positive from the beginning to the end of the quarter ($p < .000$). The second analysis revealed that the safer sex intention scores of intercourse-active subjects also increased significantly at the $p = .05$ level, though at $p = .03$, the probability level of the latter was less impressive than the former. Finally, the safer sex behavior scores of sexually active participants did evidence another significant change from pre- to post-test, this time again at the $p < .000$ level. Unfortunately, the nature of this change was toward unsafe sex.

The author concluded that while the prospect theory-based intervention resulted in no significant differences between the safer sex intention and behavior scores of subjects exposed to the negatively framed brochure and subjects exposed to the positively or neutrally framed brochures, a pattern that was consistent with the risk aversion and risk tolerance predicted by prospect theory did emerge. From the initial post-test to the ten week post-test, intercourse-abstinent subjects' safer sex intention scores increased significantly. At the same time, sexually active subjects' safer sex behavior scores decreased significantly. Considering that in the ten weeks between the two measures, subjects were enrolled in courses addressing sexual health and hence, presumably were
prompted to think about their own sexual health statuses, that abstinent subjects would become more risk-averse and intercourse experienced subjects would become more risk-tolerant is consistent with the "S"-shaped value function for gains and losses introduced by prospect theory. The finding that intercourse-abstinent subjects' safer sex intention scores increased over the course of the study while the safer sex behavior scores of intercourse-active subjects decreased over the same time period is also consistent with the over-weighting of small probabilities and the under-weighting of larger possibilities predicted by prospect theory.

Conclusions

The results of this study, when considered in light of the literature published on prospect-theory in general and prospect theory-based health behavior interventions in particular, have led to the following conclusions.

The Sample

81% of the college undergraduates participating in this study were sexually active. As noted above, many also reported having had extensive sexual experience and most reported inconsistent use of condoms at best. This level of sexual activity and experience is consistent with the findings of researchers such as Bon, Hittner, and Lawandales (2001) who also studied undergraduate samples. With only 1.4% of the sample reporting that neither they nor their current sexual partner had had previous sexual partners, and with only 12.1% of the sample reporting consistent condom use, continued investigation into ways to promote safer sex behavior among similar samples is essential. This is one
area where the predominance of college undergraduates participating in university psychology studies is an advantage. While other groups may have higher rates of STIs and greater numbers of partners, and while other groups may face greater social, economic, and environmental challenges, the sheer number of individuals in similar stages of sexual development who are brought together in college environments underscores the need for researchers to continue to identify ways to support these students' healthy sexual development by helping them to reduce their risk of serious sexual health consequences.

*The Application of Prospect Theory*

*Divergent goals*

From a health promotion perspective, the decision whether to engage in health positive behavior should be obvious. As Rothman and Salovey (1997) write, "The opportunity to obtain a prostate exam, for instance, should be embraced with little hesitation when the costs of missed early detection are made salient." The issue is that even in instances where health may be affected, not all people are primarily motivated by health-related goals. To the extent that intervention participants do not seek the goals that researchers build framed messages around, the effectiveness of interventions will likely be reduced.

The array of potential goals that individuals may consider when making sexual decisions is so vast, sexual decision problems bear little relationship to the gambles or hypothetical survival/mortality problems where prospect theory's effects are most robust. When a person evaluates a gamble, the frame of reference and prospects he or she
considers are fairly clear. In the vast majority of cases, the person's goal is to increase wealth and so he or she will likely evaluate prospects on the basis of potential wealth gained or lost. He or she will also likely be sensitive to the frame of problem that involves gains or losses in wealth. The same clear goal and ensuing sensitivity to frame would also apply to hypothetical mortality/survival decision problems such as Kahneman and Tversky's problem of the "Asian Disease." Just as the majority of persons would probably not, in a gambling decision, attempt to optimize their chances of losing money, so it seems that most decision makers will try to make decisions to maximize survival.

While making the decision to practice safer sex may involve one or two primarily health-related goals (i.e. to avoid STIs and, in some cases, to manage fertility) making the decision to have sex at all is very likely not going to involve extensive consideration of health. Considerations ranging from the desire to experience pleasure and release to the desire to maintain a mutually satisfactory intimate relationship, to such ostensibly nonsexual factors as economic considerations or the need to avoid intimacy or emotional vulnerability may very well be more likely contenders for common goals surrounding the decision to have sex. Assuming that individuals are going to be sensitive to variations in decision frames based on sexual health assumes that individuals are willing and in fact able to consider sexual health a priority when weighing prospects related to sex. Whether a safer sex brochure or video-based intervention can be compelling enough to shift participants' attention to a sexual health-based reference point, let alone one that is negatively-framed, is questionable.

The conclusion reached here, however, poses another problem. If participants are going to adopt the frame presented in a decision problem (and they must if a prospect-
theory-based intervention is going to be effective) researchers may need to present arguments that address participants', not researchers', goals and values. Examples of more salient arguments might be how condoms enhance sexual performance by delaying ejaculation or how condoms makes sex less messy and so reduce those uncomfortable post-coitus moments, especially with a partner someone does not know well, when sexual energy has abated and partners discretely attempt to clean themselves up. The problem with these types of "participant-centered" messages, especially when addressed to adolescents, is that the public's reception of them is likely to be cool at best.

**Dynamic perceptions of risk**

Another challenge to the effective application of message framing to safer sex interventions is that with many decision situations, the decision maker's priority may not be clear, as Meyerowitz and Chaiken discovered in their 1987 study. While initially it may seem that performing breast self exam (BSE) is a risk-averse behavioral option in that BSE may detect cancer early and thus promote chances of survival, Meyerowitz and Chaiken concluded that their subjects were actually experiencing the practice of BSE as a risk-tolerant behavior. For their samples of healthy subjects, BSE meant risking the possibility of finding a lump. Safer sex invokes much the same ambiguity. While for health educators safer sex may be conceptualized as risk-averse in that it is a health-protective measure, for college students, the practice of safer sex may be risk-tolerant because of the short term possibility of having a partner refuse sex because he or she is
offended at the mention of safer sex, or because of the possibility that a male partner will not be able to sexually perform with a condom, or because the experience of pleasure for both partners will be diminished.

While Rothman and Salovey (1997) comment on the possibility that safer sex may be perceived as a risk-tolerant behavioral option, what the researchers do not mention is that, within the same sample, some individuals may perceive safer sex as risk-averse while others perceive it as risk-tolerant. Since, as Rothman and Salovey point out about sunscreen use interventions, adopting a negative frame with persons who are perceiving the target behavior as risk-averse may actually undermine preventative behaviors, there could be as many participants prompted to take risks that could negatively impact health as participants prompted to engage in health-protective behaviors. To be fair, Rothman and Salovey do mention the possibility that subjects could consider a behavior from a variety of perspectives. Still, they assert that, because "social practices play a prominent role in shaping how health behaviors are perceived," individual differences in perceptions of a health behavior need not be identified. While the social perception of a health behavior, such as the social perception that BSE is a disease detecting rather than health affirming behavior, may well predominate within a group, with a behavior like safer sex, individual experiences with intercourse and/or STIs are likely to be much more varied, increasing the changes that individual perceptions will predominate over social ones. It may be that prospect theory-based interventions can only be used on an individual basis or within groups where leaders can be relatively certain that participants share the same perspective, thus significantly reducing the usefulness of the theory in the area health promotion.
STIs and reference points

