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Altering sexual prototypes via prevalence information: an experimental analogue to a sexual intervention program

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Altering sexual prototypes via prevalence information:
An experimental analogue to a sexual intervention program

by

Tami Joann Hedges Eggleston

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ABSTRACT

Past research has established that the images or prototypes that people hold of the type of person who engages in risk behaviors influence their actions (Gibbons & Gerrard, 1995; in press). However, to date, no experimental studies have been conducted to determine if these images can be altered, and, if so, what effect this has on individuals' behavioral intentions (BI) and behavioral willingness (BW) to engage in risk behaviors. The current study was designed to attempt to modify images of the type of person who uses a condom (condom user [CU] prototype) and of the person who has multiple sexual partners (casual sex [CS] prototype) by providing information about prevalence rates of these behaviors. Participants first completed measures of their sexual cognitions at the beginning of the semester, and were then recruited to participate in an experimental session. Specifically, 230 female undergraduates were assigned to one of three prevalence information manipulations: an anecdotal audio tape condition (a fictitious tape consisting of five female undergraduates discussing their sexual attitudes and behaviors), a statistical audio tape condition (an announcer reading summary statistics of campus sexual attitudes and behaviors), or a control condition (no audio tape). It was predicted that anecdotal information would have a greater impact on prototypes, BW, and BI than would statistical prevalence information. Moreover, it was predicted that self-esteem and sexual risk behaviors (e.g., lack of condom use, multiple partners) would moderate change in prototypes, BI, and BW. Specifically, it was proposed that high-risk, low self-esteem (LSE) individuals would be the most persuaded by the information and would decrease the favorability of the CS prototype, increase the favorability of the CU prototype, and
decrease their risky, sexual BW and BI (in the current study this change was labeled the "appropriate" response). It was also hypothesized that LSE individuals who engage in low-risk sexual behaviors would respond by either not altering their cognitions or perhaps slightly modifying their cognitions in a direction opposite of the appropriate response. Conversely, high self-esteem (HSE) individuals who are not engaging in risky sexual behaviors will significantly alter their cognitions in a direction congruent with the appropriate response. It was further predicted that HSE individuals who engaged in risky behaviors would react against the prevalence information which suggested that their behavior was inappropriate (Gerrard, Kurylo, & Reis, 1991; Gibbons, Eggleston, & Benthin, in press). Specifically, it was expected that high-risk HSE individuals would respond to the information by not altering their prototypes, BW, or BI. Results indicated that the prototypes were malleable. The CU prototype tended to become more favorable over time and the CS prototype showed a decline in favorability from the beginning of the semester to the experimental session. No main effect for type of prevalence information (anecdotal versus statistical) was detected. Self-esteem and sexual risk levels did moderate the change in prototypes and BW as expected. Future directions, theoretical connections, and implications for sexual interventions are discussed.
INTRODUCTION

People, especially young adults, many times engage in risky behaviors (e.g., unprotected sexual intercourse, alcohol use), and they do so even though they are often aware of the risks associated with these behaviors. This inconsistency between awareness and behavior has caught the attention of many researchers who have attempted to find out why people engage in risk behaviors. Promising avenues of investigation have focused on the influence that certain cognitions, such as the images that people hold of the typical person who engages in a particular risk behavior (e.g., the typical smoker prototype), have on their actions (Gibbons & Gerrard, 1995; Hedges, Gerrard, Gibbons, & Smith, 1995). Additionally, the extent to which people distort or misperceive social norms by either overestimating or underestimating actual prevalence rates has been found to be associated with engaging in risk behaviors (Graham, Marks, & Hansen, 1991; Prentice & Miller, 1993; Miller & Prentice, in press). Once it has been found out why individuals engage in risk behaviors, the next step is to develop interventions that use this knowledge. For example, effective campus alcohol interventions have been developed that have changed peoples' drinking behavior by reducing their tendency to overestimate campus alcohol consumption (Schroeder & Prentice, 1996).

