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Social comparison and the consideration of risk for sexually-transmitted diseases other than AIDS

Allison Sue Boney-McCoy

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Social comparison and the consideration of risk for sexually-transmitted diseases other than AIDS

Boney-McCoy, Allison Sue, Ph.D.

Iowa State University, 1993

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Social comparison and the consideration of risk for sexually-transmitted diseases other than AIDS

by

Allison Sue Boney-McCoy

A Dissertation Submitted to the Graduate Faculty in Partial Fulfillment of the Requirements for the Degree of DOCTOR OF PHILOSOPHY

Department: Psychology
Major: Psychology

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For the Graduate College

Iowa State University
Ames, Iowa

1993

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Dedicated to the memory of my father,
William A. Boney, Jr.,
a researcher whose commitment to quality
in science will always inspire me.
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ABSTRACT

The present experiment sought to determine whether principles derived from theory and research in social comparison could predict young adults' reactions to considering their risk for sexually-transmitted diseases. Results suggest that people who consider factors that increase their chances of contracting sexually-transmitted diseases feel more vulnerable to these diseases than do people who don't. These feelings of vulnerability may motivate subsequent defensive reactions, especially among persons with high self-esteem.

Persons with high but not low self-esteem who considered their risk for sexually-transmitted diseases provided more favorable ratings of themselves on the dimension of pregnancy prevention and on a general personality index than did persons who did not consider their risk. Self-enhancement on personality ratings was associated with greater perceptions of unique invulnerability to sexually-transmitted diseases.

Persons with high self-esteem who considered their risk also selected significantly riskier targets with whom to socially compare than did those who did not consider their risk. Among high self-esteem respondents who considered their risk, exposure to information about
a sexually risky peer increased their estimates of the typical peer's vulnerability to sexually-transmitted diseases. This increase in the perception of peers' vulnerability resulted in a larger perception of unique invulnerability to sexually-transmitted diseases.

Finally, among persons with high self-esteem, consideration of risk-increasing behaviors decreased their perceptions of the unpleasantness of sexually-transmitted diseases.

Persons with low self-esteem did not show significant self-enhancement, distancing, alteration in target choice, or differences in perceptions of vulnerability or unpleasantness as a function of risk consideration or exposure to a risky peer target.
INTRODUCTION
Overview

The last fifty years have seen a dramatic decrease in mortality from many causes of death that took a heavy toll in the earlier years of this century. Antibiotics and vaccination have reduced the incidence of fatality due to diseases such as polio and influenza, once prominent causes of death. The primary concern of health workers has shifted to preventing ailments that are more clearly related to aspects of an individual's lifestyle—heart disease, lung cancer, sexually-transmitted diseases—because it is to conditions such as these that a large percentage of modern health problems are due (Kirscht, 1983; Rodin & Salovey, 1989; Schoenbach, Wagner, & Beery, 1987).

Researchers in health-related fields such as psychology, psychiatry, sociology, and public health have devoted significant effort to understanding the factors that influence people to engage in preventive behaviors or to terminate risky ones. Several psychological models of risk behavior suggest that people's perception of health risk will influence prophylaxis (e.g., the health belief model, Rosenstock, 1974; protection motivation theory, Rogers, 1983; the precaution adoption process, Weinstein, 1988), and a common goal of public service
announcements or health campaigns is to induce an audience to consider their risk for a particular outcome (cf. Flay, 1987; Kirby, Barth, Leland & Petro, 1991; Schoenbach, et al., 1987). Little experimental research has been conducted on people's immediate reaction to the process of risk consideration, however (Croyle & Hunt, 1991). The present study is designed to examine young adults' reactions to considering their risk for contracting sexually-transmitted diseases (STDs), and it does so from the perspective of social comparison theory (Festinger, 1954).

This introduction is divided into three sections. The first will discuss studies that have examined the consideration of health risk and obtained data on the actual responses of people asked to consider their risk for negative health outcomes. This literature will provide a general picture of what people appear to "do" when asked to think about their risk for various health problems.

In the second section, a case will be made for the importance of information from others in the social environment, from social comparisons, to the process of risk consideration. A dual process model of health appraisal and coping (Leventhal, Nerenz, & Steele, 1984)
will be discussed as a theoretical framework for understanding the role of social comparison in risk appraisal. This model distinguishes between the cognitive responses and emotional responses that one may have to risk consideration. A discussion of social comparison theory (Festinger, 1954) and of an extension, downward comparison theory (Wills, 1981), follows. This discussion focuses on the locus of social comparison effects (on perceptions of self or perceptions of others), on two different types of "downward" comparison distinguished by Wills (1981), and on comparison strategies that are differentially characteristic of persons with high versus low self-esteem. The section on social comparison concludes with an examination of evidence suggesting that comparative (self vs. other) judgments of health risk and estimates of the prevalence of illness (a socially-influenced construct) impact preventive health behavior.

The third section of this introduction provides an overview of the magnitude and scope of the problem posed by STDs. Finally, the rationale and the specific hypotheses of the current study are presented.
The Consequences of Risk Consideration: Current Knowledge

The Risk Consideration Process

Components of Risk Perception

Consideration of health risk can include the assessment of a number of factors that have been identified by various models of health behavior (e.g., the health belief model, Rosenstock, 1974; protection motivation theory, Rogers, 1983; the precaution adoption process, Weinstein, 1988; subjective expected utility theory, Edwards, 1954; Sutton, 1982; the theory of reasoned action, Fishbein & Ajzen, 1975). These factors include one's likelihood of developing a particular ailment (perceived vulnerability), the severity of the ailment, the effectiveness of behaviors intended to prevent the ailment, and the costs associated with performing such behaviors.

Risk Consideration and Health Behavior

A review of the literature on the health belief model (Janz & Becker, 1984) demonstrated that all of these perceptions play a role in the adoption of healthy behaviors and the termination of unhealthy ones. Specifically, the more vulnerable people feel to a health problem, the more serious they perceive the problem to be, the more effective they see a particular risk-reducing behavior, and the fewer barriers they see to
performing the behavior, the more likely they will be to engage in the behavior. These effects have been found across a wide variety of health domains, from contraceptive behavior (Burger & Burns, 1988) to participating in screening for hereditary diseases (Becker, Kaback, Rosenstock, & Ruth, 1975) to breast self-examination (Kelly, 1979).

Although current psychological perspectives on health behavior are becoming more and more sophisticated, taking the dynamic and malleable nature of the risk perception process into account (e.g., Weinstein & Nicholich, 1993), as well as the role played by non-rational, emotional factors (e.g., Gerrard, Gibbons, Warner, & Smith, 1993), most researchers in the area of health behavior would support the contention that the risk consideration process is an important one with ramifications for subsequent behavior.

Impact of Risk Consideration on Perceptions of Vulnerability

The Availability Heuristic

One of the primary concerns of health researchers is the extent to which people feel vulnerable to a given health problem. When people consider their vulnerability or susceptibility to a health problem, they are called
upon to make a likelihood estimate, to make a judgment about the likelihood that a particular problem will happen to them. Research in the area of social cognition has shown that people use informal guides, or heuristics, to assist them in making judgments of this nature. One of these guides is the availability heuristic. When asked to assess the probability of an event, people's estimates vary as a function of how available in memory representations of the event are (Tversky & Kahneman, 1974). The more easily an instance of the event can be brought to mind, the more likely the event will seem. When people are asked to consider or review their risk for a particular illness, representations of the illness are by necessity called to mind. This process makes the person's cognitive representation of the event more "available" or prominent in memory and may therefore increase perceptions of the likelihood that the event will occur. A cognitively-based prediction of the effects of risk consideration, then, would suggest that consideration of health risk should increase people's feelings of vulnerability because it makes a mental representation of the "illness event" more accessible in memory.
Selective Focus

Although considerable evidence attests to the existence of the availability heuristic as a common guide in the formation of likelihood estimates (Tversky & Kahneman, 1984), the area of health behavior is one in which rational, cognitive processes may be heavily influenced by emotional factors (cf. Leventhal et al., 1984). Specifically, people are motivated to believe that they are healthy and not at undue risk, especially for health problems that they perceive to be extremely unpleasant (Gerrard, Gibbons & Warner, 1991). This motivation may lead persons who are asked to consider their health risk to focus on their risk-reducing rather than on their risk-increasing behaviors and thus "short-circuit" the effects of availability on perceptions of vulnerability (Weinstein, 1980, 1983, 1984; Gerrard et al., 1991).

Unique invulnerability. Weinstein (1980) found that when college students were asked to consider their likelihood of experiencing a variety of negative occurrences, including several health problems, they displayed a strong tendency to believe that they would be less likely than others to experience these negative events. Weinstein dubbed this effect the "optimistic
bias," and it has been observed by numerous researchers in a wide variety of contexts (cf. Kirscht, Haefner, Kegeles & Rosenstock, 1966; Perloff & Fetzer, 1986; Weinstein, 1987). Perloff (1983; see also Perloff & Fetzer, 1986) refers to this effect as an "illusion of unique invulnerability" because people appear to see themselves as uniquely exempt from unpleasant outcomes.

Egocentric biases. Weinstein (1983; Weinstein & Lachendro, 1982) hypothesized that he could reduce this perception of invulnerability by having people consider their standing on risk factors related to several health problems prior to estimating their own and others' risk. He assumed that consideration of these factors would force people to focus on those aspects of their behavior that increased their likelihood for illness and would counteract their tendencies to believe themselves less vulnerable than others.

Instead of reducing perceptions of invulnerability, however, review of risk factors was related to an increase in the discrepancy between participants' risk estimates for themselves and others. Apparently, people were able to selectively focus on those risk factors on which they had a positive standing; they gave themselves, but not others, credit for being at low risk on just enough factors to provide the impression of low
vulnerability.

Additional research (Weinstein, 1983; Weinstein & Lachendorf, 1982) revealed that when people considered their own risk-related behavior and were presented with explicit information about the risk-reducing behaviors of others that the illusion of invulnerability was substantially reduced. Even when people were merely instructed to consider the circumstances of others but were not presented with any actual information, the self-other difference was attenuated (Weinstein & Lachendorf, 1982). Weinstein concluded that perceptions of invulnerability stemmed mainly from an "egocentric bias" or failure to consider others' characteristics when making comparative risk estimates. Previous researchers have identified such egocentric tendencies in social information processing, and it has been suggested that such biases may result from purely cognitive factors (i.e., greater awareness of and information about one's own than others' behaviors, traits, etc.), as well as from motivational distortions (e.g., the desire to maintain or enhance self-esteem or self-efficacy; Ross & Sicoly, 1979).

**Listing of risk behaviors.** In order to further examine the hypothesis that people selectively focus on
their own risk-reducing behavior but not on that of others, Warner and Gerrard (1990) asked college students to list all of the behaviors that "people or their sexual partners do" that increase and that decrease the likelihood of unplanned pregnancy. They then had participants circle all of the behaviors that applied to themselves or to their primary sexual partners. In support of a self-selective-focus hypothesis, participants (male and female) indicated significantly more risk-decreasing than risk-increasing behaviors for themselves, but attributed the same number of each type of behavior to other people.

**Summary.** Studies on risk consideration suggest, therefore, that people will tend to selectively focus on their own (but not on others') risk-reducing behaviors. This tendency may simply result from a lack of information about others, from a cognitive bias that predisposes one to consider one's own traits and not those of others, or from a motivated desire to deny (relative) vulnerability. Weinstein & Lachendro's (1982) finding that presenting participants with information about their peers' risk behaviors, or simply asking participants to think about their peers' behaviors, could reduce the perception of invulnerability provides support for a rational, cognitive explanation of the phenomenon.
Additional research, however, suggests that there may also be emotional components involved in the process of risk consideration.

**Severity of Risk: Motivational Mechanisms in the Consideration of Risk**

*The emotional nature of perceived severity.*

Weinstein's focus on the cognitive components of egocentrism provides a rational basis for the effects of risk consideration on perceptions of vulnerability. Other research, however, suggests that there may be a motivational component as well to the risk consideration process. For example, Weinstein (1980) found mixed evidence regarding the relationship between people's perceptions of how serious a health problem was and the extent of their illusion of invulnerability. In the first of two studies reported in this article, no association was found between perceptions of severity and vulnerability. In the second study, however, a greater perception of invulnerability was found for more serious negative events. Although there may be some covariance between the severity of a disease and its likelihood of occurring at the population level (due to increased attempts to implement preventive measures against more severe ailments), at the level of the individual, the
primary impact of perceptions of severity on perceptions of vulnerability is most likely emotional. Simply put, people would rather not believe that they are at high risk for extremely unpleasant or untreatable illnesses.

**Influence of perceived unpleasantness on perceptions of vulnerability.** Gerrard et al. (1991) pursued this issue and found that the review of risk behaviors relevant to unplanned pregnancy significantly decreased perceptions of one's own vulnerability among women marines for whom an unplanned pregnancy would be highly undesirable but not among women marines for whom this would be a less unpleasant experience. No such impact was found on participants' estimates of vulnerability for "other women." Gerrard et al. concluded that "motivation (i.e., the desirability of avoiding pregnancy) contributed to the decrease in vulnerability in the review condition" (p. 177). Because Gerrard et al. also found that review decreased perceptions of vulnerability among women marines who thought that their methods of contraception were effective but not among those who thought that their methods were relatively ineffective, this study supports the contention that risk consideration will have effects on perceptions of vulnerability that are influenced both by rational, cognitive processes and by more emotional, motivational
forces (cf. Leventhal et al., 1984).

When Risk Consideration Increases Perceptions of Vulnerability

So what of the availability heuristic? Are there any conditions under which reviewing one's risk leads to an increase in perceptions of vulnerability? Gerrard et al. (1991) found that reviewing one's sexual history increased women's perceived vulnerability to HIV infection in the same sample in which they found the effect of perceived severity on perceptions of vulnerability to pregnancy. Because HIV infection frequently leads to the development of AIDS, the threat of HIV would be considerably greater than the threat of pregnancy for most women, and so some component other than perceptions of severity must have influenced the reaction to risk consideration in this context.

Gerrard et al. suggest two possible factors underlying this effect. First, although most of the women in the sample used some form of birth control, very few of them used condoms, which they recognized as the primary form of protection against sexually-transmitted disease (aside from abstinence). Because the level of sexual activity in this sample was relatively high, a review of risk-related behaviors in the context of HIV
could afford them little in the way of an opportunity to selectively focus on risk-reducing rather than risk-increasing behavior.

Second, data from another sample provide evidence that HIV infection is perceived to be much less controllable than pregnancy. Weinstein (1984) demonstrated that people generally feel most vulnerable to events that they perceive as uncontrollable, and Gerrard et al.'s (1991) data are consistent with this finding. In another study (Warner & Gerrard, 1990), the authors showed that when perceptions of the controllability of unplanned pregnancy were explicitly assessed, review of risk behaviors increased perceptions of vulnerability among women who felt that unplanned pregnancy was relatively uncontrollable and decreased perceived vulnerability among women who felt that it was relatively controllable. These studies suggest that risk consideration will increase people's perceptions of vulnerability if they have few or no risk-reducing behaviors on which to focus, or if the health outcome considered is perceived to be relatively uncontrollable.

Summary. In summary, studies that have examined people's response to considering their risk for health problems have shown that both cognitive (egocentric) and motivational (defensive) processes attendant upon risk
consideration can lead to lower perceptions of vulnerability among people who have considered their risk than are seen among those who have not done so, partly because people selectively focus on their risk-reducing rather than on their risk-increasing health factors. In the case where review of risky behavior confronts one with the fact that one is engaging in far more risky than preventive behaviors, however, or when one considers risk for a relatively uncontrollable health problem, risk consideration may increase one's perceptions of vulnerability.

**Impact of Risk Consideration on Perceptions of Seriousness**

Because contracting an STD is perceived to be an unpleasant, socially undesirable outcome (Solomon & DeJong, 1986), it is likely that people would have a negative emotional reaction to considering their risk for such an outcome, especially if risk consideration confronts them with evidence suggesting that they are not engaging in adequate preventive behavior. Although "safe sex" practices have increased among young adults in the past few years, they are by no means universal (Janus & Janus, 1993), and many sexually-active persons would be forced to confront a lack of such practices during the
If perceptions of vulnerability are thus increased as a result of risk consideration, what options might people have to reduce the associated feeling of discomfort? One alternative might be to downplay one's perceptions of the severity or unpleasantness of these diseases. This section will review research that indicates that people may do just that.

The TAA Enzyme Paradigm

A different and creative approach to the topic of risk consideration has been taken by Jemmott and his colleagues (Croyle & Hunt, 1991; Ditto, Jemmott, & Darley, 1988; Jemmott, Croyle, & Ditto, 1988; Jemmott, Ditto, & Croyle, 1986; see Croyle & Jemmott, 1991 for a review). Their interest lies in examining people's responses after being told that they have tested positive for an illness risk factor. Their findings are relevant to the present research in that they examine the strategies that people use to reduce the discomfort or threat associated with risk consideration when minimization of vulnerability is not a ready option.

Jemmott and his colleagues have developed a unique experimental design to assess the impact of various parameters of the risk-factor testing situation on people's perceptions of the severity of the illness,
their interest in subsequent testing, and their desire to obtain more information about the illness. This method entails testing participants in the laboratory for deficiency in a fictitious enzyme, Thioamine Acetylase (TAA). A deficiency in TAA is presented as a risk factor for subsequent pancreatic disorders. Participants in either psychology laboratory or clinical settings (both locales have generated similar results) are administered a saliva test that confirms the presence or absence of TAA (a chemically-treated strip turns green in response to the participants' saliva). Depending on experimental condition, participants are told that a green strip indicates a deficiency or no deficiency in TAA. Their cognitive appraisals of pancreatic disorders, their opinion of the test, and their desire for further information about TAA deficiency is then assessed.

Denial of Risk

Effects of test result. Findings from the TAA paradigm support the hypothesis that people are motivated to deny serious risk for illness (Jemmott et al., 1986). People who are told that they have the deficiency evaluate it as significantly less life-threatening (serious) than do people who are told that they do not have the deficiency, despite the provision of identical
information to the two groups. People who test positive for the deficiency also rate the TAA test as less accurate than do those who test negative.

These findings are consistent with reports from the medical literature that a common form of denial among patients is to minimize the seriousness of the illness (Janis, 1958; Lazarus, 1983; Lipowski, 1970). When people are confronted with the fact that they test positive for a risk factor for an illness, they cannot defend against the negative emotional reactions provoked by this knowledge by reducing their perceptions of vulnerability to the illness—that degree of freedom has essentially been removed. But they can respond by deciding that the illness itself does not pose a substantial threat, and this is apparently what people in the TAA studies do.

It seems plausible that when people consider their own risk in the absence of definitive test results, that if their review highlights numerous unhealthy behaviors (indicating high levels of vulnerability), they may respond by decreasing their perceptions of the severity of the health problem. A search of the relevant literature revealed no experimental studies that have examined this response, however, and one purpose of the present research is to ascertain the extent to which risk
consideration leads people to reduce their perceptions of the severity or unpleasantness of undesirable health outcomes.

**Motivated denial or cognitive error?** Ditto, et al. (1988) sought to determine whether the lower severity estimates provided by persons who tested positive for the TAA deficiency were the result of a motivated denial of the health risk they allegedly faced or the result of a more rational, cognitive process. They presented half of their participants with information suggesting that they had the TAA deficiency and half with feedback suggesting that they did not. Immediately prior to providing this feedback, however, they mentioned to half of the participants (crossed with deficiency status) that there was a simple, readily available treatment for the deficiency. No mention of treatment options was made to the other half of the participants.

Ditto et al. reasoned that if people responded to risk information in a purely rational way, knowing that the enzyme deficiency was easily treatable should reduce perceptions of severity. If motivated denial reduces some of the threat associated with the test result, however, then discovering that the deficiency is readily treatable should allow the patient to acknowledge the
severity of the disorder.

The results of the experiment supported a denial-based explanation. Participants who believed that they had the deficiency and who were not told that it was easily treatable provided the lowest severity estimates of all four cells, whereas those who believed that they had the deficiency but that it was easily corrected provided the highest ratings of seriousness. Additional evidence of denial was evidenced in biases in recall of the color of the chemically-treated strip that provided the test of the deficiency. Participants who were told that they were TAA deficient and who were not provided information about disease treatment recalled the color of their strips as "less green" (less indicative of the deficiency) than did other participants. These results suggest that people respond to the consideration of risk, especially if that consideration yields information suggesting high vulnerability, with defensive perceptions of the seriousness of the health threat and perhaps with derogation of the accuracy of the (external) source of the vulnerability information.

Effects of the perceived prevalence of the risk factor. An additional factor that Jemmott and his colleagues investigated as a determinant of people's perceptions of the severity of an illness or a risk
factor is the **perceived prevalence** of the risk factor. Anthropological literature (Zola, 1966) and medical literature (Jamison, Lewis, & Burish, 1986) suggest that people's perceptions of the severity of an ailment will be inversely proportional to their perceptions of its prevalence; the more common the disorder or risk factor, the less severe the associated illness will be perceived to be. Jemmott et al. (1986) found that when participants were run in groups of five, their perceptions of the severity of the TAA deficiency varied as a function of the number of people in their group who they believed tested positive for the deficiency. Whether or not they themselves were TAA deficient, people who believed that only one of the five had the deficiency perceived the lack of the enzyme to be significantly more serious than did those who were told that four out of the five had the deficiency. One way of minimizing perceptions of the severity of an illness, then, might be to look for information suggesting that the risk factors for the illness, or the illness itself, were relatively common.

In conclusion, the research conducted by Jemmott and his colleagues suggests that people are motivated to deny their risk for serious illness. When confronted with
evidence that indicates that they are at risk for an illness, they may derogate or doubt the validity of the evidence, and they may simultaneously minimize the seriousness of the illness. They may also use information about the prevalence of the risk factor to reduce their perceptions of illness severity when the risk factor is common.

**Summary of the Risk Consideration Process**

The literature reviewed to this point suggests that two of the primary components of risk perception, perceptions of vulnerability to a health problem and perceptions of the severity or unpleasantness of the problem, will affect and be affected by the process of risk consideration. This reciprocal influence will occur through both cognitive and emotional pathways that may operate simultaneously. When people consider their risk for many health problems they tend to focus on their risk-reducing rather than on their risk-increasing behaviors and to provide lower estimates of their vulnerability than do people who have not considered their risk. This tendency is especially true if people perceive the health problem to be particularly serious or unpleasant. When review of one's risk factors faces one with the inescapable conclusion that one is vulnerable, or with the belief that one cannot control the health
threat, perceptions of vulnerability may be increased by risk consideration. Under these circumstances, however, it is possible that people will respond by decreasing their perceptions of the severity or unpleasantness of the health problem. This process will be facilitated by information suggesting that the risk factor is relatively prevalent.

The next section will examine the ways in which the risk consideration process may be affected by information gleaned from others in the social environment, from social comparison.

Social Comparison Processes

Social Influences and Risk Consideration

Limitations of "Objective" Knowledge

People's appraisal of risk factors is influenced by objective knowledge obtained from many sources, including the medical community, educators, or the media. This knowledge is often incomplete, however, and uncertainty about specific parameters (e.g., how many sexual partners are "too many"?) may remain even after exposure to factual information (Leventhal et al., 1984; Pennebaker, 1982; Schachter, 1964). When objective sources of knowledge prove insufficient standards in the appraisal of a dimension, people can supplement these sources by evaluating themselves relative to other individuals—by
engaging in *social comparison*. This assumption is the cornerstone of social comparison theory (Festinger, 1954) and has been investigated and elaborated upon by numerous researchers (see Kruglanski & Mayseless, 1990; Suls & Wills, 1991; and Wood, 1989 for reviews).

Because the consideration of health risk is a complex process, it often occurs under conditions of uncertainty, and social scientists have noted a pervasive tendency for people to use social comparison information in this context (Croyle & Hunt, 1991; Ditto, Jemmott, & Darley, 1988; Jemmott, Croyle, & Ditto, 1988; Jemmott, Ditto, & Croyle, 1986; Sanders, 1982; Suls, Wan, & Sanders, 1988; Wood, Taylor, & Lichtman, 1985; Zola, 1966). The recent development of dual process models of human information-processing provides an explicit theoretical framework for the inclusion of social comparison in the risk consideration process.

**Dual Process Models of Health Appraisal**

Reactions to the consideration of risk may be construed as the development of an attitude toward the risk situation (Weisse, Nesselhof-Kendall, Fleck-Kandath, & Baum, 1990). Attitudes, in turn, have been viewed by many social scientists as composed of three parts: affect, cognition, and behavior (cf. Zimbardo, Ebbesen, &
Maslach, 1977). Recent theorists in personality and social psychology have developed dual process models that detail the ways in which the first two of these components, affect and cognition, impact the formation of responses to a variety of stimuli (e.g., Epstein, 1990; Leventhal et al., 1984; Petty & Cacioppo, 1986; Schrauger, 1975). These models contrast the largely independent contributions of rational cognitive processes and subjective, emotional processes to attitude formation. Rather than operating in an either/or fashion, these two processes exist simultaneously in most settings.

Leventhal et al. (1984) have developed a self-regulation model of illness appraisal and coping that applies the dual process construct to the area of health behavior and attitude formation. This model assumes that the mental system that processes health-relevant information:

is divided into two parallel pathways. One involves the creation of an objective view or representation of an illness threat and the development of a coping plan for managing the threat. A second pathway involves the creation of an emotional response to the problem and the development of a coping plan for the management of emotion (p. 220).
Leventhal et al. (1984) acknowledge that these pathways, and the "problem-focused" vs. "emotion-focused" coping that they may engender (cf. Lazarus & Folkman, 1984), can result in discrepant coping strategies. For example, avoidance of information suggesting that one is engaging in risky sexual behavior could be the most immediately effective mechanism for reducing worry about the problem, but acceptance of the risk and formulation of a plan to use condoms and to have the appropriate diagnostic tests conducted would provide the most direct approach to identifying and reducing any actual risk.

Leventhal et al. (1984) provide an example of their model that suggests that avoidant, emotion-focused coping may be particularly prevalent in the early stages of risk consideration, risk appraisal. In this stage, people examine the known risk factors for a particular health problem and attempt to determine what the likelihood is that they have or could develop the problem. They also suggest that social comparisons are most pronounced in this stage, when the individual is attempting to determine whether their present health situation constitutes a definite health risk or health problem. People usually do not want to interpret their behaviors or somatic sensations as indicative of the likelihood of illness.
They may therefore seek explanations or interpretations of their behavior or symptoms that allow them to minimize perceptions of vulnerability. It is at this uncertain stage when the latitude for response is the greatest, and when factors that encourage denial may have the greatest impact. If there are others in the social environment who are perceived to engage in similar behaviors or to display similar symptoms but who do not appear to have developed an illness, this may be taken as evidence that one is not at risk for or currently experiencing illness.

Summary. In summary, then, the consideration of health risk can include perceptions of vulnerability, severity, benefits of prophylactic behavior and barriers to that behavior. These appraisals and any subsequent behavior will be influenced by both cognitive and emotional processes, and both processes may be impacted by information provided from social comparisons. Rational assessments of the health behaviors of others may provide accurate, effective guides for one's own behavior. Emotionally-driven perceptions of the prevalence of illness or of risk factors among others may reduce one's perceptions of the unpleasantness of health problems, or may facilitate the interpretation of one's behavior or symptoms as not disposing one to illness.
Social Comparison: Theory and Findings

Social Comparison Theory

Self-evaluation and upward comparison. When people compare themselves with others (engage in social comparison), they access cognitive representations of themselves, of a comparison target, and of the relationship between the self and the target (Kruglanski & Mayseless, 1990). Leon Festinger's formulation of social comparison theory (1954) emphasized the goal of accurate self-evaluation in the comparison process. People were postulated to have an innate drive to evaluate their opinions and abilities. In the absence of definitive objective information or standards, people seek to meet this goal by comparing themselves with other people—by obtaining and comparing accurate representations of their own and others' standing on the dimension(s) of interest.

Because of Festinger's reference to a co-existent motive for self-improvement (the "unidirectional drive upward"), early researchers in the area of ability comparison focused on people's assumed preference to engage in social comparisons with others who were somewhat better off than they were on the comparison dimension (cf. Brickman & Bulman, 1977). Such "upward" comparisons (UC) would have the advantage of providing
information about the content of the comparison dimension (what constitutes "doing well") and about the ways in which one might alter behavior to improve one's standing on the dimension.

Seminal research in the area confirmed the hypothesis that people would evidence interest in upward comparison targets. For example, Wheeler, Schauer, Jones, et al. (1969) gave experimental participants bogus feedback that allegedly represented their standing on a valued personality trait. Participants were told their raw score (an "average" or moderate score) and their rank order in the group of people with whom they were participating (about in the middle of the distribution). They were then instructed to select the score of one other member in their group for comparison. The majority of participants chose to see the score of a group member ranked higher than themselves; in many cases they chose the score of the highest ranked member. This pattern of results was replicated in other studies (e.g., Arrowood & Friend, 1969; Gruder, Korth, Dichtel, & Glos, 1975) and was interpreted as evidence of people's interest in upward comparisons under conditions of uncertainty (see Latane, 1966, for a review of the early literature).

Another motive: Self-enhancement. Although support
was found for the existence of upward comparison choices in the laboratory, researchers in the area of social comparison soon discovered that this tendency was not a uniform one; under some circumstances, people expressed a greater interest in social comparison with others who performed worse than they did on a given dimension. Such "downward comparison" was demonstrated by Hakmiller (1966). Participants in his study were told that they scored highly on a test that measured hostility toward one's parents. This trait was either described as being a very negative one, related to personality deterioration (intended as a source of threat to participants' self-image), or as a positive one associated with maturity. Participants were then allowed to see one other score from their experimental group. Those who were told that the test measured a negative trait (the "threatened" participants) were much more likely to choose the highest (most hostile) score in the group than were those who believed that the test reflected maturity. These findings have been interpreted as support for the hypothesis that people will eschew upward comparison in favor of downward comparison (DC) if the circumstances surrounding the comparison are threatening to the self-image. Hakmiller and subsequent researchers (e.g., Brickman
suggested the existence of not one but two motives underlying the nature of social comparison: self-evaluation, as per Festinger (1954), and self-enhancement. Social scientists have long referred to the existence of a self-system that is responsible for protecting or enhancing self-esteem and the self-image (e.g., Allport, 1943; Epstein, 1973; Greenwald, 1980; James, 1915; see Steele, 1988, for a review). Singer (1966) reviewed several studies testing social comparison theory and concluded that self-image concerns might mediate choice of and reaction to particular comparison targets.

Perhaps due to the zeitgeist of logical positivism (Steele, 1988), the major focus of early research on social comparison was on people's rational, evaluation-seeking behavior, and self-enhancement motives were relatively neglected (Brickman & Bulman, 1977). Those studies that did examine choice of comparison under conditions that posed a threat to self-esteem or self-image, however, were consistent with Hakmiller's (1966) findings. When people were threatened, they tended to seek out information about others who were worse off than they were, or to avoid social comparison altogether.
Tenets of Downward Comparison Theory

In 1981, T. A. Wills surveyed the literature relevant to social comparisons made under threatening conditions and developed a formal theory of downward comparison (DC theory). The primary principles of the theory are as follows:

1) Persons can increase their subjective well-being through comparison with a less fortunate other.
2) Downward comparison is evoked by a decrease in subjective well-being.
3) Downward comparison can occur on a passive basis in which persons take advantage of available opportunity for comparison with a less fortunate other.
4) Downward comparison can be effected on an active basis...through active derogation of another person, thereby increasing the psychological distance [underline added] between the self and the other.
5) Persons who are low in self-esteem are more likely to engage in downward comparison.
6) Downward comparison tends to be directed at lower status targets.
7) People are ambivalent about downward comparison.
Wills (1981) provided evidence for all of these principles from studies on social comparison and from research on prejudice, aggression, humor, and other social psychological phenomena.