Just as it is necessary to establish that intervention participants share a common and stable view of whether safer sex is a risk-tolerant or a risk-averse behavioral option, so another challenge to the application of prospect theory in safer sex interventions is that participants must be able to adopt the reference point that is consistent with the frame presented. While some believe that, on average, college students have an optimistic view of their sexual health status, with 22 subjects or 9.5% of the sample here having reported being diagnosed with an STI, and with the most common diagnosis being Human Papilloma virus infection (HPV), a viral, occasionally chronic, and often asymptomatic infection, assuming that subjects can as easily adopt a gain frame as they can a loss frame may be naive. For any of the nine students in the sample who have been diagnosed with HPV or any of the four students in the sample who have been diagnosed with herpes simplex virus (HSV II), a gain frame message, with its requirement of a positive or at a least neutral reference point toward sexual health, may be impossible to adopt. To make matters worse is that exposing a participant who struggles with continued herpes outbreaks, for example, to a gain frame may not only inspire the resistance to regret that Rothman and Salovey (1997) describe, it could also foster a nihilism that could effectively prevent progress in support disclosure of STI status to prospective sex partners and the responsible practice of safer sex. Until the relatively recent development of HIV interventions designed to help persons disclose their HIV-positive status, little work has been done in sexual health interventions to help persons who already have an STI to prevent secondary infection.
Inaccurate risk assessment

The finding that a number of subjects appeared to be incorrect in their estimation that their partner(s) had no risk for a sexually transmitted disease points to another problem in the application of prospect theory to safer sex behavior, that even if individuals do evaluate the decision to have sex based on sexual health-related prospects, the tendency to under-weight moderate to significant risks may lead them to choose to practice unsafe sexual behavior anyway. As a number of health psychologists have pointed out, individuals are often incorrect in their estimations of personal risk or vulnerability. Since prospect theory depends on weighing potential outcomes, prospect theory-based interventions are especially vulnerable to inaccurate risk estimations. If a person perceives that he or she is not at risk for contracting an STI, producing behavior change through the application of risk-taking theory would not only be ineffective, it would be inappropriate. Ironically, a number of these inaccurate estimations of risk are actually predicted by prospect theory itself.

Drug and alcohol use and coercion

The finding of this study that a substantial number of subjects reported having decided to have sex, and in some instances, to have unsafe sex, because they were under the influence of recreational drugs including alcohol challenges the appropriateness of applying a decision making model to safer sex interventions. (McDermott, 1998) An assumption of prospect theory is that individuals consider prospects and choose between them. That individuals are reporting that they have engaged in sexual activity because their judgment was impaired suggests that interventions directed at the point of the
decision to engage in sex come too late--the framing of a decision becomes moot when the decision maker is too impaired to consider prospects. Though far more reprehensible, the finding that a substantial number of subjects had been coerced into engaging in sexual intercourse after saying "no" at least one time presents much the same challenge for applying prospect theory to sexual health behavior. In some instances of coercion, the exercise of choice may be significantly restricted if not wholly prevented.

*Intervention medium*

The lack of statistically significant differences in the safer sex scores of subjects exposed, not only to the negatively-framed brochure, but to both the negatively- and the positively-framed brochures, in comparison to those exposed to a brochure presenting no arguments at all, points to a problem with the medium not just the message. Considering all of the literature demonstrating the effectiveness of persuasive communication styles (c.f. Aggleton's 1997 review of behavior change communication strategies) that even in the ideal circumstances of this study, where literate subjects could be assigned not only to read but also to respond in writing to the brochures and to do this not only one time, but three times over the course of ten weeks, that there were no significant differences between subjects exposed to information framed with persuasive discourse and those exposed to information without any persuasive frame, suggests that brochures are less than effective instruments for communication designed to effect behavior change.
What if prospect theory is right?

Because prospect theory posits that people who perceive themselves in a loss position may be more likely to engage in risk behavior, prospect theory could easily be used to foster the notion that persons who have serious and incurable STIs, including HIV, may, at best, not be concerned about exposing others and at worst, actively try to infect sero-negative partners. As discussed above, everyday experience highlights how perceptions of the probability of an unlikely outcome are typically over-weighted, while perceptions of outcomes with much greater probability are typically under-weighted. That so many persons who think very little of having unprotected sex with a sexually experienced mutually monogamous sexual partner who has not been tested for HIV will, at the same time, actively fear that persons who have HIV will consciously transmit the virus to others demonstrates these shifts in the perception of probabilities. The problem is that the fear that persons who have HIV will recklessly endanger others fosters discrimination, which in turn engenders isolation, secrecy, and lack of proper diagnosis and medical care.

A "sub challenge" therefore presents itself here. If prospect theory does effectively predict risk-tolerant sexual behavior (and if it doesn't, any discussion about it would be moot) it may be that persons who are infected with serious and chronic STIs are likely to be more tolerant of the risk of transmission to others. After years of attempts to dissuade "victim-blaming" responses, this would be a finding that many of us would prefer not to see. In the event that prospect theory was an accurate predictor of behavior
trends among persons with serious and chronic STIs, an additional challenge would be how to find ways to avoid these results from fueling efforts to strip infected persons of basic rights.

Recommendations

The purpose of this study was to evaluate the effectiveness of an intervention that ended up having no discernable effect on participants' safer sex intentions and behaviors as these were operationalized by the study instrument. Because there was no treatment effect, the bulk of the discussion and conclusions presented in this dissertation have been critical. Still, there are at least four of reasons why the application of prospect theory's notion of framing effects would be ideal for health communications designed to promote safer sex. First, the principles of message framing could easily be applied to many existent safer sex interventions without compromising either interventions' existing theoretical foundations. Second, since to be effective, interventions must be sensitive to the contexts within which participants function, prospect theory's ability to accommodate any number of perspectives and arguments is a great advantage. (McDermott, 1998). Third, since applying a message frame to a health communication would require little to no dedication of resources such as money or time in program planning or implementation, from an administrative perspective, the application of prospect theory represents the epitome of cost effective programming. Even if the treatment effect is very small, it was created with little to no commitment of resources and therefore may be a more effective use of resources than designing additional, more elaborate interventions. Fourth, since the tenets of prospect theory are easily communicated with little additional
training and, once familiarized with appropriate examples, have intuitive appeal, from the perspective of innovation diffusion, prospect theory runs little risk of joining any number of other program innovations that never make it past the theorists' doors.

The question then becomes how, in the face of challenges such as those revealed in this study, might prospect theory be applied to sexual health interventions so as to increase the likelihood of them being effective? Based on the results of this study, the following recommendations for practice and research seem to be in order.

**Recommendations for Practice**

As mentioned above, the level of sexual activity, the extent of sexual experience, the lack of consistency with which safer sex is practiced, and the sheer concentration on college and university campuses of persons in sharing the same explorative stage of sexual development makes attention to sexual health behavior on college campuses a virtual imperative. Besides being made widely available, sexual health courses need to be designed by persons who stay current with the literature on sexual behavior and health, who have expertise in the application of that research in an academic setting, and who can and do evaluate the effectiveness of their efforts. To insure that such persons are available, more academic institutions need to promote sexual behavior and health as a legitimate area of study.

**Divergent goals**

As for the application of prospect theory for effective safer sex interventions, the problem of divergent goals between health educators and intervention participants needs
to be addressed. Framed messages need to be designed around arguments that are relevant to the intervention participants. In order to do this, secondary interventions may need to be designed to garner the support of opinion leaders and those in authority and hence facilitate the acceptance of what might very well be controversial prevention messages.

Dynamic perceptions of risk

As mentioned in the conclusions above, the possibility that the wrong combination of framed message and participant perception of the risk involved in safer sex may actually support risk behavior, if true, is going to require careful selection and monitoring of intervention participants. Groups of persons who are intercourse-abstinent or who are (correctly) assessed as having little to no risk for an STI may need to be provided with a different intervention than those who are sexually active. The use of message framing may therefore need to be restricted to one-on-one interventions where the perspective of the participant can be established. While the context of health counseling sessions would meet these criteria, another appropriate forum might be computer/internet-based safer sex interventions.