Although research with prototypes and norm perceptions has provided useful information as to why people engage in certain risk behaviors, a number of general issues have not yet been addressed. First, images and norm perceptions (or norm misperceptions) have not been examined comprehensively to assess the inter-relations and causal links
between them. Second, to fully understand the importance of norm perceptions on behaviors, it is necessary to know who is most influenced by norm information, and when and in what form the norm or prevalence information is likely to be most influential. Third, research on images and prototypes has consistently found a strong relation with the corresponding behaviors, suggesting that the images have an important impact on behavior. This, in turn, suggests that altering the images may lead to changes in behavioral intentions (BI) and behavioral willingness (BW).

Willingness and Intentions

Recently, Gibbons and Gerrard (1995; in press) have developed a model of adolescent health risk behavior called the prototype/willingness (P/W) model. The model distinguishes between two cognitive antecedents to health risk: BI and BW. Consistent with Ajzen and Fishbein's (1977) Theory of Reasoned Action, intentions are viewed as an individual's assessment of whether or not s/he plans to engage in a particular behavior. Willingness, on the other hand, is an admittance that in a hypothetical situation, the individual might be willing to engage in that behavior. This willingness construct has been found to be predictive of subsequent risk behaviors (Gibbons & Gerrard, in press; Gibbons, Gerrard, Oulette, & Burzette, in press). Moreover, a relation between prototypes and willingness has been found such that prototype favorability is predictive of subsequent willingness (Gibbons, Gerrard, Blanton, & Russell, 1996; Blanton, Gibbons, Gerrard, Conger, & Smith, in press). Because prototypes have consistently been found to be related to willingness and behavior, the
theoretical issue of prototype mutability becomes important. Specifically, changing prototypes and the related intention and willingness is meaningful from an educational and an intervention perspective. If prototypes are amenable to change, and if they influence BI and BW, then it should be possible to develop programs and interventions that are effective at altering risky behaviors.

Overview

The current study is designed to examine the impact of prevalence information and sexual prototypes on both BI and BW to engage in sexual risk behaviors. Additionally, the study is designed to act as an analogue to an intervention intended to modify sexual images by providing sexual prevalence information and information about campus sexual behaviors and attitudes. It is proposed that efforts to alter prototypes will be most successful when the prevalence information is presented in vivid anecdotal ways rather than in "dry," statistical representations. Specifically, individuals should be more persuaded by personal, anecdotal stories than by statistical, summary reports because the anecdotal information will actually provide them with (or augment their existing) images of the type of people who engage in different behaviors (e.g., the type of person who uses condoms or has casual sex). The best way to change individual's risk images (prototypes) is to provide them with specific examples of these types of people (i.e., exemplars). Moreover, it is proposed that the relations between prevalence information, prototype perceptions, willingness, and intentions will be moderated by self-esteem levels and by sexual risk. In other words, both the ease and perhaps even the
direction of change will be influenced by self-esteem levels as well as current risk status (i.e., high-risk or low-risk sexual behaviors).

The following sections will first provide background information on the independent variable in this study—prevalence information. This information will be followed with a discussion of research on the primary dependent variables of interest in this study—prototypes and images. Finally, the proposed moderators (self-esteem and sexual risk) will be discussed.

Norm Perception and Prevalence Information

Although social psychologists have been interested for many years in the impact of social influences (e.g., norms) on behavior (Asch, 1951; Milgram, 1963), there was a resurgence of interest in this topic when Ajzen and Fishbein proposed the Theory of Reasoned Action (1977). This theory hypothesized that attitudes (personal beliefs about the behavior and outcomes associated with it) and subjective norms (beliefs about important others' attitudes toward the behavior) lead to behavioral intentions, which in turn result in behaviors. In addition to Ajzen and Fishbein's definition of norms, other researchers have viewed prevalence estimates (the perceived number of people who engage in the behavior) as an indicator of norm perceptions (Graham, et al., 1991; O'Gorman, 1986; Perkins & Berkowitz, 1986). For the purposes of the current study, prevalence perceptions will be construed as an indicator of norms in concurrence with the latter conception of prevalence perceptions.
Norm Misperception