**Active vs. Passive DC**

**Passive DC.** One of Wills' (1981) most important contributions was the explicit distinction between the passive and active forms of DC. Studies like Hakmiller's (1966), in which people choose to be exposed to comparison information about someone worse off than themselves, are representative of research demonstrating passive DC, in which people take advantage of an existing opportunity to socially compare with a less fortunate other. Later research revealed another form of passive DC, one that is consistent with Wills' (1981) principle that subjective well-being would be incremented by DC. Several studies found mood improvement among people provided with information about someone who was worse off than they were on a relevant dimension (Crocker & Gallo, 1985; Gibbons, 1986; Gibbons & Boney McCoy, 1991; Gibbons & Gerrard, 1989a, 1989b; Wheeler & Miyake, 1992).

In both of these forms of passive DC, target choice and enhancement of subjective well-being, people whose
self-esteem or self-image has been threatened are taking advantage of available sources of downward social comparison. This form of DC is considered passive because it involves no "active" cognitive work on the part of the threatened person, merely a passive willingness to be reassured by the presence of others who are doing poorly (see Gibbons & Gerrard, 1991, for a review).

**Active DC.** Active DC, on the other hand, involves cognitive or physical activity that manufactures a worse off "other"—the creation of "psychological distance" between oneself and a comparison target. Active DC has also been observed in response to threat (Crocker, Thompson, McGraw & Ingerman, 1987; Gibbons & Boney McCoy, 1991; Gibbons, Gerrard, Lando, & McGovern, 1991; Taylor, Wood, & Lichtman, 1983; see Gibbons & Gerrard, 1991, for a review). Active DC is most often assessed by asking for ratings of the comparison target on personality or performance traits, and it is sometimes accompanied by questions explicitly asking people how similar they feel to a certain target (e.g., to the "typical smoker," Gibbons et al., 1991). Unlike passive DC, active DC does not appear to result in enhancement of subjective well-being (Crocker & Gallo, 1985; Gibbons & Boney McCoy, 1991), perhaps because people are ambivalent about
derogating others (Crocker & Gallo, 1985; Wills, 1981).

**Self-Esteem and DC**

**Theoretical predictions.** One of the more controversial principles in Wills' (1981) theory of DC was that persons with low self-esteem (SE) would be more likely than persons with high SE to engage in downward comparison. Wills' reasoning was that the self-images of persons with low SE are essentially under a constant state of threat, and they should therefore be more in need of the ameliorative effects of DC after additional challenge to their self-images.

A review of the literature provides mixed support for this hypothesis. Although some studies have found a greater tendency for DC among threatened persons with low than high SE (e.g., Friend & Gilbert, 1973; Gibbons & Gerrard, 1989a, 1989b; Smith & Insko, 1987; Wilson & Benner, 1971), others have seen greater evidence of DC in response to threat by persons with high SE (Crocker et al., 1987; Brown & Gallagher, 1992).

The resolution to this apparent disparity of results was suggested by Gibbons and Boney McCoy (1991) and may lie in Wills' distinction between active and passive DC. Most of the studies that have found more DC by persons with low than high SE have used measures of passive DC.
In Smith and Insko, 1987, the dependent measure was choice of comparison target, and in the research by Gibbons and Gerrard (1989a, 1989b), the index of DC was mood improvement after exposure to a comparison target who was experiencing difficulty on a salient dimension.

By contrast, those studies that have been interpreted as showing greater evidence of DC among persons with high than low SE have used measures of active DC. In Crocker et al. (1987), members of a low status (situationally threatened) group with high SE provided less favorable ratings of a high status group than did high status group members. No difference in group ratings was seen as a function of group membership among persons with low SE. Additionally, Brown and Gallagher (1992) found that people with high but not low SE responded to (private) failure on an intellectual test by derogating "most other people" on personality dimensions.

An alternative hypothesis. An explicit test of the hypothesis that persons with high SE will engage in active DC and persons with low SE will engage in passive DC after a threat to their self-image was offered by Gibbons and Boney McCoy (1991). These authors provided participants with bogus feedback suggesting that they had scored either much better (success condition) or much worse (threat condition) than other participants on a
test of "social awareness," a test of their knowledge of the opinions of others on current social issues. After describing their post-feedback mood state, participants listened to a tape allegedly made by another participant in the experiment, describing their adjustment to college (all participants made similar tapes at the outset of the experiment). The "target tape" contained information provided by a student who was apparently having difficulty adjusting to college life. This student described social and academic problems and sounded very unhappy. Participants evaluated the target on several personality variables and described their post-tape mood.

Consistent with the hypotheses, persons with low SE who received threatening feedback on the test of "social awareness" showed significant mood improvement after listening to the target tape, and they were the only group to do so. Participants with high SE who received threatening feedback showed no mood enhancement (and this was true whether post-tape mood was assessed before or after they rated the target). They did, however, engage in active DC by derogating the target on the personality variables to a greater extent than did participants in any other cell. It is important to note that participants who were not threatened (who received
"success" feedback on the social awareness test) did not engage in either active or passive DC. Gibbons and Boney McCoy's (1991) data suggest that persons with both high and low SE will engage in DC when they have experienced a threat to their self-image, but that they will approach it in different ways.

**Self-protection vs. self-enhancement.** Consistent with the findings of Gibbons and Boney McCoy (1991), Baumeister, Tice, and Hutton (1989) have suggested that persons with low SE tend to engage in "self-protective" interpersonal strategies—that they attempt to minimize attention to themselves and to avoid situations in which they cannot live up to positive claims about themselves. They are not undesirous of having a favorable self-image, but they are reluctant to claim positive traits as their own. Persons with high SE, on the other hand, perhaps because of a history of success in various areas, are more willing to describe themselves favorably and to attribute negative characteristics to others. Similarly, they are less impacted by receiving information about people who are faring worse than they are—such information does not tell them anything they do not already know (Baumeister, et al., 1987; Gibbons & Boney McCoy, 1991).

A review of the literature supports the contention
that persons with high and low SE will differ in the ways that they seek to bolster and maintain their self-images. Evidence suggests that persons with low SE will indeed be more hesitant to claim positive attributes than will persons with high SE, and that they will tend to engage in behaviors that minimize the chances of failure rather than maximizing chances for success (Arkin, 1981; Schlenker, 1987; Schlenker, Weigold, & Hallam, 1990; Wills, 1991).

Direct vs. indirect downward comparison. An example of the different strategies used by persons with high and low SE is found in the contrast of direct and indirect social comparison. It has been suggested that persons with low SE will seek to maintain or improve their self-images with social comparisons that only indirectly implicate the self, or that rely on others as the vehicle for their self-enhancement. Brown, Collins, and Schmidt (1988) found that, after a threat to self-image, high and low SE persons responded in self-enhancing but divergent ways. Their research design and findings will be discussed to provide an example of the difference between "direct" and "indirect" self-enhancement.

Participants in this study were divided into two groups ("overestimators" and "underestimators") on the
basis of feedback on a test. Threat was manipulated by telling participants that it was better to fall into one of the two groups. Each of these two groups was then split into two sub-groups and participants separated such that half of the overestimators and half of the underestimators remained in one room and the other half of each group joined another experimenter in a different room. This division provided each group with four social comparison entities: "own-group" (the sub-group to which participants were assigned); "in-group" (the sub-group of participants who performed similarly on the test but who were in the other room); and two "out-groups" (the two remaining subgroups who performed differently on the test—one in the same room and one in the other room).

All sub-groups then took part in a brainstorming task, the results of which were posted by the experimenter. The primary dependent measures were participants' ratings of the comparison groups on the creativity, originality, imaginativeness, and cleverness of their responses to this task. Participants either rated their "own-group" vs. the "out-group" in the same room with them or they rated their "in-group" counterparts in the other room vs. the "out-group" in the other room. The former rating reflected a direct form of social comparison in that participants actually rated
their group versus another group. The latter condition represented an indirect form of social comparison in which participants rated others with whom they shared a label ("overestimator" or "underestimator") versus others who did not share their group designation. Presumably, participants' sense of group membership would cause them to identify to some extent with their fellow over/underestimators, and to internalize the successes and failures of this "in-group."

The results showed that persons with high SE showed the greatest difference in ratings in the direct social comparison situation—when they rated their own-group vs. the outgroup. Among persons with high SE, solutions to the brainstorming task provided by the own-group were rated as better than the solutions provided by the out-group, while there were no differences in the ratings assigned by high SE participants to the in-group vs. the outgroup. The locus of these differences was in the higher evaluations given to the own- vs. the in-group by persons with high SE. (That the difference in group comparisons was due to enhanced evaluations of one's own-group and not to increased derogation of the out-group is important; this topic will be addressed in a later section.)
Persons with low SE showed an opposite pattern of results, demonstrating a self-enhancing response only under conditions of indirect social comparison. Although the difference in ratings between own-group and out-group was not significant, the difference between in-group and out-group ratings was. Participants with low SE rated the solution provided by the in-group (their counterparts in the other room) as significantly better than the solution provided by the out-group. Unlike the pattern of results seen among participants with high SE, the difference between the in-group ratings and own-group ratings was not significant, but it tended in the direction of favoring the in-group. The difference between the two out-group ratings was also not significant, but there was a trend for the out-group to be rated worse if it was compared to the in-group than if it was compared to the own-group.

These results suggest that although persons with high SE will respond to threat by engaging in social comparisons that directly enhance the self, persons with low SE will respond in ways that indirectly bolster their self-image, by praising others with whom they share a trait (in this case, being an "overestimator" or "underestimator"). Brown et al. (1988) concluded that persons with low SE will resort to interpersonal
strategies like this one to cope with threat, whereas persons with high SE can engage mechanisms with direct reference to the self.

**Summary of self-esteem effects.** In summary, both persons with high and low SE will engage in downward comparison in response to a threat to the self-image. Persons with high SE will tend to use active DC strategies that directly implicate the self, such as derogating a comparison target or praising the self, but they will not tend to display an increase in measures of subjective well-being after doing so. Persons with low SE will display more passive DC strategies such as selecting worse off targets for comparison and improving in mood after being exposed to such targets. They seem less willing to directly involve the self in their downward comparison strategies and more dependent on information about or ratings of others.

**Active Downward Comparison: Derogation of Others or Enhancement of Self?**

Wills' (1981) formulation of active DC specified that "psychological distance" between the self and a comparison target would be achieved by "active derogation" of the target (p. 246). Because social comparison involves invoking representations of the self
as well as of others (Kruglanski & Mayseless, 1990), there is another means by which psychological distance might be achieved, and that is by increasing the favorability of one's own image on a given dimension or dimensions. Research in the areas of social comparison theory and self-presentation theory suggests that such "self-enhancement" is indeed a common response to threat, especially for persons with high SE. A review of the literature provides support for the existence of both derogation of others and enhancement of the self, although it appears that they may operate under different conditions.

Locus of social comparison effects. It has been suggested that social comparisons will have more impact on perceptions of others than on perceptions of the self, possibly because our knowledge of others' traits is more ambiguous (Brown & Gallagher, 1992; Dunning, Meyerowitz, & Holzberg, 1989), and ceiling effects may constrain self-evaluation (Brown & Gallagher, 1992; cf. Brown, 1986; Taylor & Brown, 1988). Indeed, several studies have found more impact on evaluations of comparison targets than on evaluations of self following social comparison (e.g., Hansen & Donoghue, 1977; Hansen & Lowe, 1976; Sanders, 1982).

It should be noted, however, that most of the studies
that have found greater impact on perceptions of the target than on self-perceptions have used external information about the prevalence of specific behaviors or traits as the "social comparison information" to which people respond. For example, Sanders (1982) provided participants with a description of another person's alleged helping behavior under a given set of circumstances. Prevalence information was provided indicating that most people under those circumstances either helped or did not. Participants were asked to rate the level of guilt that the non-helping other should feel and the extent to which his or her lack of assistance was due to situational or dispositional factors. They were also asked to indicate what they would have done under the circumstances. Sanders found that people's ratings of the other person varied as a function of the prevalence information; non-helping others were rated as guiltier and more dispositionally-oriented to be unhelpful when prevalence information suggested that most other people would have helped. Participants' predictions about how they would behave under similar circumstances were unaffected by the prevalence information, however.

The extent to which results such as these can be
generalized to social comparisons made in the absence of prevalence information and in the presence of threat to self-image must be questioned. Indeed, although research does suggest that people will change their opinions of others as a function of threat, considerable evidence also exists suggesting that they will enhance their evaluations of themselves. The next two sections will review evidence for the existence of both responses to threat among persons with high SE.

Derogation of others. As mentioned previously, Gibbons and Boney McCoy (1991) found that high SE participants in their lab study who received failure feedback on a bogus test proceeded to derogate a person whose tape-recorded description of problems with college adjustment they heard.

Along the same lines, Brown and Gallagher (1992) found that high but not low SE participants who received failure feedback on a test rated the personalities of "most other people" more negatively than did participants who received feedback indicating that they had performed moderately or very well. This study is especially noteworthy because high SE participants responded to failure by derogating a social target—"most other people"—that was neither clearly worse off than themselves on a relevant dimension (as in Gibbons & Boney
McCoy, 1991) nor in any way linked to their level of threat. Although active DC can entail the active construction of a worse off other, it is illustrative of the power and flexibility of this process that it can be applied to so abstract a target as "most other people."

Derogation in response to threat has also been found in naturalistic settings. The study by Crocker et al. (1987, Study 2), cited as evidence of active DC among persons with high SE, asked members of high and low status sororities to rate high and low status sororities on a number of personality traits. They reasoned that belonging to a low status sorority would serve as a source of threat, and that high SE women in particular should respond to this threat with a social comparison strategy that would maximize their self-esteem. The ratings provided by high and low status members confirmed this hypothesis. Among low-status women with high SE, low-status sororities were rated as significantly better than high-status sororities were; high-status women with high SE rated both groups equally highly. The locus of these effects was the derogation of the high-status sororities by low status women with high SE. Women with high SE who belonged to low status sororities provided significantly lower ratings of high status sorority
members than did high SE women who belonged to high status sororities. These findings suggest that persons with high SE will respond to threats to the self-image by derogating others, even others who are higher in status than they are.

**Enhancement of self-image.** One of the articles cited as a source of support for the derogation of others as a form of active DC also found evidence of self-enhancement in response to threat. In the first study reported by Crocker et al. (1987), participants in a laboratory study were told that they scored above ("success") or below average ("failure") on a test of social and intellectual competence. Participants subsequently rated "people who scored above average" and "people who scored below average" on a list of traits related to intellectual and social attributes. All participants except those with high SE who were placed in the "below average" (failure) condition rated "people who scored below average" less positively than they rated "people who scored above average." Participants with high SE who failed rated both groups equally. This finding was due to a significant elevation in ratings for the below average group by high SE participants who scored below average. The magnitude of the own-group enhancement shown by high SE participants in the below average group was such that
their mean evaluation of below average scorers (+18) was several times greater than were the evaluations provided by participants in the remaining cells (range -5.47 to +9.83). There was no tendency, however, for the high SE participants who scored below average to derogate the above average group. Crocker et al. (1987) concluded that their results "do not support Wills' exclusive focus on derogation of outgroups" (p. 915).

Novelty of feedback. Why did Crocker et al. (1987) see enhancement of the ingroup in their first, laboratory, study and derogation of the outgroup in their second, naturalistic, study? Although the authors do not address this question, at least two explanations seem possible. First, participants in the first study were threatened on a dimension that was novel to them--with feedback on a test that they had encountered for the first time in the laboratory setting. Because this feedback was novel and had not had time to become entrenched as a component of their self-concepts, it may have been easy for high SE participants to reject the validity of the test and reaffirm their worth on the trait ratings. Given this option, there was no motive to derogate others--a less socially-acceptable action and one associated with ambivalence (Wills, 1981). In the
second study, however, the source of the threat was a somewhat permanent attribute of participants' lives and self-images—the status of the sorority to which they belonged. It may have been easier for the high SE women in this study to derogate others than to claim positive qualities that could be questioned in light of their sorority affiliation.

**Compensatory self-enhancement.** A second potential difference between the two studies is the anonymity of the evaluations provided by the sorority women. Whereas these participants were asked to make their evaluations in private and were presumably anonymous, participants in the first study were identifiable to the experimenter at least to the extent that their feedback on the bogus test was linked to their subsequent evaluations of the above and below average scorers. Research on self-presentation strategies suggests that when people are threatened on a given dimension, they will provide enhanced evaluations of themselves (especially on unrelated dimensions), when their self-evaluations are known to be public—that is, known to the experimenter or to another participant in the experiment (Baumeister, 1982; Baumeister & Jones, 1978). This strategy of "compensatory self-enhancement" (Baumeister, 1982), or of enhancing the self on other dimensions following threat, is seen more among persons
with high than low self-esteem and more in public than private.

Although some authors have concluded that this strategy simply represents an attempt to impress an audience (e.g., the experimenter or another participant) favorably, studies in which derogation of others was not an option have found private self-enhancement when this was the only way in which people could reaffirm a positive self-image (Brown & Smart, 1991; Greenberg & Pyszczynski, 1985), suggesting that compensatory self-enhancement reflects a genuine intrapsychic process. By the same token, studies that have allowed participants the option of derogating others in private (anonymously) have tended to find evidence of this strategy in response to threat among persons with high SE (e.g., Brown & Gallagher, 1992; Baumgarder, Kaufman, & Levy, 1989). Only two studies (Baumgardner et al., 1989; Gibbons & Boney McCoy, 1991) have shown derogation of a target under conditions that would allow the experimenter to clearly identify the participants, and it is possible that this option was chosen because, to the point at which derogation occurred in both studies, no comparable opportunity for self-enhancement had been provided. If members in Crocker et al.'s (1987) laboratory study felt
identifiable, they may have been more willing to engage in self-enhancement than in the socially questionable derogation of others (cf. Baumeister, 1982).

The results of the Crocker et al. (1987) studies and research in the area of self-presentation suggest that when persons with high SE are threatened, they will tend to respond by enhancing aspects of themselves, preferably aspects that are unrelated to the dimension of threat. This "compensatory self-enhancement" strategy will be particularly likely if they believe that their evaluations will be linked to them in the eyes of another person or if they are unable to deny the validity of the threat. They may also respond by derogating others, but this response seems to be most likely if their evaluations are private (anonymous) or if they are allowed no prior chance to self-enhance.

Summary of downward comparison. When people experience a threat to their self-images, they tend to respond in ways that reduce the impact of that threat. One of these ways is to engage in social comparison with others who appear to be worse off than the self on a relevant dimension, or in downward comparison. Although persons with high and low SE will both engage in DC, they appear to do so in different fashions. Persons with low SE will seek information about people who are described
as being inferior to themselves on some dimension, and they will respond to information about such individuals with improvement in their subjective well-being (e.g., mood). These forms of passive DC involve merely taking advantage of an available opportunity for DC and in no way directly invoke perceptions of the self. Persons with low SE may also engage in a form of active DC, of creating "psychological distance" between the self and a target, but only indirectly, by enhancing their image of people who have something in common with them. Persons with high SE, on the other hand, will respond to threats to their self-image by directly derogating others and by increasing the favorability of their self-images (particularly on dimensions unrelated to the threat). It appears that persons with high SE are most likely to engage in self-enhancement when their responses are known to someone else and to engage in derogation of others when their responses are private or when no chance for overt self-enhancement is offered.

Social Comparison and Risk Behavior

Given people's tendency to engage in social comparison, what impact does this tendency have on their health behavior? There is evidence to suggest that the illusion of unique invulnerability, the belief that one
is less likely than others to suffer negative events, may be associated with reduced levels of preventive health behavior. Research also suggests that perceptions of the prevalence of a risk factor will influence people's perceptions of the severity of the attendant illness, and may subsequently impact health behavior. Support for both contentions is found in both theoretical models and in applied research.

The Precaution Adoption Process

Social psychologists have suggested that the illusion of unique invulnerability may discourage people from engaging in preventive behavior (Perloff, 1983; Perloff & Fetzer, 1986; Weinstein, 1980). One model of preventive health behavior, the precaution adoption process (Weinstein, 1988), explicitly includes acknowledgement of personal risk as a necessary component in the decision to engage in preventive behavior. Not only must people realize that a given risk behavior can lead to health problems for people in general, they must accept that this behavior can cause health problems for them. Thus, they must move beyond the stage of believing that although "everyone else" may become ill from a particular behavior, they will be exempt from its deleterious consequences. The precaution adoption process also presumes that people must acknowledge the seriousness of
an ailment before they will take preventive action.  

Smokers and the Illusion of Unique Invulnerability

Research supports the validity of Weinstein's model. Boney McCoy, Gibbons, Reis, Gerrard, Luus, and Sufka (1992) assessed perceptions of vulnerability among current smokers, former smokers, and nonsmokers in a community sample. Participants were asked to estimate the likelihood that they would contract three smoking-related (and one unrelated) diseases if they were to continue/start smoking. They were also asked to estimate the likelihood that the "typical smoker" would contract the four diseases. In addition to showing significantly lower perceptions of absolute vulnerability, current smokers were the only participants to show an illusion of unique invulnerability to the three smoking-related diseases. These people rated their own likelihood of contracting the diseases if they continued to smoke as less than the likelihood of the "typical smoker." Other participants showed no difference between estimates for self and other, and indeed the difference that was seen tended to be in the opposite direction. No difference was seen between self and other among any participants on the disease that was unrelated to smoking, supporting the belief that the illusion of invulnerability seen on the
smoking-related diseases was a motivated distortion rather than the result of a cognitive error.

A second study reported in this article showed that the illusion of invulnerability was eliminated among current smokers who had recently joined a group at a smoking cessation clinic. These people had just attended the first session of the clinic at the time they filled out the assessment of invulnerability, and they had not yet attempted to quit smoking as part of the program (although they might have tried at some time in the past). Although cross-sectional results of this nature cannot be interpreted as evidence for a causal link, they support the idea that it is necessary for people to "get over" the illusion of unique invulnerability before they will engage in preventive health behavior.

Perceptions of Risk Prevalence and Behavioral Intention

Perceptions of unique invulnerability are not the only socially-derived estimates that may have an impact on health behavior. People's perceptions of the prevalence of illnesses or of risk factors may influence behavioral intention, presumably through the impact of these perceptions on estimates of illness severity (Jemmott et al., 1986; Suls, Wan, & Sanders, 1988). Croyle & Hunt (1991) used the TAA enzyme paradigm
described earlier and found that people's intention to engage in seven health behaviors designed to reduce the risk of pancreatic disease (for which they were allegedly at risk due to their results on the fictitious TAA enzyme test) was significantly associated with the risk factor status of another participant in the experiment. TAA-deficient participants showed greater intention of taking precautions when a co-participant's test result indicated that he or she did not have the TAA deficiency. This effect was mediated by the effect of co-participant risk status on perceptions of risk factor prevalence. Participants who were exposed to a co-participant who had the deficiency rated it as more common than did those whose co-participant was not TAA-deficient. The more prevalent participants perceived the TAA risk factor to be, the fewer preventive behavioral intentions they expressed. When perceptions of prevalence were controlled, there was no association between co-participant risk status and behavioral intention. These results suggest that social information (e.g., the risk status of one other person) can have an impact on perceptions of prevalence, and these prevalence perceptions can, in turn, influence the intention to engage in preventive behaviors.
Compensatory Self-Enhancement and Risk Consideration

Compensatory self-enhancement. If people consider their risk for an illness and are unable to deny a threatening amount of vulnerability, they may respond by enhancing their perceptions of themselves on other dimensions. Extensive research supports the existence of such "compensatory self-enhancement" in response to a threat to the self-image provided in laboratory settings (e.g., Baumeister, 1982; Baumeister & Jones, 1978; Brown & Smart, 1991; Greenberg & Pyszczynski, 1985) and in interviews with persons coping with serious illness (e.g., Taylor, Wood, & Lichtman, 1983).

Just world theory. If people acknowledge that a certain behavior puts them at risk for a particular illness, they may decrease their sense of unease by reminding themselves that there are other dimensions, health-related or not, on which they are performing adequately. To the extent that people can reassure themselves that they are basically "good" they can reduce their perception of the likelihood that something bad--i.e., contracting an illness--will happen to them. Indeed, people appear to perceive themselves and others through the lens of an informal "just world theory" (Lerner, 1980) that holds as its primary tenet the belief that "bad things do not happen to good
people." Thus, the person who considers their risk for STDs and their relative lack of condom use may choose to focus on their otherwise healthy lifestyle, on their reliable use of contraceptives (to prevent unplanned pregnancy), or on personality traits on which they evaluate themselves highly.

Comparison with others. The tactic of compensatory self-enhancement is likely to be even more effective to the extent that the "threatened" person believes that they are better than others on the relevant dimensions. People know that risky sexual behaviors can lead to the contraction of STDs (Althaus, 1991; Janus & Janus, 1993; Witwer, 1990), and thus they may need to find some reason why they will not suffer the fate that befalls others who engage in behaviors similar to their own. One way of achieving this conviction is to focus on factors that differentiate the self from people for whom such behaviors lead to illness—by "psychologically distancing" from such people. Derogation of others per se (lowering perceptions of others in response to threat) is not necessary in this context so long as one's self-enhancement is sufficiently great to maintain the perception that others, but not the self, are "the kind of people" to whom such outcomes occur.
Summary

There is evidence to support the contention that social comparisons in the area of health behavior may have an impact on behavioral intention and on preventive behavior itself. Perceptions of unique invulnerability and perceptions of the prevalence of an illness have both been associated with reductions in preventive health behavior and intentions. Additionally, it seems possible that people could attenuate the threat or discomfort associated with risk consideration by enhancing their perceptions of themselves on unrelated dimensions of health behavior or personality. The present study examines the ways in which perceptions of unique invulnerability, perceptions of the prevalence of risky sexual behavior and the unpleasantness of STDs, and perceptions of the self and others on unrelated health behaviors and personality traits are affected by risk consideration.

The Present Study

Sexually-Transmitted Diseases other than AIDS

Focus on STDs Other than AIDS

The present study explicitly examined young adults' reactions to considering their risk for sexually-transmitted diseases other than AIDS. There were two reasons for this focus. First, the intent of the study
was to ascertain people's response to risk consideration for a general sexually-related health risk. AIDS differs from many other communicable diseases and from many other health problems in that it is almost always fatal, and it carries with it a considerable stigma. People's response to considering their risk for such a disease might differ considerably from their response to the consideration of risk for other STDs that are more easily curable and less stigmatized.

Secondly, since the advent of widespread concern about AIDS in the middle of the 1980's, considerable attention has been paid by educators and by the media to this disease. There has been less consideration given to sexually-transmitted diseases other than AIDS (STDs), however (Althaus, 1991; Solomon & DeJong, 1986; Witwer, 1990). Surveys suggest that people (especially adolescents) know less about STDs (method of transmission, symptoms, treatment, consequences) than they know about AIDS (Witwer, 1990) and that they believe that other STDs do not cause serious health problems (Althaus, 1991). Perhaps as a result of the lack of public concern about STDs, very little research has been conducted that examines the efficacy or impact of educational programs designed to prevent them (Solomon &
DeJong, 1986). The present study examined young adults' responses to the consideration of risk for STDs in order to learn about the process of risk consideration in general, but also to ascertain what effect risk consideration has in this particular, understudied context.

Prevalence

Sexually-transmitted diseases other than AIDS (STDs) represent a major, preventable cause of illness in the United States today (Althaus, 1991; Public Health Service, 1990). In 1989, in the population as a whole, the incidence of gonorrhea was 300 cases per 100,000 people; the incidence of chlamydia was 215 cases per 100,000 people; pelvic inflammatory disease afflicted 250 out of every 100,000 women. In 1988, 167,000 people sought first-time treatment for genital herpes and 451,000 for genital warts, and 48,000 new cases of syphilis were reported. (In comparison, a total of 179,136 cases of AIDS had been reported in the United States by 1991; Althaus, 1991.)

A large percentage of these cases of STDs were accounted for by adolescents aged 15-19 years (Cates & Stone, 1992; Public Health Service, 1990). For example, the incidence of gonorrhea among people in this age group was 1,123 cases per 100,000 people—estimated to
encompass up to two-thirds of all reported cases (Cates & Stone, 1992). Pelvic inflammatory disease infected 1.7 times more sexually-active teen-aged females than sexually-active 25-29-year-olds (Althaus, 1991).

The incidence of STDs among adolescents has become a vital concern of public health providers and researchers in this country, and several of the STD-relevant objectives listed by the U. S. Department of Health and Human Services in a report describing health objectives for the country for the year 2000 refer specifically to people aged 15-19 years (Public Health Service, 1990).

**Rationale of the Present Study**

**Risk Consideration: A Source of Threat to Self-Image**

The present study examined young people's response to the consideration of risk for STDs. Based on existing literature examining the results of risk consideration (Gerrard, Gibbons, & Warner, 1991; Jemmott, Ditto, & Croyle, 1986) it was hypothesized that people would perceive risk consideration as threatening to their self-images (Croyle & Hunt, 1991). Considering risk not only makes thoughts of illness available in memory (Tversky & Kahneman, 1974), but it can also confront people with the awareness of their own failure to take precautions. A
large number of sexually-active young people fail to use condoms (only 25% of sexually-active, unmarried women aged 15-19 reported that their partner used a condom in a 1988 survey; Public Health Service, 1990). Given that condom use is the major preventive action that one can take against STDs (Cates & Stone, 1992), risk consideration should evoke an uncomfortable awareness of vulnerability among many sexually-active young people.

Types of Downward Comparison

Active vs. passive DC. When people's self-image is threatened, they can ameliorate some of this threat by engaging in social comparisons that favor the self (Wills, 1981). They may respond to threat by choosing to affiliate with others who are worse off than they are or by responding positively to information about others who are worse off (passive DC). These avenues are more likely to be evidenced by people with low than high SE. People may also respond to this type of threat by engaging in active DC--by increasing the "psychological distance" between the self and a comparison target (Gibbons & Gerrard, 1991; Wills, 1981) in such a way that the target is perceived to be inferior to the self on a relevant dimension. This goal may be achieved by derogating the target, and it is shown primarily by persons with high SE.
Self-enhancement. Although the evidence reviewed earlier suggests that self-enhancement represents a genuine intrapsychic response to threat, it does not address the more theoretical question of whether or not self-enhancement should be considered to be a form of active DC. The solution to this definitional dilemma may rest in the context of the self-enhancement. As mentioned previously, social comparison involves comparing a representation of the self with a representation of a comparison target. One criterion for considering self-enhancement as a form of active DC might be the presence of a social comparison target in the self-enhancement context.

An extremely liberal view of the conditions under which self-enhancement might be considered a form of DC might assert that, because social comparisons are a common response to a variety of situations in everyday life (cf. Wheeler & Miyake, 1992), almost any evaluation of the self will take place, at least to some extent, with reference to a comparison other or group. However, because research has suggested that people are more prone to use their self-images as the criterion for judging others than they are to use their impressions of others as the benchmark for judging themselves (Sanders, 1982),
this comprehensive criterion is an overly-broad descriptor of the conditions under which self-enhancement is likely to represent a social comparison strategy.

A more restrictive and theoretically-informative criterion would be the explicit reference to potential social comparison targets before or during the self-evaluation process. If people have competed against another, evaluated another, or received information about another before evaluating themselves, then it is likely that evaluations of the self will take place in a context of social comparison. The present study will adopt this criterion for considering self-enhancement as a form of active DC, and self-enhancement will be considered along with derogation of others as a form of this type of social comparison. This criterion is admittedly a novel one, however, and to prevent obfuscation, the specific terms "derogation of others" and "self-enhancement" will be used throughout the paper.

DC Strategies: Persons with High SE

When sexually-active persons with high SE are required to consider their risk for STDs, they may respond to the ensuing psychological discomfort (threat) by enhancing their perceptions of themselves on dimensions not directly related to the threat (e.g., personality traits) or by derogating a social comparison
target on related traits (e.g., risk behaviors). For example, high SE risk-reviewers could acknowledge their own minimal use of condoms, but they could perceive that they are otherwise fine people; conversely, they could believe that their peers are even more careless about condom use than they are.

Peers as DC targets. Although one's peers might seem like a relatively abstract comparison target, Brown and Gallagher (1992) found that threatened persons with high SE were willing to derogate "most other people" on personality dimensions, and Burger and Burns (1988) found a substantial perception of unique invulnerability for unplanned pregnancy compared to "other students" at their participants' college. It appears that, as Gibbons and Boney McCoy (1991) suggest, comparison targets do not have to be objectively "worse off" in order to serve as objects of active DC.