Accurate risk assessment

Correct information is a necessary but not sufficient factor in the success of any health promotion intervention. With prospect theory-based interventions, where an incorrect estimation of personal risk may lead a participant to dismiss the appropriate message frame, the ability of participants to accurately assess their risk is essential. Time
and energy must be dedicated to the topic of risk assessment in any prospect-theory-based intervention. An interesting note is that, with HIV infection rates among college students estimated at 0.03 (Stine, 2000) who is to say that college students' lack of vigilance with safer sex isn't appropriate? In terms of HIV, college students' apparent assessment that risk is low is fairly accurate.

*Drug and alcohol use and coercion*

Since, as mentioned above, anything that impairs an individual's capacity to weigh prospects and to act on decisions will effectively render intervention efforts targeting decision making moot, interventions designed to promote health-positive sexual decision making need to include components addressing the decision to engage in recreational drug use to the point of cognitive impairment. The key is to address an essential decision that occurs before impairment. Because individuals' decisions may be influenced or even overcome by the coercive behavior of others, interventions to dissuade persons from attempting to coerce another after the latter has expressed a definite intention may also be appropriate.

*Intervention medium*

No matter how well written or how sensitive to the concerns of intended readers the content of an informational brochure may be, if members of the intended audience do not read it, or in the case of loss framed messages, do not read it and process the information systematically, the effort is wasted. To avoid this, those designing intervention materials should choose an information medium that can, as Chaiken at al.
(1993) suggest, quickly promote involvement in the issue or elicit surprise. Since to be effective, intervention content also needs to go beyond the exchange of information and provide opportunities for reinforcement and observation and rehearsal of the targeted skills, (McDermott, 1998; Bandura, 1990) when at all possible, brochures should be used to assist interventions not to substitute for them.

Recommendations for Further Research

Salience and relevance

As a number of theorists have noted (i.e. Rothman and Salovey, 1997; Meyerowitz and Chaiken, 1987) since the success of prospect theory-based interventions depends on participants adopting the specified frame of reference, research is needed to identify arguments that are both salient to the anticipated participants and consistent with their experiences. Since a likely result of incorporating arguments that are salient to participants, however, is that others will find the resultant intervention messages offensive, research into the design and implementation of effective secondary interventions, whereby the support of opinion leaders and decision makers can be garnered, will also be necessary. Kelly's innovation diffusion theory may prove to be a useful tool when exploring the topic of secondary interventions.

Establishing and modifying reference points

Serious consideration also needs to be given to the mechanisms through which individuals' initial reference points are established and how these reference points can then be expanded or modified. While systematic processing of information appears to be
necessary for an individual to assimilate a given frame, very little is known about what else is required. If it is true that individuals will not adopt reference points that contradict their own experiences, then we may be left, for lack of better words "preaching to the choir," since persons whose experiences have led them to perceive themselves in a position of loss may not be able to adopt the requisite reference point of gain. If, as Rothman and Salovey (1997) suggest, a loss framed appeal might actually undermine the practice of a risk-averse behavior such as sunscreen use, further research is also needed into how best to mitigate the capacity of framed messages to encourage the opposite of intended effects. The best approach might be to teach intervention participants how to frame their own inner dialogues so as to support the adoption and/or maintenance of health-positive behaviors.

Effect sizes

Research is needed into establishing what effect sizes decision-framing can be expected to achieve and how consistently the expected effect is likely to be produced. While, as mentioned above, decision framing has the potential to be a very cost efficient addition to a number of already effective safer sex interventions, if the anticipated effect is likely to be very small and/or is not likely to be produced consistently, it may be better use of resources to investigate the applicability of other theories for safer sex interventions.
Deleterious effects

As mentioned above, prospect theory could be a very efficient tool for STI prevention efforts since the small amount of resources needed to implement message framing would justify even a very small health-positive effect on participant risk taking. What would tip the scales the other way, however, would be a finding that message framing could actually foster risk-tolerant safer sex behavior or intentions. As prospect theory itself predicts, the effect of losses predominate over gains of the same magnitude. While a small effect to the positive may justify implementation of resource-efficient technique, any effect to the negative is likely to be unacceptable. With this in mind, a research priority should be to establish whether, as Rothman and Salovey (1997) suggest, increased risk-tolerance toward health-negative behaviors may occur when the framed message and the participant are mismatched.

Further qualitative efforts

Because the purpose of this study was to explore whether the framing effect predicted by prospect theory, when applied to a safer sex intervention, might positively impact the safer sex-related intentions and behaviors of subjects exposed to a negatively framed brochure, the study instrument was designed to identify changes in safer sex intentions and behaviors. A different research design and instrument would be necessary to establish why a prospect theory-based intervention was not effective, and whether elements germane to message framing contributed to a lack of treatment effect at all.

In order to identify relevant and salient arguments for any given target population, qualitative data collection methods such as individual or focus group interviews must be
employed. Since, with a topic such as sexual health status, different experiences and practices may lead individual members of the same target population to process argument frames differently, a second requirement would be to establish whether individual participants did in fact adopt the frame presented to them. Again, qualitative data collection methods seem as if they would be best suited for gathering this kind of information. Since, if the intervention is to be effective, any message framing effect needs to transfer to actual sexual decision making situations, a third requirement would be to regularly collect data, not only on participants' safer sex behaviors, but also on the process through which they decided to practice safer or unsafe sex. Finally, because arguments can be made for considering safer sex as both a risk-averse and a risk-tolerant behavior, it is essential to identify how the participant experiences the prospect of practicing the target behavior.
APPENDIX A

INTERVENTION BROCHURE

A Safer Sex Guide

The best way to protect against sexually transmitted disease (STD) is not to have any sex that involves the exchange of blood or sexual fluid between you and your partner. Kissing, hugging, talking about fantasies, or giving each other massages are safe because they don't involve the exchange of sexual fluid or blood. Some STD's however, like herpes or syphilis, can be transmitted by skin to skin contact even if you don't exchange fluids. Avoid coming into contact with sores or lesions on another person.

If you do not want to abstain from sexual intercourse, the next best way to avoid contracting an STD is to be in a mutually monogamous sexual relationship with someone who does not have an STD. That's a relationship where you only have sex with one other person and that person only has sex with you and you both know that you do not have an STD and do not practice behaviors like using sharing IV drug needles where you might get a disease.

To make sure that you and your new partner don't have STD's, talk

1 Font and formatting altered for inclusion in this dissertation.

2 This brochure is an adaptation in both lay out and content of two safer sex brochures: The Safer Sex Condom Guide (1992) produced by the Gay Men's Health Crisis; Condoms, Contraceptives, and STDs: Does your birth control protect you from sexually transmitted disease? (1994) produced by the American School Health Association. The section titled "The right way to use a condom" and the passages on the male and female condoms and dental dams are quoted directly from the ASHA brochure. Much of the section titled "facts" is quoted directly from the GMHC brochure. The term "condom" has been substituted for the word "rubber" throughout.
with each other about your sexual health histories, go and get HIV antibody tests, and have a check up with a doctor. Many times, you can be tested and have a check up for free or low cost at your local health department.

Remember, the more partners you have, the more risk you have that your partner or one of your partner's past partners had an STD. Having one mutually monogamous partner at a time but having three or four in a year is about the same as having three partners at one time. Try to find someone who you will be with for a long time, perhaps even forever.

If you are not in a mutually monogamous relationship or if you are beginning a monogamous relationship but are not sure yet that you and your partner do not already have an STD, then use condoms or other barriers every time you do something that might involve the exchange of blood or sexual fluid.

At present, the male latex condom is considered the best barrier protection against STD's when the penis may enter the mouth, vagina, or anus. A male condom made of polyurethane has also been approved for birth control and is recommended for men who are allergic to latex condoms. Though it appears that polyurethane condoms may also protect partners from some STD's, research on this is still continuing. The male polyurethane condom is good for people who are allergic to latex. Male condoms made of natural membrane ("animal skin") are not recommended for disease prevention.