People often misperceive social norms; that is, they tend to either underestimate or overestimate the number of people who hold a particular attitude or who engage in certain behaviors (Marks, Graham, & Hansen, 1992; Prentice & Miller, 1993; Hansen & Graham, 1991). A phenomenon similar to norm misperception is what Snyder and Wicklund (1981) identified as "claiming consensus"—a process in which individuals who are engaging in a behavior (e.g., taking a risk) try to normalize their actions by convincing themselves that many others are also engaging in the same behavior. Evidence of this can be seen in a longitudinal study by Gerrard, Gibbons, Benthin, and Hessling (1996) that found as people increased participation in a particular risk behavior, they decided that the behavior was more common or more prevalent. In fact, over time the behavior did become more common; the increase in prevalence perceptions was significant even taking into account actual increases in prevalence, however. These prevalence ratings also were predictive of the associated risk behavior—the more the prevalence perceptions increased, the more the risk behaviors increased. In short, this study indicated that the relation between cognitions and behavior is nonrecursive: prevalence perceptions influence behaviors, just as behaviors influence cognitions.

Closely related to norm misperception is the concept of "pluralistic ignorance." This concept is defined as a belief that one's private attitudes and judgments are different from those of others, even though their public behavior is identical (Miller & McFarland, 1987).
Moreover, pluralistic ignorance involves the idea that people often believe that others have some knowledge of an issue about which they are ignorant. For example, we have all experienced being in a class and wanting to ask a question but (wrongly) assuming that everyone else in the class had more knowledge and that we were uniquely ignorant. It is generally the case, however, if one person in a class has a question, others have the same question. People may fail to ask questions in class in part due to pluralistic ignorance.

Studies have demonstrated that both misperceiving the social norm and pluralistic ignorance have an impact on a variety of attitudes and behaviors (Graham et al., 1991; Hansen & Graham, 1991; Schwartz, Loomis, & Herbert, 1975; Zuckerman, 1978; Bauman, Botvin, Botvin, & Baker, 1992). For example, Prentice and Miller (1993) reported that many people could not accurately report social norms for drinking behaviors and overestimated the amount of alcohol consumption on campus. The students also assumed incorrectly that they were more uncomfortable with this (inflated) amount of campus alcohol usage than was the average student. These authors further reported that those individuals who perceived the greatest difference between their own attitudes toward alcohol use and the social norm on campus were most likely to alter their own attitudes to be more consistent with that of their (misperceived) social norm (i.e. they developed more favorable alcohol attitudes). In addition, these researchers found that many students felt alienated because they thought they were deviant from the norm. Pluralistic ignorance has been found not just with risk
behaviors, but also with ideas, thoughts, opinions, and feelings such as political attitudes (Isenberg, 1980; Taylor, 1982; O'Gorman, 1986).

**Norm Misperception and Interventions**

Prentice and Miller (1993) speculated that traditional intervention programs aimed at the individual, such as those involving informational campaigns, may change private attitudes, but are likely to leave perceptions of social norms unaffected. They suggest that a possible way to facilitate social norm change may be to "expose" pluralistic ignorance by encouraging students to speak openly about their private attitudes. Schroeder and Prentice (1996) designed an intervention intended to correct misperceptions about alcohol use on campuses. Specifically, the intervention consisted of having students openly discuss their drinking behaviors and attitudes. Presenting actual behaviors and attitudes acted to attack pluralistic ignorance. Educating entering college students in a peer-oriented discussion, which focused on correcting (i.e., lowering) misperceptions of alcohol use, resulted in significantly less drinking in comparison with individuals who were not exposed to the prevalence education. Schroeder and Prentice believed that providing students with accurate prevalence estimates could change drinking behavior in at least two ways. "First, it could change the level of drinking that students perceive to be condoned by their peers. Given the news that their peers are not as comfortable with current drinking practices as they had thought, students might construct a new, more conservative attitude about drinking, one that corresponded to true campus sentiment. Second, social norms derive much of their
prescriptive power from the perceptions that they have universal support....providing students with evidence that their peers are not entirely comfortable with current drinking practices would certainly indicate to them that support for the drinking norm is not universal" (p. 7).

Although similar in meaning, there are some distinctions among the concepts of "misperceiving the social norm," "claiming consensus," "inaccurate prevalence estimates," and "pluralistic ignorance." The most general and least motivational term (i.e., that does not imply any conscious, effortful attempt to cognitively alter prevalence estimates, as is the case, for example, with claiming consensus), and the term that will be used throughout the remainder of this paper, will be norm misperception. It is proposed in the current study that college students misperceive sexual norms by overestimating the number of students engaging in casual sex and underestimating the number of students consistently using condoms. The prevalence information presented in the current study should act to change these misperceptions, which, in turn, will alter their relevant (sexual) prototypes, BI, and BW.