Risky others as DC targets. Persons with high SE who consider their risk might also be critical of a person who clearly engaged in risky behaviors. Someone who was apparently riskier than they were might present an even more amenable DC target than would their peers (Gibbons & Boney McCoy, 1991; Wills, 1981). It is therefore assumed that people with high SE who have considered their risk
will engage in active DC with such a target as well as with their peers.

Response to active DC. The research reviewed thus far has suggested that people with high SE are willing to enhance their self-images in ways that directly implicate the self (Baumeister et al., 1989; Brown et al., 1988). To the extent that they will engage in derogation of other people on dimensions related to risk behavior, persons with high SE will have the basis for an illusion of unique invulnerability. If others are perceived to have more partners, more frequent sexual relations, and poorer condom use than the self, they may be seen as more vulnerable to STDs. Therefore, it is possible that derogation of comparison targets will be related to greater perceptions of unique invulnerability to STDs among persons with high SE.

DC Strategies: Persons with Low SE

People with low SE tend to respond to threat with self-protective rather than self-enhancing strategies (Baumeister et al., 1989). They will therefore be less likely than persons with high SE to respond to risk consideration either with derogation of social comparison targets or enhancement of the self.

Target choice. Previous experiments have shown that when they are subjected to a threat to their self-images,
persons with low SE will choose to be exposed to worse off others to a greater extent than will persons with high SE or non-threatened persons with low SE (Pyszczynski, Greenberg, & Laprelle, 1985; Smith & Insko, 1987; Wilson & Benner, 1971).

It has been hypothesized that persons with low SE seek exposure to people who are not faring well on some dimension to reassure themselves that there are others "out there" who are as bad off or worse off than they are; the presence of such others may serve to reduce feelings of deviance or alienation (Coates & Winston, 1983; Gibbons & Boney McCoy, 1991; Gibbons & Gerrard, 1991; Wills, 1991).

When sexually-active persons with low SE are asked to consider their risk, then, they may respond positively to the opportunity to be exposed to information about someone who is even riskier than they are, and express more interest in this type of information than would persons with high SE or persons with low SE who have not considered their risk.

Response by persons with low SE to a risky target. How will people with low SE who have considered their risk respond to information about someone who is at somewhat greater risk than they are for STDs? As
mentioned earlier, people with low SE may experience feelings of deviance and be motivated to find evidence that the prevalence of certain unfavorable behaviors or traits that they possess is higher than they presently believe (Gibbons & Gerrard, 1991; Wills, 1991). Being exposed to information that suggests that one of their peers is engaging in extremely risky sexual behavior may increase low SE persons' perceptions of the prevalence of such behaviors (Croyle & Hunt, 1991; Gibbons & Gerrard, 1991).

Among persons with low SE, an increase in the perception of the prevalence of risky sexual behaviors may be accompanied by a concomitant decrease in perceptions of the severity or unpleasantness of the illnesses that are associated with those behaviors (Jemmott et al., 1988; 1986). Reducing perceptions of the unpleasantness of a negative outcome is an indirect way of restoring positive feelings about the self; even if persons with low SE feel more vulnerable to STDs after considering their risk, they may be able to diminish some of the threat thus evoked by down-playing the unpleasantness or severity of the illness. This coping mechanism will be facilitated by exposure to information about someone who engages in risky behavior.
Response to a risky target by persons with high SE. Although this process could also apply to persons with high SE, their need for reassurance of "normalcy" is not as great as that of persons with low SE, and the discovery that someone who exists who is "worse" than they are on this dimension should come as no surprise (cf. Gibbons & Boney McCoy, 1991). Particularly if they have already tempered the threat to their self-image associated with consideration in more active forms of DC, high SE, threatened, persons should not increase their perceptions of the prevalence of risky sexual behaviors in response to being provided with information about a risky peer.

Hypotheses of the Present Study

Overview

The literature reviewed in preceding sections gives rise to several hypotheses concerning the differential responses by people with high and low SE to consideration of their risk for STDs. Testing these hypotheses will extend social comparison theory by assessing the degree to which consideration of risk parallels failure feedback on tests of intelligence, social skills, and personality as a source of threat. It will provide an examination of the extent to which persons with high SE are willing to derogate others or enhance their perceptions of
themselves in response to this type of threat, and the extent to which exposure to information about a DC target increases the perceptions of prevalence of the relevant risk behavior among persons with low SE. Testing these hypotheses may also provide information that could be useful in designing improved educational or media programs to reduce the spread of STDs. A better understanding of people's response to the consideration of risk will facilitate the identification of factors that may interact with this response to encourage preventive behavior.

**Effects of Risk Consideration**

**Perceptions of vulnerability.** Sexually-active young people who do not use condoms in some or all of their sexual encounters and who are asked to consider their risk for STDs—specifically, to consider the behaviors in which they engage that could increase their chances of contracting such a disease—will show greater perceptions of self vulnerability than will people who do not consider their risk. When people are required to confront the fact that they are not taking precautions, or when they consider a risk over which they feel relatively little control, perceptions of vulnerability will tend to increase (Gerrard et al., 1991). Based on
prior research, perceptions of others' vulnerability are predicted to remain unaffected (cf. Gerrard et al., 1991) or to increase. Because of the divergent effects of risk consideration on perceptions of vulnerability for self and other, it is predicted that the perception of invulnerability will be less among people who have considered their risk than among people who have not. Differences across condition in perceptions of vulnerability will be taken as evidence of the threatening nature of risk consideration; people who feel relatively vulnerable to a disease presumably have less positive feelings about themselves than those who feel less vulnerable (cf. Croyle & Hunt, 1991).

Perceptions of unpleasantness. There are tentative predictions for the effect of risk consideration on perceptions of the unpleasantness of STDs. "Unpleasantness" may be considered similar to the concept of "seriousness" in that both terms refer to the degree of negativity associated with a given health outcome. People's evaluation of an illness's "seriousness" might be influenced by perceptions of how easy it is to cure, however. The term "unpleasantness" explicitly indexes a person's subjective evaluation of how emotionally aversive the thought of contracting a disease is. People are often upset about the thought of contracting STDs
not because they are fatal or uncurable (Althaus, 1991) but because contracting such a disease carries with it considerable social stigma (Solomon & DeJong, 1986).

Jemmott et al. (1986) found that people who were told that they tested positive for a risk factor for pancreatic disease perceived the disease as being less serious than did those who tested negative. To the extent that acknowledging one's risky behaviors is analogous to testing positive for a risk factor, it might be expected that perceptions of unpleasantness would be lower among people who had considered their risk than among people who had not. This hypothesis is only tentative because of the potentially low variability on this item. Although people might be able to downplay the "seriousness" of STDs based on their perceived ease of treatment, it would be much more difficult to convince oneself that contracting such diseases would be at all "pleasant." Therefore, it is possible that perceptions of unpleasantness will not be affected by risk consideration.

Concern about catching an STD. One response to risk consideration that is subjective and not as constrained as perceptions of unpleasantness might be concern about catching STDs. Anecdotal evidence
suggests that people may be aware that they are vulnerable to a negative outcome and yet profess a lack of concern about the possibility. For example, this author has heard several people comment that they are aware that they may develop fatal ailments from smoking cigarettes, but that they are not as concerned about that possibility as they are about the discomfort associated with quitting. When risk consideration reveals that people are engaging in too few preventive behaviors to influence perceptions of vulnerability with selective focus, and the outcome is viewed as extremely negative, one form of response to the attendant threat (cf. Croyle & Hunt, 1991) might therefore be to profess a lack of concern about the outcome. This hypothesis is very tentative, however, because it is quite possible that, to the extent that risk consideration is influenced by rational processes, perceptions of concern will be elevated by risk review just as will perceptions of vulnerability.

Reactions to Reviewing Risk: Social Comparisons

Related risk behaviors: Self. When young adults who are sexually-active and who do not regularly use condoms consider their risk for STDs, they may have to acknowledge that they have had sex frequently, or with multiple partners, without protecting themselves from
disease. Therefore, it is hypothesized that risk consideration will result in heightened awareness (greater estimates) of participants' number of sexual partners, frequency of intercourse, and failure to use condoms.

**Related risk behaviors: Peers.** Because some evidence suggests that people's consideration of risk only has impact on perceptions of the self and not on perceptions of others (Gerrard et al., 1991), definitive predictions about the impact of risk consideration on estimates of others' risk behaviors cannot be made. However, as is indicated by the previous review of the literature on social comparison and risk perception, there is reason to examine people's estimates of others' vulnerability.

If people are not presented with information about their peers' sexual behavior, they may be free to assume that other people of their age and sex are even more risky than they are (Perloff & Fetzer, 1986; Weinstein, 1980, 1983; Weinstein & Lachendorf, 1982). Social comparison theorists have often referred to the "plasticity" or "constructive" nature of the social comparison process. If comparison targets that meet a comparison need are not readily found in the environment, people are perfectly capable of making them up (see

For example, Taylor, Wood, and Lichtman (1983) found that women who had breast cancer frequently compared with hypothetical women who fared worse than they did, apparently to highlight their own coping ability (over one-fifth of their sample of 78 women expressed unsolicited social comparisons of this type). Their husbands, too, sought refuge by comparing with "animals" who left their wives after they had undergone mastectomies (almost one third of the husbands in this sample spontaneously offered such comparisons). Because very few men actually leave their spouses under these conditions (four percent in this sample), these downward comparison targets were referred to by Taylor et al. as "mythical men" (p. 35).

Because projecting negative traits onto comparison targets is a form of active DC, it is more likely that it will be demonstrated by persons with high than with low SE (Brown & Gallagher, 1992; Crocker et al., 1987; Gibbons & Boney McCoy, 1991). It is therefore tentatively hypothesized that people with high SE who are asked to consider their risk for STDs will rate their peers as having more partners, more frequent sex, and poorer condom use than will any other participants. If
perceptions of others are worse than perceptions of the self, then persons with high SE who have considered their risk should also show greater self-peer differences (favoring the self) than other participants.

**Different risk behavior.** Research has shown that persons with high SE will enhance their perceptions of themselves on traits that are unrelated to the dimension on which their self-image has been threatened (Baumeister, 1982; Baumeister & Jones, 1978; Greenberg & Pyszczynski, 1985; Schlenker et al., 1990). Therefore, it is possible that persons with high SE who have considered their risk for STDs might compensate for this threat to their self-image by enhancing their perceptions of their preventive behaviors in another domain. Because more young people use contraception (e.g., the pill) than use condoms (Gerrard et al., 1991), it is possible that they could selectively focus on those behaviors that reduce their risk for pregnancy even as they are confronted by those that increase their risk for STDs. If young people can convince themselves that they are relatively careful about contraception, this may inhibit concerns about STDs from influencing additional prophylactic behavior.

Weisman, Plichta, Nathanson, Ensminger, and Robinson
(1991) assessed the condom use behavior of 300 adolescent females and found that the majority who used condoms used them to prevent pregnancy, not STDs. More importantly, consistent condom use was negatively associated with consistent use of oral contraceptives despite the fact that the young women in this particular sample were at fairly high risk (on the basis of their sexual behaviors) for contracting an STD.

It is hypothesized that persons with high SE who have considered their risk for STDs will rate their own contraceptive behavior as more effective than will participants in other conditions. Given that there will be no corresponding enhancement of their peers, this response should translate into a self-other difference favoring the self. Because ratings of the self will take place in the context of ratings of one's peers, a social-comparison interpretation of compensatory self-enhancement will be endorsed.

Personality traits. Another set of dimensions on which persons with high SE might self-enhance following risk consideration are personality traits. Although they may have to acknowledge their lack of preventive behavior regarding STDs, they may be able to ameliorate some of the discomfort thus evoked by reassuring themselves that they are otherwise good people (i.e., intelligent,
capable, fun to be with, etc.). By the same token, they may construe their peers as possessing less sterling qualities than themselves. As suggested before, it appears that persons with high SE will self-enhance if given a chance, and that they will prefer this option to the derogation of others if they believe that someone else (e.g., the experimenter) will be able to link their evaluations to them. However, even studies in which participants' evaluations of DC targets were obviously linked to them have seen evidence of target derogation. Therefore, it is hypothesized that persons with high SE who have considered their risk for STDs will provide more favorable evaluations of themselves than will other participants, and they may also provide lower evaluations of their peers. Both of these processes should contribute to a greater self-peer difference favoring the self. As is the case with ratings of risk-related behavior, because ratings of one's personality will take place in the context of evaluations of others, they will be considered part of the social comparison process in and of themselves.

Gender differences and personality traits. As described earlier, Gibbons and Boney McCoy (1991) found that persons with high SE who had been threatened on a
test derogated a comparison target more so than did persons with high SE who had not been threatened and more so than did persons with low SE. These findings were qualified by an interaction with participant gender, however. Among males, the SE x Threat interaction was significant only on evaluations of the target that were made on dimensions related to instrumentality, or competence (e.g., "intelligent," "successful," "hard-working," etc.). Among females, the SE x Threat interaction was observed only on social evaluations of the target (e.g., "likeable"). These findings were consistent with literature on gender roles that suggests that males tend to emphasize instrumental or competence-related factors in their self-evaluations, and females tend to emphasize social or interpersonal domains (Alagna, 1982). Therefore, it was predicted that, with regard to compensatory self-enhancement on the personality evaluations, males with high SE who considered their risk for STDs would show more psychological distancing on competence-related traits and females on socially-related traits.

Perceptions of similarity. Wills (1981) suggested that the purpose of active DC was to create "psychological distance" between oneself and a comparison target, and evidence has been found that people will
explicitly reduce their perceptions of similarity over time to images that they find unfavorable (Gibbons et al., 1991). In addition, perceptions of similarity to a comparison target have been found to be negatively associated to perceptions of unique invulnerability with regard to that target (Boney McCoy et al., 1991).

Persons who have just considered their risk behaviors are presumed to be more likely to engage in psychological distancing than are those who have not because of the threat associated with risk consideration. Because risk consideration is expected to heighten participants' awareness of their own risky behavior and vulnerability, it would be difficult for these people to explicitly distance from most social comparison targets on the dimension of risk behavior. They might, however, be able to explicitly distance on the dimension of personality. Again, because distancing, like active DC, appears to be more common among persons with high than low SE, it is hypothesized that persons with high SE who have considered their risk will report feeling less similar in their personalities but not in their "sexual behavior" to both "others of their age and sex" (their peers) and to "the type of person who catches an STD" (the "typical victim"). If they have previously dealt with the threat
of risk consideration by assigning riskier behavior to their peers than to themselves, they should be motivated to maximize their perceptions of psychological distance from this target, and they should in any case want to minimize the perception of similarity between themselves and the typical victim.

Exposure to a Target Who Engages in Risky Behavior

Comparison choice. Previous studies have found that people with low SE respond to threat by selecting others as social comparison targets who are represented as being worse off than they are (e.g., Friend & Gilbert, 1983; cf. Gibbons, 1986). Persons with high SE do not seem to use this tactic following threat. It is predicted that, if participants are offered the chance to read information about the risk behaviors of another person in the experiment, persons with low SE who have considered their risk for STDs will choose a person who is represented as being riskier than will any other participants. By reading information about such a person, persons with low SE can be "reassured" that there are other people who are engaging in "worse" behaviors than they are.

Reactions to a risky target by persons with low SE. If participants with low SE are exposed to information describing a person who engages in very risky sexual
behavior (a DC target), they are predicted to respond by providing greater perceptions of the prevalence of the behavior (Gibbons & Gerrard, 1991). As a result, they may also express lower estimates of the unpleasantness of the associated diseases (Jemmott et al., 1986) than will persons with low SE who have not been exposed to the DC target information. Because perceptions of the unpleasantness of a disease do not directly implicate the self-image, people with low SE may be able to take advantage of this defense against the threat associated with risk consideration. Persons with low SE should not derogate the DC target or alter their perceptions of similarity to the target as a function of risk consideration.

**Reactions to a risky target by persons with high SE.** Persons with high SE who have considered their risk will rate the risky DC target as riskier compared to their peers than other participants will. They will not, however, exceed other participants' ratings of the riskiness of the DC target compared to themselves. Because risk consideration is expected to increase feelings of personal vulnerability, it would be very unlikely that any participants in the risk consideration condition would be able to personally distance from the
DC target on a measure of risk. They could, however, derogate the target by asserting that he or she was much riskier than the "typical peer." In keeping with these hypotheses, persons with high SE who have considered their risk will rate the DC target as less similar to themselves on the dimension of personality than will other participants. No differences will be seen on a measure that assesses similarity of sexual behavior. By engaging these comparison strategies, persons with high SE who have considered their risk can create more "psychological distance" between themselves and the embodiment of the risky behaviors they have had to confront.

Post-Manipulation Risk Perceptions

Perceptions of vulnerability: Effects of risk consideration and distancing. It is hypothesized that people who have considered their risk for STDs will still have higher perceptions of self vulnerability at the end of the experiment than will people who did not consider their risk. Among persons with high SE, however, these perceptions may have been somewhat attenuated by active DC. There is a common belief that "bad things do not happen to good people" (cf. Lerner's "just world" theory, 1980), and to the extent that persons with high SE have been able to convince themselves that others "deserve"
the negative consequences of risky behaviors, and that they themselves really are "O.K." on other dimensions, their perceptions of vulnerability may be somewhat diminished.

It is predicted, then, that among persons with high SE, the perception of self-vulnerability at the end of the experiment should be negatively associated with prior self-enhancement. It is also hypothesized that the difference in high SE persons' perceptions of vulnerability for the self and for one's peers (the perception of unique invulnerability) measured at the end of the experiment will vary as a function of the self-other differences on the preceding distancing measures.

Exposure to information about a person who engages in risky sexual behavior may facilitate active DC on the part of people with high SE. It is tentatively predicted that persons with high SE who have considered their risk and who have been exposed to such information will show enhanced illusions of unique invulnerability than will persons with high SE who do not receive such information. It is hypothesized that the primary locus of this difference will be greater estimates of peers' vulnerability among those persons exposed to information about a risky other.
Perceptions of unpleasantness. No effects of this nature are predicted for persons with low SE, who appear to prefer self-enhancement mechanisms that do not directly implicate the self (cf. Brown et al., 1988). Among persons with low SE, the only post-manipulation difference predicted is a relatively higher perception of the prevalence of risky sexual behaviors, and perhaps a lower perception of the perceived unpleasantness of STDs among those who were exposed to information about a risky peer.

Summary of Hypotheses

In summary, then, the following predictions are made concerning the effects of risk consideration, exposure to a risky target, and self-esteem on measures of risk perception, active DC, psychological distancing, and passive DC.

Effects of risk consideration on perceptions of risk and risk behavior:

1) Young adults who are sexually active and who do not always use condoms will respond to the explicit consideration of their risk-increasing behaviors for STDs with higher perceptions of self vulnerability to STDs than will persons who have not considered their risk (Gerrard et al., 1991; Tversky & Kahneman, 1974). They may also report lower perceptions of the unpleasantness
of STDs and less concern about catching STDs (Jemmott et al., 1986).

2) All persons who have considered their risk for STDs will respond by acknowledging their risky behaviors; they will provide higher estimates of their frequency of sexual behavior and number of partners, and less favorable estimates of their regularity of condom use than will persons who have not considered their risk. Persons with high SE, however, may also respond to risk consideration by providing riskier perceptions of the behavior of people their own age and sex (peers) than will people with high SE who have not considered their risk. People with low SE are not expected to engage in this form of active DC (Brown & Gallagher, 1992; Gibbons & Boney McCoy, 1991).

3) Persons with high SE will respond to risk consideration by claiming more responsible contraceptive behavior than will persons with high SE who have not considered their risks. They may also respond by derogating the contraceptive efficacy of their peers to a greater extent than will those who do not consider their risk. This response to risk consideration is not predicted for persons with low SE (Baumeister, 1982; Baumeister & Jones, 1978).
Effects of risk consideration on perceptions of personality and similarity to peers and to the typical victim:

4) Persons with high SE will respond to risk consideration by providing more favorable personality ratings of themselves, and possibly less favorable evaluations of their peers, than will persons with high SE who have not considered their risk. This pattern is not predicted among persons with low SE (Baumeister, 1982; Baumeister & Jones, 1978; cf. Gibbons & Boney McCoy, 1991).

5) Persons with high SE who have considered their risk for STDs will rate themselves as less similar in their personality, but not in their sexual behavior, to both their peers and to the "type of person who catches a STD" (the "typical victim") than will persons with high SE who have not considered their risk. This form of distancing will not be evidenced by persons with low SE.

Effects of risk consideration on social comparison choice and target evaluation:

6) Persons with low SE who have considered their risk for STDs will select riskier persons as targets for social comparison than will persons with low SE who have not considered their risk. Persons with high SE will not be as interested in comparing with a risky target, and
their target preferences will not be influenced by risk consideration (Gibbons, 1985; Gibbons & Gerrard, 1987b; Pyszczynski et al., 1985).

7) Persons with high, but not persons with low SE will derogate and distance from the risky target more if they have considered their risk than if they have not (cf. Crocker et al., 1987; Gibbons & Boney McCoy, 1991).

Joint effects of risk consideration and exposure to a risky target on risk perceptions:

8) Persons with low SE who have been exposed to information about a person who is engaging in very risky sexual behaviors will report higher perceptions of the prevalence of risky behaviors among their peers than will persons with low SE who have not been exposed to information about such a comparison target. This difference will be more pronounced among persons with low SE who have considered their risk than among those who have not (Gibbons & Gerrard, 1991).

9) Persons with high SE who have been exposed to information about a sexually risky target will report lower perceptions of the prevalence of risky sexual behaviors among their peers than will persons with high SE who have not been exposed to the risky target information. This difference will be most evident among
persons with high SE who have considered their risk (Gibbons & Boney McCoy, 1991).

10) Persons with low SE who have been exposed to the risky target will perceive STDs as less unpleasant at the end of the experiment than will persons with low SE who have not been exposed to the DC target. This difference will be more pronounced among persons with low SE who have considered their risk than among those who have not. No differences or very small differences in perceptions of unpleasantness are expected among persons with high SE, because they will presumably diffuse threat by psychological distancing (cf. Ditto et al., 1988).

11) Persons who have considered their risk will report higher perceptions of self vulnerability at the end of the experiment (T2) than will people who did not consider their risk. No differences in vulnerability of peers will be seen as a function of risk consideration alone (Gerrard et al., 1991). This pattern of results will correspond to lower perceptions of unique invulnerability among participants who considered their risk than among those who did not.

12) Persons with high SE will show a perception of unique invulnerability relative to their peers (at the end of the experiment) that is positively related to psychological distancing from peers on evaluations of
risk-related behaviors, carefulness of avoiding unplanned pregnancy, personality traits, and perceptions of similarity. The more the self is distanced from others identified as risky, the less vulnerable and the more uniquely invulnerable the self will be perceived to be. No effects on perceptions of vulnerability are predicted for persons with low SE.

13) Exposure to information about a sexually risky person will result in greater perceptions of unique invulnerability among persons with high SE who have considered their risk, most likely due to increased perceptions of vulnerability for the typical peer. Therefore, a Risk Consideration x Exposure to Risky Target x SE interaction is predicted such that persons with high SE who have considered their risk and who have been exposed to information about a risky person will show greater peer - self differences in perceptions of vulnerability (illusions of unique invulnerability) than will persons with high SE who have considered their risk and who have not been exposed to such a comparison target. Persons with high SE who have not considered their risk are not expected to differ in perceptions of invulnerability as a function of exposure to this target, because the sort of active DC that facilitates this
movement will not be evoked in the absence of threat (Gibbons & Boney McCoy, 1991). Persons with low SE are not expected to show any differences in perceptions of unique invulnerability as a function of exposure to a risky target.
METHODS

Mass-Testing

Participants

Participants in the experiment were selected from mass-testing screening sessions. All students enrolled in freshman and sophomore level psychology courses at Iowa State University were eligible to participate in mass-testing. A total of 745 students (337 males, 391 females, and 17 unidentified) participated in 35 sessions during the spring of 1991, at which screening materials for this study were administered.

Procedure

All sessions of the experiment, including mass-testing, were conducted in accordance with the policies of the Iowa State University Human Subjects Review Committee, which approved the materials and procedures used.

Mass-testing sessions were held continuously during the semester in which laboratory data were collected. Participants completed questionnaires that assessed: 1) self-esteem (the Janis-Field Feelings of Inadequacy Scale, Eagly, 1967); 2) their own standing on several risk-related factors: numeric estimates of their number of lifetime sexual partners, frequency of intercourse in the past three months, and regularity of condom use; a
Likert-scale index of their "pattern" of sexual behavior (an index of promiscuity ranging from 1 = monogamous to 4 = engages in casual sex), and an indication of their usual method of contraception; and 3) demographic questions (marital status, gender, age, year in school, prior contraction of a STD, and current or prior enrollment in a Social Psychology course; see Appendix A for a copy of the materials used in mass-testing.)

Experiment

Participants

Requirements for Experimental Participation

Willingness to participate. Potential participants were selected from mass-testing on the basis of a number of characteristics. First, they had to indicate their willingness to participate in further research based on the responses that they gave in the mass-testing session. They did this by signing their names to a statement to this effect and by providing the experimenter with their names and phone numbers.

Course restriction. Second, students could not be enrolled in the department's Social Psychology course, due to the increased suspicion often evidenced by these individuals.
Level of sexual activity. Third, participants had to be sexually active; that is, they had to report having had sex at least once in the last three months, and they had to report usually having sex more than once per semester. Because of difficulty in obtaining a sufficient number of participants for the experiment, the former of these criterion was waived for five participants, but all five reported having sex at least once per semester and having had three or more sexual partners.

Marital status. Fourth, participants could not be married. It was assumed that married individuals are more monogamous than single people, and that their concerns about STDs would be very different than those of the average college student.

Age. Participants had to be younger than 24 years of age. Perceptions of vulnerability may vary as a function of age (cf. Boney McCoy et al., 1991), and it was deemed advisable to limit the potential effects of this variable by only selecting participants who fell into the "traditional" college age range (17-23).

Prior contraction of a STD. Finally, participants could not have had a STD. Weinstein (1987; 1989) has reported evidence suggesting that perceptions of health risk are profoundly affected by prior experience with the illness or event considered, and it is not within the
scope of the present research to address these effects.

**Participant Pool**

A total of 230 participants met these qualifications. Of those who did not, 168 failed to indicate willingness for participation in further research, 221 were not sufficiently sexually active, 36 had had an STD, 21 were not single, and 69 were ineligible for other reasons (age, English not native language, median Janis-Field score, failed to answer all screening questions, or were enrolled in Social Psychology).

**Contacting Participants**

Students who met the necessary qualifications for laboratory participation were contacted on the phone and asked if they would like to participate in an experiment, based on their mass-testing responses. Students were informed that participation was entirely voluntary and that refusing to participate in this study would not disqualify them from any further studies. Of the students called, less than 10 refused to participate, and these students all indicated that their refusals were due to the fact that they had reached the limit of experimental extra credit in their psychology courses.
Final Sample

A total of 160 students (78 males and 82 females) participated in the experimental portion of the study. Participants were categorized into high and low self-esteem (SE) groups on the basis of their scores on the Janis-Field Feelings of Inadequacy Scale (Eagly, 1967) in mass-testing. The median score on this scale (range 20 to 80) was 50. The scale is scored such that lower scores reflect higher SE. Participants were considered to have high SE if their scores were less than 50 and low SE if their scores were above 50 (students with scores of 50 were not considered for participation). A total of 86 participants had high SE (43 males and 43 females) and 74 had low SE (35 males and 39 females).

Design

The design of the experiment was a fully-crossed 2 (Risk Consideration vs. No Risk Consideration) x 2 (Exposure vs. No Exposure to a Risky Social Comparison Target) factorial (see Figure 1) with a roughly equal number of persons with high SE and low SE assigned to each cell. The four cells had ns ranging from 38 to 42.
<table>
<thead>
<tr>
<th>Risk Consideration</th>
<th>No Risk Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Consider own risk &amp; answer T1 threat items</td>
<td>* No Task</td>
</tr>
<tr>
<td>* Report perception of peer/self risk behavior &amp; traits</td>
<td>* Report perception of peer/self risk behavior &amp; traits</td>
</tr>
<tr>
<td>* Report perceived similarity</td>
<td>* Report perceived similarity</td>
</tr>
<tr>
<td>* Choose essay</td>
<td>* Choose essay</td>
</tr>
<tr>
<td>* Read bogus essay</td>
<td>* Read essay author</td>
</tr>
<tr>
<td>* Rate essay author</td>
<td>* Rate essay author</td>
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<tr>
<td>* T2 threat items</td>
<td>* T2 threat items</td>
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</tbody>
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<table>
<thead>
<tr>
<th>Exposure to Bogus Risk Essay</th>
<th>No Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>* Consider own risk &amp; answer T1 threat items</td>
<td>* No Task</td>
</tr>
<tr>
<td>* Report perception of peer/self risk behavior &amp; traits</td>
<td>* Report perception of peer/self risk behavior &amp; traits</td>
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<td>* Report perceived similarity</td>
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<td>* No Task</td>
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<tr>
<td>* No Task</td>
<td>* No Task</td>
</tr>
<tr>
<td>* T2 threat items</td>
<td>* T2 threat items</td>
</tr>
</tbody>
</table>

**Comparison Sample**

* Answer T1 threat items

**Note.** Activities in which all participants engaged appear in boldface.

**Figure 1.** Experimental Design
Procedure

Introduction

All individuals who participated in a single session (usually four per session) were of the same sex. Upon arrival at the lab, all participants were told that the study concerned students' health perceptions, particularly those related to sexual behavior. They filled out informed consent statements and were sent to completely private, individual cubicles. Further instructions were read over an intercom system (see Appendix B for the text of the experimental protocol; see Appendix C for the complete materials used by participants in the experiment).

Experimental Manipulation I: Consideration of Risk

Risk consideration essay. Participants in the risk consideration condition were asked to consider the following question:

Researchers in the area of health are concerned with why people engage in behaviors that make it possible that they will become ill. One area in which we are particularly interested is the area of sexual behavior and sexually-transmitted disease. Although AIDS is probably the most talked-about sexually-transmitted disease, we are interested in studying
other sexually-transmitted diseases, like chlamydia and herpes, that also represent important health problems.

People often do not think about their risk for sexually-transmitted diseases. One purpose of this study is to get you to think about your risk for sexually-transmitted diseases other than AIDS. Please take a few minutes and think about the things that you do that make it possible that you could catch a sexually-transmitted disease other than AIDS (for example: chlamydia, herpes, genital warts, etc.). We would like you to write down anything you can think of that you do that might INCREASE the chances that you would catch such a disease. You may include information about your partner or partners if you think that something about them may increase your chances of catching a sexually-transmitted disease other than AIDS.

The text of this question was presented to participants on a sheet of paper, and it was also read aloud to them by the experimenter. Participants were given seven minutes to write their answer to the question (this length of time was decided upon after several pilot sessions).
Perceptions of threat. Three questions assessed risk consideration participants' perceptions of threat after they wrote their risk behavior essay. Participants were asked to indicate how likely they thought it was that they would contract a STDOTA in the next two years (self vulnerability), how unpleasant they perceived that actually contracting a STDOTA would be, and how personally concerned they were about catching a STDOTA. All three questions were answered by making a mark through a line anchored with the terms "not at all" and "very" (perceptions of vulnerability); "slightly unpleasant" and "extremely unpleasant"; and "not at all concerned" and "extremely concerned". All lines were 140 mm in length, and participants' responses were obtained by measuring from the leftmost end of the line to the spot where they made their mark. Scores on these and items could potentially range from 0 mm to 140 mm, with higher scores indicating greater perceived vulnerability, unpleasantness, and concern.

No risk consideration condition. Participants in the no risk consideration condition were not asked to consider their risk-increasing behaviors, nor were they asked any of the questions that assessed threat perceptions (vulnerability, unpleasantness, and concern).
Perception of risk-related behaviors. All participants were then asked to describe "the average person of their age and sex" (the "typical peer") on behavioral characteristics related to risky sexual behavior. They were then asked to describe their own behavior on the same dimensions. These were the first activities for participants in the no risk consideration group.