When a man cannot or will not use a latex condom, the female condom is the next best choice for penis-to-mouth, penis-to-vagina, or penis-to-anus sex. The female condom is a polyurethane pouch. The closed end of the pouch goes up into the vagina and stays anchored by a ring that fits around the cervix inside the vagina, like contraceptive diaphragms do. The other end of the pouch has a ring that rests outside the woman's body on the woman's labia majora or vaginal lips. Directions on how to use a female condom are provided below.

For mouth-to-vagina or mouth-to-anus sex, it is a good idea to place a latex barrier like a dental dam or a condom cut lengthwise over the vagina or anus so that blood or sexual fluids don't come into contact with the mouth. Call the STD hotline number below to find out more about dental dams, including where you can get them.
The right way to use a condom

The male condom

Treat condoms gently so that they don't get damaged. Keep them out of the sun. With latex condoms, never use skin lotions, baby oil, Vaseline, or cold cream--the oil in these products weakens the condom. If you use a lubricant, use one made with water (such as K-Y jelly.)

Put the condom on before the penis touches the vagina, mouth or anus.

Hold the condom by the tip to squeeze out the air. Leave some space at the tip to hold the semen.

Unroll the condom all the way over the erect penis.

If you feel the condom break or slip during sex, stop immediately and pull out. Put on a different condom. After sex, hold the condom at the rim and pull out slowly while the penis is still hard.

Use a new condom if you want to have sex again or if you want to have sex in a different place (for example, in the anus and then in the vagina).
The right way to use a condom

The female condom

The female condom is a polyurethane (plastic) pouch that fits inside a woman's vagina. It has a soft ring on each end. The outer ring stays ion the outside of the vagina and partly covers the labia (lips). The inner ring fits inside the vagina, much like a diaphragm, to hold the condom in place.

Insert the condom any time before the penis touches the vagina.

Add lubricant to the inside of the condom.

Squeeze the inner ring of the condom. Put the inner ring and pouch into the vagina.

Guide the penis into the condom.

If the penis comes out of the vagina during sex and then goes back in, guide it inside the condom.

Remove the condom before standing up. Pull out gently.

Throw the used condom away. Use a new condom if you want to have sex again.
Condom Facts

- Putting one drop of lubricant inside the tip of the condom can make the penis feel better. Don't put spermicide on the shaft of the penis or the condom might slip off.

- There are many different kinds of condoms to choose from. They come in many styles, shapes, and colors. One size fits all. Condoms are strong and will stretch to fit any size penis. Some condom companies make condoms in a smaller size, for those who like a tighter fit.

- Condoms can be made from animal skin or latex. Many experts think latex condoms are better than skin condoms because they are stronger. They fit better and won't break easily.

- Some condoms have water-based jelly or lubricants already on them. For some kinds of sex, especially anal sex, you need more. With latex condoms, always use water-based jelly or lubricants like K-Y or H-R jelly. Water-based means no oil or grease is in the lubricant. Lubricants that have oil or grease, like Vaseline, Crisco, mineral oil, massage oil, butter and most hand creams, can weaken condoms and can make condoms break. Do not use them. Lubricants with alcohol in them can also damage condoms.

- Spermicides are chemicals that kill sperm. Some jellies, foams, or lubricants have Spermicides in them for birth control. Some people are allergic to spermicidal jellies, foams or lubricants. Allergic means you get red or itchy. To see if you are allergic, put a little drop on your wrist, if you get red and itchy, try another brand.

- Most companies put an expiration date on the box or on the individual wrappers. Others put the date that the condoms were made. When stored in a cool, dry place condoms are good for about two years from the date they were made. It's a good idea not to use a condom if the expiration date is less than a year away. Do not keep condoms in the glove compartment of a car or in a wallet or pocketbook for a long time. Heat can make them weak. Keep unopened condoms protected from heat, sunlight, moisture and fluorescent light.
For more information on STD's, contact the National STD hotline at 1-800-227-8922.

Argument Panel One:

**What you may lose by not practicing safer sex**

- If you don't practice safer sex, you won't know for sure whether you have contracted a blood- or fluid-borne STD.
- If you don't practice safer sex, you will not know for sure whether you are putting your partner at risk of contracting a blood or sexual fluid-borne STD from you.
- If you don't practice safer sex, you may start an unintended pregnancy.
- If you don't practice safer sex, you may contract a chronic STD like herpes or even HIV. Having a chronic STD means that you will need to take precautions against spreading it to someone else for the rest of your life. Chronic STD's make having sex a lot more complicated.
- If you don't practice safer sex and you get an STD, you will need to go to the doctor for treatment and you may have to contact your past partners so that they can be checked and treated as well.
- If you don't practice safer sex, you may get an STD that will impact whether you can get pregnant and have children in the future.

Argument Panel Two:

**What you gain by practicing safer sex**

- If you consistently and successfully practice safer sex, you'll know
for sure that you don't have an STD. You don't have to worry about whether you have contracted an STD.

- If you consistently and successfully practice safer sex, you'll know for sure that you aren't putting your partner at risk of contracting an STD from you.

- If you practice safer sex, you won't have to worry that you might be pregnant when you don't want to be. You'll know for sure that you aren't pregnant.

- If you practice safer sex, you will maintain your sexual health by avoiding chronic STD's like herpes or even HIV. Chronic STD's are something that you'll have to deal with for the rest of your life. Avoiding chronic STD's lets you keep sex simple, or at least a little more simple.

- If you practice safer sex you will be taking care of your reproductive health so that you can have a healthy pregnancy, birth process and family if you choose to in the future.

- If you practice safer sex, you minimize your chance of contracting an STD and so avoid all of the doctor appointments and treatments and follow-up doctor visits. You also avoid having to contact your past sex partners so that they can seek treatment too.
APPENDIX B

INTERVENTION AND INSTRUMENT ADMINISTRATION SCRIPT

Most people know that practicing unsafe sex (exchanging sexual body fluids or exposing one's mucous membranes to another person's sexual body fluids) can put them at risk for contracting a sexually transmitted disease including HIV infection. Still, despite being aware of the health risks that can be involved in having unsafe sex, we also know that many people have trouble practicing safer sex consistently. The question becomes, is there a way to talk to people about safer sex that might help them to avoid unsafe sex and/or to practice safer sex more consistently? This is a very important topic for anyone thinking about human sexuality and health, and one that we will return to again and again in the course of the quarter.

As a way to begin our conversation about sexual decision making, sexual practices, and sexual health, those of you who care to may participate in a study on sexual decision making. What the study involves is responding honestly to an anonymous questionnaire that asks for information on your safer sex-related sexual practices, knowledge, attitudes and beliefs, then reading a brochure on safer sex and finally, responding right after you read the brochure and then again at the end of the quarter, to questions about your safer sex-related practices in the last ten weeks and about your future safer sex-related intentions. Information gathered from participants' initial anonymous responses will be used in class discussions about student sexual practices and sexual health-related knowledge, attitudes, and beliefs. When the study is complete, the information gathered will be carefully analyzed. Findings may suggest how best to help people to make decisions that support their sexual health.

It is very important that you understand that your participation in this study is entirely voluntary and that, should you decide to participate, the information that you provide is to be submitted anonymously. The study questionnaire does ask some very personal and very sensitive questions, and the study brochure includes very explicit information on safer sex. You are not required to participate and your choice whether to participate or not is in no way related to your enrollment or to your grade in the course. Your course instructor will not even know who participates and who does not. Although the more complete your responses are the more information we'll have to use in our discussions, you are also free to stop participating at any time, and in the case of filing out questionnaires, to skip any item(s) that you don't feel comfortable answering.
Though we sincerely hope that you wont, some individuals may find reading the brochure or completing the questionnaire upsetting. If you do become upset, please know that you can leave the classroom without penalty at any time. Since different people take different amounts of time to read brochures and to fill out questionnaires, leaving the classroom does not necessarily indicate that a person is distressed. If you choose not to participate but would prefer not to draw attention to that fact, you can still take a brochure and questionnaire and then turn them in blank when the rest of the class is finished. Finally, if after participating in the study you would like more information about the subject matter addressed in the questionnaire, you can refer to your textbook, visit the Women's Clinic or the Student Wellness Center at the Wilce Student Health Center, or call the Ohio STD and HIV/AIDS Hotline at 1 800 332-AIDS. If you'd like to talk with a counselor, you can call OSU Counseling and Consultation Services at 292-5766 to make an appointment. There is no charge for students' initial appointments at the counseling center, even if they do not have student health insurance. Appointments may be available on a drop-in or emergency basis. Counseling and Consultation Services is on the fourth floor of the Ohio Union. These phone numbers will be posted in the front of the room for the duration of this activity.