Although research on norm misperception is extensive, most of that research and the subsequent interventions have been conducted on alcohol and smoking behaviors. In fact, relatively little is known about norms in the area of sexual behaviors. One notable exception is a study by Terry, Gilligan, and Conway (1993), which found that perceptions of sexual norms predicted intentions, six months later, to avoid casual sex and to ask sexual partners about their previous sexual and IV drug use history. These authors did not assess norm misperception, however. Instead, the primary purpose of that study was to compare
intentions, attitudes, and norms. In addition, little research has been done on the specific factors that contribute to norm misperceptions, such as when and under what conditions norms are most influential. The next section will provide evidence as to when social norms will be most influential. Specifically, it is suggested that the influence of prevalence information depends on the form of the information.

The When of Norm Misperception

Heuristics

Heuristics have been defined as "mental short-cuts," "cognitive rules of thumb," or "mental biases" (Nisbett & Ross, 1980; Kahneman, 1991). Heuristics allow individuals to sort through large amounts of information and make quick, but occasionally incorrect, interpretations of situations (Tversky & Kahneman, 1974). It is reasonable to suggest that these heuristics may play a role in norm perceptions. One such heuristic, the availability heuristic, involves making decisions about frequencies and probabilities of situations or events based either on one's ability to recall specific instances of the event or one's perception of the ease of this recall (Kahneman & Tversky, 1982). For example, Kahneman and Tversky found that when asked if more English words have the letter "k" as the first or the third letter, most individuals would select "k" as the first letter. In fact, "k" is the third letter of English words about three times as often as it is the first letter of a word. Kahneman and Tversky (1982) suggested that the incorrect choice was made because it is easier to recall words that begin with the letter "k." Factors such as vividness and salience of particular
events may also influence ease of retrieval, thus increasing availability. The same reasoning can be applied to the impact of anecdotal information. Specifically, because anecdotes or personal stories are more vivid and salient than mere statistical summary reports of numbers and percentages (Tversky & Kahneman, 1971), anecdotes should be easier to recall. In addition, because anecdotal information involves (or can involve) the presentation of images, and prototypes are accumulations of images, it follows that anecdotes should have a greater impact on prototypes than would statistics.

The availability heuristic has also been used in explaining the impact of media representations. Eisenman (1993) investigated the impact of the availability heuristic in a study concerning college students' beliefs about drug abuse. Students in this study reported that drug usage in the United States was increasing when in fact at the time it was decreasing. According to Eisenman, students made these incorrect estimates because of the vivid, salient images of drug usage in the media that they could easily recall. Eisenman argued that the availability heuristic can lead to these misjudgments when the event is overrepresented in the media, thereby giving an impression that it occurs more often than it does in reality. The "casual sex" prototype is another type of image that is overrepresented in the media; in contrast, the "condom user" or "safe sex" image may be underrepresented (Brown & Eisenberg, 1995). This difference in media representation may, in turn, be reflected in prevalence misperceptions, such that the extent of casual sex is overestimated and condom usage is underestimated.
An additional "mental shortcut" that may influence norm perceptions is the **representativeness heuristic**. In this case, an individual makes assumptions about how similar a person, item, or situation that they are trying to judge is to a prototype or exemplar that they hold (Tversky & Kahneman, 1974). As a result of this heuristic, people often tend to ignore base rates, and instead judge others or instances based on the perceived match of vivid characteristics to their cognitive image. This disregard for base rates is exemplified by asking people if a 40-year-old man who likes to play tennis and listen to classical music is more likely to be a truck driver or an Ivy League professor. Most people will select the incorrect choice of the professor because tennis and classical music fit more with the characteristics of their image of a professor and ignore the fact (the base rate) that there are many more truck drivers than Ivy League professors (Shafir, Smith, & Osherson, 1990).

