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Impact of risk status and social comparison processes on risky sex and STD health cognitions

Michelle Leigh Gano
Iowa State University

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Impact of risk status and social comparison processes
on risky sex and STD health cognitions

by

Michelle Leigh Gano

A thesis submitted to the graduate faculty
in partial fulfillment of the requirements for the degree of
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Program of Study Committee:
Meg Gerrard, Co-major Professor
Frederick X. Gibbons, Co-major Professor
Fred Lorenz

Iowa State University

Ames, Iowa

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Graduate College
Iowa State University

This is to certify that the master's thesis of
Michelle Leigh Gano
has met the requirements of Iowa State University

Signatures have been redacted for privacy

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INTRODUCTION

Sexually transmitted diseases are among the most common infectious diseases in America today. Although there have been many studies of the social psychology of HIV infection and AIDS, few studies have examined the more prevalent STDs that occur primarily in young people under the age of 25 (Center for Disease Control, 2001). In the last few decades, the number of genital herpes cases has risen dramatically, making it the most common STD in the United States -- it affects an estimated 60 million Americans (CDC) and it is estimated that 25 percent of college students have contracted it. Despite these statistics, many college students are not aware of the prevalence of the herpes simplex virus (HSV), in fact, the American Social Health Association estimates that 80% of people in the United States with HSV type 1 (one strain of the virus responsible for genital herpes) are unaware that they have it (2001).

These factors, and the fact that people are often uncomfortable discussing their experience with STDs, contribute to the current limited knowledge of the prevalence of HSV among college students, unawareness of its incidence even among friends, and lack of awareness of how others cope with a positive diagnosis of HSV. Thus, the natural process of social comparison that exists for many other conditions that are common among college students (e.g., most students know the frequency of binge drinking, whether their friends are binge drinking, and whether they are suffering negative consequences from it) is absent for genital herpes. One result of this is that students do not have opportunities to learn through this comparison, and use it in deciding if they may also be at risk.

The present study will examine how social comparison in a threatening situation (potential of having an STD) affects individuals' intentions and willingness to engage in future risky sexual behavior, and perceived vulnerability to contract an STD. More specifically, it will examine how the sexual risk status of a target who has been diagnosed with an STD affects willingness, intentions, and perceived vulnerability of sexually active college students. It will also examine the role of social comparison tendencies and students' own risk behavior as moderators of these relations.

In addition, this study will explore previous literature that suggests young adults' decision-making "strategies" often do not follow the planful sequence outlined by expectancy-value theories that use behavioral intentions and that these cognitions are not easily affected by the social comparison (SC) process. Instead, behavioral willingness (B/W), which is less deliberative and more reactive, is more influenced via a social comparison process and is more likely to be altered. This is the social reaction pathway of the prototype/willingness (P/W) model, and along with perceived vulnerability, the attitude construct as operationalized in the model, are the primary focus of the study.

HEALTH COGNITIONS

Behavioral Intentions

The theory of reasoned action (Fishbein & Ajzen, 1975) and the theory of planned behavior (Ajzen, 1985, 1991) are two of the most well-known theories on attitudes and behaviors. The theory of reasoned action views social behavior from a decision-making perspective. The theory posits that perceptions about the behavior and its anticipated outcomes (i.e., attitudes and perceptions of what others would want one to do, or subjective norms) combine to create behavioral intention (BI). According to the Theory of Reasoned Action and the Theory of Planned Behavior, behavior is a direct result of the behavioral intention, which is the decision to act or not. The concept of intention to perform a behavior presupposes that the behavior is a conscious choice; this process is thought to be a reasoned one that involves some premeditation and planning.

In using the theory of reasoned action to predict sexual intercourse among young adults, Gilmore et al. (2002) found support for the model underlying teens' decisions to have sex. Past sexual intercourse was associated with intentions to have sex, which, in turn, were associated with attitudes and norms. Using a longitudinal design, Morrison, Gillmore, and Baker (1995) also found support for the theory of reasoned action in predicting condom use and behavior, i.e., intentions to use condoms predicted condom use six months later. Attitudes, subjective norms, and behavioral skills have also been found to predict intentions to use condoms among gay adolescents (Boldero, Sanitioso, & Brain, 1999). The theory of planned behavior was developed to increase the theory of reasoned action's predictive ability

by adding the concept of perceived behavioral control, the belief that one can actually perform the behavior, as another variable that influences intention (Ajzen, 1991). This theory has increased researchers' ability to explain behavior; it is less clear, however, that it improves the explanation of health-impairing behaviors.

Although past research demonstrates that these rational models have had some success in predicting intentions and behaviors, these theories have been criticized for being less applicable to complex as opposed to simple behaviors, particularly social behaviors that require the involvement of others (Eagly & Chaiken, 1993). In addition, their success in predicting risky-health behaviors in young adults has been mixed (Gibbons, Gerrard, Blanton, & Russell, 1998). Overall, these expectancy theories are more effective at predicting rational or reasoned behaviors and are less effective at explaining behaviors that are socially undesirable (Beck & Ajzen, 1991), or that have a significant affective component (Eiser, Eiser, & Pauwels, 1993), both of which are characteristics of adolescent health-risk behaviors. In fact, when asked if they intend to binge drink or have sex without protection, the vast majority of adolescents will say no. Statistics indicate, however, that many of them will do these behaviors, and some number will do them repeatedly (Johnston, O'Malley, & Bachman, 2000).

Behavioral Willingness

Adolescents' decisions to engage in risky-health behaviors often do not follow the planning sequence outlined by the theories of reasoned action or planned behavior. In fact, research has shown that intentions to engage in a behavior may not always be the best predictor of whether individuals (adolescents and young

adults) actually do engage in specific behaviors (Gibbons & Gerrard, 1995, 1997; Gibbons, Gerrard, Blanton, & Russell, 1998; Gibbons, Gerrard, Ouellete, & Burzette, 1998). This recognition was one reason that Gibbons, Gerrard, and their colleagues developed the prototype/willingness model to expand on the theories of reasoned action and planned behavior. This model was designed to address the social nature of health-related risk behaviors in adolescents and young adults, and acknowledge that not all behaviors are intentional, but often are reactions to risk-conducive situations people encounter.

The prototype/willingness (P/W) model posits two pathways to risk behavior, one of which is reasoned or intentional, whereas the other is characterized by a relative lack of consideration or planning. The reasoned path reflects the fact that sometimes young adults do engage in risky behaviors because they have made a conscious decision ahead of time to do so. The social reaction path acknowledges that adolescent risk behavior is often a reaction to risk-conducive circumstances. Thus, instead of being planful or intentional, much of adolescents' risk behavior is a reflection of willingness to engage in a risky activity when an opportunity presents itself.

The prototype-willingness model suggests that because willingness is a more than a predetermined plan of action, it is more likely than intentions to be altered by social factors. These factors could include peer pressure or some form of social comparison. For example, social comparison with a person who has an STD should have more impact on willingness to engage in risky sexual behaviors than it does on intentions to do so.

Perceived Vulnerability

The attitude construct as operationalized in the P/W model, focuses on perceived *personal* vulnerability to negative consequences. Not only does comparing with another influence willingness to engage in risky health behaviors, but comparisons also influence vulnerability to contracting an STD. There is evidence that individuals' estimates of the likelihood that they will suffer negative consequences from risky behavior reflect awareness of the relation between risk behavior and these consequences (see Gerrard, Gibbons, & Bushman, 1996; Weinstein & Nicolich, 1993; Weinstein, Rothman, & Nicolich, 1998). For example, people who are engaging in different levels of risk behavior report vulnerability estimates that reflect their behavior. In a study by Van der Velde, Van der Plight, & Hooykaas (1994) participants were asked to estimate their risk of being infected with AIDS in the next two years and then were asked to estimate the same risk for a random, same sex, same age individual from the general population. They found that participants were sensitive to their own risk level: the high-risk group (prostitutes) rated their risk the highest and the low-risk group (monogamous heterosexuals) rated their risk the lowest.

In another similar study, women college students made judgments about their likelihood of getting pregnant in a series of hypothetical situations in which frequency of sexual intercourse and contraceptive method were manipulated (Gerrard & Luus, 1995). They were able to combine information about frequency of sexual intercourse and contraceptive use to generate relatively accurate risk estimates, suggesting that they understood how frequency and method, and the interaction

between the two are related to pregnancy risk.

Gerrard, Gibbons, & Bushman's (1996) meta-analysis of the relation between perceived vulnerability and precautionary behavior in 26 cross-sectional studies of HIV risk estimates also concluded that estimates of vulnerability to HIV infection are reflective of risk and precautionary sexual behaviors. For example, those who engage in more risk behaviors tend to have higher estimates of their likelihood of contracting HIV than do those who engage in fewer risk behaviors. In spite of this ability to acknowledge the risk associated with their behavior, people who engage in health risk behaviors maintain a form of optimistic bias in that they believe that they are at lower risk than are others (Weinstein, & Klein, 1996).

Thus, it has been suggested that the negative relation between behavior and perceived risk involves cognitive dissonance, e.g., lowering one's perceptions of the risks involved with a risky behavior can reduce the dissonance associated with realizing one has engaged in an irresponsible behavior (e.g., Gibbons, Eggleston, & Benthin, 1997). Similarly, in a longitudinal study examining adolescents' cognitions related to drinking, reckless driving, and smoking, increases in risk behavior were accompanied by increases in perceived vulnerability and decreases in health and safety concerns (Gerrard, Gibbons, Benthin, & Hessling, 1996).

Perceived vulnerability and social comparison. Individuals are able to estimate their risk accurately, however biased perceptions of perceived risk may occur through social comparison processes in which an inappropriate comparison other is generated in assessing one's personal risk (Klein & Weinstein, 1997). The targets used for comparison are usually ones that are seen as being more extreme

in their risk behavior. These targets are thought to be vulnerable to the negative consequences associated with the risk behavior and they are also seen as being different from the self (e.g., Perloff & Fetzer, 1986). Thus, comparison with these high-risk targets may allow individuals to conclude that their personal vulnerability is relatively low.

A willingness to engage in similar risky behavior may be a reflection of the biased perception of diminished personal risk inherent in such behavior due to comparison with a high-risk target. Thus, optimism about one's own risk may reflect the lack of specific information or knowledge about the target that permits observers to construe the target in a manner so as to enhance the other's apparent risk relative to their own (Alicke, Klotz, Breitenbecher, Yurak, & Vredenburg, 1995; Perloff & Fetzer, 1986).