There were a total of four risk behavior questions, including assessments of frequency of sexual intercourse, number of sexual partners, frequency of condom use, and how "careful" the target was "about making sure they (or their partner) don't have an unwanted pregnancy." This final question was included as a dimension that is clearly related to sexual behavior but is not directly linked to the transmission of STDs in order to assess compensatory self-enhancement (Baumeister, 1982) in the area of risk behavior.

"Subjectivity" of risk behavior ratings. Participants reported their perceptions of their own and the typical peer's risk-related behaviors by making slash marks through 140 mm lines anchored with the terms "not at all" and "very," "very few" and "very many," "very rarely" and "very often," etc. These estimates are considered subjective because they reflect participants'
interpretations of the behaviors surveyed rather than concrete numeric responses. Even numeric responses would, of course, represent estimates; most people would not go to the trouble (assuming they could) of calculating their exact, absolute frequency of condom use, and perceptions of the typical peer's behavior could only be speculative. But the same numeric estimate might have very different meanings to different people (Boney McCoy & Reis, in preparation), and it is of less interest to this study to know exactly how often a person uses condoms than whether the person interprets this number as "very often" or "very rarely." From a social comparison perspective, it is the thought "I may not use condoms a lot, but other people use them even less than I do" that is likely to dispel the threat induced by risk consideration—-not the comparison of raw numeric estimates of behavioral frequency.

**Personality ratings.** Participants also rated the typical peer and themselves on 14 personality attributes (e.g., intelligent, capable, friendly, etc.; see Appendix A for a complete list). These ratings were made by making slash marks through 140 mm lines anchored with the terms "not at all" and "very." Personality evaluations allowed participants to derogate the typical peer or to
engage in compensatory self-enhancement on dimensions not directly related to risk behavior. Traits related both to competence and to interpersonal relations were included in this list to assess gender differences in comparison strategy (cf. Gibbons & Boney McCoy, 1991).

Perceptions of similarity. A third series of items required participants to indicate how similar they felt to the typical peer and how similar they felt to the "kind of person who catches a sexually-transmitted disease other than AIDS" (the "typical victim"). They were asked to indicate their perceptions of similarity to both of these targets on the global dimensions of "personality" and "sexual behavior." Responses were made in the same line-slashing format as were previous questions; the 140 mm lines were anchored with the terms "not at all" and "very."

Experimental Manipulation II: Choice of and Exposure to Risk Behavior Essay

Target preference. At this point in the experiment, participants in the exposure condition were told: "It is known that people often obtain information about health risks by talking with other people about their behavior. We would like to find out more about people's reactions to this kind of information." Exposure condition participants were then told that they would have the
opportunity to read the anonymous risk behavior essay of a previous participant in the study (who had volunteered to have his or her essay used in this fashion), and that we would assess their reaction to that information.

Participants were told that several essays of this sort had each been assigned a code by our experimental team, based upon how likely each essay author was to contract a sexually-transmitted disease. Codes ranged from 1 ("very little risk") to 7 ("extremely high risk"). Participants were told that they could select which essay they wished to read but that, because we wanted all the essays to be read by a certain number of participants, we could not guarantee that they would get their choice. The critical dependent measure was the risk extremity of "author" each subject chose. Participants in the no exposure condition were not exposed to any portion of the exposure manipulation.

Risk behavior essay. Participants in the exposure condition actually all received the same typed transcript of a risk behavior essay that was created by the experimenter (see Appendix D). This essay was clearly coded a "6" and described an individual (of the same sex as the participant) who engaged in behaviors that would put him or her at high risk for STDOTAs (having sex
without condoms with people who the person did not know very well). In those cases where participants chose an essay coded other than "6," the experimenter called attention to the discrepancy and explained that we had gathered all of the responses we needed to the essay they originally chose. In no case did a participant express disappointment, annoyance, or suspicion over this substitution, either during the course of the experiment or during the subsequent debriefing.

**Ratings of the essay author.** After reading the risk behavior essay, participants in the exposure condition rated the riskiness of the author's behavior compared to their own behavior and compared to that of the typical peer. These ratings were made on seven-point Likert scales (1 = "This person seems much less at risk..." to 7 = "This person seems much more at risk..."). They also rated how similar they felt to the author on the global dimensions of "personality" and "sexual behavior" by making slashes through two 140 mm lines anchored with "not at all" and "very." These questions concluded the exposure manipulation.
Post-Exposure Measures: Perceptions of Threat and Prevalence of Risky Sexual Behavior

Measures of perceived threat. All participants were then asked to estimate their likelihood of contracting an STDOTA in the next two years, how unpleasant it would be to actually have an STDOTA, and how personally concerned they were about catching a STDOTA. The format and wording of the questions (slash marks made on 140 mm lines) were identical to those used in the first assessment of threat in the risk consideration condition.

Perceptions of the vulnerability of the typical peer. Participants were also asked how likely they thought it was that the typical peer would contract a STDOTA within the next two years so that an index of the perception of unique invulnerability could be calculated (the peer vs. self difference). This estimate was also made in the form of a slash mark on a 140 mm line. Participants would show the perception of unique invulnerability to the extent that estimates for the typical peer exceeded those for the self.

Perceptions of the prevalence of risky sexual behavior. Finally, participants were asked how common they thought it was for people of their age and sex to engage in risky sexual behaviors (defined as "not using condoms" or "having sex with several partners"). This
question was answered by making a slash mark on a 140 mm line anchored with the terms "not at all" and "very."

Debriefing. All participants were told that the purpose of the research was to investigate people's reactions to considering their risk for a negative health outcome and to being exposed to information about someone else who engages in risky behaviors. The experimental manipulations that they did not experience were explained to participants in the no risk consideration and no exposure conditions. All participants were reassured that no risk behavior essays written by actual participants would ever be used in the experiment, and all participants in the risk consideration condition were offered the option of tearing up their essays before they left (none did).

Comparison Sample

Rationale

A key assumption of this study was that explicitly considering one's risk-increasing behaviors would induce a sense of threat. It was necessary to test the validity of this assumption by asking the questions that assessed level of threat (perceived vulnerability, perceived unpleasantness, and personal concern) of a sample of people who had not been instructed to consider their
risk-increasing behaviors, and who had not been exposed to any other experimental manipulations. The assumption (and the manipulation) would be validated to the extent that participants in the experimental risk consideration condition showed greater perceived vulnerability than did participants who had not explicitly considered their risk-increasing behaviors. It was hypothesized that perceptions of the unpleasantness of STDOTAs and concern about catching STDOTAs might actually be less among people who had considered their risk than among those who had not, as these defensive perceptions might serve to counteract some of the threat engendered by increased feelings of vulnerability.

Procedure

Participants

A total of 264 students from various psychology courses that offered class credit for experimental participation took part in the development of a "comparison sample." These participants filled out questionnaires in small groups of 2 to 10 persons in a non-laboratory setting, and they were not asked to consider or list their risk-increasing behaviors at any time (see Appendix E for complete materials).
Perceptions of Threat

These participants responded to questions that assessed their perceptions of the likelihood that they would catch a STDOTA in the next two years, of the unpleasantness of actually catching a STDOTA, and their personal concern about catching a STDOTA—the threat perceptions questions from the experiment.

Self-Esteem and Risk-Related Behavior Questions

They also filled out the Janis-Field Feelings of Inadequacy Scale and answered the same "objective" risk behavior questions that were asked of laboratory participants in the mass-testing screening sessions (numeric estimates of the frequency of sex, number of partners, and frequency of condom use, as well as "pattern" of sexual behavior, marital status, and prior infection with an STD).

Willingness to Participate

Finally, in an attempt to make this comparison sample as comparable as possible with the laboratory sample, all participants responded to the question: "If we were to conduct an experiment in the laboratory based on the information that you have given us in this questionnaire, for which you could get extra credit, would you be willing to participate in it?" Participants responded on a four-point scale on which "1" meant "definitely yes,"
"2" meant "probably yes," "3" meant "probably no," and "4" meant "definitely no."

Requirements for Inclusion in the Comparison Sample

In order to be included in the final comparison sample, participants had to meet the same criteria established for participants in the laboratory sample (e.g., being single, sexually active, less than 24 years old, never having had a STD, etc.). In addition, they had to respond with "definitely yes" or "probably yes" to the question that assessed willingness to participate in a hypothetical experiment based on the information in the questionnaire.

Final Comparison Sample

A total of 115 participants (55 male and 60 female) met these criteria. Of the remainder, 5 were not sufficiently sexually active, 13 had had an STD, 45 refused to answer the STD question, 4 were married, 35 failed to answer the marital status question, 10 were "probably" or "definitely" not willing to participate in a hypothetical experiment based on their answers to the questionnaire, 15 declined to answer the "willingness" question, and 22 were ineligible for other reasons (age or median Janis-Field score). The median score on the Janis-Field scale for the whole group was 50, the same as
in the mass-testing sessions from which the laboratory participants were drawn, so the categories of high and low self-esteem were comparable to those established for the laboratory (n = 58 high self-esteem and n = 57 low self-esteem).
RESULTS

Characteristics of the Experimental Sample

**Self-Esteem and Age**

**Self-Esteem**

Experimental participants were divided into high and low self-esteem (SE) groups on the basis of scores on the Janis-Field Feelings of Inadequacy scale administered at mass-testing. Participants in the low SE group had significantly higher scores on this index ($M = 59.54; n = 74$) than did participants in the high SE group ($M = 39.83; n = 86; p < .0001$). There were no significant differences across any of the experimental conditions in self-esteem score.

**Age**

The average participant age in this sample was 19.4 years, and there were no significant differences across the experimental conditions for this characteristic.

**Risk-Relevant Behaviors**

"Pattern" of Sexual Behaviors

The mean on the mass-testing screening question that assessed "pattern" of sexual behavior was 1.73 for the laboratory sample as a whole. A response of "1" corresponded to the statement "I am completely monogamous -- I only have sex with one person, in a long-term, committed relationship," a response of "2" corresponded
to the statement "I only have sex with one person during a period of time, but I don't tend to stay with one person for more than a few months or a year at most," and a response of 3 corresponded to the statement "I have sex with more than one person during a period of time, but they are people I know and have some form of relationship with." There were no significant differences in "pattern" across the experimental conditions of risk consideration or exposure or across the variable of self-esteem, or any interactions of these variables (all ps > .18).

**Number of Sexual Partners**

The mean number of partners reported by participants in the laboratory sample was 4.81, and there were no differences across any of the manipulated variables or self-esteem on this measure (all ps > .21).

**Frequency of Sexual Intercourse**

The mean frequency of intercourse reported by participants in the laboratory sample was 4.24 on a scale on which a "4" corresponded to "at least once a month, but not as often as once a week" and a "5" corresponded to "at least once a week, but not more than three times a week." There were no differences across the manipulated variables or self-esteem on frequency of intercourse (all
Frequency of Condom Use

The average reported frequency of condom use among the participants in this sample was 3.68 on a scale where a "3" corresponded to "about half of the time (2 out of every 4 times)" and a "4" corresponded to "about 25% of the time (1 out of every 4 times)." There were no differences across the manipulated variables or self-esteem on this measure (all ps > .17).

Efficacy of Contraception Usually Used

An ANOVA on the efficacy of participants' contraceptive behavior showed a significant Risk Consideration x Exposure x Self-Esteem interaction ($F(1,152) = 4.32$, $p = .04$), but comparisons across cells revealed no significant differences and no trends that would systematically influence the predicted results.

Manipulation Checks

Cooperation with Instructions

Instructions

Experimental participants in the risk consideration condition were instructed to think about and list "the things you do that make it possible that you could catch a sexually transmitted disease other than AIDS...write down anything you can think of that you do that might INCREASE the chances that you would catch such a
disease." No mention was made of considering or listing risk-reducing behaviors.

**Participant Behavior**

When the reasons listed by the participants were analyzed for content by two independent raters, however (inter-rater reliability = .96), it was found that 41% of the males and 45% of the females (a total of 33 participants) listed as many or more risk-reducing as risk-increasing behaviors. Whereas those participants who appear to have followed the instructions listed an average of 2.64 risk-increasing behaviors, these 33 people listed an average of only .94 of such behaviors (p < .0001). By contrast, the 33 people who did not follow directions listed an average of 2.4 risk-decreasing behaviors, whereas those who followed the instructions listed an average of .20 behaviors of this type (p < .0001).

Analyses comparing the two groups showed that the 47 participants who listed more risk-increasing than risk-reducing behaviors reported significantly more promiscuous "patterns" of sexual behavior in mass-testing (M = 2.04) than did the 33 who failed to follow instructions (M = 1.42; F(1,76) = 8.54, p = .005). These 47 participants also tended to report more sexual
partners and less frequent condom use than did the other 33 risk consideration participants, although these differences were not significant (ps > .12). There were no differences between the two groups in SE (p > .39) or in gender composition (chi-square analysis, p > .65).

These data suggest that some participants may have had more risky behaviors on which to base their essays than did others, and these "riskier" participants may have therefore experienced more "threat" associated with risk consideration. In addition, "pattern" of sexual behavior was significantly associated with many of the dependent measures in the study, suggesting that it influenced responses across participants. All analyses in this experiment were therefore conducted as analyses of covariance (ANCOVAs), with participants' "pattern" of sexual behavior used as a covariate. Chow tests (Keppel, 1987) showed no evidence of heterogeneity of slopes across the dependent measures, supporting the selection of this variable as a covariate. All means presented have been adjusted for the effects of this covariate.

**Threat Induction: Risk Consideration vs. "Comparison Sample"**

*Purpose*

In order to assess the extent to which consideration of risk induced feelings of threat, Sample (risk
consideration vs. "comparison sample") x SE (high vs. low self-esteem) ANCOVAs compared the responses given on the "threat" questions by participants in the experimental risk consideration condition with those given by the 115 participants in the separate, non-experimental comparison sample who were not asked to consider their risk-increasing behaviors. These two samples did not differ significantly on number of sexual partners, frequency of sex, or frequency of condom use (all ps > .45). A difference was found on "pattern" of sexual behavior, however, such that participants in the comparison sample were somewhat more monogamous (M = 1.54) than were participants in the experimental risk consideration condition (M = 1.79; p = .03). Therefore, all analyses comparing the two samples were performed as ANCOVAs covarying the effect of "pattern" of sexual behavior.

Perceptions of Threat

Perceived vulnerability. Consistent with the stated assumptions, risk consideration participants reported feeling significantly more vulnerable (M = 32.22) than did comparison sample participants (M = 23.54; F(1,189) = 6.29, p = .02; see Table 1).

Perceptions of unpleasantness. There was no difference between the two samples on perceptions of the
### Table 1

**Mean Risk Perception as a Function of Prior Risk Consideration**

<table>
<thead>
<tr>
<th></th>
<th>Risk Consideration</th>
<th>Comparison Sample</th>
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<tbody>
<tr>
<td><strong>Sample (n=80)</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Own vulnerability to STDOTAs</td>
<td>32.22&lt;sup&gt;a&lt;/sup&gt; (26.42)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>23.64&lt;sup&gt;b&lt;/sup&gt; (24.21)&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Perceived unpleasantness of STDOTAs</td>
<td>126.41&lt;sup&gt;a&lt;/sup&gt; (16.23)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>126.52&lt;sup&gt;a&lt;/sup&gt; (14.90)&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
<tr>
<td>Personal concern about STDOTAs</td>
<td>71.75&lt;sup&gt;a&lt;/sup&gt; (41.63)&lt;sup&gt;a&lt;/sup&gt;</td>
<td>89.23&lt;sup&gt;b&lt;/sup&gt; (43.76)&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

**Note.** Scales all ranged from 0 to 140 mm; higher numbers indicate more vulnerability, unpleasantness, and concern. Means within a row not sharing a subscript differ at p < .05 according to t-tests. Standard deviations for each cell are indicated in parentheses.
unpleasantness of actually catching a STDOTA (p > .95). These results suggest that perceptions of unpleasantness were not affected by risk consideration, and that results involving the perceived vulnerability-times-unpleasantness index will be largely due to the effects of perceived vulnerability. Therefore, no further results concerning this index will be reported.

Personal concern. Risk consideration participants reported feeling significantly less "personal concern" about catching STDOTAs than did participants in the comparison sample (M = 71.75 vs. 89.23; F(1,189) = 7.89, p = .005). This difference disappeared when the 47 participants in the risk consideration condition who listed more risk-increasing than -decreasing behaviors were examined separately (M = 83.11, p > .80), and it was exacerbated when the remaining 33 risk consideration participants (M = 56.31) were compared with the comparison sample (t(142) = 12.88, p = .001). The effect with the full experimental sample thus appears to be due to the fact that the 33 people who listed more risk-decreasing than risk-increasing behaviors reported substantially less concern that did people in the comparison sample (who had not had the opportunity to focus on their risk-reducing activities.) Among the 47
participants who followed the experimental directions to focus on risk-increasing behaviors, considering risk had no impact on their level of concern about contracting a STDOTA, as evidenced by the lack of a significant difference between these participants' reported concern and that of the people in the comparison sample.  

Summary of Risk Consideration Manipulation

The instructions to focus on factors that would increase their risk for STDOTAs were not heeded by 33 of the 80 participants in the risk consideration condition. This finding calls into question the ability of the manipulation to inculcate a sufficient level of threat in the risk consideration condition to differentiate it from the experimental "no risk consideration" group on subsequent measures. The finding that participants in the risk consideration condition felt more vulnerable than those in the comparison sample (who did not consider their risk) suggests that the former individuals were threatened to some extent, but it does not remove concern about the efficacy of the manipulation, especially in light of the significant difference in the opposite direction on the measure of personal concern. This issue and its ramifications for the pattern of obtained results will be treated further in the discussion section.
Experimental Analyses I: Consideration of Risk

RISK-RELATED BEHAVIORS: EFFECTS OF RISK CONSIDERATION
AND OF SELF-ESTEEM

Overview

Questions. All participants rated both themselves and the "typical person of [their] age and sex" (the typical peer) on their subjective perceptions of four risk-related behaviors: number of sexual partners, frequency of sexual intercourse, regularity of condom use, and carefulness in preventing unplanned pregnancy. Participants in the risk consideration condition responded to these measures after considering their risk and after responding to the items that assessed perceived threat. For members of the no risk consideration condition, this was the first task of the experiment.

Hypotheses. These questions were asked to ascertain the extent to which people would attempt to put "psychological distance" between themselves and a social comparison target, the "typical peer." It was hypothesized that people with high SE who had considered their risk would show the greatest differences in their estimates for self and other, ascribing riskier sexual behaviors to their peers than to themselves. It was tentatively hypothesized that persons with high SE who had considered their risk would create this distance by
derogating the risk behavior of their peers on behaviors related to the contraction of STDs and by enhancing their own standing on a similar but potentially separate dimension, carefulness of avoiding unplanned pregnancy.

**Analyses.** Risk Consideration x Self-Esteem (SE) ANCOVAs (using "pattern" of sexual behavior as a covariate) were conducted separately on estimates for the two targets (self and typical peer) and then on both measures together using Target (typical peer vs. self) as a repeated measure on each of the four indexes. Where differences between these targets are referenced, they were calculated such that higher numbers reflect differences in favor of the self (peer - self differences for number of partners and frequency of intercourse and self - peer differences for frequency of condom use and carefulness in preventing unplanned pregnancy.)

**Number of Partners**

*Separate self and other estimates.* Risk Consideration x SE ANCOVAs on perceptions of one's own and the typical peer's number of sexual partners revealed only a main effect of SE on perceptions of peers' partners ($F(1,155) = 4.80, p = .04$). Persons with low SE perceived their peers to have had more sexual partners (scale $M = 63.16$) than did persons with high SE (scale $M$
Repeated measures. A significant main effect of target in the repeated measures ANCOVA showed that participants perceived the typical peer to have had more sexual partners than they had ($M = 59.16$ vs. $36.76$ on the $140$ mm scale; $F(1,155) = 96.04$, $p = .001$). A SE x Target interaction ($F(1,155) = 10.58$, $p = .002$) indicated that, although the difference between the two estimates was significant across all cells, it was more pronounced among low SE than high SE participants ($M$ difference $= 30.36$ vs. $15.47$; $t(155) = 3.25$, $p = .002$; see Table 2).

Number of partners as an indication of attractiveness. Number of partners was included as an index of risky behavior, and as such was conceived of as an attribute on which participants could distance themselves from the typical peer in a way that would make them seem less vulnerable to STDOTAs. It appears that this factor may be too strongly associated with young people's perceptions of their own self-worth to be considered in this fashion, however. Not surprisingly, correlational analyses suggested that number of partners was viewed as a positive trait. Participants' ratings of their own "attractiveness" on a subsequent questionnaire correlated $+.18$ ($N = 160$; $p = .03$) with their ratings of their own number of partners and $-.21$ ($N = 160$; $p = .009$).
Table 2

Participants' Perceptions of the Number of Partners of the Self and of the Typical Peer as a Function of Self-Esteem

<table>
<thead>
<tr>
<th></th>
<th>High SE (n=86)</th>
<th>Low SE (n=74)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Peer</td>
<td>55.74&lt;sup&gt;a&lt;/sup&gt;</td>
<td>63.16&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
<tr>
<td>Self</td>
<td>40.27&lt;sup&gt;c&lt;/sup&gt;</td>
<td>32.80&lt;sup&gt;c&lt;/sup&gt;</td>
</tr>
<tr>
<td>Difference</td>
<td>15.47&lt;sup&gt;a&lt;/sup&gt;</td>
<td>30.36&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

Note. Scales range from 0 to 140 mm ("very few" to "very many"). Means not sharing a subscript differ from like means (cell means or difference scores) at p < .05 according to t-tests.
with the peer - self difference on number of partners. This item, therefore, proved to be a somewhat invalid measure of distancing in the sense that was intended. People felt less attractive the more that they perceived that others "outdid" them in number of partners; therefore, any boost to their self-image that would be derived from feeling less at risk as a result of fewer partners would likely be attenuated by the concomitant reduction in their perceived attractiveness.

**Frequency of Sexual Intercourse**

*Separate self and other estimates.* As was the case with estimates for number of partners, the only significant result from separate Risk Consideration x SE ANCOVAs on the frequency of sex for self and the typical peer was a main effect of SE on ratings of the typical peer. Persons with low SE perceived that their peers were having sex more frequently (scale $M = 94.87$) than did persons with high SE (scale $M = 87.48$; $F(1,155) = 3.95$, $p = .05$).

*Repeated measures.* Participants perceived their own frequency of intercourse to be significantly less than that of the typical peer (scale $M = 75.44$ vs $90.90$; $F(1,155) = 13.32$, $p = .001$), and this effect was qualified by an interaction with SE ($F(1,155) = 6.80$, $p = .02$; see Table 3). Low SE participants perceived a
Table 3
Perceptions of the Frequency of Intercourse for the Self and for the Typical Peer

<table>
<thead>
<tr>
<th></th>
<th>High SE</th>
<th>Low SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Target</td>
<td>n=86</td>
<td>n=74</td>
</tr>
<tr>
<td>Peer</td>
<td>87.48&lt;sub&gt;a&lt;/sub&gt;</td>
<td>94.87&lt;sub&gt;b&lt;/sub&gt;</td>
</tr>
<tr>
<td>Self</td>
<td>78.24&lt;sub&gt;c&lt;/sub&gt;</td>
<td>72.21&lt;sub&gt;c&lt;/sub&gt;</td>
</tr>
<tr>
<td>Difference</td>
<td>9.24&lt;sub&gt;a&lt;/sub&gt;</td>
<td>22.66&lt;sub&gt;b&lt;/sub&gt;</td>
</tr>
</tbody>
</table>

Note. Scales range from 0 to 140 mm ("very rarely" to "very often"). Means not sharing a subscript differ from like means (cell means or difference scores) at p < .001 according to t-tests.
greater peer - self difference ($M$ difference $= 22.67$) than did high SE participants ($M$ difference $= 9.24$, $t(155) = 2.61$, $p = .02$). There were no other significant effects.

**Frequency of intercourse and attractiveness.** As was the case with number of partners, there is some question as to the appropriateness of considering frequency of intercourse to be a trait on which people will psychologically distance in response to risk consideration. Although high frequency of intercourse is certainly a risk-increasing factor, and as such could have served as a vehicle for participants to distance in a "safe" way from their peers, males' ($n = 78$) ratings of their own attractiveness were positively associated with their reports of self frequency ($r = .32$, $p = .005$) and negatively associated with peer - self frequency differences ($r = -23$, $p = .04$). Although these correlations were not significant among females ($rs = .18$ and .04, $ps > .11$ and .70, respectively), these findings suggest that frequency of intercourse is perceived to be a positive trait and one on which self-enhancing distancing is not likely to occur in the way that was hypothesized.

Factor analysis (varimax rotation) of peer - self difference scores for the four risk behaviors supported
the idea that participants perceived number of partners and frequency of intercourse differently from the other two behaviors, as they loaded onto one factor, while condom use and contraceptive carefulness loaded onto a separate factor. Therefore, it appears that number of partners and frequency of intercourse are not suitable items for assessing threat-induced distancing.

**Frequency of Condom Use**

*Separate self and other estimates.* Separate ANCOVAs conducted on participants' perceptions of regularity of condom use for themselves and for the typical peer revealed only a marginally significant effect of risk consideration on use by the typical peer. Persons who considered their risk for STDOTAs perceived their peers to use condoms somewhat less frequently (scale $M = 71.74$) than did participants in the no risk consideration condition (scale $M = 79.28$; $F(1,155) = 3.25$, $p = .07$).

*Repeated measures.* Contrary to predictions, participants perceived their peers' condom use to be somewhat more frequent (less risky) than their own (scale $M = 75.59$ (peers) vs. $65.18$ (self; $F(1,155) = 3.29$, $p = .08$). A marginally significant $SE$ by Target interaction ($F(1,155) = 3.05$, $p = .09$) qualified this effect (see Table 6). Although participants with high $SE$
saw themselves as using condoms less than the typical peer (M difference = 16.53; \( t(156) = 2.27, p = .03 \)), low SE participants perceived no such difference (M difference = 3.29, \( t(155) = .42, p > .60 \)). No other effects approached significance, including the Risk Consideration x Target interaction (\( p > .90 \)). This finding suggests that the prior observation of a main effect of risk consideration on peers' condom use should not be considered an unqualified indication of derogation; because peers were perceived to be more careful than participants considered themselves to be, some attenuation of this perception does not truly qualify as derogation or distancing, and the pattern of results was similar with the risk subset. Because of the unusual nature of this finding, the self-peer differences in perceived condom use of the 33 participants in the risk consideration condition who listed as many or more risk-decreasing than -increasing behaviors were also examined. It seemed possible that these less objectively risky people might show a reversal of this trend. Among these participants, however, as among the sample as a whole, persons with high SE perceived that their peers' condom use (M = 79.89) exceeded their own (M = 69.28) although this difference was not significant (\( t(31) = 1.05, p > .30 \)).
This finding deviates from predictions and is especially unusual in light of the fact that, among persons with high SE, self-peer differences in perceived condom use were positively associated with self-peer differences in perceptions of the personality traits "successful," "realistic," and "sensible" (all ps < .10)—all fairly favorable traits as was evidenced by their positive association with perceived attractiveness (all ps < .10). Why persons with high SE credited their peers with more condom use than they attributed to themselves is therefore unclear.

**Unplanned Pregnancy Prevention**

*Separate self and other estimates.* There were no significant main effects or interaction terms involving risk consideration for estimates of carefulness of pregnancy prevention for either the self or for the typical peer (all ps > .10). The results of the repeated measures analysis led to the exploration of simple interaction and simple main effects, however, that will be discussed in the following section.

*Repeated measures.* In contrast to the findings on condom use, participants perceived their own efforts to avoid unplanned pregnancy (scale \( M = 107.62 \)) to be superior to those of the typical peer (scale \( M = 75.37 \));
Unlike the estimates provided for number of partners and frequency of intercourse, participants clearly viewed failure to take steps to prevent unplanned pregnancy in a negative way. The measure was significantly correlated with participants' overall ratings of themselves (obtained in a subsequent questionnaire); the more careful participants perceived themselves to be about avoiding unplanned pregnancy, the more positive were their self-rating indexes ($r(160) = .30, p = .001$).

A marginally significant Risk Consideration x Target interaction on carefulness of pregnancy prevention ($F(1,155) = 3.45, p = .07$; see Table 4) suggested that participants who had been asked to consider their risk perceived a greater difference between themselves and the typical peer than did participants in the no risk consideration condition. This finding is consistent with the hypothesis that people who considered their risk would attempt to "psychologically distance" from a social comparison target. Simple main effects tests using the within-subjects error term in the denominator (Winer, 1971) demonstrated that the self-peer difference among participants in the risk consideration condition ($M$ difference = 37.48) was significantly greater than this difference among no risk consideration participants ($M$
difference = 27.35; \( t(155) = 2.64, \ p = .01 \).

The disparity in these difference scores across risk consideration appeared to be due more to a difference in estimates for self than for the typical peer. Separate ANCOVAs conducted on estimates for the self and for the typical peer suggested that although self estimates of carefulness tended to be somewhat higher among participants who had considered their risk (scale \( M = 111.43 \)) than among those who had not (\( M = 103.52; F(155) = 2.73, \ p < .11 \)), perceptions of peers' efforts to prevent unplanned pregnancy decreased non-significantly in response to threat (\( p > .60 \)).

The predicted Threat x SE x Target interaction on the repeated measures ANCOVA was not significant (\( p > .35 \)). Inspection of the means, however, revealed that the predicted tendency for the self - peer difference to be greater among risk consideration than no risk consideration participants held only for participants with high SE. Among high SE persons, the self - peer difference was indeed greater among risk consideration participants (\( M \) self - peer difference = 37.44) than among no risk consideration participants (\( M \) difference = 22.48; \( t(155) = 2.86, \ p = .005 \); see Table 4). The self - peer difference did not vary significantly as a function
Table 4

Perceptions of the Carefulness of Pregnancy Prevention for the Self and the Typical Peer

<table>
<thead>
<tr>
<th>Group</th>
<th>High SE</th>
<th>Low SE</th>
<th>Overall</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(n=43)</td>
<td>(n=37)</td>
<td>(n=80)</td>
</tr>
<tr>
<td>Risk Consideration</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self</td>
<td>116.78&lt;sub&gt;a&lt;/sub&gt; (24.63)</td>
<td>106.08&lt;sub&gt;ab&lt;/sub&gt; (32.60)</td>
<td>111.43&lt;sub&gt;a&lt;/sub&gt; (28.90)</td>
</tr>
<tr>
<td>Peer</td>
<td>79.34&lt;sub&gt;c&lt;/sub&gt; (28.79)</td>
<td>68.56&lt;sub&gt;c&lt;/sub&gt; (28.73)</td>
<td>73.95&lt;sub&gt;b&lt;/sub&gt; (29.09)</td>
</tr>
<tr>
<td>Difference</td>
<td>37.44&lt;sub&gt;a&lt;/sub&gt;</td>
<td>37.52&lt;sub&gt;a&lt;/sub&gt;</td>
<td>37.48&lt;sub&gt;a&lt;/sub&gt;</td>
</tr>
<tr>
<td>No Risk Consideration</td>
<td>(n=43)</td>
<td>(n=37)</td>
<td>(n=80)</td>
</tr>
<tr>
<td>Self</td>
<td>101.55&lt;sub&gt;b&lt;/sub&gt; (34.48)</td>
<td>105.49&lt;sub&gt;b&lt;/sub&gt; (29.36)</td>
<td>103.52&lt;sub&gt;a&lt;/sub&gt; (32.05)</td>
</tr>
<tr>
<td>Peer</td>
<td>79.07&lt;sub&gt;c&lt;/sub&gt; (25.42)</td>
<td>73.26&lt;sub&gt;c&lt;/sub&gt; (28.62)</td>
<td>76.17&lt;sub&gt;b&lt;/sub&gt; (26.93)</td>
</tr>
<tr>
<td>Difference</td>
<td>22.48&lt;sub&gt;b&lt;/sub&gt;</td>
<td>32.23&lt;sub&gt;ab&lt;/sub&gt;</td>
<td>27.35&lt;sub&gt;b&lt;/sub&gt;</td>
</tr>
</tbody>
</table>

Note. Scales range from 0 to 140 mm ("extremely careless" to "extremely careful"). Means with different subscripts differ from like means at p < .05 according to t-tests. Standard deviations appear in parentheses.
of risk consideration among participants with low SE ($t(155) = .94, p > .34$). Separate inspection of the means for self and other with simple main effects tests showed further support for an interpretation of compensatory self-enhancement. Among people with high SE, those who considered their risk evaluated their own pregnancy prevention efforts significantly more positively (scale $M = 116.78$) than did those who did not consider their risk (scale $M = 101.55$; $t(155) = 2.35, p = .03$). No such effect of risk consideration was seen for self ratings among people with low SE ($p > .95$) or for ratings of the typical peer ($ps > .95$ and $.50$ for persons with high and low SE, respectively).