In order to include a number of different relationship patterns, many questions are asked three times—one for each of three relationship patterns. Please choose the question or questions that apply to you and then mark "Not applicable" for those that don't. Also, because differences of just one word such as "safer" versus "unsafe" sex or mutually monogamous and not mutually monogamous can be important for the integrity of the information we collect, please read carefully.

At this time I will hand a questionnaire out to everyone in the classroom. You have the next hour to complete the questionnaire if you choose, or to study, etc. if you choose not to complete the questionnaire. Feel free to go anywhere you feel comfortable. Whether you choose to complete a questionnaire or not, for your anonymity, we would like you to seal your questionnaire and then drop it in the box at the back of the classroom when you return. Class will reconvene in this room in one hour.

Thank you
APPENDIX C

INSTRUMENT COVER SHEET

In order to maintain your anonymity while being able to match your responses on this questionnaire to your responses on questionnaires that you may complete later in the quarter, please fill in the following:

The number of sisters you have _____

The number of brothers you have _____

The first letter of the street name for your permanent home address _____

The last number of your local telephone number _____

The month that you were born ____________

The first letter of your mother's maiden name _____

Please Note: Your participation in this study is entirely voluntary. Your name will never be asked or recorded in relation to this study and so any information you provide will be entirely anonymous. The study questionnaire does ask some very personal and very sensitive questions and the study brochure includes very explicit information on safer sex. You are not required to participate and your choice whether to participate or not is in no way related to your enrollment or to your grade in the course. Your course instructor will not even know who participates and who does not. Although the more complete your responses are the more information we'll have to use in our discussions, you are also free to stop participating at any time, and in the case of filing out questionnaires, to skip any item(s) that you don't feel

________________________

1 Font and formatting altered for inclusion in this dissertation.
comfortable answering. If you choose not to participate but would prefer not to draw attention to that fact, you may return your blank questionnaire with questionnaires from rest of the class. To give you a chance to consider the subject matter addressed in this study, a related article has been included at the end of this questionnaire for your perusal.
APPENDIX D

STUDY INSTRUMENT

Sexual Relationship Options

Definitions

1. Mutually monogamous partner:

A person with whom you have agreed that each of you will have sex only with each other.

An example of a mutually monogamous partner is a person's spouse or life partner. The relationship is mutually monogamous as long as both persons remain sexually faithful to each other.

2. Primary partner:

The person with whom you have sex the most often although your relationship is not mutually monogamous.

An example of a primary partner is the spouse of a person who has other sex partners.

3. Other partner(s):

A sexual partner who is not your primary or mutually monogamous partner.

Examples of an "other" partner include the sex partner of a person who also has a spouse as in the example above. Other sex partners might also be persons with whom an individual has sex only once or maybe once in a while.

2 Font and formatting altered for inclusion in this dissertation.
Safer Sex Options

Definitions

Safer sex means sexual activity that does not put participants at risk for contracting a sexually transmitted disease (STD). STDs can be transmitted when the blood, semen, vaginal secretions, and breast milk of one person comes in contact with the skin or mucous membranes of another. STD's can also be transmitted through mouth-to-genital and genital-to-genital contact.

There are three ways to practice safer sex. The first way is to abstain from all activity that might allow an STD to be transmitted. Activities such as deep massages or "outercourse" between persons who are clothed are examples of sexual activities that don't pose a risk for STD transmission.

The second way to practice safer sex is to always use a barrier like a condom or a dental dam when engaging in sexual activities that might pose a risk for STD transmission. Remember, practicing safer sex means using a condom or dental dam for oral sex as well as for vaginal and anal sex.

The third way to practice safer sex is to engage in any activity that might pose a risk for STD transmission only with a mutually monogamous partner and only after both partners have determined that neither one of you has contracted an STD from previous sexual partners.
Section One - Student profile and sexual relationship status

1. What is your current age? _______
3. What is your sex?
   1. Female
   2. Male

2. What is your ethnicity?
   1. African American
   2. Asian or Pacific Islander
   3. American Indian
   4. Caucasian
   5. Hispanic
   6. Other _______

4. What is your current academic rank?
   1. Freshman
   2. Sophomore
   3. Junior
   4. Senior
   5. Graduate student
   6. Other _______

5. Have you ever had oral, vaginal or anal sex?
   1. Yes
   2. No
   (If you haven't ever had oral, vaginal or anal sex, please circle the "No" response, respond to item #23 below, and then skip to Section Four.)

6. How many female sexual partners have you had in your lifetime? _______

7. How many male sexual partners have you had in your lifetime? _______

8. Have you tried to conceive a child in the last three months?
   1. Yes
   2. No
   3. Not applicable

9. Have you ever shared needles or syringes when injecting illegal street drugs?
   1. Yes
   2. No
   3. I've never injected street drugs.

10. Have you ever been diagnosed with syphilis or gonorrhea?
    1. Yes
    2. No

11. Have you ever been diagnosed with chlamydia?
    1. Yes
    2. No

12. Have you ever been diagnosed with venereal warts or the virus that causes them, HPV?
    1. Yes
    2. No

13. Have you ever been diagnosed with genital herpes?
    1. Yes
    2. No
Section One - cont.

14. Have you ever been diagnosed with hepatitis B?
   1. Yes
   2. No

15. Have you ever been diagnosed with pelvic inflammatory disease (PID)?
   1. Yes
   2. No

16. Have you ever been diagnosed with HIV infection?
   1. Yes
   2. No

17. Have you ever been diagnosed with any sexually transmitted disease (STD) not mentioned above?
   1. Yes
   2. No

18. If you answered "yes" to question #17, is the condition chronic, meaning that it may return periodically throughout your life?
   1. Yes
   2. No
   3. Not sure

19. How old were you when you first had sexual intercourse, whether oral, vaginal or anal? _______ years old

20. How many mutually monogamous* sexual relationships have you had in your lifetime?
    _______ relationships

   *The term "mutually monogamous" is defined on the first page of this questionnaire.

21. Have you had oral, vaginal or anal sex with another person in the last 3 months?
    1. Yes
    2. No

   (If you have not had oral, vaginal or anal sex in the last three months, please circle the "No" response here, answer item #23 below, and then skip to Section Four.)

22. If you have had oral, vaginal or anal sex in the last three months, how many sexual partners have you had in the last three months? _________ partners
Section One - cont

23. In the last three months have you:

1. decided to have sex and then regretted the decision later? Yes No

2. felt pressured or coerced into having sex after you said "no" at least one time? Yes No

3. pressured or coerced someone into having sex after they said "no" at least one time? Yes No

4. had a partner refuse to have safer sex because it was safer sex? Yes No

5. had a partner refuse to have unsafe sex because it was unsafe sex? Yes No

6. refused to have safer sex because it was safer sex? Yes No

7. refused to have unsafe sex because it was unsafe sex? Yes No

8. decided to have sex because you were under the influence of drugs or alcohol? Yes No

9. decided to have unsafe sex because you were under the influence of alcohol or drugs? Yes No

* The terms "safer" and "unsafe" sex are defined on the second page of this questionnaire.
Section Two - Student sexual activity

If you have not had sex in the last three months, please skip to Section Four. If you have had oral, vaginal or anal sex with another person at least once in the last three months, please complete this section of the questionnaire.