Conditional perceived vulnerability. The majority of previous studies have used absolute PV measures (e.g. "What is the likelihood that you will contract an STD"). These types of PV are generally positively associated with health risk behavior and intentions. This is consistent with the belief that BI is associated with an acknowledgement of risk, unlike BW (Gibbons et al., 1998). A problem with absolute PV is that these measures confound intentions with vulnerability; those not intending to engage in the risk behavior typically report they are not at risk (Gibbons et al., 1998, Weinstein et al., 1998).

Conditional measures of PV (Con PV) ask participants what their personal risk would be *if* they were to engage in the behavior. Such measures are less susceptible to this problem because they are not as closely linked to previous or

anticipated behavior (Gibbons, Lane, Gerrard, Pomery, & Lautrup, 2002). Thus, Rodin (1992) suggests they are better indicators of perceived risk. Previous research has found that there is a negative relation between Con PV and BW (Gibbons et al., 1998). The more willing participants are to engage in a risky behavior, the more likely they are to think they can get away with it without suffering the negative consequences. The present study used a conditional measure of PV as well as perceived danger.

Social Comparison Process

Social comparison theory suggests that individuals evaluate their personal attributes and their situation by comparing themselves with others (Festinger, 1954). This would suggest that when an individual is faced with a situation of thinking about their risk of contracting a disease, they would compare themselves with similar others on attributes related to the risk. However, thoughts about having or contracting STDs are typically private in nature (Lewis, Rosenthal, Succop, Stanberry, & Bernstein, 1999), so individuals may be embarrassed about discussing the diseases even with friends. Therefore, the type of comparison targets an individual may encounter in dealing with STDs may lead to a type of forced social comparison. Although we have some control over the comparison opportunities we pay attention to and how we construct these opportunities, many social comparison opportunities are forced upon us, such as information about other people's sexuality in the media.

There are many potential effects a comparison target may have on the self, however, relatively little research has focused on how a forced social comparison

influences future behavior. Most social comparison studies have focused on events that have already occurred or comparison in stressful situations in which the individual knows the event is likely to occur. Few studies have examined the effects of comparison activity with respect to events that may occur in the future (Aspinwall, 1997). Aspinwall suggests that proactive comparisons may be useful in decision making, emotional regulation, and in anticipating and mentally simulating one's own emotional responses to an outcome. The information provided by another's actions, outcomes, and emotional responses may facilitate the development of action plans and of mental simulations of how one would cope with different outcomes and their affective consequences (Aspinwall, 1997). The current study examines the effects of the information provided by a specific comparison target on participants' safe-sex intentions, willingness, and perceived vulnerability.

Social comparison moderation. The degree to which a comparison target affects cognitions can vary depending on the comparer's tendency to socially compare. In examining this moderating role of social comparison, Gibbons & Gerrard (1995) tested the hypothesis that the image of those who engage in risky health behaviors would be most predictive of risk behavior for participants who have a general tendency to socially compare. They found that the prototypes were more impactful for high social comparers, in spite of a preliminary 3-item scale. Thus, social comparison tendencies did moderate the impact of the prototypes on risk behavior.

Further examining this social comparison moderation, Gibbons et al. (1998) used structural equation modeling to assess the ability of their model to predict changes in the risky sexual behavior of college students. In addition, they examined the impact

of social comparison tendencies using the Iowa-Netherlands Comparison Orientation Measure (INCOM) of social comparison tendencies (Gibbons & Buunk, 1999). The paths from prototype to behavioral willingness (BW) were significantly stronger for students who were high in SC tendencies. The same pattern of results emerged in an ongoing prospective study of substance use among adolescents (Gerrard, Gibbons, Reis-Bergan, & Wills, 2004). This study, designed to examine the development of health risk behaviors within a minority sample, found that risk images of substance users predicted substance use BW, and that prediction was significantly stronger for those who were high in SC tendencies.

Also examining this influence of social comparison tendencies on behavioral willingness, Gibbons, Lane, Eggleston, Gerrard, and Reis-Bergan (2004) found the least amount of willingness to use substances and to have casual sex was reported by adolescents and college students who were high in comparison tendencies and had a negative image, or prototype, of those who engage in casual sex. In a related study Gibbons et al. (2004, Study 2) had college students listen to an audiotape in which a student was described by others who supposedly knew him/her fairly well. The image of the student was described as either favorable (e.g., good student, popular, athletic) or unfavorable, followed by information indicating the student was a virgin or had had a number of casual sexual partners. This study demonstrated that encouraging social comparison with a target who had an unappealing personality and was engaging in casual sex did not change participants' behavioral intentions (BI) to engage in risky sex, but did alter their BW. Social comparison moderation

was not a significant moderator in this study, however the effects found did tend to be stronger for participants who had high pretest scores on the INCOM.

Social comparison, similarity, and distancing. A number of studies have suggested that perceived similarity to a target is necessary for SC to be impactful (Wills, 1987). For example, Thornton, Gibbons, & Gerrard (2002; Study 1) asked college students to socially compare with a target who was described as either someone who gets pregnant intentionally or someone who engages in unprotected sex at the risk of exposure to an STD. The target was described as either similar or dissimilar to them. Results indicated that when students compared with a similar target, their perceptions of the target predicted their willingness to engage in risky sex, but their perceptions of vulnerability did not. Comparison with a dissimilar person, however, led to the opposite finding-- target perceptions did not predict willingness, but perceptions of risk did.

In another study (Thornton et al., 2002, study 2), target similarity was manipulated. Female participants read a description of a student who was said to be sexually active but inconsistent in their use of contraception, and who was described as either similar or dissimilar to them. Participants indicated how similar they thought they were to the target, provided an evaluation of her, and then indicated their own BW for unprotected sex. Participants' evaluations interacted with perceived similarity to predict BW: the more favorable participants' evaluations were, the higher their BW, but only when social comparison was encouraged with the manipulation of perceived similarity. Thus, social comparison with a similar target will likely lead to increased willingness to engage in the behavior when the prototype is

favorable. However, having a negative image of the comparison target is likely to lead to comparisons that are biased toward finding differences between the self and the target, i.e., is likely to result in distancing from that target, and thus lower BW.

The distancing process is a form of active downward comparison (Wills, 1981), which is considered a motivated type of comparison in which the comparer looks for distinction between the self and the target while derogating the target (Gibbons & Gerrard, 1995). Distancing from a comparison target by focusing on dissimilarities rather than the similarities can lead to lowered perceptions of perceived vulnerability. For example, Gump and Kulik (1995) exposed participants to a comparison peer who was or was not said to be HIV positive (have contracted the virus that causes AIDS). Those exposed to the HIV positive target rated this individual as less similar to themselves than the students who heard from a HIV negative peer. Also, relative to those not exposed to the HIV target, those who were lowered their perceptions of the riskiness of their own HIV-relevant traits and behaviors.

J.D. Fisher et al., (1996) showed college students a HIV prevention video that depicts HIV positive adolescents. The experimenters manipulated the similarity of the interviewees' to the audience. The participants who viewed the more similar HIV-positive interviewees reported significantly higher levels of perceived vulnerability than did participants who viewed dissimilar individuals. In examining the affiliation preferences for members of a smoking cessation group, it was found that preference for other members who were not having trouble quitting was associated with a decrease in perceived similarity to, or distancing from, the typical

smoker, which in turn was related to smoking cessation (Gerrard, Gibbons, & Lane, 2004). Thus, psychological distancing from a comparison target that engages in the negative behavior can have positive health-related benefits.

However, for high-risk individuals, when comparing with a lower-risk target, their PV may be decreased and their BW increased due to a cognitive process Weinstein (1982) described as “absent-exempt”. This process involves one believing that if they have not yet experienced any negative health consequences, then perhaps they will not. In addition, they may believe that if there is not a linear relationship between number of partners and getting an STD, then why not continue their behavior; perhaps they have a better choice in partners or it is just “luck”.

Thus, past research has demonstrated that participants who tend not to compare do not pay as much attention to the comparison target. The comparers relative risk level, and comparisons with others have been found to have more impact when participants perceive greater similarity to a negative target, by increasing PV and decreasing BW. Thus, it was hypothesized that participants who compared with a similar STD positive target would report greater PV and lower BW. The present study gives students an opportunity to learn through a comparison process that is not always available.

PRESENT STUDY

The present study was designed to answer the following questions: a) how will induced social comparison with a similar or non-similar STD positive comparison target, in terms of behavioral risk behaviors, influence subsequent health cognitions in relation to having sex without a condom and perceived risk of contracting an STD, b) will social comparison processes involving specific health-behavior information have a greater influence on BW versus BI, and c) will high social comparers versus low social comparers be more influenced by this specific type of social comparison? More specifically, participants who are at high or low-risk of contracting STDs socially compared with STD-positive targets who had engaged in high or low-risk sexual behavior. Herpes (HSV-2) was the disease examined in this study because it is an asymptomatic, chronic disease that is prevalent among college students. The following hypotheses were tested:

- 1) Participant risk status and target risk status will interact to produce differences in BW such that participants will report lower BW when they compare with a target whose level of risk behavior is similar to their own.
- 2) Social comparison with high vs. low-risk targets will affect BI less than BW.
- 3) Participant risk status and target risk status will interact to produce differences in PV such that participants will report higher PV when they compare with a target whose level of risk behavior is similar to their own.
- 4) Between subjects effects will be moderated by individual differences in the tendency to socially compare; i.e., the hypothesized interactions between

participant and target risk will be stronger among participants who are high in social comparison tendencies, than those who are low on this dimension.

METHOD

Participants

Potential participants for this study completed a pre-test measure that included a large number of scales designed to determine eligibility for research participation. Participants also completed mass-testing questions regarding their intentions and willingness to engage in risky sexual behavior, perceived vulnerability to STDs, and their social comparison tendencies (see Appendix A). From that group, participants who reported that they were not virgins, had unprotected sex, were not married, and had never been diagnosed with an STD were called and asked if they would be willing to participate in a study dealing with health behaviors. A total of 189 undergraduate students participated in the present study; however only 175 (68 males and 107 females) had complete data and were used in the subsequent analyses. The 14 that were not used in the analyses did not complete their risk behavior information. The participants averaged 21 years of age (range = 18-26). The participants were randomly assigned to hear the low (n = 90) or high (n = 85) risk tape.

Procedure

Participants were run in same sex groups of one to four participants conducted by a same sex experimenter. Upon arriving in the lab, the participants were told they were participating in an experiment that was part of an ongoing study being conducted in collaboration with the Student Health Center. The study was described as an examination of psychological reactions to health problems, and reactions to, and impressions of, others who are experiencing specific health

problems. Participants were also told that they would be hearing a tape made by one of six ISU students who would be discussing a personal health problem; after listening to the tape, they would be asked to write about their reactions to it.