Although this pattern is broadly consistent with the underlying expectations of this study (high but not low SE persons will respond to risk consideration with a psychological defense that separates them from others), the lack of a significant interaction precludes drawing definitive support from these results. In addition, although there was a trend for persons with high SE who considered their risk to rate their efforts at pregnancy prevention more highly than did persons with low SE who considered their risk, this trend was not significant ($p = .12$). However, the presence of higher ratings for self carefulness among persons with high SE who have
considered their risk than among persons with high SE who have not considered their risk, and the absence of such an effect of risk consideration among persons with low SE, is consistent with the hypothesis that persons with high SE would show compensatory self-enhancement in response to threat on a dimension not directly related to the threat. In this case, people with high SE who considered their risk appear to have simultaneously accepted their relative lack of condom use and enhanced their perceptions of their contraceptive behavior.

**Summary of Risk-Related Behaviors**

In contrast to predictions, participants evaluated their own behavior as somewhat **riskier** than that of the typical peer on one behavior, frequency of condom use. This difference was particularly pronounced for participants with high SE. Risk consideration tended to cause participants to lower their estimates of their peers' condom use, but because the Risk Consideration x Target interaction did not approach significance, and especially because participants perceived their peers to be more frequent than they in their condom use, this finding by itself does not warrant an interpretation of derogation or distancing.

On the other three risk-related behavior questions,
participants perceived that their peers had more partners than they, had sex more frequently, and were less careful about preventing unplanned pregnancy. These three findings could all be interpreted as indicating that participants perceived their peers to be riskier than they in their sexual behaviors (derogation), but there is cause to question whether this is the case for number of partners and frequency of intercourse. Both of these items were positively associated with participants' perceptions of their own attractiveness, and in both cases the peer – self differences were particularly pronounced among participants with low rather than high self-esteem.

There is evidence, however, to suggest that participants viewed the failure to prevent unplanned pregnancy negatively, as carefulness in avoiding this outcome was positively associated with overall self personality ratings. Perhaps not surprisingly, the only item to show a pattern of results even broadly consistent with predictions was carefulness of unplanned pregnancy prevention. Although the predicted three-way interaction was not significant, simple main effects tests showed that high SE participants perceived greater self – peer differences in the risk consideration condition than in the no risk consideration condition. No effect of risk
consideration was seen on the self-peer differences among participants with low SE.

Furthermore, the locus of this effect can be traced to differences in perceptions of self among persons with high SE as a function of risk consideration. Participants with high SE who considered their risk rated their own contraceptive behavior as significantly more careful than did persons with high SE who did not consider their risk. No such pattern was seen among persons with low SE. These findings are consistent with the suggestion that persons with high SE who have been threatened on a given dimension will take advantage of an opportunity to enhance themselves on another dimension. Because people could be very effective contraceptors (i.e., by using the birth control pill) and simultaneously be very poor at avoiding STDOTAs (by not using condoms), enhancing on this dimension may be viewed as a form of compensatory self-enhancement (cf. Baumeister, 1982).

Personality Ratings: Effects of Risk Consideration and Self-Esteem

Rationale

It was hypothesized that persons with high SE who had considered their risk would respond to the threat or
discomfort evoked by such consideration by psychologically distancing from a comparison target, the typical peer, on personality dimensions, dimensions that were not directly related to their risk for STDOTAs. This distancing could take the form of derogation of the typical peer, of enhancement of self ratings, or both. Because participants' evaluations were anonymous, they might feel free to derogate the typical peer; they could also take the more acceptable route of increasing their perceptions of themselves and thus avoid the ambivalence associated with derogation of others. No effects on evaluation of self or of the typical peer were predicted as a function of risk consideration for persons with low SE.

Thirteen-Item Index

Of the 14 adjectives used to assess participants' perceptions of their own and the typical peer's personalities, one ("insecure") was discarded due to its extremely low item-total correlation with the scale formed by the other 13 ($r_s = .007$ and $.096$ for self and typical peer). The final reliability for the scale composed of the remaining 13 items was alpha = .80 for self and .87 for the typical peer. The scale ranged from 0 (least favorable) to 140 (most favorable). Where difference scores are referenced, they were created by
subtracting the typical peer's score from the score for the self (a self–peer difference); higher numbers reflect an evaluation in favor of the self.

**Effects of Risk Consideration and Self-Esteem**

**Self-esteem and target.** A Risk Consideration x SE x Target repeated measures ANCOVA compared participants' evaluations of themselves and the typical peer on this index. Participants rated themselves significantly more positively ($M = 100.86$) than they rated the typical peer ($M = 78.96$; $F(1,155) = 404.27$, $p < .0001$). This effect was qualified by a SE x Target interaction ($F(1,155) = 4.67$, $p = .04$; see Table 5). The self–other difference was greater for high than low SE participants ($t(155) = 2.17$, $p = .04$).

**Risk consideration and self-esteem.** A marginally significant Risk Consideration x SE interaction ($F(1,155) = 3.34$, $p = .07$) suggested that ratings for both self and for the typical peer were higher among high SE, risk consideration participants than among any others. Examination of separate Risk Consideration x SE ANCOVAs for self and typical peer (see Table 5) confirmed that high SE participants who were asked to consider their risk rated themselves significantly more favorably than did participants in any other cell (all $t$s(155) > 2.50,
Table 5

**Evaluations of Self and the Typical Peer on the Personality Trait Index**

<table>
<thead>
<tr>
<th>Group</th>
<th>High SE</th>
<th>Low SE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Risk Consideration</strong></td>
<td>(n=43)</td>
<td>(n=37)</td>
</tr>
<tr>
<td>Self</td>
<td>106.35&lt;sup&gt;a&lt;/sup&gt; (8.29)</td>
<td>97.43&lt;sup&gt;b&lt;/sup&gt; (12.77)</td>
</tr>
<tr>
<td>Peer</td>
<td>80.28&lt;sup&gt;c&lt;/sup&gt; (16.39)</td>
<td>78.28&lt;sup&gt;c&lt;/sup&gt; (11.52)</td>
</tr>
<tr>
<td><strong>Difference</strong></td>
<td>26.07&lt;sup&gt;a&lt;/sup&gt;</td>
<td>19.15&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

| **No Risk Consideration** | (n=43) | (n=37) |
| Self                     | 99.49<sup>b</sup> (15.16) | 99.49<sup>b</sup> (11.32) |
| Peer                     | 77.46<sup>c</sup> (14.10) | 79.85<sup>c</sup> (15.31) |
| **Difference**           | 22.03<sub>ab</sub> | 19.64<sup>b</sup> |

**Note.** Scales range from 0 to 140 mm (negative to positive evaluations). Means with different subscripts differ from like means at p < .05 according to t-tests. Standard deviations appear in parentheses.
all ps < .05). This pattern was not observed for evaluations of the typical peer (all ts < .90, all ps > .35).

Risk consideration, self-esteem, and target. Although the three-way Risk Consideration by SE by Target interaction was not significant (p > .25), comparison of the self-other differences across the four cells showed that high SE participants in the risk consideration condition exhibited significantly more self-other difference in favor of the self (M difference = 26.07) than did low SE participants who considered their risk (M difference = 19.15, t(155) = 3.22, p = .002) and than low SE participants who did not consider their risk (M difference = 19.64, t(155) = 2.99, p = .004). High SE participants in the risk consideration condition showed marginally more self-enhancement than did high SE participants in the no risk consideration condition (M difference = 22.03, t(155) = 1.95, p = .06; see Table 5). Thus, the results support the idea that persons with high SE will respond to risk consideration by engaging in compensatory self-enhancement, although they do not seem to derogate a social comparison target.

Gender Differences in Personality Trait Evaluation

Based on prior research in social comparison (Gibbons & Boney McCoy, 1991), analyses were conducted to
determine whether males and females might differ in their preferred styles of active downward comparison (DC). Gibbons and Boney McCoy (1991) suggested that females might show selective distancing on social or interpersonal traits and males on competence/ability dimensions.

"Social" and "competence" subscales. Selected items from the personality index were assigned to "social" or "competence" subscales on the basis of testing in a separate sample of undergraduate students. Participants in this separate sample (n = 245) were asked to rate a series of traits on a 140 mm line scale similar to those used in this experiment. Each line was anchored with the term "social" at the far left and with the term "competence/ability" at the far right. The midpoint on this scale was 70 mm; traits receiving a mean rating of less than 70 were on the "social" side of the scale. Traits receiving a rating of more than 70 were on the "competence/ability" side.

Four items from the present study were rated as "social" by participants in the separate sample: fair-minded, friendly, attractive, and patient. These four items received an average rating of 49.75 in the separate sample, putting them well on the "social" side of the scale. In the present study, a subscale composed of
these four items had a reliability of alpha = .55 for self ratings and alpha = .60 for the typical peer. There were also four items from this study that were rated on the "competence/ability" side of the scale in the separate sample. These items included: capable, successful, intelligent, and hardworking. These items had an average rating of 94.86 in the separate sample, suggesting that they were clearly identified with the "competence/ability" dimension. In the present study, a subscale composed of these four items had a reliability of alpha = .72 for both self and typical peer ratings.

Separate analyses for females and males. Male and female participants reported significantly different "patterns" of sexual behavior in mass-testing (males' M = 1.88, females' M = 1.57; F(1,158) = 4.81, p = .04). Because this variable is strongly associated with the risk for STDOTAs, and because it was the variable that most clearly differentiated participants for whom the risk consideration manipulation appeared to have been successful from those for whom it did not, it would be a necessary covariate in any analyses involving participant gender. Unfortunately, this variable displayed heterogeneity of slopes with regard to the interaction between risk consideration and gender, and so it could not be appropriately included in an analysis of
covariance (Cohen & Cohen, 1983). Separate Risk Consideration x SE x Target x Dimension (Social vs. Competence) repeated measures ANCOVAs were therefore conducted for males and females on the personality subscales.

Female participants. Among female participants, the expected main effect of target was found such that all participants rated themselves more positively than they rated the typical peer ($F(1,77) = 22.56$, $p = .001$). This main effect was qualified by a Target x Dimension interaction ($F(1,77) = 8.06$, $p = .007$; see Table 6). Female participants showed greater self–peer differences for the social ($M$ difference $= 19.38$) than for the competence subscale ($M$ difference $= 14.96$; $t(78) = 3.01$, $p = .004$). The anticipated four-way interaction was not significant ($p > .40$).

Male participants. Males also provided self ratings that were significantly higher than the ratings they accorded the typical peer ($F(1,73) = 45.46$, $p = .001$). This main effect was qualified by a SE x Target x Dimension interaction ($F(1,73) = 5.35$, $p = .03$; see Table 7). Among males, the greatest self–peer difference was shown among high SE participants on the competence subscale ($M$ difference $= 23.82$). This difference was
Table 6
Female Participants' Evaluations of the Self and the Typical Peer on the "Social" and "Competence" Subscales of the Personality Trait Index

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Social</th>
<th>Competence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self</td>
<td>99.44&lt;sub&gt;a&lt;/sub&gt;</td>
<td>101.52&lt;sub&gt;a&lt;/sub&gt;</td>
</tr>
<tr>
<td>Peer</td>
<td>80.06&lt;sub&gt;b&lt;/sub&gt;</td>
<td>86.56&lt;sub&gt;c&lt;/sub&gt;</td>
</tr>
<tr>
<td>Difference</td>
<td>19.38&lt;sub&gt;a&lt;/sub&gt;</td>
<td>14.96&lt;sub&gt;b&lt;/sub&gt;</td>
</tr>
</tbody>
</table>

Note.  <sup>a</sup> n = 82. Means not sharing a subscript differ at p < .005 according to t-tests.
### Table 7

**Male Participants' Evaluations of the Self and the Typical Peer on the "Social" and "Competence" Subscales of the Personality Trait Index as a Function of Self-Esteem**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Social High SE</th>
<th>Competence High SE</th>
<th>Social Low SE</th>
<th>Competence Low SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self</td>
<td>95.42&lt;sub&gt;a&lt;/sub&gt;</td>
<td>107.43&lt;sub&gt;b&lt;/sub&gt;</td>
<td>92.73&lt;sub&gt;a&lt;/sub&gt;</td>
<td>99.95&lt;sub&gt;a&lt;/sub&gt;</td>
</tr>
<tr>
<td>Peer</td>
<td>77.79&lt;sub&gt;c&lt;/sub&gt;</td>
<td>83.59&lt;sub&gt;d&lt;/sub&gt;</td>
<td>76.05&lt;sub&gt;c&lt;/sub&gt;</td>
<td>85.83&lt;sub&gt;d&lt;/sub&gt;</td>
</tr>
</tbody>
</table>

**Diff.**

<table>
<thead>
<tr>
<th>Social</th>
<th>Competence</th>
</tr>
</thead>
<tbody>
<tr>
<td>17.63&lt;sub&gt;a&lt;/sub&gt;</td>
<td>23.84&lt;sub&gt;b&lt;/sub&gt;</td>
</tr>
<tr>
<td>16.68&lt;sub&gt;a&lt;/sub&gt;</td>
<td>14.12&lt;sub&gt;a&lt;/sub&gt;</td>
</tr>
</tbody>
</table>

**Note.**  
<sub>a</sub> n = 78. Means not sharing a subscript differ from like means (cell means or difference scores) at p < .01 according to t-tests.
significantly greater than the differences shown by high SE males on the social dimension ($M = 17.55$) or by low SE males on either the competence ($M = 14.14$) or social dimensions ($M = 16.75$; all $ps = .002$). The other three self–peer differences were not significantly different from one another (all $ps > .10$). The expected four-way interaction was not significant ($p > .90$).

**Summary of Personality Traits**

*Effects of risk consideration, self-esteem, and target.* All participants gave much more favorable personality ratings to themselves than to the typical peer. In support of the hypothesized Risk Consideration x SE interaction, participants with high SE who considered their risk displayed a tendency toward greater self–peer differences did other participants. Inspection of the means showed that high SE participants in the risk consideration condition gave themselves significantly more favorable personality ratings than did participants in any other cell. They did not, however, rate the typical peer any differently than did other participants, so distancing in this instance can be ascribed to self-enhancement rather than to derogation of others. These results are similar to those found on the measure of unplanned pregnancy prevention in that high SE participants in the risk consideration condition
demonstrated a response that differed from that of other participants in the experiment—they responded to the consideration of risk for STDOTAs by enhancing their perceptions of themselves on dimensions not directly related to risk for such diseases.

**Effect of participant gender.** The analyses that examined gender differences in downward comparison found that females tended to show the greatest self-peer differences on the social subscale, whereas the greatest differences among male participants were found among high SE males on the competence subscale. Although these findings are consistent with the idea that women emphasize social dimensions in social comparison and males (particularly those with high SE) emphasize competence and ability, there were no significant interactions with risk consideration.

**Perceptions of Similarity**

**Rationale**

It was predicted that persons with high SE who had considered their risk would respond to this presumably threatening process by psychologically distancing from a social comparison target. This goal could be achieved by enhancing perceptions of the self, derogating the target, or explicitly decreasing perceptions of similarity between the self and the target.
Similiarity to the Typical Peer

Participants were asked to rate how similar they believed their personality and their sexual behavior was to that of the typical peer (0 = not very similar to 140 = very similar). Participants felt moderately similar to their peers on both dimensions (Ms = 76.96 and 82.12, respectively). A Risk Consideration x SE ANOVA revealed no significant main effects or interactions on either dimension (all ps > .11). Simple main effects tests also failed to yield the predicted differences as a function of risk consideration and SE.

Similiarity to the Typical Victim

Participants were asked to rate the similarity of their personality and sexual behavior to that of the "typical person who catches a sexually-transmitted disease other than AIDS" (the "typical victim"). Although they felt less similar on both dimensions to this target than they did to their peers (Ms = 53.69 and 38.69; both t(155) = 7.50, ps < .0001), Risk Consideration x SE ANOVAs revealed no significant main effects or interactions for either dimension (all ps > .49. Simple effects tests also failed to support the hypothesized Risk Consideration x SE interaction on these measures. Thus, none of the hypotheses concerning direct
distancing on the measures of perceived similarity were supported. Apparently, although persons with high SE who considered their risk enhanced their self-images with regard to contraceptive behavior and their general personality traits, they were not willing or able to explicitly distance from their peers or from the "typical victim" more so than were other participants.

Experimental Analyses II: Response to Information About a Person at High Risk for STDOTAs

Choice of Social Comparison Target

Rationale

Whereas persons with high SE were hypothesized to respond to risk consideration by creating psychological distance between themselves and a comparison target, persons with low SE were not expected to engage in this self-enhancing strategy. Instead, persons with low SE were expected to respond to risk consideration by choosing to socially compare with a person who seemed to be at considerable risk for contracting a STDOTA. Because all of the low SE persons in this experiment (like the persons with high SE) engaged in some behaviors that could put them at risk for catching STDOTAs, they may have been motivated to obtain information suggesting that their own risky behaviors were relatively common or innocuous; such information could make them feel less
deviant (cf. Gibbons & Gerrard, 1991) and therefore less uncomfortable about the behaviors that risk consideration caused them to confront.

**Choice Measure**

Half of the participants in the risk consideration condition and half of those in the no risk consideration condition were presented with a social comparison choice. More specifically, they were asked to select and read an essay about another participant's sexual behavior. These essays were characterized as representing one of seven increasing levels of risk for STDOTAs, and were supposedly written at the beginning of the experiment by participants who had volunteered to have their essays used for this purpose. Alleged "riskiness" of the author of the essay chosen represented the dependent measure.

These participants were all actually presented with the same essay to read, contrived by the experimenter to serve as a fairly risky (downward) comparison target. Participants then rated the essay author on a variety of dimensions.

**Effects of Risk Consideration**

A Risk Consideration x SE ANCOVA on participants' choice of essay (1 = low risk author to 7 = high risk author) revealed a main effect of risk consideration,
such that participants who had been asked to consider their risk chose essays by riskier authors ($M = 5.83$) than did participants who were not asked to consider their risk ($M = 4.90$; $F(1,77) = 6.72$, $p < .02$).

This finding suggests that, even after the time spent in filling out the risk-related behavior, personality, and similarity measures, the effects of risk consideration were still present. The fact that people who considered their risk chose to read the essays of riskier people than did those who did not consider their risk is consistent with the assumption that risk consideration engendered some feelings of self-image threat in the sample as a whole; people who considered their risk may have wanted to reassure themselves that there were people "out there" who were even riskier than they were.

**Risk Consideration and Self-Esteem**

This main effect was qualified by a Risk Consideration x SE interaction ($F(1,77) = 5.14$, $p < .03$; see Table 8). Among low SE participants, there was no difference in the riskiness of essays chosen by participants who considered their risk ($M = 5.72$) and those who did not ($M = 5.60$; $p > .80$). Among participants with high SE, however, risk consideration was associated with the selection of significantly riskier essays ($M = \ldots$)
Table 8

Choice of Comparison Risk Behavior Essay<sup>a</sup>

<table>
<thead>
<tr>
<th>Group</th>
<th>High SE</th>
<th>Low SE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Risk Consideration</td>
<td>5.94&lt;sub&gt;a&lt;/sub&gt;</td>
<td>5.72&lt;sub&gt;a&lt;/sub&gt;</td>
</tr>
<tr>
<td></td>
<td>(1.07)</td>
<td>(1.45)</td>
</tr>
<tr>
<td>No Risk Consideration</td>
<td>4.21&lt;sub&gt;b&lt;/sub&gt;</td>
<td>5.60&lt;sub&gt;a&lt;/sub&gt;</td>
</tr>
<tr>
<td></td>
<td>(2.28)</td>
<td>(1.89)</td>
</tr>
</tbody>
</table>

<sup>Note</sup>. <sup>a</sup> Mean fictitious essay author's alleged risk for contracting STDOTAs (1 = very little risk to 7 = extremely high risk). Means not sharing a subscript differ at p < .007. Standard deviations appear in parentheses. Cell ns range from 19 to 21.
5.94 vs 4.21; t(77) = 3.55, p = .0008).

These results departed from predictions in that it was the high rather than the low SE participants who accounted for the difference in essay choice between people who did and who did not consider their risk. Possible reasons for this departure from predictions will be suggested in the Discussion section.

Perceptions of the Essay Author

Riskiness of Author's Sexual Behavior

Rationale. Participants in the exposure condition rated the author of the fictitious risk behavior essay on the riskiness of his or her sexual behavior compared to the riskiness of their own sexual behavior and to that of their peers. It was hypothesized that persons with high SE who had considered their risk would rate the essay author's riskiness compared to peers as greater than would any other participants. No differences were expected to occur as a function of risk consideration on ratings of the essay author's riskiness compared to self. Risk consideration would provide the motivation to derogate or distance from this target, but because it was also expected to increase perceptions of self-vulnerability (and did), it was not expected to facilitate explicit distancing on a measure of riskiness.
Efficacy of the manipulation. Risk Consideration x SE ANCOVAs on these questions validated the assumption that the author of this essay would be seen as riskier than the participants saw themselves or the typical peer. The mean rating of the target's riskiness compared to the self was 6.3 on a scale ranging from 1 = "this person seems at much less risk than I am" to 7 = "this person seems at much more risk than I am." (A rating of 6 corresponded to the statement "this person seems at somewhat more risk than I am"). The author was also seen as riskier than the typical peer (M = 5.3; on this scale, 5 = "this person seems at slightly more risk than average").

Riskiness of the author compared to the self. Unexpectedly, the previous ANCOVAs revealed a significant Risk Consideration x SE interaction (F(1,77) = 3.98, p = .05; see Table 9). Persons with high SE who considered their risk rated the essay author as more risky compared to themselves (M = 6.51) than did persons with high SE who did not consider their risk (M = 5.80; t(77) = 2.38, p = .02). No difference was seen among persons with low SE in their ratings of the essay author's risk compared to their own as a function of risk consideration (p > .61). This interaction may be interpreted as suggesting that persons with high but not low SE respond
Table 9

**Perceptions of the Essay Author's Riskiness Compared to the Self**

<table>
<thead>
<tr>
<th>Group</th>
<th>High SE</th>
<th>Low SE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Risk Consideration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High SE</td>
<td>6.51&lt;sub&gt;b&lt;/sub&gt;</td>
<td>6.29&lt;sub&gt;ab&lt;/sub&gt;</td>
</tr>
<tr>
<td>(1.12)</td>
<td>(1.13)</td>
<td></td>
</tr>
<tr>
<td><strong>No Risk Consideration</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High SE</td>
<td>5.80&lt;sub&gt;a&lt;/sub&gt;</td>
<td>6.45&lt;sub&gt;b&lt;/sub&gt;</td>
</tr>
<tr>
<td>(1.21)</td>
<td>(0.89)</td>
<td></td>
</tr>
</tbody>
</table>

**Note.**  <sup>a</sup> Mean riskiness of essay author compared to the self (1 = much less risky to 7 = much more risky). Means not sharing a subscript differ at p < .05 according to t-tests. Standard deviations appear in parentheses.
to risk consideration by derogating the essay author. As can be seen from Table 9, however, this interaction is driven primarily by the significant difference between persons with high and low SE in the no risk consideration group. In the absence of risk consideration, persons with high SE rated the essay author as significantly less risky than did persons with low SE ($t(77) = 2.15, p = .04$). Risk consideration eliminated this difference ($p > .45$) by significantly raising the risk perceptions of persons with high SE.

This finding was unexpected; although persons who have considered their risk have motivation to distance from risky targets, and to attribute greater risk to such targets than to themselves, it is surprising that they would be able to "overcome" the increase in perceptions of their own vulnerability and rate this target as riskier (compared to themselves) than did people who had not considered their risk and thus not elevated their perceptions of their own vulnerability. Interpretation of this interaction is complicated by the fact that persons with high and low SE differed in the absence of risk consideration and not in the presence of the manipulation. Without knowing the genesis of this original difference, it is not certain to what its disappearance in the presence of risk consideration...
should be attributed. Although one alternative is certainly threat-induced derogation of the essay author, the absence of a significant SE difference in ratings in the risk consideration condition renders such an interpretation tentative at best.

**Riskiness of the essay author compared to peers.** Contrary to predictions, no support was found for the hypothesis that persons with high SE who considered their risk would perceive the essay author to be riskier compared to peers than would other participants. A Risk Consideration x SE ANCOVA yielded no results approaching significance (all $ps > .40$), and simple effects tests also failed to provide support for the hypothesis. Given the significant interaction on the measure of riskiness compared to self, the lack of any effects on this measure is somewhat surprising.

Two measures that may have relevance to this dilemma are participants' perceptions of similarity to their peers and similarity to the "typical victim" of STDOTAs in sexual behavior, both measured just before the exposure manipulation. The association between these two items provides a rough estimate of the extent to which participants associate their peers with the "kind of person who catches a STDOTA." Persons with high SE who
did not consider their risk showed no association whatsoever between these two items (partial \( r(40) = .05, p > .70 \)) -- their perceived similarity to their peers was not related to their perceived similarity to the "typical victim" of STDOTAs on the dimension of sexual behavior. Among persons with high SE who did consider their risk, however, perceptions of their similarity to peers' sexual behavior was highly correlated with perceptions of their similarity to the sexual behavior of the "typical victim" (partial \( r(40) = .46, p = .003 \)). The difference between the two correlations was significant \( (z = 2.00, p = .05) \).

Although these analyses are exploratory, this finding suggests that persons with high SE who considered their risk came in some way to associate their peers with "the kind of person who catches a STDOTA". Given this association, it is more understandable that these same participants would not then rate the sexual behavior of the essay author as being much riskier than that of their peers. The essay author was, in effect, "the type of person who catches a STDOTA," at least in the riskiness of his or her sexual behavior.

These conclusions are highly tentative, of course, and they raise questions about the reason for this association. The association is especially curious in light of the prior finding that participants perceived
their peers' condom use to exceed their own, a finding inconsistent with the association between peers and the "typical victim." These data do suggest, however, that even in the absence of direct derogation of a target, cognitive processes may occur in response to threat that negatively transform the mental representation of the target, and that may affect subsequent operations involving this target.

Perceptions of Similarity to the Essay Author

Participants in the exposure condition rated their perceived similarity to the essay author in both personality and sexual behavior (0 = not similar; 140 = very similar). Risk Consideration x SE ANCOVAs failed to reveal any significant main effects or interactions for either dimension (ps > .25), and simple effects tests failed to support the hypothesis that persons with high SE who considered their risk would explicitly distance from the essay author by perceiving themselves to be less similar to him or her than would other participants, although a non-significant trend in this direction was seen (p = .31). The lack of significance on these measures was surprising given the significant Risk Consideration x SE interaction on perceptions of the essay author's riskiness compared to the self, and given
the degree of association between this measure and perceptions of similarity to the author on the dimension of sexual behavior (partial $\chi(18) = -.50, p = .03$).

**Summary of Risk Behavior Essay Manipulation**

Participants in the risk consideration condition selected significantly riskier targets than did no risk consideration participants, and this effect was entirely due to the risk consideration vs. no consideration difference among high SE individuals, rather than among participants with low SE, as was originally predicted. Because persons with high and low SE differed in essay choice in the absence of risk consideration rather than in the risk consideration condition, however, it appears that risk consideration simply equalized the two groups rather than increasing the interest of high SE persons above that of persons with low SE.

All participants perceived the essay author to be at higher risk than themselves and than the typical peer. Persons with high SE who considered their risk perceived the riskiness of the essay author compared to themselves to be greater than did persons with high SE who did not consider their risk. No such pattern was seen among persons with low SE. Because persons with high and low SE differed in their ratings of the essay author in the no risk consideration condition, and not in the risk
consideration condition, however, interpretation of this finding is somewhat qualified. As was the case with choice of essay author, risk consideration appears to have increased high SE participants' perceptions of the riskiness of the author to a level equal to that of low SE persons' ratings, not to a level above theirs. Until the reason underlying the original difference between low and high SE persons is identified, the impact of a manipulation that removes this difference cannot be fully understood.

Risk consideration did not have an effect on participants' perceptions of the essay author's risk compared to peers, as had been originally predicted. Correlational analyses suggested that a potential reason for this finding was an increased association between high SE participants' perceptions of peers and of the "typical victim" of STDOTAs as a function of risk consideration. There were also no effects of risk consideration or SE on perceptions of similarity to the essay author in personality or sexual behavior.

Post-Manipulation Analyses

Perceptions of vulnerability for self, of the unpleasantness of STDOTAs, and of one's concern about catching STDOTAs were then assessed a second time for
persons in the risk consideration condition and for the first time among persons in the no risk consideration condition. Perceptions of the typical peer's vulnerability and of the perceived prevalence of "risky sexual behavior" among one's peers were assessed for the first time among all participants.

**Perceived Vulnerability**

**Hypotheses**

It was hypothesized that people who had considered their risk for STDs would show greater self-vulnerability and therefore smaller perceptions of unique invulnerability than would persons who had not considered their risk.

Perceptions of the typical peer's vulnerability were not predicted to differ as a function of risk consideration, but they were predicted to vary as a function of a Risk Consideration x Exposure x SE interaction. Specifically, persons with high SE who had considered their risk and who were exposed to the fictitious peers' risk behavior essay were predicted to show higher perceptions of vulnerability for the typical peer than were persons with high SE who considered their risk and were not exposed to this target. No differences in perceptions of the typical peers' vulnerability were predicted among persons with high SE who had not
considered their risk or among persons with low SE.

Vulnerability of the Self

A Risk Consideration x Exposure x SE ANCOVA examined participants' perceptions of the likelihood that they would contract an STDOTA in the next two years. This was the same question that assessed perceived vulnerability among Risk Consideration participants at the beginning of the experiment. There were no significant main effects or interactions on this variable (all ps > .24), suggesting that some of the impact of the risk consideration may have been attenuated by this point in the experiment.

Partial correlations (partially the effects of "pattern" of sexual behavior and perceptions of vulnerability at T1) provided some support for the hypothesis that persons with high SE would report lower perceptions of self-vulnerability the more that they enhanced their self-images on prior items. The more highly that persons with high SE rated themselves on the personality index, the less vulnerable they felt at the end of the experiment ($r(39) = -.34$, $p = .03$). The association between self-ratings on carefulness of pregnancy prevention and T2 self-vulnerability was not significant, however ($p > .90$). Among persons with low
SE, no relationship between self-ratings and T2 self-vulnerability was seen ($p > .40$).

These findings suggest that there was a link between high SE persons' perceptions of their personalities and their risk for disease, even controlling for risk assessed before the personality measure was completed. Controlling for T1 self-vulnerability lessens the possibility that the relationship between T2 self-vulnerability and personality ratings were simply the result of a global tendency to evaluate the self positively. These results are correlational and cannot be taken as proof of a causal relationship between self-enhancement on personality items and personal vulnerability at T2, but they do provide evidence that would support this hypothesis.