Because many health behaviors (especially health risk behaviors) are so vivid and have a variety of salient characteristics associated with them (Baumann, Cameron, Zimmerman, & Leventhal, 1989; Bishop, 1991; Lau, Bernard, & Hartman, 1989; cf. Kaplan & Shayne, 1993), it seems that this heuristic would have a large impact on peoples' images of the typical person engaging in certain health behaviors (e.g., the typical smoker, see prototype discussion below, Gibbons & Gerrard, in press).

**Anecdotal versus Statistical Information**

In part due to the use of heuristics, and also because of a basic reluctance to accept numerical information, people frequently do not use numbers when trying to judge
uncertainty (Nisbett, Krantz, Jepson, & Kunda, 1983). This basic numerical reluctance, termed "innumeracy," is defined by Paulos (1988) as "an inability to deal comfortably with the fundamental notions of number and chance...[that] plagues far too many otherwise knowledgeable citizens" (page 3). Moreover, individuals typically do not use numbers, percentages, or statistical data when making decisions (Windschitl & Wells, 1996). Instead, they are much more likely to use anecdotal information (i.e., vivid, verbal descriptions).

An example of this innumeracy was found by Nisbett, Borgida, Crandall, and Reed (1976) such that individuals were more influenced about the quality of an automobile based on a vivid, anecdotal account (e.g., "My brother had a Volvo. First, that fancy fuel injection computer thing went out...next he started having trouble with the rear end...finally sold it in three years for junk." p. 129) than by statistical expert accounts from Consumer Reports. Borgida and Nisbett (1977) also found that people frequently disregard seemingly useful base rate data (statistical summaries of populations), whereas brief, face-to-face comments from one person often have a substantial impact on their attitudes. Students in the Borgida and Nisbett (1977) study were either presented with a statistical summary of many students' course evaluations or had a brief discussion with one student who took the course. The results supported the idea that individuals are more likely to change their attitudes (in this case, their course choices) based on one concrete, vivid account, than on an abstract summary of many accounts. Additional studies have found similar results with other attitudes (e.g., choosing consumer products, powdered drink preferences), such that one vivid anecdotal case
often has a greater impact on attitudes and behaviors than does more reliable, but relatively pallid statistical or numerical information (Hamill, Wilson, & Nisbett, 1980; Hansen & Donoghue, 1977; cf. Nisbett, et al., 1983).

In summary, research on heuristics illustrates how mental shortcuts may result in errors. Norm misperceptions may be an example of one such error that can result from the use of heuristics. Specifically, individuals who engage in a particular behavior (e.g., smoking, having sex, drinking, etc.) are likely to be much more salient and more easily remembered than are individuals who do not engage in the behavior. The salience and vividness of "doers" compared to "non-doers" may lead to an overestimation of these behaviors—or norm misperception. Fazio, Sherman, and Herr (1982) called this tendency to remember actions more readily than non-actions the "feature-positive effect."

In part because anecdotal information is more easily recalled, it will be more influential than statistical information in terms of its impact on attitude and behavior change. In addition, because anecdotal information involves the presentation of images, and prototypes are the accumulation of images, it follows that anecdotes should have a greater impact on prototypes than will statistics. Prevalence information should have a greater effect on prototypes, BI, and BW when presented via a salient, easy to recall, anecdotal story rather than a statistical, "dry" report of numbers and percentages. Therefore, a hypothesis to be tested in the current study is that vivid anecdotal information will have a greater impact than statistical information in terms of decreasing the favorability of the "casual sex" prototype.
and increasing the favorability of the "condom user" prototype. Thus, anecdotal information is proposed to be the "when" of norm misperception.

In the current study, prevalence information was presented via audio tape in the form of anecdotes or statistics. This was done in an attempt to alter the college students' prototypes. The anecdotal information audio tape consisted of a fictitious group of female undergraduates discussing their past sexual behaviors, past condom use, partner histories, sexually transmitted diseases, and attitudes about sex. The statistical information audio tape consisted of an announcer reading campus statistics about the same topics. The percentages provided in the statistics audio tape, and the extensions from the statistics in the anecdotal tape were based on actual prevalence rates and open-ended comments obtained from Iowa State University students regarding their sexual behaviors and attitudes, including number of partners and condom-use (Eggleston, Gibbons, & Gerrard, 1996). In the anecdotal prevalence information condition, the information remained essentially the same (e.g., a percentage of 60% in the statistical condition was transformed to 3 out of the 5 women in the anecdotal condition). It was hypothesized that this prevalence information: a) would produce differences on a recall test and evaluations of the tapes as a function of which prevalence information condition the participants received, b) would act to decrease the favorability of the casual sex prototype, increase the favorability of the condom user prototype, and in turn decrease risky sexual BI and BW; and c) that this change would be more pronounced in the anecdotal condition than the statistic condition.
Images and Prototypes