Participants were then given an informed consent form to read and sign if they agreed to participate in the study. They were then led to individual rooms. After explaining how the intercom system worked and where the questionnaires were located, the experimenter left them alone in their separate rooms to ensure privacy while they completed a pre-test questionnaire about their sexual behaviors, sun tanning behaviors, and drinking behaviors (see Appendix B). The health behaviors in addition to sexual behaviors were included because the participants had been told the tape would be related to one of six different types of health behaviors and we did not want to create suspicion before they heard the tape.

Next, participants were told that they were going to hear an audiotape of a participant from the previous semester who agreed to talk about his/her experience with being diagnosed with herpes after visiting the Health Center. Each participant was randomly assigned to hear a tape depicting a high or low-risk same-sex comparison target who reported that he or she had tested positive for herpes, and revealed that he/she was coping poorly with the diagnosis. In the high-risk condition the comparison target reported having five previous sexual partners, and using protection less than the average ISU student. In the low-risk condition the comparison target reported having only one partner and using protection more often than average. Each audiotape lasted approximately four minutes (see Appendix C).

After listening to the audiotape, the participants read a brief summary of general information about genital herpes (see Appendix D) and were then asked to complete a questionnaire that assessed willingness, intentions, perceived vulnerability, and a manipulation check (see Appendix E). For the questions related to casual sex, participants were asked to imagine that they were not in a steady or serious relationship. Participants were also asked to imagine they were in a serious or steady dating relationship for each of the questions related to sex with a steady partner. When participants finished, they signaled the experimenter and were asked to place their questionnaires in an envelope for privacy. The experimenter then probed for suspicion about the audiotape, and fully debriefed the participants.

Measures

Participant sexual risk. Pre-manipulation sexual practices were assessed by asking participants in an open ended format “How many steady partners have you had in your lifetime?” Condom use was assessed by asking “How often have you used a condom in these relationships?” followed by a 7-point scale (1=*never*; 7 = *all the time*). The same questions were asked for casual partners, defined as not being a serious or steady dating partner. The condom use scores were reverse coded. Participant risk behavior was computed by multiplying the number of (steady and casual) partners with the infrequency of condom use for each type of partner. Because the risk behavior scores were skewed in the direction of high-risk, these scores were then log transformed and standardized. The participant risk score averaged 9.8 (range = 1-66).

Intentions. At mass-testing participants were asked to indicate on a 1-7 point scale (1= *strongly disagree*; 7 = *strongly agree*) how much they intended to “have sex with a steady partner without a condom in the next six months” and “have sex with a casual partner without a condom in the next six months”. The two mass-testing items had a low reliability ($\alpha = .40$).

At post-measure participants were again asked to indicate on a 1-7 point scale (1= *strongly disagree*; 7 = *strongly agree*) how much they intended to “have sex with a steady partner without a condom in the next six months” and “have sex with a casual partner without a condom in the next six months”. Participants were also asked whether they intended to “have sex without a condom” at post-measure. The three intention items at post-measure were aggregated into a no condom intention index ($\alpha = .72$).

Willingness. In order to assess behavioral willingness (BW) to engage in risky sexual behavior at mass-testing, participants were presented with a series of hypothetical situations that are common for students their age and then asked to rate how willing they would be to engage in different outcomes. BW to have sex with a casual partner was assessed by asking participants “suppose you start talking with a man/woman whom you find very attractive and are enjoying hanging out with, and at the end of the evening you both want to be alone, but you do not have a condom with you. How willing would you be to ___?” The participants responded to each of the following items: 1) go ahead and make out but not have sex, 2) have sex without a condom, 3) have sex and use withdrawal, 4) go home alone, each on 7-point scales (1=*not at all willing*; 7 = *very willing*). Questions one and four were reverse

coded and were not included in the final mass-testing index because of low correlations with questions two and three. Mass-testing BW combined the two no condom casual partner BW questions to form a BW index ($\alpha = .83$).

The post-measure BW index consisted of casual BW and steady BW. Once again, BW to have sex with a casual partner was assessed by asking participants “suppose you start talking with a man/woman whom you find very attractive and are enjoying hanging out with, and at the end of the evening you both want to be alone, but you do not have a condom with you. How willing would you be to ___?” The participants responded to each of the following items: 1) go ahead and make out but not have sex, 2) have sex without a condom, 3) have sex and use withdrawal, 4) go home alone, each on 7-point scales (1=*not at all willing*; 7 = *very willing*). Questions one and four were reverse coded and were not included in the final index because of low correlations with questions two and three.

At post-measure only, participants were asked “suppose you are on a date with your boy/girlfriend and you want to have sexual intercourse, but neither of you has a condom. How willing would you be to ___?” The participants responded to the following items: 1) go ahead and use withdrawal, 2) make out, but don't have sex, 3) have sex without a condom, on a 7-point scale (1= *not at all willing*; 7 = *very willing*). Question two was reversed coded and was not included in the final index due to low correlation with the other items. The post-measure BW index consisted of four casual and steady no condom willingness items; the two withdrawal questions and the two sex without a condom questions ($\alpha = .81$).

Perceived vulnerability. *Conditional perceived vulnerability* was assessed at mass-testing by asking “If you were to have sex with a casual partner without a condom, what do you think the chances are that you would get an STD?” followed by a 7-point scale (1= *very likely*; 7 = *not at all likely*). Vulnerability was also assessed by asking “If the typical ISU student was to have sex with a (casual/steady) partner without a condom, what do you think the chances are that they would get an STD?” followed by a 7-point scale (1 = *very likely*; 7 = *not at all likely*). Personal ConPV and ISU student ConPV correlated .60 and thus were included in the same index. *Danger* was assessed by asking “How dangerous do you think having sex with a casual partner and without a condom is?” followed by a 7-point response scale (1= *not at all dangerous*; 7 = *very dangerous*). PV combined three PV items and one casual sex danger item to form the mass-testing measure of PV ($\alpha = .75$).

Conditional perceived vulnerability was also assessed at post-measure by asking participants “If you were to have sex with a (casual/steady) partner without a condom, what do you think the chances are that you would get an STD?” followed by a 7-point scale (1= *very likely*; 7 = *not at all likely*). Vulnerability was also assessed by asking “If the typical ISU student was to have sex with a (casual/steady) partner without a condom, what do you think the chances are that they would get an STD?” followed by a 7-point scale (1 = *very likely*; 7 = *not at all likely*). *Danger* was assessed by asking “How dangerous do you think having sex without a condom is?” and “How dangerous do you think having sex with a casual partner and without a condom is?” followed by a 7-point response scale (1= *not at all*

dangerous; 7 = *very dangerous*). For the post-measure PV the four PV items and the two danger items were aggregated to form a measure of PV ($\alpha = .81$). Table 1 shows the indices used for each index at both time periods.

Social comparison. Social comparison (SC) orientation was assessed with the Iowa-Netherlands Comparison Orientation Measure (INCOM; Gibbons & Buunk, 1999). This instrument provides respondents with a general description of social comparison, followed by 11 questions (e.g., “I often compare myself with others with respect to what I have accomplished in life.” “I often compare how I am doing socially (e.g., social skills, popularity) with other people.” “When I get a test score back or receive grades, I often like to find out how other people did on that test or project.”). Each item was followed by a 1-5 point scale labeled “I disagree strongly” to “I agree strongly” ($\alpha = .82$). The median score on the INCOM, used in later analyses to separate high and low social comparers, was 3.5 (range = 2-5).

Similarity. Although the manipulation was not designed to alter similarity, it was assumed that low-risk participants would report being more similar to the low-risk target while the high-risk participant would report being more similar to the high-risk target. Participants were asked how similar they thought they were to the student they heard on the audiotape (1 = *not at all*; 7 = *extremely*).

Table 1
Items Used to Form Mass-testing and Post-Measures of BI, BW, and PV

Behavioral Intentions	Mass- Testing	Post- Measure
Have sex with a steady partner without a condom.	X	X
Have sex with a casual partner without a condom.	X	X
Have sex without a condom.		X
Behavioral Willingness		
<u>Casual Partner</u>		
1) Have sex using a method like withdrawal.	X	X
2) Have sex without a condom.	X	X
<u>Steady Partner</u>		
1) Have sex using a method like withdrawal.		X
2) Have sex without a condom.		X
Perceived Vulnerability		
<u>Casual Partner</u>		
1) If you were to have sexual intercourse with a casual partner without a condom, what do you think the chances are that you would contract an STD?	X	X
2) If a typical ISU student were to have sexual intercourse with a casual partner a condom, what do you think the chances are that they would contract an STD?	X	X
3) How dangerous (health-wise) do you think having sexual intercourse with a casual partner and without a condom is?	X	X
<u>Steady Partner</u>		
1) If you were to have sexual intercourse with a steady partner without a condom, what do you think the chances are that you would contract an STD?		X
2) If a typical ISU student were to have sexual intercourse with a casual partner a condom, what do you think the chances are that they would contract an STD?		X
3) How dangerous (health-wise) do you think having sexual intercourse with a steady partner and without a condom is?	X	X

Manipulation check. In order to examine the effectiveness of the comparison target risk manipulation, participants were asked the following items based on the tape they heard: "how many sexual partners did the student on the tape mention" (1 = 1; 7 = *more than 6*); "how committed were the student's relationship(s)" (1 = *not at all*; 7 = *very*); "how often did the student use a condom" (1 = *never*; 7 = *all of the time*); and "how risky do you believe the student's behavior to be" (1 = *not at all*; 7 = *very*). Participants also rated how similar they thought they were to the student in terms of possible exposure to STD's (1 = *not at all*; 7 = *extremely*).

RESULTS

Forty percent of participants in the mass testing pool reported that they were: not virgins, had had unprotected sex, were not married, and had never been diagnosed with an STD; thus, they were eligible to participate in the study. The 175 participants in this study reported an average of 3.5 sexual partners (lifetime); 2 steady partners and 1.5 casual partners. Thirty-five percent reported having only one sexual partner, while twenty percent reported having 5 or more partners. When asked how often they had had sex without a condom, participants averaged 5 on a 7-point scale (1 = *never*, 7 = *all the time*).