*Please note: definitions of relationship types are on the first page of this questionnaire.

1. If you have had vaginal, anal or oral sex with a mutually monogamous* sexual partner in the last three months, which of the following describes your partner's sexual history.

   1. My partner has had more than one lifetime sexual partners.
   2. My partner has only had one lifetime sexual partner--myself.
   3. I'm not sure about my partner's sexual history.

2. If you have had vaginal sex with a mutually monogamous* sexual partner in the last three months, has your partner ever shared needles or syringes when taking illegal street drugs by needle?

   1. My partner has never used IV drugs.
   2. My partner has used IV drugs but has never shared needles or syringes.
   3. My partner has used IV drugs and has shared needles and syringes.
   4. I don't know if my partner has ever used IV drugs or shared needles or syringes.

3. If you have had vaginal or anal sex with a mutually monogamous* sexual partner in the last three months, how often did you and your partner use condoms when having vaginal or anal sex?

   1. Always
   2. Most of the time
   3. Occasionally
   4. Never
   5. Partner type does not apply.
   6. Sexual activities do not apply.

   Please note: If you had vaginal or anal sex with a mutually monogamous partner only once in the last three months, did you use a condom?

   1. Yes
   2. No

4. If you have had oral sex with a mutually monogamous* sexual partner in the last three months, how often did you and your partner use condoms or other latex or plastic barriers when having oral sex?

   1. Always
   2. Most of the time
   3. Occasionally
   4. Never
   5. Partner type does not apply.
   6. Sexual activity does not apply.

   Please note: If you had oral sex with a mutually monogamous partner only once the last three months, did you use a condom or other latex or plastic barrier?

   1. Yes
   2. No

5. If you have had vaginal sex with a mutually monogamous* sexual partner in the last three months, do you and your partner use condoms for contraception?

   1. Yes
   2. No
Section Two - cont.

6. If you have had vaginal or anal sex in the last three months with a primary* but not mutually monogamous sexual partner, how often did you and your partner use condoms when having vaginal or anal sex?

1. Always
2. Most of the time
3. Occasionally
4. Never
5. Partner type does not apply.
6. Sexual activities do not apply.

Please note: If you had vaginal or anal sex with a primary partner only once in the last three months, did you use a condom?

1. Yes
2. No

7. If you have had oral sex in the last three months with a primary* but not mutually monogamous sexual partner, how often did you and your partner use condoms or other latex or plastic barriers when having oral sex?

1. Always
2. Most of the time
3. Occasionally
4. Never
5. Partner type does not apply.
6. Sexual activity does not apply.

Please note: If you had oral sex with a primary partner only once in the last three months, did you use a condom or other latex or plastic barrier?

1. Yes
2. No

8. If you have had vaginal or anal sex more than once in the last three months with a partner or partners who were not your mutually monogamous or your primary* sexual partner, how often did you use condoms when having vaginal or anal sex?

1. Always
2. Most of the time
3. Occasionally
4. Never
5. Partner type does not apply.
6. Sexual activities do not apply.

Please note: If you had vaginal or anal sex with a non-primary, non-monogamous partner or partners only once in the last three months, did you use a condom?

1. Yes
2. No

9. If you have had oral sex more than once in the last three months with a partner who was not your mutually monogamous or your primary* sexual partner, or if you have had oral sex in the last three months with more than one person who was not your mutually monogamous or your primary* sexual partner, how often did you use condoms or other latex or plastic barriers when having oral sex?

1. Always
2. Most of the time
3. Occasionally
4. Never
5. Partner type does not apply.
6. Sexual activity does not apply.

Please note: If you had oral sex with a non-primary, non-monogamous partner only once in the last three months, did you use a condom or other latex or plastic barrier?

1. Yes
2. No
In order to get more specific information about student sexual relationships, the following questions ask about your interactions with one specific partner, the most recent one. Please answer the following questions about your interactions with your most recent sexual partner.

1. Which of the following types of sexual relationships best describes your relationship with your most recent sexual partner? (Please circle one of the three choices given below.)

Note: definitions and examples of these relationship types are on the first page of this questionnaire.

1. My most recent sexual partner was a mutually monogamous partner.
2. My most recent sexual partner was a primary but not mutually monogamous partner.
3. My most recent sexual partner was not a mutually monogamous or a primary partner.

2. If your most recent sexual partner was someone with whom you were in a mutually monogamous relationship, how many months had you and your partner been in that mutually monogamous relationship when you last had sex? _______ months

3. If your most recent sexual partner was someone who was not a mutually monogamous or a primary partner, was this partner someone with whom you had sex only once?
   1. Yes
   2. No
   3. Not applicable

4. If your most recent sexual partner was someone who was not a mutually monogamous or a primary partner, was this partner someone with whom you will have sex again?
   1. Yes
   2. No
   3. Maybe
   4. Not applicable
Please answer the following questions as they apply to you and your most recent sexual partner.

<table>
<thead>
<tr>
<th>Question</th>
<th>Options</th>
</tr>
</thead>
</table>
| 1. If you and your most recent partner had vaginal or anal sex only one time, did you use a condom? | 1. Yes  
2. No  
3. Not applicable                                                                 |
| 2. If you and your most recent partner had oral sex only one time, did you use a condom or other latex or plastic barrier? | 1. Yes  
2. No  
3. Not applicable                                                                 |
| 3. If you and your most recent partner had vaginal or anal sex more than one time, how often did you and your most recent partner use condoms when having vaginal or anal sex? | 1. Always  
2. Often  
3. Occasionally  
4. Never  
5. Not applicable                                                                 |
| 4. If you and your most recent partner had oral sex more than one time, how often did you and your most recent partner use condoms or other latex or plastic barriers when having oral sex? | 1. Always  
2. Often  
3. Occasionally  
4. Never                                                                 |
| 5. Have you and your most recent sexual partner talked about safer sex? | 1. Yes  
2. No                                                                 |
| 6. Have you and your most recent sexual partner talked about your sexual health history? | 1. Yes  
2. No                                                                 |
| 7. Have you talked with your most recent sexual partner talked about his or her sexual health history? | 1. Yes  
2. No                                                                 |
| 8. Has your most recent sexual partner been examined by a doctor for STD's? | 1. Yes  
2. No  
3. I don't know  
4. My partner had no risk for STD's                                                                 |
| 9. Has your most recent sexual partner been tested for antibodies to HIV, the virus that can cause AIDS, since he or she last had unprotected sex or shared IV drug needles and syringes? | 1. Yes  
2. No  
3. I don't know  
4. My partner had no risk for HIV.                                                                 |
Section Two - cont.

10. If your most recent partner has been tested for antibodies to HIV, the virus that can cause AIDS, since he or she last had unprotected sex or shared IV drug needles and syringes, was there at least three months between his or her last risk behavior and the time he or she was tested?
   1. Yes
   2. No
   3. I don't know.
   4. Not applicable

11. Have you told your most recent sexual partner that you always want to practice safer sex?
   1. Yes
   2. No

12. Have you asked your most recent sexual partner to have sex only with you?
   1. Yes
   2. No

13. Have you agreed with your most recent sexual partner that you would have sex only with him or her?
   1. Yes
   2. No

14. Have you been examined by a doctor for STD's?
   1. Yes
   2. No
   3. I don't know.
   4. I have no risk for STD's.

15. Have you been tested for antibodies to HIV, the virus that can cause AIDS, since you last had unprotected sex or shared IV drug needles and syringes?
   1. Yes
   2. No
   3. I don't know.
   4. I have no risk for HIV.

16. If you have been tested for antibodies to HIV, the virus that can cause AIDS, since you last had unprotected sex or shared IV drug needles and syringes, was there at least three months between your last risk behavior and the time you were tested?
   1. Yes
   2. No
   3. I don't know.
   4. I have no risk for HIV.
Section Three - Student intentions with current sexual partner

This section of the questionnaire asks about things you intend to do in the next month with your current sexual partner. If you do not have a sexual partner at this time, please skip to Section Four. Again, please answer according to your intentions in the next 30 thirty days.