**Vulnerability of the Typical Peer**

A similar ANCOVA was conducted on participants' estimates of the likelihood that the typical person of their age and sex would contract a STDOTA in the next two years. A significant Risk Consideration x Exposure interaction ($F(1,151) = 3.97, p = .05$) suggested that the impact of risk consideration on perceptions of peers' vulnerability was moderated by exposure to the "risky" sexual behavior essay (see Table 10). Among participants who were not exposed to the essay, participants in the
Table 10

**Perceptions of Peers' and Own Vulnerability**

<table>
<thead>
<tr>
<th>Exposure to essay</th>
<th>Risk Consideration</th>
<th>No Risk Consideration</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Peers</strong></td>
<td>81.54&lt;sup&gt;ab&lt;/sup&gt; (25.18)</td>
<td>79.42&lt;sup&gt;ab&lt;/sup&gt; (24.52)</td>
</tr>
<tr>
<td><strong>Self</strong></td>
<td>30.28&lt;sup&gt;c&lt;/sup&gt; (29.42)</td>
<td>29.42&lt;sup&gt;c&lt;/sup&gt; (25.58)</td>
</tr>
<tr>
<td><strong>Difference</strong></td>
<td>51.26&lt;sup&gt;ab&lt;/sup&gt;</td>
<td>50.00&lt;sup&gt;b&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>No exposure</th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Peers</strong></td>
<td>73.81&lt;sup&gt;b&lt;/sup&gt; (25.78)</td>
<td>87.26&lt;sup&gt;a&lt;/sup&gt; (23.17)</td>
</tr>
<tr>
<td><strong>Self</strong></td>
<td>32.64&lt;sup&gt;c&lt;/sup&gt; (25.97)</td>
<td>27.89&lt;sup&gt;c&lt;/sup&gt; (21.55)</td>
</tr>
<tr>
<td><strong>Difference</strong></td>
<td>41.17&lt;sup&gt;c&lt;/sup&gt;</td>
<td>59.37&lt;sup&gt;a&lt;/sup&gt;</td>
</tr>
</tbody>
</table>

**Note.** Scales range from 0 to 140 mm. Means not sharing as subscript differ at p < .05. Standard deviations appear in parentheses. Cell ns range from 38 to 42.
risk consideration condition perceived their peers to be at significantly less risk ($M = 73.81$) than did those in the no risk consideration condition ($M = 87.26$; $t(151) = 2.42$, $p = .02$). Among those participants who were exposed to the essay, however, there was no difference in perceptions of peers' vulnerability between the risk consideration condition ($M = 81.54$) and the no risk consideration condition ($M = 79.42$, $p > .60$).

Although the predicted Risk Consideration x Exposure x SE interaction did not approach significance ($p > .50$; means not in Table 10), simple effects tests were conducted to address the prediction that persons with high SE who considered their risk and who were exposed to the risk behavior essay would perceive their peers to be at more risk than persons with high SE who considered their risk and who were not exposed to the essay. These tests supported the hypothesis. Persons with high SE who considered their risk and who read the risk behavior essay provided significantly higher estimates of their peers' vulnerability ($M = 82.62$) than did persons with high SE in the risk consideration/no exposure condition ($M = 67.98$; $t(151) = 1.96$, $p = .05$). No difference in ratings of the typical peer as a function of exposure to the essay was seen among persons with high SE who did not consider their risk ($p > .40$) or among persons with low
Perception of Unique Invulnerability

Perceptions of unique invulnerability were investigated in a Risk Consideration x Exposure x SE x Target (self vs. typical peer) repeated measures ANCOVA comparing participants' perception of their own vulnerability to that of the typical peer. A highly significant main effect of target ($F(1,151) = 210.97, p < .0001$) revealed that participants perceived their own vulnerability ($M = 30.04$) to be much less than that of the typical peer ($M = 80.07$).

Risk consideration. This effect was qualified by a Risk Consideration x Target interaction ($F(1,151) = 3.95, p = .05$). As predicted, the illusion was significantly greater among participants in the no risk consideration condition ($M_{peer - self
difference} = 54.68$) than among those in the risk consideration condition ($M_{difference} = 46.22; t(151) = 2.83, p = .006$). This interaction was largely driven by the tendency for persons in the risk consideration condition to give lower vulnerability estimates for the typical peer than did persons in the no risk consideration condition ($p = .14$).

Exposure. A Risk Consideration x Exposure x Target interaction qualified this finding ($F(1,151) = 5.18, p = $
.03; see Table 10). This interaction could be interpreted in two ways. The first describes the effect of exposure to the essay on the relationship between risk consideration and perceptions of unique vulnerability. In the absence of exposure to the risk behavior essay, persons in the risk consideration condition showed lower perceptions of unique invulnerability (M peer - self difference = 41.17) than did persons in the no risk consideration condition (M difference = 59.37; t(151) = 4.24, p < .0001). Among participants who were exposed to the essay, however, no difference was seen in unique invulnerability as a function of risk consideration (p > .40).

A second way of viewing the interaction is to focus on the effect that risk consideration has on the relationship between exposure to the essay and unique invulnerability. In the absence of risk consideration, participants who were exposed to the essay displayed lower perceptions of unique invulnerability (M peer - self difference = 50.00) than did persons who were not exposed to the essay (M difference = 59.37; t(151) = 2.21, p = .03). In the risk consideration condition, however, the opposite pattern appeared; participants who were exposed to the essay showed greater perceptions of unique invulnerability than did persons who were not
exposed to the essay ($t(151) = 2.38, p = .02$).

The common element in these interpretations is the finding that either risk consideration or exposure to the risk behavior essay alone reduced the perception of unique invulnerability from its level in the no risk consideration/no exposure condition. The condition in which both risk consideration and exposure occurred, however, did not differ significantly from the condition in which neither occurred.

**Effects of self-esteem.** Although the predicted Risk Consideration x Exposure x SE x Target interaction was not significant ($p > .50$), persons with high SE who considered their risk and who were exposed to the fictitious risk behavior essay displayed greater perceptions of unique invulnerability ($M_{\text{peer - self difference}} = 54.09$) than did persons with high SE who considered their risk but who were not exposed to the essay ($M_{\text{difference}} = 38.16; t(151) = 2.76, p < .007$), as was predicted.  

**Summary**

Perceptions of self-vulnerability measured at the end of the experiment did not differ as a function of either risk consideration or exposure to the fictitious risk behavior essay, suggesting that the impact of the threat
associated with risk consideration had declined since the beginning of the session. Although the critical interaction was not significant, simple effects tests supported the hypothesis that persons with high SE who had considered their risk would rate their peers as being more vulnerable if they had been exposed to the risk behavior essay than if they had not. This finding is in keeping with the previous suggestion that, over the course of the experiment, persons with high SE who considered their risk came to equate their peers and the "kind of person" who catches a STDOTA.

As predicted, perceptions of unique invulnerability were greater among persons who had not considered their risk than among those who had. This finding was qualified by a Risk Consideration x Exposure interaction; the impact of risk consideration on perceptions of unique invulnerability was significant only for those participants who were not exposed to the risk behavior essay. Among those who were, there was no difference in unique invulnerability between those who did and did not consider their risk.

Self-Enhancement and Perceptions of Invulnerability

Hypotheses. Among persons with high SE, the perception of unique invulnerability was expected to vary positively with self-enhancement on prior distancing
measures; to the extent that people had been able to
defend their self-images by distancing from the typical
peer or from the essay author, their perceptions of
invulnerability should increase (cf. Lerner's "just
world" theory, 1977).

Because persons with low SE were not predicted to
engage in psychological distancing of any form, and
because research suggests that such persons tend to
respond to threats to the self-image with indirect rather
than with direct social comparison strategies, it was not
hypothesized that any of the items assessed previously
would be associated with the size of the perception of
invulnerability for persons with low SE.

Persons with high SE demonstrated a reaction to risk
consideration that involved reporting distancing or
enhanced perceptions of the self on only two items:
carefulness of avoiding unplanned pregnancy and the index
of personality traits. Therefore, correlational analyses
partially controlling the effect of "pattern" of sexual
behavior and self vulnerability at T1 were conducted to
test the hypothesis that self-enhancement on these items
would be associated with an increase in the perception of
unique invulnerability.
Carefulness of avoiding unplanned pregnancy. A marginally significant positive association between the self - peer difference in carefulness of avoiding unplanned pregnancy and the illusion of unique invulnerability was found among participants with high SE ($r(39) = .26, p = .10$). This correlation did not approach significance among persons with low SE ($p = .24$).

Personality trait index. The self - peer difference on the personality trait index was also positively associated with the perception of unique invulnerability among persons with high SE ($r(39) = .32, p = .05$). No such pattern was seen among participants with low SE ($p = .70$).

Summary. These findings support the hypothesis that persons with high SE will experience an increase in the perception of unique invulnerability that is positively associated with the extent to which they psychologically distance from their peers. Surprisingly, this pattern was also found among persons with low SE with regard to distancing on perceptions of carefulness of preventing unplanned pregnancy. Only persons with high SE, however, showed a significant association between self - peer differences in personality ratings and the perception of unique invulnerability.
**Perceptions of the Prevalence of Risky Sexual Behaviors**

**Hypotheses**

It was hypothesized that persons with low SE would seek information suggesting that there were other people who engaged in riskier sexual behaviors than they did, and that if they were presented with information about one such person, that their perceptions of the prevalence of such behaviors would increase (cf. Gibbons & Gerrard, 1991; Wills, 1987). This pattern was expected to be particularly pronounced among those persons with low SE who had considered their risk. A Risk Consideration x Exposure x Self-Esteem interaction was therefore hypothesized on participants' perceptions of the prevalence of risky sexual behaviors.

**Findings**

Risk Consideration x Exposure x SE ANCOVAs failed to reveal any significant main effects or interactions on the item that assessed participants' perceptions of the prevalence of risky sexual behaviors among their peers. (all ps > .28). Simple main effects tests on specific hypotheses also failed to produce significant results.

Thus, the predicted Risk Consideration x Exposure x SE interaction was not supported; exposure to a risky social comparison target did not significantly increase perceptions of the prevalence of risky sexual behaviors.
among persons with low SE, regardless of risk consideration.

**Perceptions of Unpleasantness and Concern**: Hypotheses

**Perceived unpleasantness of STDOTAs.** Because persons with low SE who were presented with the risk behavior essay were expected to increase their perceptions of the prevalence of risky sexual behaviors, they were also expected to decrease their perceptions of the unpleasantness of STDOTAs. This effect was predicted to be most pronounced among those persons with low SE who considered their risk for STDOTAs.

**Personal concern about catching a STDOTA.** Personal concern, like perceived unpleasantness, is a dimension that persons who have considered their risk might minimize in response to the discomfort associated with confronting risky health behaviors. It was tentatively hypothesized that persons who considered their risk might show less personal concern about contracting a STDOTA than would persons who had not considered their risk. The results from the contrast of the risk consideration condition with the comparison sample call this hypothesis into question, however. That comparison showed that persons who truly focused on risk-increasing behaviors
felt no more or less concerned than did persons who were never asked to consider their risk, while persons who focused on their risk-reducing behaviors felt less concerned than did both of these other groups.

**Findings**

**Perceived unpleasantness.** Risk Consideration x Exposure x SE ANCOVAs examined participants' perceptions of the unpleasantness of actually catching a STDOTA. In keeping with predictions, participants who had considered their risk perceived the contraction of STDOTAs to be significantly less unpleasant (M = 123.91) than did participants who had not considered their risk (M = 129.53; F(1,151) = 4.36, p = .04). No other effects reached significance (all ps > .10). The main effect of risk consideration was in keeping with the assumption that the threat associated with risk consideration would lead to the use of various psychological defenses, but the absence of an interaction with exposure and SE precludes strong support for the specific hypotheses. In addition, the absence of a difference in perceptions of unpleasantness between risk consideration participants and the members of the separately-run "comparison sample" (reported in a previous section) renders interpretation of this finding tentative.
Association of perceived prevalence with perceived unpleasantness. It was originally predicted that perceptions of the prevalence of risky sexual behaviors would be negatively associated with perceptions of the unpleasantness of actually catching a STDOTA, especially among persons with low SE. This hypothesis was not supported, either for the sample as a whole (p > .60) or among participants with low SE (p > .90) or high SE (p > .70).

Personal concern about catching a STDOTA. Risk Consideration x Exposure x SE ANCOVAs failed to reveal any significant main effects or interactions on the item that assessed participants' feelings of personal concern about catching a STDOTA (all ps > .20). Simple main effects tests also failed to confirm the hypotheses.

Summary. Participants in the risk consideration condition showed less extreme perceptions of the unpleasantness of catching a STDOTA than did participants in the no risk consideration condition, supporting the assumption that people would respond to risk consideration by minimizing their perceptions of the unpleasantness of the considered risk, but no effect of either SE or exposure to the risk essay was seen.

Perceptions of the prevalence of risky sexual
behaviors were not associated with perceptions of the unpleasantness of having a STDOTA.

There were no significant effects of risk consideration or exposure on perceptions of personal concern about catching a STDOTA.
Endnotes

1 No differences in perceptions of unique invulnerability as a function of exposure to the essay were seen among persons with high SE who did not consider their risk (p > .28) or among persons with low SE who considered their risk (p > .30). Unexpectedly, among persons with low SE who did not consider their risk, perceptions of unique invulnerability were greater among those who were not exposed to the essay than among those who were (p = .05).

2 Exposure x SE x Time repeated measures ANCOVAs compared the perceptions of self-vulnerability, unpleasantness, and personal concern that were assessed in the risk consideration condition at the beginning (T1) and at the end (T2) of the experiment. The only effect to approach significance was a SE x Time interaction on personal concern (F(1,75) = 3.90, p = .06). Risk consideration participants with high SE tended to feel less concerned at the end of the experiment (M = 70.84) than at the start (M = 74.48; t(75) = 1.19, p = .24), and risk consideration participants with low SE tended to feel more concerned at the end of the experiment (M = 77.14) than at the start (M = 71.42; t(75) = 1.69, p = .08). Risk consideration participants with high and low SE differed significantly in their change in personal concern from T1 to T2 (t(75) = 2.90, p = .005).
DISCUSSION

The present experiment sought to determine whether principles derived from theory and research in social comparison could predict young adults' reactions to considering their risk for STDs. This discussion will highlight the findings of the study and address methodological issues that were raised by these findings. It will also consider the implications of the study for health interventions.

Risk Consideration

Efficacy of Threat Manipulation

One of the primary hypotheses of this study was that the consideration of health risk would induce a sense of threat. This hypothesis was based on two assumptions: 1) When persons who are at risk for a health problem are asked to consider their risk-increasing factors, they will do so; and 2) The threat that is induced by risk consideration is equivalent to that which results from more standard experimental methods of threat induction (e.g., alleged failure on a test of personality or cognitive skills; Croyle & Hunt, 1991). Both of these assumptions are called into question by the findings of this study.
Focusing on Risk-Increasing vs. Risk-Decreasing Factors

Participants in this study were asked to consider and list only those factors that might increase their risk for STDOTAs. These instructions were written on the sheets on which participants wrote about these factors, and they were read aloud by the experimenter, as well. Therefore, it was surprising that 33 of the 80 participants in the risk consideration condition listed as many or more risk-decreasing as risk-increasing factors. These findings represent an extraordinary level of failure to comply with experimental instructions, and it would be useful to understand what differentiated the 47 participants who focused on risk-increasing factors from the 33 who focused on risk-reduction.

Differences in risk perception between the subgroups. The results showed that those participants who focused on risk-reduction felt less personal concern about catching a STDOTA than did participants in the separate "comparison sample" who did not consider their risk, and they felt no more vulnerable to STDOTAs than did the members of this comparison sample. The remaining 47 risk consideration participants, on the other hand, felt significantly more vulnerable than did members of the comparison sample, and equally concerned. Whether participants' focus during the risk consideration task
influenced subsequent perceptions of concern and vulnerability, or whether pre-existing differences in perceived concern and vulnerability led to the difference in focus between the two subgroups cannot be directly addressed with these data.³

Underlying differences between the subgroups. The 33 persons who focused on risk-reduction were more monogamous than were those who focused on risk-increasing factors, but the difference between the two groups in practical terms was relatively small. For the most part, the participants in both subgroups appear to have engaged in serial monogamy; those who focused on their risk-increasing behaviors were not what most health researchers would consider to be at extremely high risk, nor were those who focused on risk-reduction risk-free. Future research should assess the decisional strategies that people use to determine the focus of risk review. Because health risk appraisal is a component of commonly-used health promotions (Schoenbach, et al., 1987), it would be useful to understand the conditions that lead relatively similar people to respond to risk consideration in very different ways.

Implications for the experimental results. The data reviewed thus far suggest that the manipulation that was
intended to induce threat may have been unsuccessful for almost half of the participants in the risk consideration condition; the 33 people who focused on risk-reduction felt no more vulnerable to STDOTAs than did a comparison sample of persons who did not consider their risk, and they reported significantly less personal concern about catching a STDOTA. If it was indeed the case that these 33 participants were not threatened, analyses that omitted them should tend to show stronger results than those in which they were included. All of the analyses in this experiment were therefore conducted a second time with only the 47 risk consideration participants who focused on risk-increasing behaviors to represent the risk consideration condition (without "pattern" of sexual behavior as a covariate). Rather than being enhanced, the results from these analyses were almost invariably less strong than those with the entire sample; not only did the loss of power reduce the significance of the effects, but the actual trends tended to be less pronounced.

The analyses were also repeated a third time, including the entire sample but without "pattern" of sexual behavior as a covariate. Most of the effects reported in the present paper were less significant without the inclusion of the "pattern" covariate; some
dropped below the level of significance. Taken together, these findings suggest that although the 33 participants in the risk consideration condition who focused on risk-reduction were not as threatened as the other 47, they may not have responded altogether differently on subsequent measures. Because several predicted interactions that involved risk consideration were found to be significant in the analyses of covariance, it may be concluded that the risk consideration manipulation was effective to some extent in the risk consideration condition as a whole, although it appears to have been more pronounced among the 47 participants who focused on risk-increasing factors.

**Degree of Threat Induced**

Given that participants in the risk consideration condition were threatened by the manipulation, why did they respond to the measures of personality and pregnancy prevention primarily with self-enhancement and not with derogation of their peers? One possible reason might be that the level of threat that was instilled by this manipulation was simply not sufficient to induce derogation. It is possible that, owing to the ambivalence that people have about derogation of others (Wills, 1981), that a higher level of threat is necessary
for this type of response than for self-enhancement.

**Failure feedback vs. self-generated threat.** Prior experiments involving downward comparison that have found threat-related derogation and distancing have generally induced threat by providing participants with bogus failure feedback on tests of personality or cognitive skills (e.g., Gibbons & Boney McCoy, 1991). In their research on the effects of risk factor testing, Jemmott and his colleagues (e.g., Jemmott et al., 1986) provided participants with clear-cut information that they had a risk factor for an illness. Both of these manipulations directly convey to participants that their status on a specific dimension is undesirable. In the present study, however, participants had to essentially threaten themselves by acknowledging risky behavior. It is possible that because the degree of undesirability of their behaviors was open to interpretation, that the level of threat thus induced was not generally of sufficient magnitude to result in derogation of others.

**Nature of the comparison target.** This explanation for a low level of threat in the present study may be called into question by Crocker et al.'s (1987) Study 2. In this study, women with high SE in low-status sororities derogated women in high-status sororities. The source of threat was simply membership in the low-
Is the threat associated with being in a non-prestigious social organization greater than that derived from confronting risky sexual behavior? It may be that, for the population sampled by both Crocker et al. and by the present study (college students), the answer is yes. Social activities are very important to college students, and as has been previously noted, the sexual behavior of the students in the present sample was not excessively risky.

It may be the case, however, that differences in the dynamics of the threat between the two studies, rather than differences in the level of threat, were responsible for the divergent outcomes. Sorority status is a highly comparative dimension; there could be no low-status sororities if there were no high-status sororities. Therefore, members of low-status sororities have a pre-existing competitive relationship established with high-status sororities; members of high-status sororities represent a salient outgroup. By contrast, people's risk behavior is not pre-determined by the way in which they compare with others, and the "typical peer" is not a target with whom most people generally compete. Although people can give meaning to their level of risk by
comparing with others, their actual behaviors exist independent of others' behaviors.

Given that the present study did not present participants with explicit feedback indicating that they possessed an undesirable trait, and that it did not ask participants to rate comparison targets with whom a competitive relationship had been pre-established, it is perhaps not surprising that participants responded to the threat induced by risk consideration by enhancing their perceptions of themselves rather than by derogating peers. It may be that in order for derogation to occur, participants must either be presented with clear feedback suggesting that they possess an undesirable trait, or they must be allowed to rate a comparison target with whom they have a pre-existing competitive or negative orientation. None of the studies reviewed for the present paper contain evidence that would oppose such a hypothesis, but further research is necessary to substantiate it.

Identifiability of participants. A third, although perhaps less plausible, reason for the relative paucity of peer derogation is that participants felt identifiable. As presented in the Introduction of this study, a survey of research on downward comparison suggests that people are less likely to derogate others
under "public" conditions than under conditions of total anonymity. Prior studies using between-subjects manipulations of social context have shown that persons who receive threatening feedback and who are given the opportunity to evaluate a comparison target will be more derogatory of this target if they believe that their prior performance and/or evaluations of the target are purely private rather than known to another person (such as the experimenter or another participant; Baumgardner, Kaufman, & Levy, 1989; Brown & Gallagher, 1992).

Participants in the present study did not put their names or any identification number on any of the questionnaires in the experiment. They did, however, put their names on the informed consent statement that they filled out at the start of the experiment. They retained this form during the experiment and were told that they were to keep it "to remind them of their rights as participants," and that they would give it back to us at the end of the session. In fact, at the end of the session, we asked them to place the consent form with their other experimental materials--this was the mechanism by which we linked their responses during the experiment with their previous responses in mass-testing.

If participants believed all along that their consent
forms would be associated with their other materials, this fact alone may have biased them against responding to "threat" with derogation of others. Arguing against this interpretation, however, is the fact that the same strategy for matching lab responses to pre-experimental responses was used in the studies by Gibbons and Boney McCoy (1991) that found clear evidence of target derogation among persons with high SE. Because participants in the present experiment were not directly asked whether or not they felt identifiable, this issue cannot be resolved with the available data. Subsequent research should attempt to replicate the present findings in a situation that guarantees and assesses feelings of anonymity to see whether people genuinely prefer to respond to this sort of threat with self-enhancement or whether, under different circumstances, they might derogate others.

**Self-Enhancement**

Although the present study did not find consistent derogation of the available comparison targets, persons with high SE who considered their risk did evaluate themselves more favorably on the dimensions of pregnancy prevention and personality than did persons with high SE who did not consider their risk. They also tended to evaluate themselves more positively than did persons with
low SE did. This finding suggests that the threat induced by risk consideration was sufficient to inspire compensatory self-enhancement on dimensions not directly related to the threat.

**Perceived Carefulness of Avoiding Unplanned Pregnancy**

It was hypothesized that persons with high SE who considered their risk for STDOTAs would respond to this experience by enhancing their perceptions of themselves on a risk behavior that was not directly related to the transmission of STDOTAs, carefulness of prevention of unplanned pregnancy. Prevention of unplanned pregnancy is considered unrelated to the prevention of STDOTAs because the primary form of contraception in this population is the birth control pill (Gerrard & Warner, 1991), and that tendency was replicated in this sample. Although effective in preventing pregnancy, "the pill" does not retard the transmission of STDs, and as such is unrelated to STD prevention.

Although the critical interaction of risk consideration, target, and SE was not significant, simple main effects tests supported the hypothesis. Persons with high SE who considered their risk rated themselves as being significantly more careful than did persons with high SE who did not consider their risk; no such
difference was seen as a function of risk consideration for persons with low SE. In addition, persons with high SE who considered their risk showed a significantly greater difference between their ratings of themselves and their peers (in their favor) than did persons with high SE who did not consider their risk. No such pattern was seen among persons with low SE.

These results support the hypothesis that persons with high SE will respond to risk consideration by distancing from their peers on a risk behavior that is not directly related to the prevention of STDs.

Implications of distancing on the dimension of pregnancy prevention. The results of the present study have implications for young people who engage in sex and who reassure themselves that they are behaving in a safe way if they protect themselves from unplanned pregnancy. In the present sample, 51.2% of the participants used the pill as their most recent form of contraception; 34.4% used condoms; only 3.7% used both.

A separate set of data collected at this same university (Gibbons & Gerrard, unpublished data) suggests that these numbers are fairly representative of the college population as a whole. In their sample of freshmen male and females, 33.5% of sexually-active students (n = 403) reported using the pill at last
intercourse, 40% reported using condoms, and only 4.2% said that they used both forms of protection. By their sophomore year, 12.4% of sexually active students in this sample reported using both condoms and the pill at last intercourse, but this is still a relatively low percentage. In this larger sample, the average number of lifetime sexual partners was almost three by the start of the freshman year—a large enough number to warrant some caution vis a vis the spread of STDs.

The results of the present study suggest that young people's tendency to focus their preventive sexual behaviors on contraception rather than on the prevention of STDs may stem in part from a defensive reaction to their perception of vulnerability to these diseases. Such a reaction simultaneously represents an appropriate, rational, "cognitive" response to the problem of unplanned pregnancy and an irrational, emotional response to the fear of contracting STDs. Engaging in appropriate contraceptive behavior reduces the danger of unwanted conception, and it may alleviate some of the discomfort associated with considering one's risk for STDs, but it does nothing to actually reduce the spread of these diseases. Educational programs need to stress the importance of behaviors designed to prevent both unwanted
pregnancy and STDs, and they might be advised to explicitly discuss the tendency to ignore the latter if the former issue is adequately addressed.

**Evaluations of Self and Typical Peer on Personality Traits**

It was hypothesized that persons with high SE who had considered their risk for STDs might engage in compensatory self-enhancement or in derogation of the typical peer on personality dimensions not directly related to sexual behavior. To the extent that people believe in a "just world" (Lerner, 1980), distancing from one's peers on personality dimensions could reassure one that although "others" might contract STDs from risky sexual behavior, they themselves were not "the type of person" to whom this would happen.

The results offered some support for this hypothesis. Persons with high SE who considered their risk evaluated themselves more favorably than did any other participants. Because there were no significant differences in evaluations of the typical peer's personality, this pattern resulted in a tendency for persons with high SE who considered their risk to distance from their peers more than any other participants. They showed greater self-peer differences than did participants with low SE regardless
of risk consideration, and a marginally greater difference than did persons with high SE who had not considered their risk.

**Gender differences.** Based on previous research (Gibbons & Boney McCoy, 1991), it was expected that males and females might differ in their preferred dimensions of downward comparison. Specifically, it was hypothesized that males would prefer to compare on dimensions associated with competence or instrumentality and females would prefer to compare on interpersonal or social dimensions. This hypothesis was tested by performing the relevant analyses on sub-groups of the personality traits identified by another sample as clearly representing "competence" or "social" traits. Because of statistical problems associated with using "pattern" of sexual behavior in analyses including gender as a variable, separate analyses were performed on the responses given by males and females.

Although the results broadly confirmed the hypothesis that males will report more self-peer difference on traits associated with competence and females on "social" traits, the lack of significant interactions with risk consideration precludes interpreting these differences as "distancing" in response to threat. Females showed more
self-peer difference on "social" traits than on those related to competence, but there were no interactions with risk consideration. Among males, the greatest difference was seen among males with high SE on competence-related traits, but again, no interactions with risk consideration occurred. In both cases, the general tendency toward greater self-enhancement by persons with high SE who had considered their risk was present, but it appears that there was not enough power in the separate analyses to achieve significant results.

The present study differs from the original Gibbons and Boney McCoy (1991) paper that reported an interaction among threat, gender, and dimension of distancing both in requiring more lengthy evaluative responses (more personality traits included as evaluative dimensions) and, perhaps, in the less acute nature of the threatening stimuli. It is also possible that including a broader range of personality traits "dissipated" the effect that was seen by Gibbons and Boney McCoy; because participants in the present study had numerous items on which to distance, it may not have been necessary to distance strongly on any one of them to achieve the necessary boost to participants' self-images. Subsequent research in this area should attempt to ascertain the way in which degree of threat and number of response items influence
the extent to which males and females will engage in downward comparison on different dimensions. 

**Compensatory Self-Enhancement or Generalized Positive Self-Regard?**

For persons with high SE to respond with compensatory self-enhancement, some threat to their self-images for which compensation is required must exist. As has been noted previously, there remains some question as to the extent of the threat actually induced by risk consideration in this experiment. Another explanation for the elevated ratings given by these persons must therefore be entertained. It is possible that the self-evaluations of high SE persons who considered their risk were simply a reflection of the generally positive image of themselves that resulted from considering their sexual behavior. Although there were no differences in the sexual behaviors of persons with high and low SE reported at mass-testing in a relatively "objective" format (e.g., actual number of sexual partners and frequency of intercourse), when asked about their sexual behavior in more "subjective" terms during the experiment, persons with high SE perceived less difference between themselves and their peers on number of partners and frequency of intercourse than did persons with low SE. Because peers
were perceived to exceed the participants themselves on both of these dimensions, and because both dimensions appear to have been evaluated positively, it is likely that persons with high SE came away from the risk consideration task with more favorable images of themselves in the sexual domain than did persons with low SE. Because the rest of the experiment emphasized sexual issues, this generally positive self-impression may have been bolstered among persons with high SE. Persons with high SE who did not consider their risk would not have experienced this type of rewarding self-focus at the beginning of the experiment, and might therefore have lacked the generally enhanced self-perceptions of those in the risk consideration condition.

This explanation of the self-enhancement observed among persons with high SE who considered their risk is consistent with the unexpected finding that, when they were exposed to the "risky" sexual behavior essay, they derogated the author's riskiness compared to themselves but not compared to the typical peer. It does not explain, however, why they also provided higher estimates of the typical peer's vulnerability after being exposed to the "risky" essay or why the association between self-enhancement on the personality index and perceptions of self-vulnerability at T2 were significant even after
perceptions of self-vulnerability at T1 were controlled.

In summary, there is not incontrovertible evidence that the risk consideration manipulation produced threat or that the subsequent elevation in ratings of self by persons with high SE should be interpreted as compensatory self-enhancement. Given the absence of peer derogation in response to threat, the present data are also supportive of the hypothesis that persons with high SE will respond to consideration of sexual risk with a generalized positive view of themselves that extends to subsequent evaluations made in the context of sexual issues. Further research should attempt to disentangle these two interpretations of the data by assessing people's responses to the consideration of other health risks. If smokers with high SE who consider their risk for lung cancer provide more favorable ratings of their personalities and their risk for an unrelated illness than do persons with high SE who do not consider their risk and than persons with low SE, an explanation favoring the compensatory self-enhancement response to risk consideration will be supported.
Exposure to a Risky Comparison Target

Choice of Comparison

Effect of Risk Consideration

Persons who have been threatened in some way may feel deviant or unusual, and they may look for reassurance that there are "others" who are equally or more threatened than they are (Coates & Winston, 1983; Gibbons & Boney McCoy, 1991; Gibbons & Gerrard, 1991; Wills, 1991). Additional support for this hypothesis was found in the present study. Persons who considered their risk for STDOTAs chose to socially compare with a target who was riskier than the targets chosen by persons who had not considered their risk. Contrary to the original hypotheses, however, this difference was seen among participants with high rather than low SE.

Threat reduction or content comparison? Although these results are generally consistent with the assumption that threat will lead people to seek information about others who are also threatened (to engage in passive DC), other interpretations are plausible, especially in light of the fact that it was persons with high and not low SE who differed in their comparison choices as a function of risk consideration.

Persons in the risk consideration condition differed from those in the no risk consideration condition in that
members of the former (but not the latter) wrote risk behavior essays like the one they were to select for comparison. Rather than being motivated by the desire to reduce feelings of threat, persons in the risk consideration condition may have simply sought information that would allow them to compare the contents and characteristics of the essay that they wrote to the contents of an essay written by someone who was somewhat more extreme on the dimension of interest. A primary tenet of social comparison theory is that people socially compare when they lack objective information about their standing on a dimension (Festinger, 1954), and research has shown that people tend to prefer extreme examples of a comparison dimension regardless of whether that dimension is positive or not (e.g., Smith & Insko, 1987; Wilson & Benner, 1971). Because the task of writing a paragraph about one's risky sexual behavior is likely to be a novel one for most people, participants who had written risk behavior essays at the start of the experiment may have simply been curious to ascertain how the contents of their essay would compare to that of someone who scored on an extreme end of the "risk" scale. Reading an essay by someone who was at extremely low risk would not have been particularly informative. Such a
person most likely had very conservative sexual behavior or was sexually inactive, and would not offer useful comparison information for participants who were sexually active and at some risk. The essay of a fairly risky person, however, would provide information about such features as the length of the essay, the amount of detail, and the presence of graphic language.