There were no differences between high and low risk level or between comparison target conditions in participant social comparison levels ($ps > .10$). In addition, there were no differences in mass-testing BI, BW, and PV between target conditions ($ps > .10$). Participants' mass-testing health cognitions were examined by dividing participants into a high and low-risk group at the median sexual risk score. High-risk participants reported higher willingness and higher intentions to engage in risky sexual behaviors ($ps < .05$). In addition, although non-significant, the high-risk participants reported slightly lower levels of PV ($p < .20$). As represented in Table 2, BW and BI were positively correlated. In addition, PV was negatively correlated with BW and BI indicating that those intending and willing to engage in sex without a condom also reported less vulnerability to STDs. As expected, participant risk level was positively correlated with BI and BW.

Table 2
Correlations, means, and standard deviations for BW, BI, PV, participant risk, comparison level, and target risk.

	1	2	3	4	5	6
1. BW	--					
2. BI	.65***	--				
3. PV	-.39***	-.41***	--			
4. Participant Risk	.39***	.41***	-.09	--		
5. Social Comparison	-.01	-.07	-.11	-.04	--	
6. Target Risk	-.22**	-.09	-.00	-.06	-.03	--
M	2.61	2.91	4.60	.78	3.48	.49
SD	1.33	1.51	.88	.44	.55	.50

+ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$; BW, BI, PV, and INCOM ranged from 1-7; risk-level ranged from 0=low, 1=high.

Manipulation Comparisons

Comparison target. Participants who listened to the low-risk comparison target tape reported that the target had fewer partners ($M = 1.4$ vs. 4.9 , $t(172) = -17.45$, $p < .001$), more frequent condom use ($M = 4.5$ vs. 3.4 , $t(173) = 6.2$, $p < .001$), and lower levels of risky behavior ($M = 3.6$ vs. 5.5 , $t(173) = -7.85$, $p < .001$) than did participants in the high-risk target condition. In addition, participants who listened to a low-risk target reported that the target had significantly higher commitment to their relationship than did participants who heard a high-risk target ($M = 5.0$ vs. 3.4 , $t(173) = 8.0$, $p < .001$). Thus, the comparison target manipulation was effective in terms of the participants' perceptions of the low versus high-risk target.

Similarity. Regression analyses revealed there was a significant main effect for the continuous measure of participant risk ($\beta = .20, t = 1.98, p < .05$) such that high-risk participants were more likely to report being similar to the comparison target. In addition, there was a significant main effect for target risk on similarity, such that those who listened to the low-risk target reported higher levels of similarity versus those who listened to the high-risk target ($\beta = -.33, t = -4.84, p < .001$). In addition, there was a marginal interaction between participant risk and target risk ($\beta = .17, t = 1.65, p = .10$), such that low-risk participants reported higher similarity to the low-risk target versus the high-risk comparison target.

Effect of Participant and Target Risk on Health Cognitions

Behavioral willingness. To take advantage of the continuous nature of SC and participant risk, hierarchical multiple regression analyses were used to examine the hypothesized target risk by participant risk interaction on post-measure BW, PV, BI, as well as the anticipated SC moderation of this interaction. The effect of participant risk, target risk, and SC level on willingness to engage in sexual intercourse without a condom, were examined.

As predicted, there was a significant main effect for the continuous measure of participant risk ($\beta = .55, t = 5.32, p < .000$) such that high-risk participants were more likely to report higher BW. In addition, there was a significant main effect for target risk on BW, such that those who listened to the high-risk target reported lower BW ($\beta = -.21, t = -3.01, p < .01$). Also as predicted, there was a significant interaction between participant risk and target risk ($\beta = -.23, t = -2.24, p = .03$) such

that high-risk participants who heard the low-risk target reported higher BW than high-risk participants who listened to the high-risk tape, see Figure 1 (based on Table 4) (see Table 3 for means based on a 2-way ANOVA). Simple slopes tests revealed that BW to have sex without a condom was associated with target risk among high-risk participants ($\beta = -.25$, $t = -2.25$, $p = .01$). Simple slopes tests revealed that BW to have sex without a condom was not significantly associated with target risk among low-risk participants ($p > .10$). Thus, target risk did not significantly affect the BW of low-risk participants.

Table 3
Mean post-measure BW, BI, and PV in relation to performing high-risk sexual activities as based on a 2-way ANOVA.

	Low-Risk Target		High-Risk Target	
	Low Risk Participant	High Risk Participant	Low Risk Participant	High Risk Participant
BW	2.40 (1.08)	3.26 (1.52)	2.02 (1.02)	2.56 (1.24)
PV	4.73 (.79)	4.51 (.96)	4.57 (.79)	4.62 (.92)
BI	2.5 (1.40)	3.43 (1.47)	2.24 (1.35)	3.23 (1.52)

Note. Standard deviations are in parentheses. All items on a 7-pt. scale; 1=low and 7=high.

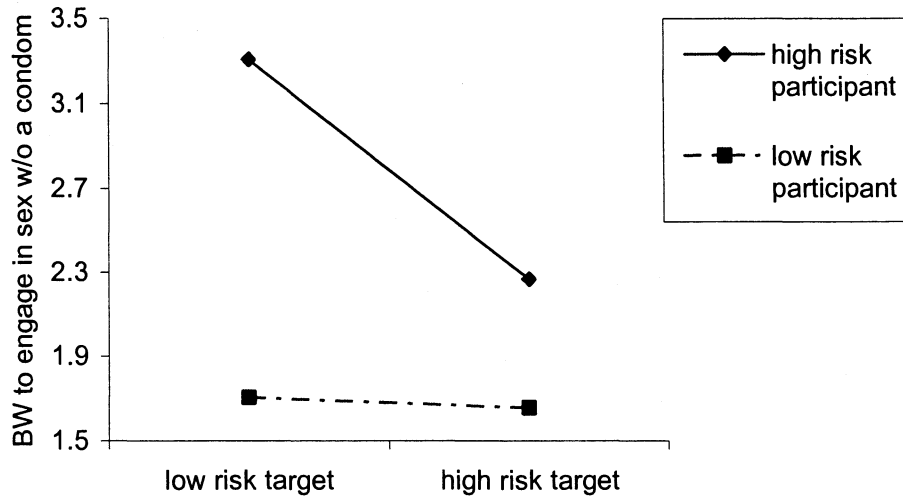


Figure 1. Behavioral willingness to have sex without a condom as a function of participant-risk and target-risk.

This interaction was qualified by the anticipated 3-way interaction ($\beta = -.14$, $t = -1.99$, $p < .05$) between SC, target risk, and participant risk (see Table 4). It was hypothesized that high SC participants would be more influenced by the manipulation than would low SC participants. To further investigate the 3-way interaction, a median split was used to separate participants into high and low SC groups. Additional hierarchical regressions were then conducted on the 2-way participant risk by target risk for each of these groups. For low social comparers, the 2-way interaction was not significant ($p > .80$) (see Figure 2). For high social comparers, however, the participant risk by target risk interaction was significant ($\beta = -.41$, $t = -3.11$, $p = .003$) (see Figure 3). Thus, among high-risk participants who engage in social comparison, those who compared with the low-risk target reported higher BW than those who compared with the high-risk target. For high-social

comparers, simple slopes tests again revealed that BW to have sex without a condom was associated with target risk only among high-risk participants ($\beta = -.44$, $t = -3.39$, $p = .001$). Thus, high-risk individuals who are high in social comparison tendencies were influenced the most by comparison with a similar risk target.

Change in BW. A conservative test was done in order to examine change in participant BW. The regressions were repeated, including mass-testing BW as a control variable. Consistent with the previous analyses, the participant-risk main effect and the participant-risk x target-risk interaction remained significant; the 3-way interaction became marginally significant ($p = .1$).

Table 4
Behavioral Willingness

Variable	Standardized Coefficients	t	p-value
Intercept		22.72	.000
Participant Risk	.55	5.32	.000
Target Risk	-.21	-3.01	.003
Social Comparison (SC)	.05	.48	.63
Participant Risk x Target Risk	-.23	-2.24	.03
Participant Risk x SC	-.02	-.23	.82
Target Risk x SC	-.05	-.54	.59
Target Risk x Participant Risk x SC	-.14	-1.99	.04

Note. Participant risk is continuous from low to high risk. Target risk was coded 0=low-risk, 1=high-risk. Social comparison is continuous from low to high.

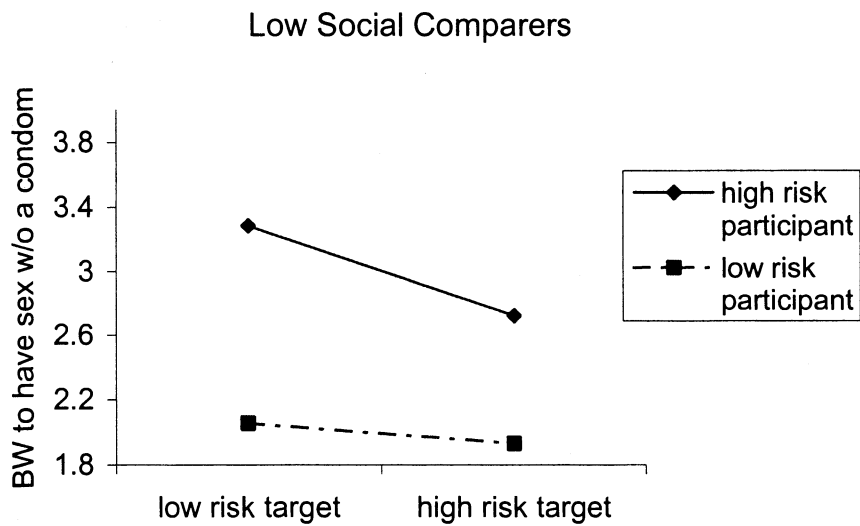


Figure 2. Behavioral willingness to have sex without a condom as a function of participant-risk and target-risk for low social comparers.