In both social psychology and cognitive psychology, researchers have been interested in determining how individuals store perceptions of other people in memory. One proposed way that people store information about events, instances, and individuals is via prototypes or images (cf. Cantor & Mischel, 1979; Higgins, Herman, & Zanna, 1981; Fiske & Taylor, 1991). Health psychologists initially assessed the images and prototypes associated with health risk behaviors including smoking and drinking. For example, research on images associated with smoking indicated that young people whose self-concepts were similar to the prototypical smoker were more likely to smoke (Chassin, Presson, Sherman, Corty, & Olshavsky, 1981; Barton, Chassin, Presson, & Sherman, 1982). Similarly, Chassin and colleagues have suggested that favorable social images of drinkers are related to alcohol use (Chassin, Tetzloff, & Hershey, 1985). Gibbons and Gerrard and their colleagues have extended the ideas of image perceptions and have developed a measure to assess perceptions of the favorability of risk prototypes (e.g., the "typical" smoker, drinker, reckless driver, and unwed parent). This prototype research has been guided by two basic assumptions: First, people maintain images or representations of the type of person who engages in different risk behaviors; and second, these prototypes can be articulated and assessed. The current study will test an additional assumption in the Prototype/Willingness model (Gibbons & Gerrard, in press), which is that these prototypes can be modified and would therefore be useful in interventions.
A behavioral prototype has been defined by Gibbons, Gerrard, and Boney McCoy (1995) as "the type of person who engages in, or actually typifies, the behavior." A number of studies have demonstrated that prototypes are important in influencing behavior. For example, Gibbons and Gerrard (1995) found that women who had a relatively favorable prototype of an unwed pregnant woman, or men who had a relatively favorable prototype of the type of young man who has caused an unplanned pregnancy, were more likely to engage in unprotected sexual intercourse themselves. Similar results were also found with images of the typical smoker, drinker, and reckless driver predicting subsequent smoking, drinking, and reckless driving behavior, respectively (Gibbons & Gerrard, 1995; Hedges et al., 1995). Furthermore, Gibbons and Eggleston (in press) reported that the favorability of the typical smoker image among smokers who had joined a smoking cessation program was predictive of their subsequent relapse. In addition, it has been found that prototype favorability is associated with willingness to engage in risky sexual behaviors (Gibbons et al., 1995; Gibbons et al., 1996) and actual sexual behaviors (Gibbons & Gerrard, 1995).

**Negative and Positive Images**

Gibbons and Gerrard (in press) have suggested that negative images (e.g., the typical smoker or drinker) have a greater impact on behavior than do positive images (e.g., the typical non-smoker or non-drinker). These researchers suggest that this differential impact of positive and negative images is in part due to a comparison process of the image with the self. Specifically, it is proposed that people will use negative images as a motivator to avoid
becoming like the type of person that image represents, namely a smoker, a heavy drinker, a person who has casual sex, etc. Gibbons and Gerrard (1995, in press) defined this motivation to find a distinction between the self and an undesirable image "distancing." Of course, a person could also compare with a positive image and aspire to become like this positive image (assimilation). As mentioned above, Gibbons and Eggleston (in press) found that the smokers who had a relatively favorable image of the typical smoker (a negative image) were more likely to relapse than those with a relatively unfavorable image. This study also assessed the participants' image of a typical "former smoker" (a positive image) and this image was not predictive of subsequent relapse. This initial research suggests that the distancing motivation (from a negative image) may be greater than the assimilation motivation (i.e., the desire to become like a positive image), at least in terms of risk behaviors such as sex, drinking, and smoking. Consistent with past research, it was proposed that it would be easier to alter (derogue) a negative image (e.g., show the negative aspects of the casual sex image) than to alter (bolster) the favorability of a positive image (e.g., show the positive aspects of a condom user).