1. I intend to start abstaining from any unprotected anal or vaginal sex with my current mutually monogamous sexual partner.
   1. Yes
   2. No
   3. I already do this.
   4. Partner type does not apply.
   5. Sexual activity does not apply.

2. I intend to start abstaining from any unprotected oral sex with my current mutually monogamous sexual partner.
   1. Yes
   2. No
   3. I already do this
   4. Partner type does not apply.
   5. Sexual activity does not apply.

3. I intend to start abstaining from all vaginal, anal, or oral sex, whether protected or unprotected, with my current mutually monogamous sexual partner.
   1. Yes
   2. No
   3. I already do this
   4. Partner type does not apply.
   5. Sexual activity does not apply.

4. I intend to start abstaining from all unprotected anal or vaginal sex with my primary sexual partner.
   1. Yes
   2. No
   4. Partner type does not apply.
   5. Sexual activity does not apply.

5. I intend to start abstaining from any unprotected oral sex with my current primary sexual partner.
   1. Yes
   2. No
   3. I already do this.
   4. Partner type does not apply.
   5. Sexual activity does not apply.

6. I intend to start abstaining from all vaginal, anal, or oral sex, whether protected or unprotected, with my current primary sexual partner.
   1. Yes
   2. No
   3. I already do this.
   4. Partner type does not apply.
   5. Sexual activity does not apply.

7. I intend to start abstaining from any unprotected anal or vaginal sex with all of my current non-monogamous, non-primary sexual partner(s).
   1. Yes
   2. No
   3. I already do this.
   4. Partner type does not apply.
   5. Sexual activity does not apply.

8. I intend to start abstaining from any unprotected oral sex with all of my current non-monogamous, non-primary sexual partner(s).
   1. Yes
   2. No
   3. I already do this.
   4. Partner type does not apply.
   5. Sexual activity does not apply.
Section Three - cont.

9. I intend to start abstaining from all vaginal, anal, or oral sex (whether protected or unprotected) with any monogamous, non-primary sexual partner(s).
   1. Yes
   2. No
   3. I already do this.
   4. Partner type does not apply.
   5. Sexual activity does not apply.

10. I intend to talk with my current partner(s) about safer sex.
    1. Yes
    2. No
    3. I've already done this.

11. I intend to ask my partner(s) to have sex only with me.
    1. Yes
    2. No
    3. I've already done this.

12. I intend to start reducing the number of sexual partners that I have.
    1. Yes
    2. No
    3. Not applicable

13. I intend to begin having sex with only one partner.
    1. Yes
    2. No
    3. I already do this.

14. While I don't intend to have sex with only one partner, I do intend to reduce the number of sexual partners I currently have.
    1. Yes
    2. No
    3. Not applicable

15. I intend to begin abstaining from unprotected anal, vaginal and oral intercourse until I am with a person who agrees to be in a mutually monogamous sexual relationship with me.
    1. Yes
    2. No
    3. I already do this.

16. I intend to begin abstaining from any (protected or unprotected) anal, vaginal or oral intercourse until I am with a person who agrees to be in a mutually monogamous sexual relationship with me.
    1. Yes
    2. No
    3. I already do this.

17. I intend to go to the doctor to be examined for STD's.
    1. Yes
    2. No
    3. I've done this since I last had unsafe sex or shared needles.
    4. I have no risk for STD's.

18. I intend to have an HIV antibody test to find out if I have contracted HIV, the virus that can cause AIDS.
    1. Yes
    2. No
    3. I've done this since I last had unsafe sex or shared needles.
    4. I have no risk for HIV.
Section Three - cont.

19. I intend to ask my partner(s) to go to the doctor and be examined for STD's.
   1. Yes
   2. No
   3. I've already done this.
   4. My partner(s) have already done this since he/she/they last had unsafe sex or shared needles.
   5. My partner has no risk for STD's.

20. I intend to ask my partner(s) to have an HIV antibody test to find out if they have contracted HIV, the virus that can cause AIDS.
   1. Yes
   2. No
   3. I've already done this.
   4. My partner(s) have already done this since he/she/they last had unsafe sex or shared needles.
   5. My partner has no risk for HIV.

21. I intend to gather more information about how STD's are transmitted and prevented.
   1. Yes
   2. No
   3. I've already done this.
   4. Not applicable

22. I intend to get more information on what type of condoms to buy and how to use them.
   1. Yes
   2. No
   3. I've already done this.
   4. Not applicable

23. I intend to obtain condoms and/or dental dams or other latex or plastic barriers.
   1. Yes
   2. No
   3. I already do this.

24. I intend to make sure that I always carry condoms and/or dental dams or other latex or plastic barriers when I might have sex.
   1. Yes
   2. No
   3. I already do this.

25. I intend to seek information on spermicidal lubricants that can be used with condoms to help prevent STD transmission and/or unintended pregnancy.
   1. Yes
   2. No
   3. I've already done this.
   4. Not applicable

26. I intend to prepare to use spermicidal lubricant in combination with condoms.
   1. Yes
   2. No
   3. I've already done this.
   4. Not applicable

27. I intend to practice safer alternatives to penetrative sex such as mutual masturbation or genital to genital contact with one or both partners fully clothed.
   1. Yes
   2. No
   3. I already do this.

28. I intend to limit or avoid alcohol or drug use when it might influence me to have unsafe sex.
   1. Yes
   2. No
   3. I already do this.
   4. Alcohol or drug use doesn't affect my sexual judgment.

29. I intend to avoid persons or situations that might tempt me to have unsafe sex.
   1. Yes
   2. No
   3. I already do this.
Section Three - cont.

30. I intend to learn how to be less afraid or embarrassed when I talk about safer sex.
    1. Yes
    2. No
    3. I don't feel afraid or embarrassed when I talk about safer sex.

31. I intend to learn how to be more assertive when it comes to refusing to have unsafe sex.
    1. Yes
    2. No
    3. I already am assertive when it comes to refusing to have unsafe sex.

32. I intend to learn how to cope with negative feelings such as boredom, frustration or loneliness that might lead me to have unsafe sex.
    1. Yes
    2. No
    3. I've already done this.
    4. I'm not influenced by negative feelings.
Section Four - Student intentions with prospective sexual partners

If you completed Section Three, please skip to Section Five. If not, answer the following questions about what you would do if you were considering having oral, vaginal or anal sex with someone for the first time.

1. I intend to talk about safer sex with any prospective sexual partners before we have sex for the first time.
   1. Yes
   2. No

2. Before we have sex for the first time, I intend to tell any prospective sexual partners that I always want to practice safer sex.
   1. Yes
   2. No

3. I intend to talk about my sexual health history with any prospective sexual partners before we have sex for the first time.
   1. Yes
   2. No

4. I intend to ask about any prospective sexual partners' sexual health history before we have sex for the first time.
   1. Yes
   2. No

5. Unless he or she has never had vaginal, oral or anal sex before, I intend to ask any prospective partner to go to the doctor to be checked for STD's before we have sex for the first time.
   1. Yes
   2. No

6. Unless he or she has no risk for HIV, I intend to ask any prospective partner to have an HIV antibody test before we have sex for the first time.
   1. Yes
   2. No

7. I intend to go to the doctor to make sure that I don't have any STD's before I have sex for the first time with a new partner.
   1. Yes
   2. No
   3. I've already done this since I last had unsafe sex or shared needles.
   4. I have no risk for STD's.

8. I intend to have an HIV antibody test, before I have sex for the first time with a new partner.
   1. Yes
   2. No
   3. I've already done this since I last had unsafe sex or shared needles.
   4. I have no risk for HIV.