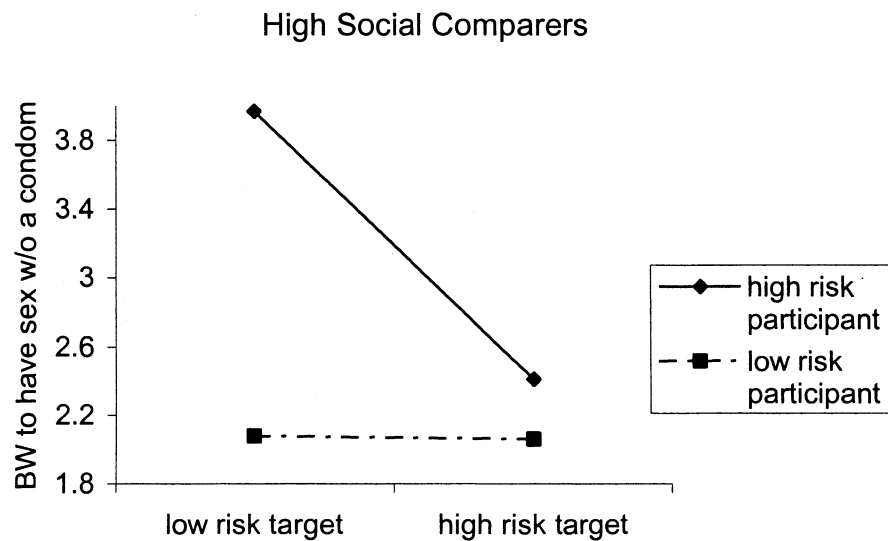


Figure 3. Behavioral willingness to have sex without a condom as a function of participant-risk and target-risk for high social comparers.

Perceived vulnerability to STDs. The effects of participant risk, target-risk, and SC level on perceived vulnerability to an STD were also tested with multiple linear regression. These analyses focus on perceived risk of engaging in sexual intercourse without a condom. Two outliers were deleted from the analyses on PV due to extreme values. As hypothesized, there was a significant main effect for participant risk ($\beta = -.33, t = -2.93, p < .01$), such that high-risk participants reported lower PV. In addition, there was a significant main effect for social comparison tendencies such that high social comparers reported less PV ($\beta = -.23, t = -2.09, p < .05$).

As predicted, there was a significant interaction between participant risk and target risk ($\beta = .25, t = 2.22, p < .05$). As can be seen in Figure 4, low-risk participants who listened to the low-risk comparison target reported higher PV than those who listened to the high-risk tape (based on Table 5). High-risk participants who heard the low-risk comparison target reported lower PV than those who listened to the hi-risk target (see Table 1 for means). Simple slopes tests revealed that the slopes for risk-status were not significantly different from zero (p -values > 0.40), although in they are significantly different from each other. As seen in the BW analyses, this interaction was qualified by the marginal 3-way interaction among SC, target risk, and participant risk ($\beta = .129, t = 1.70, p < .10$) (see Table 5).

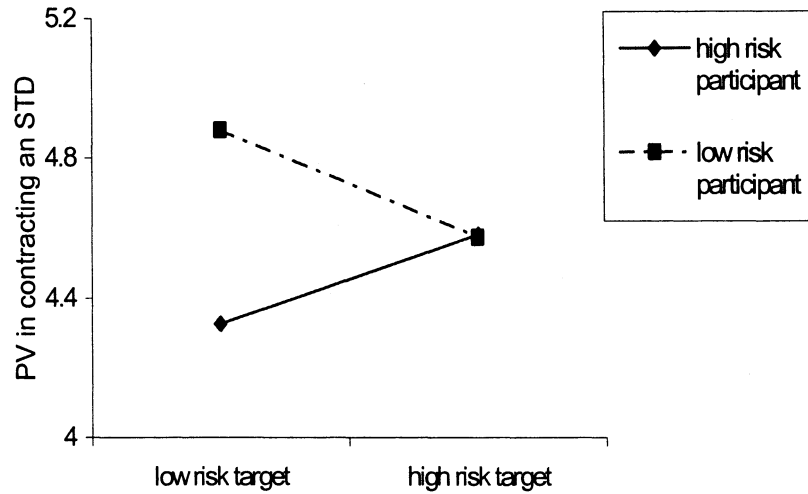


Figure 4. Perceived vulnerability to STDs as a function of participant-risk and target-risk for high social comparers.

Table 5
Perceived Vulnerability

Variable	Standardized Coefficients	t	p-value
Intercept		52.98	.000
Participant Risk	-.33	-2.93	.004
Target Risk	-.02	-.20	.841
Social Comparison (SC)	-.23	-2.09	.038
Participant Risk x Target Risk	.25	2.22	.028
Participant Risk x SC	.10	1.18	.241
Target Risk x SC	.12	1.11	.267
Target Risk x Participant Risk x SC	.13	1.70	.09

Note. Participant risk is continuous from low to high risk. Target risk was coded 0=low-risk, 1=high-risk. Social comparison is continuous from low to high.

To further investigate the 3-way interaction, the SC median split was once again used and separate additional hierarchical regressions were conducted on the 2-way participant risk by target risk for the high and low SC groups. For low social comparers, the 2-way interaction was not significant ($p > .10$) (see Figure 5). However, for high social comparers, the participant risk by target risk interaction was significant ($\beta = .42, t = 2.65, p < .01$) (see Figure 6). Thus, the high-risk, high-comparer participants, who compared with the low-risk target, reported the lowest levels of perceived vulnerability. The low-risk participants who frequently engage in social comparison, and who compared with the low-risk target, reported the highest levels of perceived vulnerability.

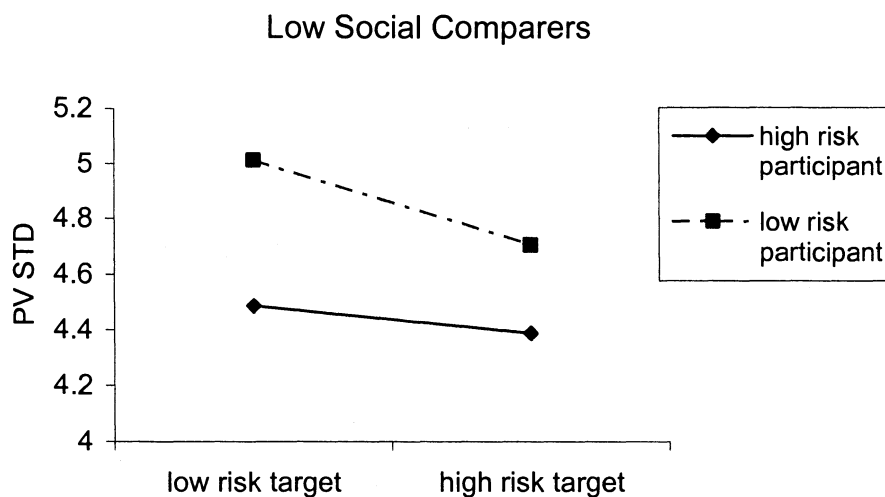


Figure 5. Perceived vulnerability to STDs as a function of participant-risk and target-risk for low social comparers.

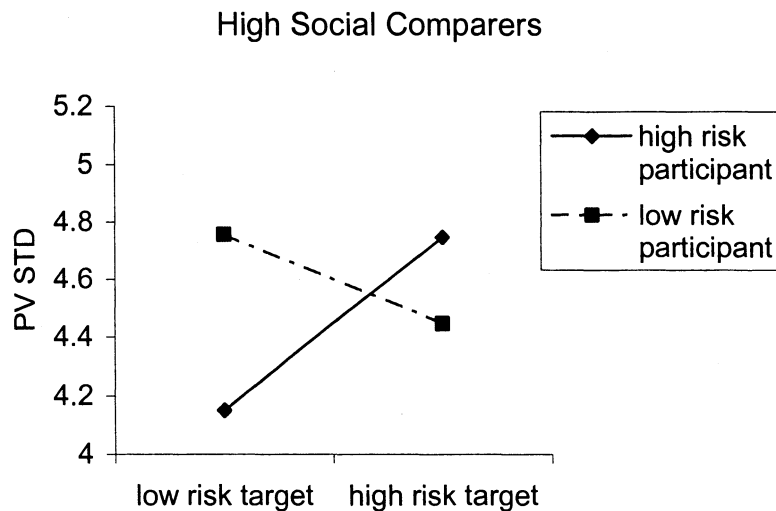


Figure 6. Perceived vulnerability to STDs as a function of participant-risk and target-risk for high social comparers.

Change in PV. In order to examine change in participant PV, the regressions were repeated, including mass-testing PV as a control. The participant-risk main effect remained significant, as did the participant-risk x target-risk interaction; the 3-way interaction was no longer significant ($p > .30$).

Behavioral intentions. As seen with the dichotomized participant risk status, regression analyses revealed a significant main effect for participant risk ($\beta = .45$, $t = 4.27$, $p < .000$) such that high-risk participants were more likely to report greater intentions to engage in sex without a condom. The assumption that there would not be a significant interaction between participant risk and target risk for intentions was also supported ($\beta = -.055$, $t = -.53$, $p > .50$). These analyses support the hypothesis that intentions would not be as affected as willingness by the social comparison process manipulated in this study. In order to examine change in participant BI, the

regression was repeated, including mass-testing BI. The participant-risk main effect remained significant ($p = .001$), although the 2-way interaction was still not significant ($\beta = -.11$, $t = -1.17$, $p > .24$).

Effect of PV on BW

A number of studies have shown that perceptions of risk predict willingness to engage in risky health behaviors (Gerrard, Gibbons, Vande Lune, Pexa, & Gano, 2002; Thornton, Gibbons, & Gerrard, 2002). An additional regression analysis was performed to see if change in risk perceptions between mass-testing and post-manipulation would predict change in BW. Mass-testing BW, PV, participant-risk and comparison target condition, followed by the post-measure PV were entered in the regression. A significant effect was found ($\beta = -.203$, $t = -2.73$, $p < .05$) showing that change in PV predicted change in BW while controlling for condition. As would be predicted, participants who increased their PV, in turn decreased their BW.

DISCUSSION

The present study provided an experimental demonstration of the influence of induced social comparison on health cognitions. A number of studies have demonstrated that social comparison can influence behavioral willingness (Gerrard, Gibbons, Reis-Bergan, & Wills, 2004; Gibbons et al., 1998). The current study replicated these previous studies—comparison with a high-risk target decreased participants' willingness to engage in risk behavior. In addition, the current study expanded this line of research by demonstrating that the influence of social comparison on willingness is moderated by participant behavior and social comparison tendencies. More specifically, analyses revealed that comparison with a high-risk target only significantly influenced willingness among participants who were also at high risk, and that the effect was amplified by a generalized tendency to socially compare with others.

As predicted, high-risk participants who heard from a similar high-risk comparison target reported higher vulnerability to STDs than high-risk participants who heard from a low-risk target. In addition, low-risk participants who listened to the similar low-risk comparison target were more likely to report higher PV than those who listened to the high-risk tape. As evidenced in the predicted three-way interactions, the expected influence of social comparison tendencies was found such that the participant risk by target risk interactions were stronger among those who engage in social comparisons more often. Furthermore, willingness varied significantly as a function of condition, whereas intentions did not, providing further support that willingness and intentions are distinct constructs.