**Internal analyses.** There is no way to be certain which of these alternatives is the correct one, but internal analyses suggest that information-seeking may have predominated. When persons in the risk consideration condition were split on two of the threat indexes measured at the start of the experiment, self-vulnerability and personal concern, no differences were seen between persons high and low in vulnerability or between those high and low in personal concern in their choice of comparison target ($ps > .50$). In addition, the correlations between perceptions of vulnerability and personal concern and choice of target were non-significant ($ps > .30$). These analyses suggest that choice of comparison target was not strongly associated with perceptions of threat, as measured by these risk perceptions.

**Threat reduction vs. other motives.** Consistent with these findings, Wheeler and Miyake (1992) have recently
suggested that some of the evidence supporting the hypothesis that threatened people prefer downward comparison targets may have been incorrectly interpreted. They cite for an example Hakmiller's classic (1966) study. In this experiment, people who were told that their high score on a personality inventory reflected a very negative trait selected comparison targets with much higher scores than did people who were told that their high scores reflected a fairly positive trait. This study has traditionally been interpreted to indicate that threatened people will prefer to compare with people who are worse off than will non-threatened people. But an alternative hypothesis offered by Hakmiller himself, and echoed by Wheeler and Miyake (1992), is that when high scores were represented as reflecting a very negative trait, they were simply more interesting than when they allegedly represented a moderately positive one. Participants in the Hakmiller study may have thus selected downward comparison targets for reasons other than threat reduction.

In the present study, persons with high SE who considered their risk may have selected riskier comparison targets than those who did not because they wanted to reduce threat, but they could also have acted
in this way for other reasons. Given the outcome of the present study, and the concerns voiced by Wheeler and Miyake, it seems important that future research on comparison choice carefully controls for alternative reasons for selecting extreme targets.

**Self-Esteem**

Contrary to the hypothesis that it would be persons with low SE who would respond to risk consideration by selecting riskier social comparison targets, this pattern was shown by persons with high SE. Persons with high SE were interested in less risky targets than were persons with low SE in the absence of risk consideration, and this difference was eliminated with the risk consideration manipulation. Because there were no differences in comparison choice in the presence of risk consideration, it is difficult to draw definitive conclusions from these results.

It is possible that persons with low SE were constrained by ceiling effects, and that they were interested in risky enough targets in the no risk consideration condition that they could not increase this level in response to risk consideration. The data suggest that this was not the case, however. The means for the two low SE cells were 5.72 and 5.60, and the maximum on the scale was 7, leaving open the possibility
for a significant difference between the two cells.

The answer to this question may lie in the nature of the comparison materials. Unlike many social comparison studies in which participants are offered the chance to see another participant's score on a test of personality or intellectual ability, this study allegedly presented participants with detailed descriptions of a peer's sexual behavior. Participants' responses to previous questions indicated that persons with low SE perceived their peers to have more sexual partners than they, and to have sex more frequently. Because number of partners and frequency of sex were perceived by members of this sample as positive traits, it is possible that persons with low SE perceived the riskier essay authors as upward and not downward comparison targets. Persons with high SE may have felt more secure in their own sexual behavior (they did not perceive differences between their own and peers' number of partners or frequency of sex), and they may thus have been freer to socially compare with someone who was described as being at high risk; for them, this person would not represent an upward comparison target in the way that it might for persons with low SE.

Previous studies have allowed participants to select
comparisons with others based on dimensions that are clearly negative; risky sexual behavior, on the other hand, like other risky behavior (e.g., smoking, drinking, etc.). carries with it both negative and positive associations (cf. Chassin, Presson, Sherman, Corty, & Olshavsky, 1984; Gibbons & Gerrard, in press).

Researchers in the area of social comparison will need to take this dual nature of risk behaviors into account in their design and interpretation of studies that investigate young people's responses to social comparison in these contexts.

**Evaluation of a Risky Comparison Target**

**Perceptions of Riskiness**

Participants in the exposure condition were all exposed to the same risk behavior essay, allegedly written by a person who was rated as a "6" on the seven-point scale of riskiness. This person described having multiple sexual partners whom they did not know very well, and rarely using a condom. Participants rated this person's risk for contracting a STDOTA compared to themselves and compared to the "typical peer." It was hypothesized that persons with high SE who considered their risk would rate the essay author higher on the riskiness-compared-to-peers scale than would other participants, but that no differences would be seen among
participants on the riskiness-compared-to-self measure. Persons who had considered their risk were predicted to feel too vulnerable to directly distance from the target on riskiness, but they could derogate the author by claiming that he or she was more risky than average.

The results did not support the hypotheses. Participants did not differentially rate the riskiness of the essay author compared to peers either as a function of risk consideration or self-esteem. Unexpectedly, an interaction was seen between risk consideration and self-esteem on the riskiness-compared-to-self item. The pattern of means on this question was identical to that for choice of comparison target. Persons with high SE who considered their risk rated the essay author as riskier than did persons with high SE who did not consider their risk. No difference in riskiness rating was seen as a function of risk consideration among persons with low SE. As was the case with choice of target, there was no difference between persons with high and low SE in the risk consideration condition. Persons with high SE were less critical of the essay author in the absence of risk consideration than were persons with low SE; this difference was not present among those participants who considered their risk.
Research on the social perceptions of persons with high and low SE suggests that persons with low SE may tend to be more negative in their perceptions of others in the absence of threat than are persons with high SE, but that because this negativity extends to their perception of themselves as well, it does not result in psychological distancing (Crocker et al., 1987). The results of the present study are consistent with such an approach.

These findings, and those on the choice measure, might suggest that the net result of risk consideration is to make the comparison behavior of persons with high SE more similar to that of persons with low SE. Caution must be exercised, however, in reducing these findings to this level. Risk consideration was associated with alteration in the comparison behavior of persons with high but not low SE. In addition, the results on the prior measures of self-enhancement show effects that clearly differentiate persons with high and low SE in the presence of risk consideration.

Perceptions of Similarity to the Essay Author

It was hypothesized that persons with high SE who had considered their risk would psychologically distance from the essay author on the dimension of personality by rating their similarity to the author as less than other
participants would. No distancing in excess of that shown by other participants was predicted on perceptions of similarity to the author's sexual behavior. These hypotheses were similar to those for the perceptions of similarity to the typical peer and the "typical victim" of STDOTAs.

Like the results on those measures, no effects were seen for either risk consideration or SE on perceptions of similarity to the essay author. The lack of significant differences on the assessment of similarity to the essay author is especially surprising given the interaction between risk consideration and SE on the riskiness-compared-to-self measure (which immediately preceded the similarity measures). If persons with high SE who considered their risk perceived the essay author to be at higher risk compared to themselves than did persons with high SE who did not consider their risk, it follows logically that this author should be seen as less similar to the self by these participants on some relevant dimension. It is possible that such explicit distancing did occur on a dimension that was not assessed in this experiment, but it is hard to imagine what dimensions would have more relevance to the transmission of STDs than would sexual behavior (a rational
relationship) or personality (a more irrational relationship).

A more likely explanation is that, in many respects, the personality and sexual behavior of the essay author were so similar to those of the participants (all were sexually active college students) that explicitly denying similarity on these dimensions would have been difficult. The discrepancy in these findings highlights the often inconsistent responses of persons who are asked to consider their health risk, however (cf. Leventhal, et al., 1984).

Interactive Effects of Exposure and Risk Consideration

Perceptions of Vulnerability

Predictions

Perception of one's own vulnerability as assessed at the end of the experiment was hypothesized to still be influenced by risk consideration; people who had considered their risk were expected to feel more vulnerable to STDOTAs than were people who did not consider their risk. No effect of risk consideration alone was expected on participants' perceptions of vulnerability for their peers (cf. Gerrard et al., 1991), but a three-way Risk Consideration x Exposure x SE interaction was expected. Persons with high SE who considered their risk and who were exposed to the
fictitious essay were predicted to show greater perceptions of peers' vulnerability than other participants.

Together, these patterns were predicted to lead to a smaller perception of unique invulnerability among persons who had considered their risk than among those who had not. This main effect was tentatively expected to be qualified by a Risk Consideration x Exposure x SE interaction parallel to that predicted for ratings of peers' vulnerability. Persons with high SE in the risk consideration/exposure condition were predicted to show greater perceptions of unique invulnerability than were other participants, particularly persons with high SE in the risk consideration/control II condition.

**Self Vulnerability**

In contrast to predictions, the results did not show a significant difference between people who considered their risk and those who did not in perceptions of self vulnerability at the end of the experiment (T2). The lack of a difference on this dimension was surprising because of the considerable difference that existed on T1 self-vulnerability between participants in the risk consideration condition and the members of the separate, extra-experimental "comparison sample" who did not
consider their risk (N = 115). This finding may indicate that perceptions of self-vulnerability decreased between T1 and T2 among persons in the risk consideration condition. Analyses conducted between T1 and T2 for members of the risk consideration condition (see Footnote 2) did not show a significant decrease over time in perceptions of self-vulnerability, however. Additionally, comparisons between perceptions of self-vulnerability for participants in the risk consideration condition and those of the members of the comparison sample remained significant at T2 (F(1,191) = 4.99, p = .03).

In the absence of a decrease in perceptions of vulnerability among risk consideration participants, there may have been an increase in perceptions of self-vulnerability among persons in the no risk consideration condition. It is possible that simply being in an experiment that asked questions about STDs might have elevated feelings of self-vulnerability among experimental participants who were not asked to explicitly consider their risk at the start of the experiment. Because T1 risk perceptions were not assessed for no risk consideration participants, this hypothesis cannot be directly tested, but indirect evidence suggests that it may be a valid explanation of
the results.

When the perceptions of self-vulnerability at T2 among persons in the no risk consideration condition were compared with those of persons in the separate "comparison sample," a significant interaction revealed that, among persons with high SE, simply being in the experiment resulted in higher perceptions of self-vulnerability than were seen among persons in the "comparison sample" (M = 29.45 vs. M = 17.66; t(191) = 4.89, p = .03). No effect of experimental participation was seen for persons with low SE (p > .30). These exploratory analyses suggest that perceptions of threat may have increased among persons in the no risk consideration condition over the course of the experiment, resulting in the lack of a significant effect of risk consideration on T2 perceptions of self-vulnerability.

These findings suggest that the effects of risk consideration on the dependent measures in this study may have been somewhat attenuated by the fact that all participants were somewhat threatened simply by virtue of having responded to the dependent measures. This may represent still another reason for the relatively limited amount of differential derogation that was observed as a function of risk consideration.
Peers' Vulnerability

Risk consideration. As predicted, there was no effect of risk consideration alone on perceptions of peers' vulnerability; persons who considered their risk provided similar estimates of their peers' likelihood of contracting STDOTAs as did persons who did not consider their risk. These results are consistent with prior findings suggesting that risk consideration will not impact perceptions of others' vulnerability (Gerrard et al., 1991). This finding is in keeping with the general absence of active derogation of peers in this study. Persons who considered their risk did not appear to derogate their peers on perceptions of risk behavior or personality, but instead enhanced perceptions of themselves.

Exposure. It was hypothesized, however, that being exposed to information about an alleged peer who engaged in very risky sexual behavior would lead to revised perceptions of one's peers among persons with high SE who had considered their risk. Research has suggested that exposure to even one instance of health-relevant attributes can influence people's perceptions of those attributes (Croyle & Hunt, 1991), and it is possible that participants' perceptions of their peers might be affected negatively by information suggesting that a peer
was exceedingly risky.

Although the predicted Risk Consideration x Exposure x SE interaction was not significant, the two-way Risk Consideration x Exposure interaction was, and investigation of the means did show some support for the predicted effect. Persons with high SE who considered their risk and who were exposed to the fictitious risk behavior essay perceived that their peers were significantly more likely to contract STDOTAs than did persons with high SE who considered their risk but who were not exposed to the essay. No such difference in reaction to the essay was seen among persons with high SE who did not consider their risk or among persons with low SE.

These results suggest that persons with high SE who have been threatened by considering their risk for a disease and who are exposed to information suggesting that a peer is engaging in very risky behaviors will alter their perceptions of their peers in general in a way that makes them seem more vulnerable. This alteration in perception of one's peers has implications for alteration of the perception of unique invulnerability, and hence, potentially for preventive health behavior (Burger & Burns, 1988).
Perceptions of Unique Invulnerability

Risk consideration. In accordance with predictions, persons who considered their risk for STDs showed a smaller difference between their perceptions of vulnerability for themselves and for their peers (perception of unique invulnerability) than did persons who did not consider their risk. Unexpectedly, this pattern of results was primarily driven by lower vulnerability estimates for the typical peer in the risk consideration than in the no consideration condition. It was originally hypothesized that risk consideration would lead to lower perceptions of unique invulnerability by elevating perceptions of self-vulnerability in this condition. As has been noted before, however, it appears that the perceived self-vulnerability of members of both the risk consideration and the no risk consideration conditions may have been influenced by mere participation in the experiment, and they did not differ from one another on this measure at T2. Why risk consideration led participants to give lower estimates of peers' vulnerability at T2 is unclear, however.

This finding is a somewhat hopeful one vis a vis educational interventions that seek to increase people's awareness of their vulnerability and subsequently encourage preventive behavior (e.g., the health risk
appraisal method, Robbins & Hall, 1970; see Schoenbach, et al., 1987 for a review). Consideration of risk in and of itself can reduce people's perceptions that others, but not themselves, will face the negative consequences of risky health behavior.

**Psychological distancing.** A qualification of the finding that risk consideration reduces perceptions of unique invulnerability is that these perceptions are bolstered by psychological distancing, particularly among persons with high SE. Correlational analyses suggested that, among persons with high SE, the magnitude of the self–peer difference in vulnerability was positively associated with self–other differences in personality evaluations.

Compensatory self-enhancement of the nature seen on the personality traits is assumed to reduce the discomfort caused by threat to the self-image on some other dimension. In cases such as the present one, where the original dimension is preventive health behavior, it seems possible that this amelioration of self-image might work to inhibit intentions to improve such behavior. In the present study, the positive association among persons with high SE between self-rating on personality and personal vulnerability, and
between distancing on this measure and the perception of unique invulnerability, suggests the presence of such an effect. Clearly, it would not be beneficial to suggest strategies that would reduce people's self-esteem as a way of improving health behavior. But educational programs might do well to call explicit attention to the system of "just world" beliefs that may operate to impede condom use, contraception, and other preventive behavior by associating positive personality traits with reduced vulnerability or unique invulnerability.

**Exposure.** Finally, participants who considered their risk and who were exposed to information about a risky peer showed greater perceptions of unique invulnerability than did participants who considered their risk and were not so exposed. This pattern was significant across the sample as a whole, but it was particularly pronounced among persons with high SE. The difference in perceptions of invulnerability as a function of exposure to the fictitious risk essay was primarily due to increased perceptions of peers' riskiness among those exposed to it. Lower perceptions of peers' vulnerability were the driving force behind the reduced perception of invulnerability seen in the risk consideration, and it appears that exposure to a risky peer social comparison target works directly to eliminate this difference.
These findings have relevance to intervention programs that seek to alter young people's behavior by interaction with risky peers. Some intervention programs include presentations by young people who have engaged in risky behavior and who have "gotten caught"—either by pregnancy, disease, or other undesirable consequences. The present research suggests that such intervention strategies need to be monitored very carefully to insure that some members of the audience do not derive from these presentations a more "risky" image of their peers in general that facilitates a perception of unique invulnerability.

Further research must be conducted, however, to ascertain the extent to which the present findings generalize to such "real life" circumstances, in which the "risky targets" are not simply detailing risky behavior but also discuss its undesirable consequences and caution against it. Longitudinal assessments of this effect would also be useful in determining whether the change in perceptions of one's peers that is associated with exposure to one risky peer is an enduring one or relatively transitory. Momentary fluctuations in perceptions of invulnerability during an educational presentation are unlikely to have serious behavioral
ramifications; if the altered perception of invulnerability persists, however, preventive behavior could be adversely influenced (Burger & Burns, 1988).

Unique Invulnerability and Preventive Behavior

The present study did not assess subsequent preventive behavior or behavioral intentions. It seems possible, however, that a return to original levels of perceived unique invulnerability, either as a result of distancing or of engaging in downward comparison with a risky peer, might impede prophylactic behavior that could otherwise be facilitated by risk consideration.

Contraceptive behavior and illusions of invulnerability. Burger & Burns (1988) surveyed sexually active female undergraduates about their contraceptive behavior and about their perceptions of vulnerability to unplanned pregnancy. Women in this sample were asked to indicate the likelihood that they would become pregnant in the next 12 months, and the likelihood that the average female student at their university, the average American female of the same age, and the average American female of childbearing age would become pregnant in the next 12 months. They were also asked to indicate what percentage of the time that they had used contraception during intercourse in the last six months. Participants showed significant illusions of unique invulnerability
with regard to all three comparison targets. More importantly, the inverse correlation between the illusion of invulnerability and frequency of effective contraception (methods not including withdrawal, douching, and guessing at a safe time of the month) was significant. The greater the illusion, the less often these women had used effective birth control over the past six months.

Although this correlational study supports the hypothesis that the illusion of unique invulnerability will be associated with a lack of preventive health behavior, the possibility exists that rather than perceptions causing behavior, ineffective contraceptive behavior may give rise to defensive social comparisons. Women who use poor contraception may "justify" their behavior by endorsing the belief that they are at relatively low risk. This alternative interpretation could not be examined with these data.

Divergent findings. Whitley and Hern (1991) attempted to replicate Burger and Burns' (1988) study and to pinpoint the locus of the unique invulnerability effect. They were interested to determine whether, compared to actual likelihood figures, women overestimated the vulnerability of others or
underestimated their own vulnerability to unplanned pregnancy. They found that although sexually active women tended to be reasonably accurate about their own chances of becoming pregnant, they overestimated the risk faced by other women. They were, however, unable to replicate the association between perceptions of unique invulnerability and contraceptive behavior seen by Burger and Burns (1988). Instead, a significant trend in the opposite direction was found; the more uniquely invulnerable the women in this sample felt, the more effective was their contraception.

Perceptions of vulnerability and sexual experience. Why did these two studies find seemingly antithetical results? One possibility is that participants in the two studies were at different stages in their experience with sexual activity. Weinstein and Nicolich (1993) review the process involved in computing correlations between perceptions of vulnerability and preventive behavior and conclude that it is important to identify and statistically control for the amount of experience people have with a given risk behavior. Shortly after becoming aware that one is engaging in risky behavior, the correlation between feelings of vulnerability and precautionary behavior should be strongly positive; the more vulnerable a person feels, the more likely he or she
should be to take precautions. Once people have engaged in a risk behavior for a longer period of time, however, those people who are likely to take preventive action will have done so. At this more advanced stage, the correlation between perceptions of vulnerability and change in behavior over time should drop to non-significance, and perceptions of vulnerability should be negatively correlated with precautionary behavior at any given time; the more one engages in preventive behavior, the less vulnerable one should feel.

Although the issue of temporal fluctuation has been discussed with reference to absolute rather than relative perceptions of vulnerability, because a major component of the illusion of unique invulnerability is the perception of one's own risk, this issue is relevant to the social comparison of risk as well. It seems likely, based on studies like Boney McCoy et al. (1992) and Burger and Burns (1988), that perceptions of unique invulnerability do serve as impediments to the adoption of precautionary behavior, but research has yet to be done to clearly establish the conditions under which this association will be found.

In the meantime, given the available evidence, it seems wisest to continue to identify and address any
factors that may work to increase or maintain perceptions of unique invulnerability, especially among persons who are relatively new to a domain of health behavior. The present study suggests that two factors that may help to maintain these perceptions, at least among persons with high SE, are self-enhancement on personality traits and exposure to social comparison targets who facilitate the perception of one's peers as risky.

**Perceptions of Prevalence, Unpleasantness, and Concern**

**Perceived Prevalence of Risky Sexual Behavior**

**Hypotheses.** It was hypothesized that persons with low SE who were exposed to information about a peer who was engaging in risky sexual behavior would report higher perceptions of the **prevalence** of such behaviors among their peers than would persons with low SE who had not been so exposed. This pattern was expected to be more pronounced among persons with low SE who had considered the risk than among those who had not, because it was assumed that persons who had considered their risk would feel more deviant and in need of reassurance (cf. Gibbons & Gerrard, 1991) than would those who had not.

**Findings.** The results failed to support the hypotheses concerning perceived prevalence; no effects of risk consideration, exposure to the risk essay, or SE
were seen on perceptions of the prevalence of risky sexual behavior.

The source of the predictions for prevalence were the findings from anthropological and medical literature suggesting that perceptions of prevalence and severity or unpleasantness covary, and from the laboratory studies of Jemmott and his colleagues (see Croyle & Jemmott, 1991, for a review). In these latter studies, people's perceptions of the prevalence of a risk factor or an illness have been impacted by information about the risk status of even one other person. The Jemmott paradigm assesses perceptions of the prevalence of a risk factor with which students are totally unfamiliar before coming to the lab (because it is a fictitious one). They possess no prior perceptions of its unpleasantness or prevalence. Therefore, it may be relatively easy for these novel perceptions to be impacted by laboratory manipulations. In the case of real diseases, however, people have been exposed to information about their relative unpleasantness, severity, prevalence, etc. from a variety of sources before participating in an experiment. It is harder to alter perceptions that are based on extensive knowledge than those that are based on minimal information and it may be the case that exposure
to one instance of a risky peer is not sufficiently impactful to alter previously existing beliefs about the prevalence of this type of risky behavior.

**Perceived Unpleasantness of STDOTAs**

**Hypotheses.** Jemmott and his colleagues (Jemmott et al., 1986; see Croyle & Jemmott, 1991, for a review) have conducted experiments suggesting that experimentally-manipulated perceptions of the prevalence of a risk factor can influence persons' perceptions of the severity of that factor or of the attendant illness. The less prevalent a risk factor is perceived to be, the more severe its consequences are considered. Because the original hypotheses of this experiment predicted that persons with low SE who had considered their risk for STDOTAs and who had been exposed to information about a risky peer would provide significantly higher estimates of the prevalence of risky sexual behavior among their peers than would other participants, it was also predicted that these people would show lower perceptions of the unpleasantness of STDOTAs. Perceptions of the dimension of unpleasantness rather than that of severity were assessed in order to explicitly tap participants' evaluative reactions to the illness, exclusive of any indication of ease of treatment or likelihood of contraction. No differences were predicted among persons
Findings. Because strong support was not found for the hypotheses concerning perceptions of prevalence, it was not entirely surprising that no support was found for the hypotheses concerning perceived unpleasantness. The only effect on perceived unpleasantness was a main effect of risk consideration such that persons who considered their risk perceived the contraction of STDOTAs to be less unpleasant than did persons who had not considered their risk. This finding is in keeping with the finding of Jemmott et al. (1986) that people who were told that they tested positive for a fictitious health risk factor rated it as significantly less serious than did persons who were told that they had tested negative. Jemmott et al. interpreted this difference as evidence of denial or minimization among people who tested positive for the risk factor. In the present study, people who confronted risky sexual behaviors may have engaged in similar denial or minimization to relieve some of the discomfort associated with that process.

Personal Concern About Catching a STDOTA

Like the perception of unpleasantness, the perception of personal concern was one on which it was thought that people who had considered their risk might be able to
minimize the discomfort associated with confronting vulnerability. It might be easier to minimize feelings of concern than of unpleasantness, however, because STDOTAs are, realistically, very unpleasant outcomes. The possibility remained, however, that rather than reflecting denial or minimization, that perceptions of concern might vary positively, in a rational fashion, with perceptions of vulnerability. Therefore, there were no definite predictions with regard to this variable. There were no significant effects of any variables on perceptions of personal concern at T2. A marginally-significant SE x Time interaction (see Footnote 2) suggested that, although the personal concern of persons with high SE tended to decrease over the course of the experiment, the concern of persons with low SE tended to decrease.

Conclusions

The results of this experiment results suggest that people who are asked to consider their risk for health problems, such as STDOTAs, will often focus on risk-reducing behaviors, even when they are explicitly asked to think about those factors that increase their risk. Despite this tendency, risk consideration appears to have aroused enough threat to cause persons with high SE to engage in compensatory self-enhancement on the dimensions
of pregnancy prevention and personality, to select riskier targets with whom to socially compare (than did other persons with high SE), to perceive a social comparison target as riskier compared to themselves than did others with high SE, and to rate the "typical peer's" vulnerability to STDOTAs as greater than others with high SE when they were given the opportunity to socially compare with one risky peer. Self-enhancement on the personality measure was related to lowered perceptions of self-vulnerability to STDOTAs among persons with high SE, and the extent to which they distanced from their peers on this measure was positively associated with the extent to which they perceived themselves to be uniquely invulnerable to STDOTAs. In addition, persons with high SE who considered their risk showed greater perceptions of unique invulnerability if they were exposed to a risky peer social comparison target.

Persons with low SE, in contrast, did not demonstrate any responses to risk consideration or to exposure to a risky social comparison target that appeared to represent a defensive response to threat. Persons with low SE may have fewer mechanisms at their disposal to combat the feelings of vulnerability (and therefore threat) that may accompany risk consideration. Because no measures of
behavioral intention or subsequent preventive or risk behavior were collected, it is not possible to determine whether this relative lack of psychological defenses translates into healthier behavior. The lack of significant differences in mass-testing between persons high and low in SE on measures of monogamy, number of partners, and frequency of sex or of condom use tends to argue against this possibility, but it is one that should be more fully investigated in future examinations of risky and preventive health behavior.
Endnotes

1 Data from the separate "comparison sample" suggest that the two experimental subgroups may have differed on at least one dimension of risk perception before the experiment started. Eighty participants from the comparison sample were matched on gender and "pattern" of sexual behavior with the the 80 participants in the risk consideration condition—47 were matched with the risk consideration participants who listed more risk-increasing than risk-decreasing factors and 33 were matched with those who focused more on risk-reduction. Comparisons between these two new subgroups addressed the question of whether the two experimental subgroups may have had pre-existing differences that might have influenced their response to the risk consideration task.

Although the two new matched subgroups did not differ from one another in perceptions of vulnerability (p > .35), or unpleasantness (p > .90), they did differ significantly in personal concern about catching an STDOTA. The comparison sample subgroup that was matched with the 47 risk consideration participants who focused on risk-increasing behaviors felt significantly more concern (M = 102.51) about catching a STDOTA than did the subgroup that was matched with the 30 risk consideration participants who focused on risk-reduction (M = 61.45;
$t(78) = 4.68, p < .001)$. Because this difference existed between two subgroups who had not considered their risk, it seems likely that the two subgroups in the experimental sample may have differed in personal concern at the beginning of the risk consideration manipulation.

Lack of personal concern about the topic of the experiment may have made it easier for the 30 participants to focus on risk-reduction. Research has shown that people tend to prefer to focus on risk-reducing rather than on risk-increasing factors (Gerrard, et al., 1991; Warner & Gerrard, 1991), and risk-increasing factors may be even less accessible in the memories of people who are relatively unconcerned about a health problem.
REFERENCES


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APPENDIX A

MASS-TESTING MATERIALS
MASS-TESTING INSTRUCTIONS

PLEASE READ THESE INSTRUCTIONS BEFORE BEGINNING

In this questionnaire you will be asked to answer several questions about yourself and your perceptions of others. Some of the questions about yourself are very personal and deal with sexual relations. Some of them are less personal. You are absolutely free to leave any questions blank that you do not want to answer, and you are free to leave the session at any time and still get your extra-credit point.

Your answers to these questions will be completely confidential. No one will see them but the experimenter and her assistants. Your responses to these questions will never be associated with your name in any reference to this study, and these data sheets will be stored in a lab behind two locked doors at all times. Your name will be replaced with a subject number no later than May 20, 1991, or your information will be completely destroyed by that date.

If you wish to be contacted for further experimental participation based on your answers to this questionnaire, please PRINT and SIGN your name in the space below that says "I would like to be called for further participation" and give us your phone number. Signing here does not guarantee that you will be called, but it lets us know that this is O.K. with you. If you do NOT wish to be called as a result of this questionnaire, please sign your name in the space below that says "Please do not contact me" and DO NOT give us your phone number. This guarantees that you will not be called on the basis of your responses on this questionnaire. It does NOT mean that you will not be called as a result of any other mass-testing questionnaires you may fill out.

---

I would like to be called for further participation based on THIS questionnaire.

Please PRINT your name: ____________________________________________

Please SIGN your name: ____________________________________________

Please write your phone number: ________________________________

Please write your student ID: ________________________________

Please indicate how many years you have been in college. If this is your first year, write "1". If this is your second year, write "2", etc. __________

Please indicate your age in years. ________________________________

Please indicate your sex: ________ male ________ female

Have you EVER (including now) taken Social Psychology (Psych. 280 at ISU)?

______ yes ________ no

********** O R **********

--- Please do NOT contact me for further participation based on the mass-testing questions in THIS PACKET

Please SIGN your name: ____________________________________________
Health Factors Questionnaire

We are interested in the way people perceive health behavior on a variety of health dimensions. Please respond to these questions by making the appropriate response directly on this sheet. Some of the questions will ask you to consider the chances that specific events will happen to people. Others will ask you to describe yourself on certain health dimensions.

PLEASE REMEMBER THAT YOUR RESPONSES TO THESE QUESTIONS ARE COMPLETELY VOLUNTARY. YOU DO NOT HAVE TO RESPOND TO ANY QUESTIONS THAT YOU DO NOT WANT TO. ALL OF YOUR RESPONSES WILL BE KEPT COMPLETELY CONFIDENTIAL, AND SEEN ONLY BY THE EXPERIMENTER AND HER ASSISTANTS.

For the first 7 questions, please make a slash mark (/) through each of the lines to indicate your response. You can make your marks through any point on the lines.

1. How likely do you think it is that the average person of your age and sex will be injured in a serious car accident in the next two years?

   EXTREMELY LOW CHANCE
   EXTREMELY HIGH CHANCE

2. How likely do you think it is that the average person of your age and sex will develop heart trouble someday?

   EXTREMELY LOW CHANCE
   EXTREMELY HIGH CHANCE

3. How likely do you think it is that the average person of your age and sex will catch a sexually-transmitted disease other than AIDS in the next 2 years (for example: chlamydia, herpes, genital warts, etc.)?

   EXTREMELY LOW CHANCE
   EXTREMELY HIGH CHANCE

4. How often do you think that the average person your age and sex wears seat belts?

   VERY RARELY
   VERY OFTEN

5. How often do you think that the average person your age and sex flosses their teeth?

   VERY RARELY
   VERY OFTEN

6. How common do you think that risky sexual behavior is among people of your age and sex (for example: not using condoms or having sex with more than one person)?

   VERY RARE
   VERY COMMON
7. How common do you think that driving a car while under the influence of alcohol or drugs is among people of your age and sex?

VERY RARE

For the rest of the questions on this questionnaire, please CIRCLE the appropriate response or check the appropriate blank. Please remember that all your responses are voluntary and confidential.

8. How often do you exercise each week?

a. I get almost no exercise on a weekly basis
b. I get no regular exercise except for walking to and from class or work
c. I get at least half an hour of exercise each week, but not as much as an hour
d. I get between 1 to 3 hours of exercise each week
e. I get more than 3 hours of exercise each week, but less than an hour a day
f. I get about an hour a day of exercise
g. I get more than an hour a day of exercise

9. During the school year so far, how often would you say that you have felt "stressed out" on average?

a. less than once a month
b. about once a month, but not more often
c. more than once a month but not every week
d. about once a week, but not more often
e. more than once a week, but not every day
f. every day

10. How much alcohol do you consume in an average week? Assume that one can of beer, one glass of wine, or one mixed drink (containing an ounce of 80 proof alcohol) is considered a "drink."

a. None
b. Less than one drink per week.
c. About one drink per week.
d. Between 1 - 3 drinks per week.
e. Between 4 - 7 drinks per week.
f. More than 7 drinks per week.

11. How often do you wear seat belts when you are riding in a car?

a. never
b. only when going on long trips
c. less than once in every ten times I ride in a car
d. between one in every ten times and one in every five times I ride in a car
e. more than every one in five times I ride in a car but not every time
f. every time I ride in a car

PLEASE CONTINUE...
12. How often do you have sexual intercourse?
   a. Never -- I am not sexually active
   b. Less than once per semester
   c. At least once per semester, but not as often as once a month
   d. At least once a month, but not as often as once a week
   e. At least once a week, but not more than three times a week
   f. More than three times per week

PLEASE ANSWER THE REST OF THESE QUESTIONS ONLY IF YOU REPORTED THAT YOU HAVE SEX ONCE PER SEMESTER OR MORE (RESPONSES C - F) IN QUESTION #12.