9. Before we have sex for the first time, I intend to ask any new sexual partner to have sex only with me.
   1. Yes
   2. No

10. I intend to have sex with only one partner.
    1. Yes
    2. No
11. While I don't intend to have sex with only one partner, I do intend to limit the number of partners I have.
   1. Yes
   2. No
   3. Not applicable

12. I intend to choose a partner who wants to be in a mutually monogamous sexual relationship with me.
   1. Yes
   2. No

13. I intend to abstain from unprotected vaginal and anal sex until I am with a person who agrees to be in a mutually monogamous sexual relationship with me.
   1. Yes
   2. No

14. I intend to abstain from unprotected oral sex until I am with a person who agrees to be in a mutually monogamous sexual relationship with me.
   1. Yes
   2. No

15. I intend to abstain from any oral, vaginal or anal sex (whether protected or unprotected) until I am with a person who agrees to be in a mutually monogamous sexual relationship with me.
   1. Yes
   2. No

16. I intend to gather more information about how STD's are transmitted and prevented.
   1. Yes
   2. No
   3. I've already done this.

17. I intend to get more information on what type of condoms to buy and how to use them.
   1. Yes
   2. No
   3. I've already done this.
   4. Not applicable

18. I intend to obtain condoms and/or dental dams or other latex or plastic barriers.
   1. Yes
   2. No
   3. I've already done this.
   4. Not applicable

19. I intend to make sure that I always carry condoms and/or dental dams or other latex or plastic barriers when I might have sex.
   1. Yes
   2. No
   3. I already do this.
   4. Not applicable

20. I intend to seek information on spermicidal lubricants that can be used with condoms to help prevent STD transmission and/or unintended pregnancy.
   1. Yes
   2. No
   3. I've already done this.
   4. Not applicable
Section Four - cont.

21. I intend to prepare to use spermicidal lubricant in combination with condoms.
   1. Yes
   2. No
   3. I've already done this.
   4. Not applicable

22. I intend to practice safer alternatives to penetrative sex such as mutual masturbation or genital to genital contact with one or both partners fully clothed.
   1. Yes
   2. No
   3. I already do this.

23. I intend to limit or avoid alcohol or drug use when it might influence me to have unsafe sex.
   1. Yes
   2. No
   3. I already do this.
   4. Alcohol or drug use doesn't affect my sexual judgment.

24. I intend to avoid persons or situations which might tempt me to have unsafe sex.
   1. Yes
   2. No
   3. I already do this.

25. I intend to learn how to be less afraid or embarrassed when I talk about safer sex.
   1. Yes
   2. No
   3. I don't feel afraid or embarrassed when I talk about safer sex.

26. I intend to learn how to be more assertive when it comes to refusing sex without a condom or other barrier.
   1. Yes
   2. No
   3. I already am assertive when it comes to refusing to have unsafe sex.

27. I intend to learn how to cope with negative feelings such as boredom or frustration or loneliness that might lead me to have unsafe sex.
   1. Yes
   2. No
   3. I've already done this.
   4. I'm not influenced by negative feelings.
Section Five - Knowledge, attitudes and beliefs

Please circle your response to each question.

1. Which of the following sexually transmitted diseases can be transmitted through unprotected oral sex, whether mouth to vagina, mouth to penis, or mouth to anus?

   1. Genital herpes  
      - Yes  
      - No  
      - Not sure  

   2. Syphilis  
      - Yes  
      - No  
      - Not sure  

   3. HIV (the virus that can cause AIDS)  
      - Yes  
      - No  
      - Not sure  

   4. Pubic lice  
      - Yes  
      - No  
      - Not sure  

   5. Chlamydia  
      - Yes  
      - No  
      - Not sure  

2. Which of the following sexually transmitted diseases can be contracted through penis to vagina or penis to anus sex even when the partners are correctly and successfully using condoms?

   1. Genital herpes  
      - Yes  
      - No  
      - Not sure  

   2. Syphilis  
      - Yes  
      - No  
      - Not sure  

   3. HIV (the virus that can cause AIDS)  
      - Yes  
      - No  
      - Not sure  

   4. Pubic lice  
      - Yes  
      - No  
      - Not sure  

   5. Chlamydia  
      - Yes  
      - No  
      - Not sure  

Which of the responses provided best represents your perception of the likelihood of each of the following occurring?

1. A woman contracts HIV after one act of unprotected penis to vagina sex with a man who is infected with HIV.
   1. Very likely  
   2. Likely  
   3. Unlikely  
   4. Very unlikely  

2. A man contracts HIV after one act of unprotected penis to vagina intercourse with a woman who is infected with HIV.
   1. Very likely  
   2. Likely  
   3. Unlikely  
   4. Very unlikely
Section Five - cont.

3. A person contracts HIV after one act of receptive penis to anus sexual intercourse.
   1. Very likely
   2. Likely
   3. Unlikely
   4. Very unlikely

4. A person contracts HIV after one act of receptive mouth to penis or mouth to vagina sexual intercourse.
   1. Very likely
   2. Likely
   3. Unlikely
   4. Very unlikely

5. A person contracts HIV while giving first aid to an HIV positive person who is bleeding.
   1. Very likely
   2. Likely
   3. Unlikely
   4. Very unlikely

6. A person contracts HIV after using an HIV contaminated intravenous drug needle and syringe one time.
   1. Very likely
   2. Likely
   3. Unlikely
   4. Very unlikely

Please circle the number indicating your response to the following questions.

1. Most condoms break because of which of the following?
   a. user error
   b. manufacturer error
   c. improper packaging
   d. poor quality materials

2. About _____% of college students have been diagnosed with an STD?
   1. less than 10%
   2. 10 to 25%
   3. 26 to 50%
   4. more than 50%

3. Sue has an HIV antibody test in September and then again in February. If both of her test results are negative and she hasn't engaged in any activities that might pose a risk for HIV infection in between the two tests, how confident can she be that she doesn't have HIV?
   1. Very confident
   2. Confident
   3. Not very confident

4. Mark's sexual partner tested negative for antibodies to HIV one year after the last time they had unprotected intercourse. If Mark has not engaged in any other risk behaviors in the mean time, how confident can he be that he does not have HIV?
   1. Very confident
   2. Confident
   3. Not very confident

True or false

1. Scientists are confident that they know how HIV, the virus that can cause AIDS, is transmitted.
   1. True
   2. False

2. Scientists are confident that they know how the virus that causes venereal warts is transmitted.
   1. True
   2. False
3. Many people who have a sexually transmitted disease don't know it.
   1. True
   2. False

4. A person can have a sexually transmitted disease for more than a year without having any symptoms.
   1. True
   2. False

5. The pap smear that is done during a woman's annual gynecological exam will detect whether a woman has contracted syphilis or herpes.
   1. True
   2. False

6. A person who has an STD but has no symptoms can still transmit the STD to his or her sexual partner.
   1. True
   2. False

7. Some STD's can be transmitted from a man to a woman during penis to vagina sex even if the man does not climax inside the woman.
   1. True
   2. False

8. Having unprotected sex with a person who has an STD will always result in the partner being infected with the STD as well.
   1. True
   2. False

9. If using a condom or other barrier during sex could reduce your risk of contracting an STD from 10% to 0%, would you be willing to use condoms or other barriers every time you had sex until an alternative form of STD prevention or treatment was discovered?
   1. Yes
   2. No

10. If using a condom or other barrier during sex could reduce your risk of contracting an STD from 25% to 15%, would you be willing to use condoms or other barriers every time you had sex until an alternative form of STD prevention or treatment was discovered?
    1. Yes
    2. No

11. In your opinion, should a brand of condoms that is estimated to fail no more than 20% of the time be advertised as suitable for disease prevention?
     1. Yes
     2. No

12. In your opinion, should a brand of condoms that was estimated to remain intact no less than 80% of the time to be advertised as suitable for disease prevention?
    1. Yes
    2. No

Thank you for completing this survey!
BIBLIOGRAPHY