Behavioral Willingness and Risk Status

Decreasing the favorability of the similar comparison target can reduce willingness to engage in the behavior that could potentially lead to the same negative consequences experienced by the target. As the P/W model would suggest, the image of the comparison target with an STD is unfavorable and participants may be motivated to avoid being associated with it in the future. This was shown in the high-risk participants who reported less willingness to have sex without a condom after listening to the similar high-risk peer versus a dissimilar low-risk peer.

However, comparisons to a person who is obviously different may be seen as much less relevant (Festinger, 1954). Overall, low-risk participants reported less similarity to the STD positive targets, although they reported seeing the high-risk target as the most dissimilar to themselves and their image of that target was more negative. This finding is similar to Rothman et al. (1999) who found that the most sexually active participants who viewed a vulnerability-oriented film about HIV reported the most similarity to all participants in the film. The low-risk participants were the least willing to engage in risky sexual behavior overall and reported higher past condom use. It is likely that they are more set in the sexual patterns, which are already fairly safe, thus making it harder to influence their BW in relation to condom use, no matter their comparison target.

In addition, the high-risk participants who compared with the dissimilar low-risk comparison target reported the greatest willingness to engage in sex without a condom. More specifically, this finding was most evident among those who engage

in comparison tendencies more often. They may have been distancing themselves from the downward comparison target who got an STD after only one partner, in turn reducing risk perception and increasing willingness. They have had sex with multiple partners without a condom and have not been affected, while this person had just one and got an STD. The high-risk participants may believe that if there is not a linear relationship between number of partners and getting an STD, then why not continue their behavior. This is similar to Weinstein's (1982) absent-exempt cognitive process in which one believes that if they have not yet experienced any negative health consequences, then perhaps they will not.

BW versus BI

The *P/W* model suggests that social comparison will have a greater influence on willingness than on intentions because willingness is a *social* reaction, and is more likely to be altered by social factors. In the current study, past behavior is a second factor that may also contribute to this finding. The current study also replicated that willingness is more influenced by social comparison with an STD positive target. However, BW is likely to be more influenced than BI in non-married college students. Most college freshman and sophomores are still being presented with new opportunities to engage in risky sexual behavior with which they may have little experience.

Consideration of Risk

Biased (falsely low) perceptions of vulnerability to an STD may result from a social comparison process in which an inappropriate, typically higher-risk comparison other is used in assessing one's own risk (Klein & Weinstein, 1997). In

turn, this may lead people to believe their risk of contracting an STD is low.

Consistent with the present study, however, these risk perceptions covary with the comparison target, with social comparison processes, and the social reaction path of the PW model (e.g., Perloff & Fetzer, 1986, Gibbons & Gerrard, 1995). The low and high-risk targets provide specific information that does not as easily allow the comparer to construe the target in order to enhance the targets risk vis a vis their own risk. The present study gave the participant a chance to compare on an important variable that can influence one's risk perceptions in the comparison process, i.e., past risky sexual behaviors.

Risk perception was shown to vary in relation to the risk of the comparison target and the risk of the participant. This is also consistent with previous studies, which have found that perceived risk is influenced by the apparent similarity of the comparison target (e.g. Thornton et al, 2002, Klein & Weinstein, 1997). In addition, this was demonstrated experimentally. The impact of the manipulated comparison was greater in the condition that was intended to facilitate more social comparison with the target, namely, the more similar target in terms of risk behavior. As predicted in the present study, high-risk participants who heard from the similar high-risk STD positive target reported the more perceived vulnerability in contracting an STD than did those who heard from the low-risk target. In addition, the low-risk participants who heard from their similar counterpart reported more vulnerability to STDs than those who heard from a higher-risk target. Both high and low risk participants who heard from the dissimilar counterparts reported lower levels of PV, consistent with Gump & Kulik (1995), who found that participants who viewed

themselves as less similar to an HIV positive target, also reported lower levels of susceptibility to HIV.

Risk Perception and Willingness

Willingness to engage in a behavior may be less a matter of intending to take risks than a reflection of the biased perception of diminished risk in the behavior due to comparison with an unrealistic comparison target. Previous research has shown a negative relationship between perceived risk and willingness (Thornton et al., 2002). BW involves some denial of risk; in turn, the person is more likely to think they can get away with their behavior without getting an STD (e.g. Gibbons et al. 1998).

Social comparison with these negative targets of a victim, similar in risk behavior, may promote a greater sense of invulnerability, which in turn may decrease motivation to engage in preventive behavior (Weinstein & Klein, 1995). The negative relation between change in conditional PV and BW, as shown in the current results, demonstrates that increasing one's vulnerability to an STD is associated with lower willingness to have sex without a condom. In addition, the high-risk participants most willing to have sex without a condom, also reported the least PV to STDs. This finding is similar to Gibbons et al. (1998) who found that the more willing adolescents were to drink and drive, the less they thought they would have an accident if they did. Thus, in the present study, lower PV is related to greater denial of the risk of the behavior, and greater willingness to engage in the behavior.

Individual Differences in Social Comparison

As predicted social comparison tendencies did moderate the impact of the participant and target risk interaction on both willingness to have sex without a condom, and vulnerability to STDs. Specifically, participants whose SC scores were above the median were more responsive to the experimental manipulation. In fact, the slopes for the low SC groups suggest that high-risk sexually active young adults may not be affected by health messages and other interventions if they do not typically engage in social comparison. This means that a high-risk, sexually active individual may be less affected by interventions and other messages if they do not engage in social comparison.

The current study has ramifications for an intervention that attempts to induce people to focus on their risk for STDs through a type of social comparison process. Active heterosexuals typically do not consider themselves or their partners to be at risk for an STD (Berrios et al., 1993). Those not confronted with their health risk may infer their future risk is low and it may be beneficial to highlight their risk for contracting STDs. An intervention may target not only the social consequences of engaging in the behavior, but also the health consequences by having participants compare with a similar other who is already suffering those consequences. As demonstrated in the present study, an intervention may work better for those who engage in social comparison more often and are already at some risk. In addition, comparison processes have more impact on those who are younger and may be best for teens and young adults, esp. in regards to risk behavior (Krosnick & Judd, 1982; Gibbons & Gerrard, 1997).

Similarity to Comparison Target

It appears that comparison tendencies are necessary for the comparison target to be attended to and have an impact, and the nature of that impact is shaped by the characteristics of the comparison other. For example, the current study showed that high-risk participants, who compared with similar high-risk targets, reported the lower BW and higher PV in comparison to those who compared with less similar low-risk targets. This was particularly true for high-social comparers. In addition, low-risk participants who compared with similar low-risk targets reported higher PV than those who compared with high-risk targets. Comparisons with similar others has more positive impact (e.g., Michinov & Michinov, 2001), than comparison with dissimilar others, especially in situations where one knows little about others, such as sexual behaviors (Fox & Kahneman, 1991).

The manipulation of past risk behavior of the STD positive comparison target was unique in that it provided an objective basis for judging similarity between the participant and target. Similarity was made salient by having participants think about their own past behavior before they heard about the comparison targets' behaviors. This study is also unique in that it included both participant and comparison target risk status as predictors of health cognitions. As predicted by the P/W model, the (unfavorable) image of a target similar in risk behavior resulted in lower BW and higher PV.

Limitations

Some limitations of the present study include the fact that the measures at mass-testing and post-measurement were not compatible. Although similar

measures were available, most were missing a few key indicators. It would have been beneficial to have pre-measures that could be better controlled for and used to examine changes in health cognitions. Another limitation is the reliance on self-report of behavior, which is subject to bias. In this study some of the participants categorized as low-risk may have, in fact, been at higher-risk. In addition, it would have been preferable to be able to create greater similarity between the targets and the participants, by having more than two categories of target risk.

There are many other cognitive factors that may play a role in the differences found in the present study. For example, the degree of control a participant feels they have may alter the meaning and significance of comparison process. Also, it would be beneficial to examine any change in the prototype individuals may have of peers who have risky sex. The image represented in the present study is an unattractive image that represents the negative consequences of engaging in certain sexual behaviors. Previous studies have found that prototype perception is influential in BW and behavior related to risky health behaviors and this link is stronger for those who are social comparers (e.g., Gibbons & Gerrard, 1997). Self-esteem is another construct that may have implications for the effects found in the study. Researchers have found that low self-esteem individuals respond appropriately when faced with information about the riskiness of their behaviors, whereas high-self-esteem avoid implications of unwanted information (Gibbons, Eggleston, & Benthin, 1997; Smith, Gerrard, Gibbons, 1997). Thus, it may be worthwhile to investigate other cognitive mediators and moderators.

Conclusion

There has been little research examining the role of the impact of social comparison on perceived vulnerability and willingness to engage in risky behavior. The present study advances this line of research by using a specific comparison other in order to evaluate the influence of images on willingness and perceived vulnerability to negative consequences associated with engaging in health risk behavior. It demonstrates the need to consider the risk status of both the audience and potential comparison targets employed in preventive health messages, and suggests that high social comparers and those who are at a greater risk may be more impacted by comparison targets than are others.

APPENDIX A

Mass Testing Questionnaire

The following questions are personal in nature. As indicated in the general instructions at the beginning of this mass-testing session, your participation is voluntary, and you are free to skip all items that you are not comfortable answering without penalty. Your responses to these questions are for the research use of the Psychology Department experimenters associated with this study. They will be kept confidential to the extent permitted by applicable laws and regulations.

1. Are you a virgin? (1=Yes, 2=No)
2. If you are currently in a dating relationship, how would you characterize that relationship? (1-I am not currently in a serious relationship, 2-Not at all serious or steady, to 8-very serious/steady)
3. Have you ever been diagnosed with an STD? (1=Yes, 2=No)
4. Do you intend to have *vaginal sex* with a *casual* partner (not a serious or steady dating partner) *without protection against STDs* in the next 6 months? (1-I definitely will not to 7-I definitely will)
5. Do you intend to have *vaginal sex* with a *steady* partner *without protection against STDs* in the next 6 months? (1-I definitely will not to 7-I definitely will)
6. Do you intend to have *oral sex* with a *casual* partner (not a serious or steady dating partner) *without protection against STDs* in the next 6 months? (1-I definitely will not to 7-I definitely will)
7. Do you intend to have *oral sex* with a *steady* partner *without protection against STDs* in the next 6 months? (1-I definitely will not to 7-I definitely will)
8. If you were to have *vaginal sex* with a *casual* partner (not a serious or steady dating partner) *without protection against STDs*, what do you think the chances are that you would contract an STD? (1-not at all likely to 7-very likely)
9. If you were to have *oral sex* with a *casual* partner (not a serious or steady dating partner) *without protection against STDs*, what do you think the chances are that you would contract an STD? (1-not at all likely to 7-very likely)
10. Please estimate the likelihood that you will contract an STD (OTHER than AIDS; e.g., herpes, genital warts) in the future. (1=extremely unlikely, 7=extremely likely)
11. How many people have you had sexual contact with (vaginal or oral sex) total in your lifetime? (1=none, 9=more than 11)

12. Have you ever had sexual intercourse without using a condom? (1=never had sex, 8=all the time)

13. How concerned are you with the possibility of contracting an STD in the future? (1=not at all, 7=very much)

14. Do you intend to be tested for an STD (other than AIDS) in the next 6 months? (1=yes, 2=no, 3=maybe)

Assume you are not seriously dating anyone. Suppose you were at a party and met a man/woman for the first time. You think that he/she is very attractive (the feeling is obviously mutual). At the end of the evening you find yourself alone with this person. Neither of you has used or has protection against STDs. To what extent would you be willing to do each of the following in this situation? (1-Not at all willing to 7-Very willing).