13. Have you had sexual intercourse in the last three months?  
   ______ yes  _______ no

14. How many sexual partners have you ever had?  _______________________

15. How would you describe your usual pattern of sexual behavior?
   a. I am completely monogamous -- I only have sex with one person, in a long-term, committed relationship.
   b. I only have sex with one person during a period of time, but I don't tend to stay with one person for more than a few months or a year at most.
   c. I have sex with more than one person during a period of time, but they are people I know and have some form of relationship with.
   d. I have sex fairly casually with people I have just met, as well as with people I know and have a relationship with.

16. Have you ever had a sexually-transmitted disease (for example, herpes, chlamydia, syphilis, genital warts, etc.)? (This does NOT include yeast infections.)
   ________ yes  __________ no

17. Please indicate what form of birth control you or your partner use MOST OFTEN. Please only indicate ONE FORM OF BIRTH CONTROL.
   a. none  e. sponge
   b. withdrawal  f. diaphragm with foam or jelly
   c. rhythm  g. condoms
   d. jelly or foam without a diaphragm  h. birth control pills
   i. other (please specify)  _______________________

19. How often do you or your partner use condoms when you have sex?
   a. every time
   b. about 75% of the time (3 out of every 4 times)
   c. about half of the time (2 out of every 4 times)
   d. about 25% of the time (1 out of every 4 times)
   e. almost never
   f. never

20. Please indicate your current marital status:
   a. single  c. married  e. divorced
   b. engaged  d. separated  f. widowed
APPENDIX B

EXPERIMENTAL PROTOCOL
Hi, my name is Sue. I'm a graduate student in the Psychology department, and I'll be the experimenter in today's study. I'd like to thank you all for coming today and I'd like to know each of your FIRST names. There will be several questionnaires for you to fill out in this experiment, and it's important that you understand what each of them is asking, so if you have any questions at any time, please feel free to ask. I'd like to take this opportunity to remind you that your participation here today is completely voluntary, and that you are free to leave at any time or to refuse to answer questions without losing your extra credit.

This experiment is concerned with people's health behaviors, and with sexual behavior in particular. You will be asked to respond to several questionnaires that deal with your sexual habits and with your perceptions of things related to those habits. You will each be in a separate cubicle here in the lab, so you will be able to fill out the questionnaires in private. We'll mark your questionnaires with code numbers that we'll match with your name until all of our data is in the computer, at which time your name will be totally removed from your data. The list that matches names and code numbers will be kept with the data in this lab behind two locked doors at all times, and only I and my assistants will have access to it. Once all the data is in the computer, the list that matches your name to your subject number will be destroyed, so there will be no permanent record that links your name to your responses. Is that clear? Do you have any questions?

I expect that the experiment will take about an hour, and that you will receive 1 experimental extra credit point. If the experiment goes over an hour, you will get two points.

Do you have any questions? I'd like to obtain your formal consent to participate in this experiment today [hand out consent statement]. If you have any questions about participating, please feel free to ask them at any time.

[TAKE SUBJECTS INTO CUBICLE D. SHOW THEM THE INTERCOM, AND TELL THEM THAT THEY WILL BE TOLD EXACTLY WHAT TO DO ALL DURING THE EXPERIMENT -- THEY SHOULD NOT OPEN FOLDERS UNTIL THEY ARE ASKED TO DO SO. THEN SEPARATE THEM INTO THEIR SEPARATE CUBICLES. TEST THE INTERCOM SYSTEM AND BEGIN.]

________________________________________________________________________

FOLDER 1

Please take the questionnaire out of FOLDER 1 and read along with me.

[READ THE INSTRUCTIONS FOR FOLDER 1].

Some people prefer to write in short phrases. Others use whole sentences and paragraphs. You can write in whatever style you are most comfortable with. You'll have a few minutes to think about this and to write down anything you do that might increase your chances of catching a sexually-transmitted disease other than AIDS. Please do not go on to any of the other folders until I ask you to do so. Please start.

[GIVE THEM 2:00, THEN SAY THAT, IF ANYONE WANTS MORE TIME, THEY SHOULD PRESS THEIR CALL BUTTON. GIVE THEM UP TO 3:00 AT MOST AND THEN GET THEM TO WRAP IT UP.]

Please put that questionnaire back into FOLDER 1.

________________________________________________________________________
FOLDER 2

Please take the questionnaire out of FOLDER 2 and answer the questions in it. To answer these questions, make a slash mark through each line to indicate your responses. Your marks may fall through any point along the lines. Please start.

[GIVE SUBJECTS 20 SECONDS. ASK THOSE WHO ARE NOT DONE TO PRESS THEIR CALL BUTTONS. GIVE THEM ANOTHER 15 SECONDS AND THEN GET THEM FINISHED UP.]

Please put that questionnaire back into FOLDER 2.

FOLDER 3

Please take the questionnaire out of FOLDER 3. This should be called the Health Factors Questionnaire. Please read the instructions along with me.

[READ INSTRUCTIONS ON QUESTIONNAIRE]

You'll have about a minute to answer these questions. Please start.

[GIVE THEM 45 SECONDS. ASK THOSE WHO AREN'T DONE TO PRESS THEIR CALL BUTTONS. TELL THEM TO PRESS THEIR CALL BUTTONS AS SOON AS THEY ARE FINISHED -- START PRODDING PEOPLE AFTER ANOTHER 20 SECONDS IS UP IF THEY ARE NOT DONE YET.]

Please put that questionnaire back into FOLDER 3.

FOLDER 4

Please take the questionnaire out of FOLDER 4 and read the instructions along with me.

[READ THE INSTRUCTIONS FROM THE QUESTIONNAIRE]

Please make slash marks through the lines as before to indicate your responses. You'll have about a minute to answer these questions. Please start.

[GIVE THEM 1:15. AT THAT TIME ASK THOSE WHO AREN'T DONE TO PRESS THEIR CALL BUTTONS. ASK THEM TO PRESS THEIR BUTTONS ONCE THEY ARE FINISHED, BUT START TO FINISH THEM UP IF THEY ARE NOT DONE IN ANOTHER 20 SECONDS.]

Please put that questionnaire back into FOLDER 4.

FOLDER 5

We'd like to find out a little more about you. Please take the questionnaire out of FOLDER 5 and answer each question by making a slash mark through each line. You'll have about a minute to answer these questions.

[GIVE THEM 45 SECONDS AND ASK FOR BUTTONS IF NOT DONE. ASK THEM TO PRESS THEIR BUTTONS AS SOON AS THEY ARE DONE IF THEY AREN'T FINISHED, UP TIL ANOTHER 45 SEC--THEN TRY TO GET THEM FINISHED.]

Please put this questionnaire back into FOLDER 5 and go on to FOLDER 6.
FOLDERS 6 and 7

Please answer the questions in FOLDER 6. You'll have about a minute to answer these questions.

[GIVE THEM 1 MINUTE AND THEN ASK FOR BUTTONS. IF NOT DONE, ASK THEM TO PRESS THEIR BUTTONS AS SOON AS THEY ARE, UP TO ANOTHER 30 SECONDS, WHEN YOU SHOULD TRY TO GET THEM FINISHED.]

Please put that questionnaire back into FOLDER 6, and go on to FOLDER 7. Please answer the questions in FOLDER 7.

[GIVE THEM 30 SECONDS AND THEN ASK FOR BUTTONS. GIVE ANY WHO AREN'T DONE ANOTHER 15 SECONDS AND THEN FINISH THEM UP.]

Please put that questionnaire back into FOLDER 7 and go on to FOLDER 8.

FOLDER 8

Please take the questionnaire out of FOLDER 8 and read the instructions along with me. It is important that you understand these instructions and what you are supposed to do in FOLDER 8.

[READ INSTRUCTIONS]

Please press your call buttons as soon as you have finished deciding which subject's information you would like to read and have made an x in the appropriate space.

[WAIT UNTIL ALL SUBJECTS HAVE PRESSED THEIR BUTTONS. IF ALL DO NOT AFTER 30 SECONDS, ASK THOSE WHO ARE UNecided TO PRESS THEIR CALL BUTTONS AND GIVE THEM A LITTLE MORE TIME. AFTER ANOTHER 15 SECONDS, ASK AGAIN. IF ANYONE IS STILL NOT DONE, GO TO THEIR CUBICLE AND SEE WHAT THE PROBLEM IS.]

I'll be around now to collect your first 8 folders.

[COLLECT FIRST 8 FOLDERS. CHECK TO SEE WHICH TARGET EACH PERSON SELECTED. THEN, GO AROUND AND GIVE EACH SUBJECT THE DC TARGET INFORMATION. IF THE TARGET THE SUBJECT SELECTED WAS 6, WHEN YOU HAND OUT THE DC INFORMATION, DON'T SAY ANYTHING SPECIAL. IF IT WAS NOT 6, VERY BRIEFLY MENTION THAT THE ONE THEY ASKED FOR HAD ALREADY BEEN EVALUATED, SO WE GAVE THEM ANOTHER. DO NOT MAKE TOO MUCH OF THIS. TELL SUBJECTS TO WAIT TO OPEN THE FOLDERS UNTIL YOU TELL THEM TO.]

O.K., please open the folder I just handed out and read the information written by the other student that's in there. You'll have a minute or two to read this information to see what this other student is like. I'll let you know when to go on to the other folders.

[GIVE THEM 1:00 TO READ.]

O.K., please put that information back into the folder and go on to FOLDER 9.

FOLDER 9

We'd like to get your general impressions of the person whose information you just read. Please take the questionnaire out of FOLDER 9 and answer the questions in it.
[GIVE THEM 30 SEC. ASK FOR BUTTONS. GIVE ANOTHER 10 SEC. AND FINISH]

Please go on to FOLDER 10.

--------------------

FOLDER 10

We'd like to ask you a few more questions about your perceptions of sexual behavior. Please take out the questionnaire in FOLDER 10 and make a slash mark through each line to indicate your responses. You'll have about a minute to answer these questions.

[GIVE THEM 45 SECONDS, THEN ASK. IF NOT DONE, ANOTHER 20 SECONDS, THEN TRY TO GET THEM FINISHED. DON'T RUSH THIS ONE TOO MUCH, THOUGH.]

Please put that questionnaire back into FOLDER 10 and go on to FOLDER 11.

--------------------

FOLDER 11

Please take the questionnaire out of FOLDER 11.

[READ THE INSTRUCTIONS ON THE SHEET.]

- Please read all of these questions before you start answering, and be as complete as possible in your answers. Please press your call buttons when you are done with this questionnaire.

[WAIT UNTIL ALL HAVE PRESSED THEIR BUTTONS. TIMES WILL RANGE FROM 25 SECONDS TO 2:30 MINUTES OR LONGER, DEPENDING ON HOW MUCH PEOPLE HAVE TO WRITE. IF ALL HAVE NOT PRESSED AFTER 3 MINUTES, ASK FOR BUTTONS FROM THOSE WHO ARE NOT DONE, AND TRY TO FINISH THEM UP.]

Please put that sheet back into FOLDER 11. I'd also like you to put the subject consent form that you filled out at the start of the experiment into FOLDER 11 as well. We'd really appreciate it if you would stack your folders so that number 9 is on top and number 11 is on the bottom. You can leave your folders and our pencils in your rooms, and we'd like you come on back into the lobby now.
APPENDIX C

COMPLETE EXPERIMENTAL MATERIALS FOR A PARTICIPANT IN THE

RISK CONSIDERATION / EXPOSURE CONDITION
Researchers in the area of health are concerned with why people engage in behaviors that make it possible that they will become ill. One area in which we are particularly interested is the area of sexual behavior and sexually-transmitted disease. Although AIDS is probably the most talked-about sexually-transmitted disease, we are interested in studying other sexually-transmitted diseases, like chlamydia and herpes, that also represent important health problems.

People often do not think about their risk for sexually-transmitted diseases. One purpose of this study is to get you to think about your risk for sexually-transmitted diseases other than AIDS. Please take a few minutes and think about the things that you do that make it possible that you could catch a sexually transmitted disease other than AIDS (for example: chlamydia, herpes, genital warts, etc.) We would like you to write down anything you can think of that you do that might INCREASE the chances that you would catch such a disease. You may include information about your partner or partners if you think that something about them may INCREASE your chances of catching a sexually-transmitted disease other than AIDS.
Please answer the following questions by making a slash mark (/) through each line to indicate your response. Your marks may fall through any points along the lines.

1. How likely do you think it is that you will catch a sexually-transmitted disease other than AIDS sometime in the next 2 years?

   EXTREMELY LOW / EXTREMELY HIGH

2. Please think about actually having a sexually-transmitted disease other than AIDS. How unpleasant is the idea of your actually having such a disease?

   SLIGHTLY UNPLEASANT / EXTREMELY UNPLEASANT

3. How concerned are you, personally, about catching a sexually-transmitted disease other than AIDS?

   NOT AT ALL CONCERNED / EXTREMELY CONCERNED
Health Factors Questionnaire

We would like you to indicate your perceptions of where the AVERAGE PERSON OF YOUR AGE AND SEX stands on these health behaviors. We know that it can be hard to make generalizations about other people, and that sometimes people cannot be easily categorized "in general." But people often form rough impressions of what others are like, and it is those impressions that we would like you to share with us.

Please make a slash mark (/) through the each of these lines to indicate your responses. Your marks can fall through any point on the lines.

1. In general, how often would you say the average person of your age and sex has sexual intercourse?

   VERY / RARELY / VERY / OFTEN

2. In general, how many sexual partners would you say that the average person of your age and sex has had?

   VERY FEW / VERY MANY

3. In general, how careful do you think that the average sexually-active person of your age and sex is about making sure they (or their partner) don't have an unwanted pregnancy?

   EXTREMELY / CARELESS / EXTREMELY / CAREFUL

4. In general, how often do you think that the average person of your age and sex (or their partner) uses condoms when having sexual intercourse?

   VERY RARELY / VERY OFTEN
Perceptions of the Average Person

Now we'd like you to give us your impressions of the average person of your age and sex on some different dimensions, to give us a more complete picture of how you perceive people in general. Please make slash marks through each line to indicate the extent to which you think each of the following terms is characteristic or true of the average person of your age and sex.

1. Capable

   NOT TRUE
   OF THE
   AVERAGE PERSON
   MY AGE AND SEX
   
   VERY TRUE
   OF THE
   AVERAGE PERSON
   MY AGE AND SEX

2. Independent

   NOT TRUE
   OF THE
   AVERAGE PERSON
   MY AGE AND SEX
   
   VERY TRUE
   OF THE
   AVERAGE PERSON
   MY AGE AND SEX

3. Sensible

   NOT TRUE
   OF THE
   AVERAGE PERSON
   MY AGE AND SEX
   
   VERY TRUE
   OF THE
   AVERAGE PERSON
   MY AGE AND SEX

4. Fair-minded

   NOT TRUE
   OF THE
   AVERAGE PERSON
   MY AGE AND SEX
   
   VERY TRUE
   OF THE
   AVERAGE PERSON
   MY AGE AND SEX

5. Successful

   NOT TRUE
   OF THE
   AVERAGE PERSON
   MY AGE AND SEX
   
   VERY TRUE
   OF THE
   AVERAGE PERSON
   MY AGE AND SEX

PLEASE CONTINUE...
6. Intelligent

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<th>Statement</th>
<th>My Age and Sex</th>
<th>Average Person</th>
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<td>Not true</td>
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<td>Average person</td>
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<td>My age and sex</td>
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7. Dependable

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<th>My Age and Sex</th>
<th>Average Person</th>
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<td>Average person</td>
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8. Attractive

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<th>My Age and Sex</th>
<th>Average Person</th>
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<td>Average person</td>
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9. Hard-working

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<th>My Age and Sex</th>
<th>Average Person</th>
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<td>Average person</td>
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10. Patient

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11. Insecure

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Please continue...
12. Friendly
NOT TRUE
OF THE
AVERAGE PERSON
MY AGE AND SEX

13. Cautious
NOT TRUE
OF THE
AVERAGE PERSON
MY AGE AND SEX

14. Realistic
NOT TRUE
OF THE
AVERAGE PERSON
MY AGE AND SEX
Health Behavior Questions

We would now like you to describe yourself on the following health dimensions. Please make a slash mark (/) through each of the lines to indicate your responses.

1. In general, how often would you say you have sexual intercourse?

___________________________________________

VERY RARELY                        EXTREMELY
OFTEN

2. In general, how many sexual partners would you say that you have had?

___________________________________________

VERY FEW                          VERY MANY

3. In general, how careful do you think that you are about making sure that you (or your partner) don't have an unwanted pregnancy?

___________________________________________

EXTREMELY                        EXTREMELY
CARELESS                          CAREFUL

4. In general, how often would you say that you or your partner use condoms when you have sexual intercourse?

___________________________________________

VERY RARELY                        VERY OFTEN
Perceptions of Yourself

We would like you to tell us a little more about yourself by describing yourself on the following dimensions. Please describe yourself the way you really are by making a slash mark through each line, below.

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PLEASE CONTINUE TO THE OTHER SIDE OF THE PAGE...
8. Attractive

NOT TRUE OF ME

VERY TRUE OF ME

9. Hard-working

NOT TRUE OF ME

VERY TRUE OF ME

10. Patient

NOT TRUE OF ME

VERY TRUE OF ME

11. Insecure

NOT TRUE OF ME

VERY TRUE OF ME

12. Friendly

NOT TRUE OF ME

VERY TRUE OF ME

13. Cautious

NOT TRUE OF ME

VERY TRUE OF ME

14. Realistic

NOT TRUE OF ME

VERY TRUE OF ME
PERCEPTIONS OF SIMILARITY

1. How similar do you feel your sexual behavior is to that of the average person of your age and sex? Please make a slash mark through the line to indicate your response.

NOT VERY SIMILAR

VERY SIMILAR

2. How similar do you feel your personality is to that of the average person of your age and sex?

NOT VERY SIMILAR

VERY SIMILAR

3. How similar do you feel that your sexual behavior is to that of the kind of person who catches a sexually-transmitted disease (other than AIDS)?

NOT VERY SIMILAR

VERY SIMILAR

4. How similar do you feel that your personality is to that of the kind of person who catches a sexually-transmitted disease (other than AIDS)?

NOT VERY SIMILAR

VERY SIMILAR
People can get information about health and illness from doctors, school classes, or television programs. But people also use information that they get from people like themselves to decide what things they should do or should avoid doing. We are interested in the way that people respond to health information about other people like themselves. In a minute, you will be asked to read some of the experimental sheets filled out in this experiment by another student. This student has agreed to let her information be used in this way, but you will not be told the name of the student, and the written parts have been retyped rather than letting you see the original handwriting. After you read the information provided by this student, you will answer some questions.

Several students have offered to let us use their experiment information in this part of the experiment, and we have ranked these students on the basis of how much at risk they appear to be, based on their behavior, for catching a sexually-transmitted disease other than AIDS. This scale ranges from 1 to 7. On this ranking scale, a ranking of 1 means that the student is at very little risk of catching a sexually-transmitted disease, and a ranking of 7 means that they are at extremely high risk of catching a sexually-transmitted disease other than AIDS.

We would like to have several subjects read each of these sets of information, but we will let you indicate which of them you would most like to read.

Please make a check mark, below, beside the number of the ONE subject whose information you would most prefer to read. Please only make a check mark beside the number of ONE subject.

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<tr>
<th>RISK RATING</th>
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1. Whether or not you actually got the person you picked, why do you think that you picked the person you did?

2. How similar do you think your sexual behavior is to that of the person whose information you just read?

   EXTREMELY DISSIMILAR
   EXTREMELY SIMILAR

3. How similar do you think your personality is to that of the person whose information you just read?

   EXTREMELY DISSIMILAR
   EXTREMELY SIMILAR

4. How does this person compare to you in the riskiness of their sexual behavior? (Risky for catching a sexually-transmitted disease.) Please only check one.

   ______ This person seems at much less risk than I am.
   ______ This person seems at somewhat less risk than I am.
   ______ This person seems at slightly less risk than I am.
   ______ This person seems at about the same risk as I am.
   ______ This person seems at slightly more risk than I am.
   ______ This person seems at somewhat more risk than I am.
   ______ This person seems at much more risk than I am.

5. How do you think that this person compares to the average person of your age and sex in the riskiness of their sexual behavior?

   ______ This person seems at much less risk than average.
   ______ This person seems at somewhat less risk than average.
   ______ This person seems at slightly less risk than average.
   ______ This person seems at about average risk.
   ______ This person seems at slightly more risk than average.
   ______ This person seems at somewhat more risk than average.
   ______ This person seems at much more risk than average.
1. How likely do you think it is that the average person of your age and sex will catch a sexually-transmitted disease other than AIDS sometime in the next 2 years?
   
   EXTREMELY LOW
   CHANCE
   
   EXTREMELY HIGH
   CHANCE

2. How common do you think that risky sexual behavior (for example, not using condoms or having sex with several partners) is among people of your age and sex?
   
   VERY RARE
   
   VERY COMMON

3. How likely do you think it is that you will catch a sexually-transmitted disease other than AIDS sometime in the next 2 years?
   
   EXTREMELY LOW
   
   EXTREMELY HIGH

4. Think about actually having a sexually-transmitted disease other than AIDS. How unpleasant is the idea of your actually having such a disease?
   
   SLIGHTLY UNPLEASANT
   
   EXTREMELY UNPLEASANT

5. How concerned are you, personally, about catching a sexually-transmitted disease other than AIDS?
   
   NOT AT ALL CONCERNED
   
   EXTREMELY CONCERNED
APPENDIX D

FICTITIOUS RISK BEHAVIOR ESSAYS FOR FEMALES AND MALES
Researchers in the area of health are concerned with why people engage in behaviors that make it possible that they will become ill. One area in which we are particularly interested is the area of sexual behavior and sexually-transmitted disease. Although AIDS is probably the most talked-about sexually-transmitted disease, we are interested in studying other sexually-transmitted diseases, like chlamydia and herpes, that also represent important health problems.

People often do not think about their risk for sexually-transmitted diseases. One purpose of this study is to get you to think about your risk for sexually-transmitted diseases other than AIDS. Please take a few minutes and think about the things that you do that make it possible that you could catch a sexually transmitted disease other than AIDS (for example: chlamydia, herpes, genital warts, etc.) We would like you to write down anything you can think of that you do that might increase the chances that you would catch such a disease. You may include information about your partner or partners if you think that something about them may increase your chances of catching a sexually-transmitted disease other than AIDS.

Before I was with my boyfriend, there was once or twice that I met a guy at a party, and he was someone I knew, but not real well, and I ended up sleeping with him. And I didn't think about using condoms. Now, with my boyfriend, we don't ever use condoms, and we have sex pretty often. I don't think he's seeing anyone else, but I don't know very much about who he was with before he met me. I know some of his friends party with people they don't know well, so I guess that could be a problem.
Researchers in the area of health are concerned with why people engage in behaviors that make it possible that they will become ill. One area in which we are particularly interested is the area of sexual behavior and sexually-transmitted disease. Although AIDS is probably the most talked-about sexually-transmitted disease, we are interested in studying other sexually-transmitted diseases, like chlamydia and herpes, that also represent important health problems.

People often do not think about their risk for sexually-transmitted diseases. One purpose of this study is to get you to think about your risk for sexually-transmitted diseases other than AIDS. Please take a few minutes and think about the things that you do that make it possible that you could catch a sexually transmitted disease other than AIDS (for example: chlamydia, herpes, genital warts, etc.) We would like you to write down anything you can think of that you do that might increase the chances that you would catch such a disease. You may include information about your partner or partners if you think that something about them may increase your chances of catching a sexually-transmitted disease other than AIDS.

--- Before I was with my girlfriend, I slept with girls I met at a party and didn't know real well -- once or twice.

--- I didn't think about using condoms. My girlfriend and I don't ever use them, and we have sex pretty often.

--- I don't think my girlfriend is seeing anyone else, but I don't know a lot about who she was with before she met me. Some of her friends party with people they don't know well -- that could be a problem.
APPENDIX E

MATERIALS USED BY PARTICIPANTS IN THE SEPARATE COMPARISON SAMPLE
PLEASE READ THESE INSTRUCTIONS BEFORE BEGINNING

In this questionnaire you will be asked to answer several questions about yourself and your perceptions of others. Some of the questions are fairly personal in nature and deal with sexual behavior. Some of them are less personal. You are free to leave any questions blank that you do not want to answer, and you are free to leave the session at any time and still get your extra-credit point.

Your answers to these questions will be COMPLETELY ANONYMOUS. DO NOT WRITE YOUR NAME ANYWHERE ON THIS PACKET. Only the experimenter and her assistants will see these packets.

THE QUESTIONS BEGIN ON THE NEXT PAGE
A. We would like to ask you some questions about your health behavior, specifically in the area of sexual behavior. Please answer the following 3 questions by making a slash mark (/) through each line to indicate your responses. Your marks may fall through any points along the lines. Please remember that your responses are completely anonymous.

1. How likely do you think it is that you will catch a sexually-transmitted disease other than AIDS sometime in the next 2 years?

   EXTREMELY LOW       EXTREMELY HIGH

2. Please think about actually having a sexually-transmitted disease other than AIDS. How unpleasant is the idea of your actually having such a disease?

   SLIGHTLY UNPLEASANT   EXTREMELY UNPLEASANT

3. How concerned are you, personally, about catching a sexually-transmitted disease other than AIDS?

   NOT AT ALL CONCERNED   EXTREMELY CONCERNED

B. The following set of questions is intended to assess how you feel about yourself in a variety of areas. This is an inventory of how you feel about yourself, and how frequently you may feel that way. Please answer the questions carefully. After reading the question, select the answer which best describes your thoughts and feelings and mark that answer in the proper column on the answer sheet. Be as honest as possible, and mark those answers which describe you as you really are, not as you would like to be or think you should be. PLEASE CIRCLE THE APPROPRIATE RESPONSE TO EACH QUESTION.

It is not necessary to think over any question very long. Circle your answer quickly and go on to the next statement. Try to avoid the "Sometimes" response as much as possible. Select this answer only if you really cannot decide whether the other responses are appropriate. Remember, all your answers are completely anonymous.

1. How often do you have the feeling that there is nothing you can do well?

   A. Very often  B. Fairly often  C. Sometimes  D. Once in a great while  E. Practically never

2. How often do you feel that you have handled yourself well at a social gathering?

   A. Very often  B. Fairly often  C. Sometimes  D. Once in a great while  E. Practically never

PLEASE CONTINUE...
3. When you have to talk in front of a class or a group of people your own age, how afraid or worried do you usually feel?

A. Very afraid B. Fairly afraid C. Somewhat afraid D. Fairly unafraid E. Very unafraid

4. How often do you have the feeling that you can do everything well?

A. Very often B. Fairly often C. Sometimes D. Once in a great while E. Practically never

5. How often do you worry about whether people like to be with you?

A. Very often B. Fairly often C. Sometimes D. Once in a great while E. Practically never

6. When you talk in front of a class or a group of people your own age, how pleased are you with your performance?

A. Very pleased B. Fairly pleased C. Somewhat pleased D. Fairly displeased E. Very displeased

7. How often do you feel self-conscious?

A. Very often B. Fairly often C. Sometimes D. Once in a great while E. Practically never

8. How comfortable are you when starting a conversation with people who you don't know?

A. Very comfortable B. Fairly comfortable C. Somewhat comfortable D. Fairly uncomfortable E. Very uncomfortable

9. How often are you troubled with shyness?

A. Very often B. Fairly often C. Sometimes D. Once in a great while E. Practically never

10. How often do you feel that you are a successful person?

A. Very often B. Fairly often C. Sometimes D. Once in a great while E. Practically never

11. How often do you feel inferior to most of the people you know?

A. Very often B. Fairly often C. Sometimes D. Once in a great while E. Practically never

12. How confident are you that your success in your future job or career is assured?

A. Very confident B. Fairly confident C. Somewhat confident D. Fairly unconfident E. Very unconfident

PLEASE CONTINUE...
13. How often do you think that you are a worthless individual?
A. Very often  B. Fairly often  C. Sometimes  D. Once in a while  E. Practically never

14. When speaking in class discussions, how sure of yourself do you feel?
A. Very sure  B. Fairly sure  C. Somewhat sure  D. Fairly unsure  E. Very unsure

15. How much do you worry about how well you get along with people?
A. Very much  B. Fairly much  C. Somewhat much  D. Fairly little  E. Very little

16. How sure of yourself do you feel when among strangers?
A. Very sure  B. Fairly sure  C. Somewhat sure  D. Fairly unsure  E. Very unsure

17. How often do you feel that you dislike yourself?
A. Very often  B. Fairly often  C. Sometimes  D. Once in a while  E. Practically never

18. How confident do you feel that some day the people you know will look up to you and respect you?
A. Very confident  B. Fairly confident  C. Somewhat confident  D. Fairly unconfident  E. Very unconfident

19. How often do you feel so discouraged with yourself that you wonder whether anything is worthwhile?
A. Very often  B. Fairly often  C. Sometimes  D. Once in a while  E. Practically never

20. In general, how confident do you feel about your abilities?
A. Very confident  B. Fairly confident  C. Somewhat confident  D. Fairly unconfident  E. Very unconfident

C. We would like to ask you one more series of questions about yourself. We know that some of these questions are fairly personal — we will really appreciate your willingness to answer them, but you are free to leave them blank. This information is totally anonymous — your name will never be associated with it. If you have been through Mass-Testing this semester, these questions may look familiar to you. Mass-Testing is totally separate from this questionnaire, however, so we would appreciate it if you would give us this information again. PLEASE CIRCLE THE CORRECT RESPONSE OR WRITE THE INFORMATION IN THE BLANK PROVIDED.

PLEASE CONTINUE ON TO THE NEXT PAGE
1. How often do you have sexual intercourse?
   a. Never — I am not sexually active
   b. Less than once per semester
   c. At least once per semester, but not as often as once a month
   d. At least once a month, but not as often as once a week
   e. At least once a week, but not more than three times a week
   f. More than three times per week

PLEASE ANSWER THE REST OF THESE QUESTIONS ONLY IF YOU REPORTED THAT YOU HAVE SEX ONCE PER SEMESTER OR MORE (RESPONSES C - F) IN QUESTION #1 THAT YOU JUST ANSWERED.

2. How many sexual partners have you ever had?

3. Have you had sexual intercourse in the last three months?
   ☐ yes ☐ no

4. How would you describe your usual pattern of sexual behavior?
   a. I am completely monogamous — I only have sex with one person, in a long-term, committed relationship.
   b. I only have sex with one person during a period of time, but I don't tend to stay with one person for more than a few months or a year at most.
   c. I have sex with more than one person during a period of time, but they are people I know and have some form of relationship with.
   d. I have sex fairly casually with people I have just met, as well as with people I know and have a relationship with.

5. Have you ever had a sexually-transmitted disease (for example, herpes, chlamydia, syphilis, genital warts, etc.)? (This does NOT include yeast infections.)
   ☐ yes ☐ no

6. Please indicate what form of birth control you or your partner use MOST OFTEN. Please only indicate ONE FORM OF BIRTH CONTROL.
   a. none e. sponge
   b. withdrawal f. diaphragm with foam or jelly
   c. rhythm g. condoms
   d. jelly or foam without a diaphragm h. birth control pills
   i. other (please specify)

7. How often do you or your partner use condoms when you have sex?
   a. every time
   b. about 75% of the time (3 out of every 4 times)
   c. about half of the time (2 out of every 4 times)
   d. about 25% of the time (1 out of every 4 times)
   e. almost never
   f. never

PLEASE CONTINUE
8. Please indicate your current marital status:

a. single  
ac. married  
be. divorced  
bd. engaged  
bd. separated  
bf. widowed

E. We are interested to know how many people would be willing to participate in another experiment based off of the information in this questionnaire, if one existed. There are no more experiments starting this late in the semester, but this information will help us estimate the number of subjects we might get in the future. Please indicate if you would be willing to be in an experiment based off this information IF one existed at present.

_____ yes  _____ probably yes  _____ probably no  _____ no