15. Make-out and have vaginal sex using a method like withdrawal (i.e., withdrawing the man's penis before ejaculation-a type of "safer sex"),

16. Make-out, but stop before vaginal intercourse,

17. Make-out and have vaginal sex without protection,

18. Have oral sex without protection;

19. In general, how dangerous (health-wise) do you think having *oral sex* with a *casual* partner (not a serious or steady dating partner) *without protection against STDs is?* (1-not at all dangerous to 7-very dangerous)

20. In general, how dangerous (health-wise) do you think having *vaginal sex* with a *casual* partner (not a serious or steady dating partner) *without protection against STDs is?* (1-not at all dangerous to 7-very dangerous) (Note: There's an identical question for "sexual intercourse" instead of "oral sex")

21. If you were to have *vaginal sex* with a *steady* partner *without protection against STDs*, what do you think the chances are that you would contract an STD? (1-not at all likely to 7-very likely)

22. How likely is it that you will have *oral sex* with a *casual* partner (not a serious or steady dating partner) *without protection against STDs* in the next 6 months? (1-not at all likely to 7-very likely)

23. How much would concern about contracting an STD influence your choice to have sex without protection? (1=not at all, 7, very much)

24. How likely is it that you will have *vaginal sex* with a *casual* partner (not a serious or steady dating partner) *without protection against STDs* in the next 6 months? (1-not at all likely to 7-very likely)

25. How likely is it that you will have *oral sex* with a *steady partner without protection against STDs* in the next 6 months? (1-not at all likely to 7-very likely)
26. How likely is it that you will have *vaginal sex* with a *steady partner without protection against STDs* in the next 6 months? (1-not at all likely to 7-very likely)
27. If a typical ISU student were to have *vaginal sex* with a *casual partner* (not a serious or steady dating partner) *without protection against STDs*, what do you think the chances are they would contract an STD? (1-not at all likely to 7-very likely)
28. If a typical ISU student were to have *oral sex* with a *casual partner* (not a serious or steady dating partner) *without protection against STDs*, what do you think the chances are they would contract an STD? (1-not at all likely to 7-very likely)
29. If a typical ISU student were to have *vaginal sex* with a *steady partner without protection against STDs*, what do you think the chances are they would contract an STD? (1-not at all likely to 7-very likely)
30. Do you intend to have *vaginal sex* with a *casual partner* (not a serious or steady dating partner) *with protection against STDs* in the next 6 months? (1-I definitely will not to 7-I definitely will)
31. How likely is it that you will have *vaginal sex* with a *casual partner* (not a serious or steady dating partner) *with protection against STDs* in the next 6 months? (1-not at all likely to 7-very likely)
32. If you were making a list of your sexual partners, would you include those people with whom you've only had oral sex? (A= yes, B = no)

Debriefing Statement:

We are interested in the knowledge, attitudes, and behaviors of college students in regards to oral and vaginal sex. Specifically, we want to examine if students have different perceptions about the risks associated with oral versus vaginal sex. If you have any questions regarding this research, please contact Dr. Rick Gibbons at 294-8924. If you have any questions or concerns about your health or about how to protect yourself from STDs, you may contact the ISU Student Counseling Services at 294-5056 or the ISU Student Health Center at 294-5801.

APPENDIX B
Health Behavior Questionnaire

Please answer each question as honestly as possible. Your answers will remain confidential and will *not* be connected with your name. You may skip any questions that make you feel uncomfortable.

11. How many times did you use a tanning booth or salon in the last 6 months?

A	B	C	D	E	F	G	H
0	1-2	3-5	6-10	11-15	16-25	26-35	36 or more

12. How many times did you sunbathe (spend time in the sun for the primary purpose of "getting some color") this past summer?

A	B	C	D	E	F	G	H
0	1-2	3-5	6-10	11-15	16-25	26-35	36 or more

13. How many times last summer were you outside in the sun for more than 30 minutes doing something other than sunbathing (working, playing sports, etc.)?

A	B	C	D	E	F	G	H
0	1-2	3-5	6-10	11-15	16-25	26-35	36 or more

14. How many people have you had sexual intercourse with (total in your lifetime)?

a) How many of these were *steady* partners (a serious and committed dating partner)? _____

b) How often have you used a condom in these *steady* relationships?

1	2	3	4	5	6	7
never			about half the time			all of the time

c) How many of these were *casual* partners (not a serious or steady dating partner)? _____

d) How often have you used a condom in these *casual* relationships?

1	2	3	4	5	6	7
never			about half the time			all of the time

5. At what age did you first have sexual intercourse? _____

6. How many of your friends have had sexual intercourse with a *casual* partner(s) (a non-committed relationship)?

1	2	3	4	5	6	7
none			about half			almost all

7. How many of your friends have had sexual intercourse *without a condom*?

1	2	3	4	5	6	7
none			about half			almost all

8. How many of your friends have had more than 4 drinks in a single drinking episode during the last 3 months?

1	2	3	4	5	6	7
none			about half			almost all

9. Please indicate how many times you have had a whole drink of alcohol (for example, a bottle of beer or a whole mixed drink) during the last 3 months: _____

10. How many times you have had more than 4 drinks in a single drinking episode during the last 3 months: _____

APPENDIX C Target Script

(uncomfortable) So, I guess I'm supposed to read off and answer some questions on this sheet I was given. The first question asks me to tell a little bit about myself. (pause) I guess I am pretty much what you would call a typical ISU student. Umm, I'm a sophomore in LAS and I grew up in Iowa. I like to spend time with my friends, I play some sports and I like to listen to lots of different kinds of music, (pause) I really don't know what else to say, so I guess I'll move on to the next question. *Okay, it says to describe my sexual experiences. Well, I guess that's why I am here (pause, awkward tone) Well, I've had one partner who I knew for quite awhile before we decided to have sex. We used a condom most of the time, but not always. (five partners with whom I didn't always use a condom) (pause)* Okay, the next question gets into why I am here at the Health Center, I guess I kind of answered that already but.. (pause). Well, it's because I was diagnosed with herpes simplex virus 2 a few months ago. I guess this is usually called genital herpes. Umm, I was surprised to find out I actually had genital herpes. I guess I never thought I'd actually get an STD (pause). I've had many different thoughts about this, and I guess I don't think I've been dealing with it very well. (pause) I'm, uh, nervous about future relationships. I don't really know how I'd bring it up with someone that I may want to get close to in the future. (pause) I guess I am somewhat angry because I thought I could trust the person I was with, even though I know she didn't know she had the disease at the time. I think it may be hard for me to talk about this with a girl I would like to hook up with in the future. I mean, even if she cares about me, it still may be hard for her to really understand and accept it, at least I think so. (pause) I really don't know who to talk to, I can't really talk to my friends, because I'm embarrassed and I don't think they'd understand. Anyway, I feel as though I am now kind of different from them and I'm nervous about people finding out I have herpes (pause) Anyway, I know there are others like me on this campus with STDs, but I still feel kind of alone in dealing with this. Well, I guess that's about all I have to say for now.

APPENDIX D

Herpes Information Sheet

At least one in four Americans will contract a STD at some point in their lives. In the United States alone, an estimated 15.3 million new cases of STDs occur each year. Two-thirds of all the STDs occur in people 25 years of age or younger. Yet, less than half of young adults have ever been tested for a STD other than AIDS.

Genital herpes is a common STD. This STD is a contagious viral infection that affects an estimated one out of four (or 60 million) Americans ages 12 and older. During the past 20 years, the number of Americans with genital herpes infection has increased 30%. The largest increase is currently occurring in young white teens and young adults. Genital herpes (HSV-2) infection is now five times more common in 12-19 year olds and is twice as common in young adults ages 20-29 than it was 20 years ago. The infection is caused by the herpes simplex virus (HSV). There are two types of HSV, and both can cause genital herpes. HSV type 1 is the most prevalent and most commonly causes sores on the lips (cold sores), but it can cause genital infections as well. HSV type 2 most often causes genital sores, but it can also affect the mouth.

Genital herpes infection usually is acquired by sexual contact with someone who unknowingly is having an asymptomatic (no-symptoms present) outbreak or by a person who is infected with HSV and has noticeable symptoms. Herpes infections can be transmitted during close oral, anal, or oral-genital contact, including intercourse, kissing, or any direct skin-to-skin contact that allows for the transfer of body fluids.

One-third of individuals in the United States with genital herpes are unaware of their disease because they may not develop symptoms, it may take awhile for their symptoms to occur, or they may not recognize their symptoms. When symptoms do occur, they vary widely from person to person. If symptoms do occur, they may include painful sores, fever, muscle aches, painful urination, and swollen glands. An uninfected individual has about a 75% chance of contracting herpes during intimate contact with someone who has the herpes virus, even if that person has no symptoms. Even if an infected person never has noticeable symptoms, it is still possible for them to infect another person who may in turn get noticeable symptoms.

Genital herpes increases the risk of acquiring HIV, the virus that causes AIDS, by providing an accessible point of entry for HIV. The herpes virus can also be transmitted to offspring; babies can die if they become seriously infected. The most accurate method of testing for herpes is a viral culture of sores that may appear. For those who do not have noticeable symptoms, a blood test can detect antibodies to the virus, which indicate that the person has been infected with HSV at some time. New blood tests have been developed that can indicate if the person has the type 1 or the type 2 infection.

APPENDIX E

Post-measure Questionnaire

Indicate how you feel at this moment on each item.

1. calm

1	2	3	4	5	6	7
not at all		somewhat		moderately		very much

2. regretful

1	2	3	4	5	6	7
not at all		somewhat		moderately		very much

3. upset

1	2	3	4	5	6	7
not at all		somewhat		moderately		very much

4. anxious

1	2	3	4	5	6	7
not at all		somewhat		moderately		very much

5. comfortable

1	2	3	4	5	6	7
not at all		somewhat		moderately		very much

6. relaxed

1	2	3	4	5	6	7
not at all		somewhat		moderately		very much

7. worried

1	2	3	4	5	6	7
not at all		somewhat		moderately		very much

8. pleasant

1	2	3	4	5	6	7
not at all		somewhat		moderately		very much

Before we assess your reactions to the audiotape, we are interested in your own attitudes about health behaviors.

Please answer the following questions. Please read each question *and* each choice *very carefully*. You are free to skip any questions that you do not feel comfortable answering and you are free to stop at any time.

1. Assume you are not involved in a steady or serious dating relationship. Suppose you're at a party and you start talking to a guy with whom you have enjoyed hanging out with a few times before. You think that he is very attractive and you are enjoying spending time with him. At the end of the evening, you're feeling as if you might like to be alone with him and you are certain that he feels the same way. Neither of you has a condom with you. He invites you back to his apartment.

In this situation, how willing would you be to do each of the following?

A	B	C	D	E	F	G
not at all willing						very willing

___ a. Go to his apartment, make-out and have sex using a method like withdrawal

(i.e. withdrawing the man's penis before ejaculation).

___ b. Go to his apartment, make-out, but don't have sexual intercourse.

___ c. Tell him you've had a good time, but go home alone.

___ d. Go to his apartment, make-out and have sex without a condom.

2. Suppose you are out on a date with your boyfriend and you both want to have sexual intercourse. Neither of you has a condom with you. Under these circumstances, how willing would you be to do each of the following?

A	B	C	D	E	F	G
not at all willing						very willing

___ a. Go ahead but use a method like withdrawing the man's penis before ejaculation.

___ b. Make out, but don't have sex.

___ c. Go ahead and have sexual intercourse without a condom.

3. How much sympathy and understanding do you have for the person you heard on the tape?

1 2 3 4 5 6 7
none very much

4. In your opinion, how risky were the sexual behaviors of the student on the audiotape?

1 2 3 4 5 6 7
not at all very

5. How much do you think you would like the student on the audiotape if you met her?

1 2 3 4 5 6 7
not at all very much

6. How well was the student you heard on the audiotape coping with her health problem?

1 2 3 4 5 6 7
not at all very well

7. Please indicate how many sexual partners the student you heard on the tape mentioned she has had.

1 2 3 4 5 6 more than 6 unsure

8. Based on the information you have, we would like you to rate the student you just heard on the following dimensions. If you are unsure, please guess.

a) How committed was the relationship(s) of the student on the tape with her sexual partner(s)?

1 2 3 4 5 6 7
not at all very

b) How often did she use a condom with her partner(s)?

1 2 3 4 5 6 7
never about half all of
the time the time

9. How similar do you think you are to the student you heard on the tape?

1	2	3	4	5	6	7
not at all similar						extremely similar

10. In your opinion, how similar are you to the student on the audiotape in terms of possible exposure to STDs?

1	2	3	4	5	6	7
not at all similar						extremely similar

11. On average, how committed have the relationship(s) been with your own sexual partner(s)?

1	2	3	4	5	6	7
not at all						very

12. To what extent do you see yourself as vulnerable to contracting an STD?

1	2	3	4	5	6	7
not at all						very

13. Do you intend to have *sexual intercourse* without a condom in the next 6 months?

1	2	3	4	5	6	7
I definitely will not				maybe		I definitely will

14. How likely is it that you will have *sexual intercourse* without a condom in the next 6 months?

1	2	3	4	5	6	7
not at all likely						very likely

For the following five questions, assume you are not in a steady or serious dating relationship.

15. Would you intend to have sexual intercourse with a casual partner (someone you don't know really well) in the next 6 months?

1 2 3 4 5 6 7

I definitely
will not

maybe

I definitely
will

16. Would you intend to have sexual intercourse with a casual partner (someone you don't know really well) without a condom in the next 6 months?

1 2 3 4 5 6 7

I definitely
will not

maybe

I definitely
will

17. If you were to have sexual intercourse with a casual partner (someone you don't know really well) without a condom, what do you think the chances are that you would contract an STD?

1 2 3 4 5 6 7

not at all
likely

very
likely

18. How likely is it that you would have sexual intercourse with a casual partner (someone you don't know really well) in the next 6 months?

1 2 3 4 5 6 7

not at all
likely

very
likely

19. How likely is it that you would have sexual intercourse with a casual partner (someone you don't know really well) without a condom in the next 6 months?

1 2 3 4 5 6 7

not at all
likely

very
likely

For the following three questions, assume you are in a steady or serious dating relationship.

20. Would you intend to have sexual intercourse with your steady partner without a condom in the next 6 months?

1	2	3	4	5	6	7
I definitely will not				maybe		I definitely will

21. If you were to have sexual intercourse with your steady partner without a condom, what do you think the chances are that you would contract an STD?

1	2	3	4	5	6	7
not at all likely						very likely

22. How likely is it that you would have sexual intercourse with your steady partner without a condom in the next 6 months?

1	2	3	4	5	6	7
not at all likely						very likely

* * * * *

Answer the remaining questions with your current dating situation in mind.

23. Do you intend to get tested for an STD (other than AIDS) in the next 6 months?

1	2	3	4	5	6	7
I definitely will not			maybe			I definitely will

24. In general, how dangerous (health-wise) do you think having sexual intercourse with a steady partner and without a condom is?

1	2	3	4	5	6	7
not at all dangerous						very dangerous

25. In general, how dangerous (health-wise) do you think having sexual intercourse with a casual partner without a condom (someone you don't know really well) is?

1 2 3 4 5 6 7

not at all
dangerous

very
dangerous

26. If a typical ISU student were to have sexual intercourse with a steady partner without a condom, what do you think the chances are that they would contract an STD?

1 2 3 4 5 6 7

not at all
likely

very
likely

27. If a typical ISU student were to have sexual intercourse with a casual partner (someone they don't know really well) without a condom, what do you think the chances are that they would contract an STD?

1 2 3 4 5 6 7

not at all
likely

very
likely

28. How concerned are you with the possibility of already having contracted an STD?

1 2 3 4 5 6 7

not at
all

very

29. How concerned are you with the possibly of contracting an STD in the future?

1 2 3 4 5 6 7

not at
all

very

30. How many people (including friends) do you know who have been diagnosed with an STD?

0 1 2 3 4 5 more than 5

31. Please estimate the likelihood that you will contract an STD other than AIDS (e.g., herpes, genital warts) in the future.

1 2 3 4 5 6 7
 extremely as unlikely as likely extremely
 unlikely as likely likely

32. If you are currently in a committed relationship, how long have you been with your current partner?

1) _____ years _____ months

2) not currently in a relationship

33. Which types of birth control method do you and your partner use? If you do not currently have a steady partner, what type(s) of method(s) did you and your partner use in your last relationship? (circle all that apply)

A. none B. birth control pills C. condom
 D. IUD E. Depo-provera F. Norplant
 G. birth control patch H. othim

34. Now we'd like you to think about the type of female your age who has sex without a condom. What traits do you think this person is likely to have?

smart

1 2 3 4 5 6 7

not at all somewhat moderately extremely

confused

1 2 3 4 5 6 7

not at all somewhat moderately extremely

dull (boring)

1 2 3 4 5 6 7

not at all somewhat moderately extremely

popular

1 2 3 4 5 6 7

not at all somewhat moderately extremely

immature

1 2 3 4 5 6 7

not at all somewhat moderately extremely

“cool” (sophisticated

1 2 3 4 5 6 7

not at all somewhat moderately extremely

self-confident

1 2 3 4 5 6 7

not at all somewhat moderately extremely

careless

1 2 3 4 5 6 7

not at all somewhat moderately extremely

unattractive

1 2 3 4 5 6 7

not at all somewhat moderately extremely

considerate

1 2 3 4 5 6 7

not at all somewhat moderately extremely

self-centered

1 2 3 4 5 6 7

not at all somewhat moderately extremely

independent

1 2 3 4 5 6 7

not at all somewhat moderately extremely

35. Now we'd like you to think about the type of female your age who has sex with a casual partner (someone she doesn't know very well) and without a condom. What traits do you think this person is likely to have?

smart

1 2 3 4 5 6 7

not at all somewhat moderately extremely

confused

1 2 3 4 5 6 7

not at all somewhat moderately extremely

dull (boring)

1 2 3 4 5 6 7

not at all somewhat moderately extremely

popular

1 2 3 4 5 6 7

not at all somewhat moderately extremely

immature

1 2 3 4 5 6 7

not at all somewhat moderately extremely

"cool" (sophisticated

1 2 3 4 5 6 7

not at all somewhat moderately extremely

self-confident

1 2 3 4 5 6 7

not at all somewhat moderately extremely

careless

1 2 3 4 5 6 7

not at all somewhat moderately extremely

42. Assume you are in a serious dating relationship. Would you intend to have oral sex with a steady partner (a serious and committed dating partner) without a condom in the next 6 months?

1	2	3	4	5	6	7
not at all likely						very likely

41. Assume you are in a serious dating relationship. How likely is it that you would have oral sex with a steady partner (a serious and committed dating partner) without a condom in the next 6 months?

1	2	3	4	5	6	7
not at all likely						very likely

44. Assume you are not in a serious dating relationship. Would you intend to have oral sex with a casual partner (someone you don't know really well) without a condom in the next 6 months?

1	2	3	4	5	6	7
not at all likely						very likely

43. Assume you are not in a serious dating relationship. How likely is it that you would have oral sex with a casual partner (someone you don't know really well) without a condom in the next 6 months?

1	2	3	4	5	6	7
not at all likely						very likely

45. If a typical ISU student were to have oral sex with a casual partner (someone they don't know really well) without a condom, what do you think the chances are that they would contract an STD?

1	2	3	4	5	6	7
not at all likely						very likely

46. In general, how dangerous (health-wise) do you think having oral sex with a casual partner (someone you don't know really well) without a condom is?

1 2 3 4 5 6 7

not at all
dangerous

very
dangerous

Thank you for completing these questions.

**Please place this questionnaire along with the Sexual History
Questionnaire in the envelope.**

Flip up the call switch to signal the experimenter that you have finished.

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