Altering Prototypes and Images

Given the consistency of these results in demonstrating the influence that prototypes have on behaviors, examining antecedents of prototypes appears to be very important. The current study proposes that prevalence information may be one factor that influences prototype perceptions. Specifically, it is proposed that students generally overestimate the
number of students who are engaging in casual sex and underestimate the number of students using condoms. This misperception regarding prevalence estimates is further predicted to influence perceptions of others who are engaging in risk behaviors. It is assumed that students do not possess entirely negative images of the typical person who has casual sex (in part because they are overestimating the prevalence of individuals engaging in that behavior; Brown & Eisenberg, 1995). Conversely, it is assumed that students do not possess uniformly positive images of the typical person who uses condoms (in part because they are underestimating the number of people using condoms). Of course, other aspects besides norm misperceptions are likely to have an impact on images, including the portrayal of these images in the media, the number of friends who engage in these behaviors, parental attitudes regarding these images, individuals' actual experiences with the behaviors, and so forth. It is hypothesized, however, that norm misperceptions may be the most easily tractable element that influences images (at least from an educational and intervention perspective).

The current study proposes that norms have their influence on behaviors, in part, due to changes in prototype perceptions. Thus, a mediational model is being proposed. According to this model (see figure 1) prototypes act as mediators of the norm to behavior path. Previous research has established a link from norms to behavior (Prentice & Miller, 1993) and from prototypes to willingness and behavior (Gibbons & Gerrard, 1995; Blanton et al., in press; Gibbons et al., 1996). What the current research will add, however, is a demonstration that altering norms, or "correcting" norm misperceptions, will act to change
The norm change to prototype change link is crucial in regard to modifying these cognitions in interventions.

The norm to prototype link and subsequent prototype to behavior link was assessed in a longitudinal study of rural adolescents by Blanton et al. (in press). Specifically, these authors found a positive link between adolescents' perceptions of smoking prevalence among their friends and their own smoking prototypes as well as a link between their perceptions of drinking prevalence and their drinking prototype. This study provides initial support for the idea that prevalence perceptions are influential in the development of prototypes. The current study will extend and complement the Blanton et al. (in press) study in four ways. First, the
current study is experimental rather than correlational; in the current study, prevalence estimates will be manipulated rather than just measured. Second, the current study will assess prevalence estimates and prototype perceptions of college students rather than adolescents. Third, the current study will assess sexual prevalence estimates and sexual prototypes rather than cognitions regarding drinking or smoking. Fourth, the current study will assess two assumed moderators of the prevalence to prototype link, namely self-esteem and sexual risk; these two moderators will be discussed in the following sections.

The Who of Norm Misperception

Self-Esteem

Traditionally, high self-esteem has been viewed as a positive and desirable personality characteristic (Taylor & Brown, 1988; cf. Setterlund & Niedenthal, 1993). Recently, however, research has suggested that HSE individuals may have a tendency to distort or ignore information that is inconsistent with their current attitudes or behaviors (i.e., motivated processing), and that this can result in some negative consequences (Baumeister, Heatherton, & Tice, 1993; Wayment & Taylor, in press; cf. Baumeister, 1996). In other words, people with HSE do not necessarily accept or reject information in a rational, logical way. Instead, they sometimes (mis)interpret information in a manner that is consistent with their pre-existing attitudes and behaviors (Baumeister et al., 1993). It is important to note that a perceived incongruence between attitudes and behaviors, or an incongruence between initial attitudes and subsequent information, is what motivates HSE individuals to engage in
motivated processing. Inconsistent information presumably makes HSE individuals feel threatened because they are confronted with messages suggesting that their behaviors or attitudes are inappropriate. For example, when a HSE individual who is sexually active and not using condoms is presented with information about the possible negative consequence of not using a condom, they will feel threatened—an example of dissonance. Thus, when presented with threatening information, HSE individuals are more likely than are low self-esteem (LSE) individuals to alter or ignore that information (Gerrard, Kurylo, & Reis, 1991; Smith, Gerrard, & Gibbons, in press; Gibbons et al., in press).

Another example of dissonance can be found in Gibbons, Eggleston, and Benthin (in press). This study reported that among individuals who were involved in a smoking cessation program and then relapsed, those with high as opposed to low SE were more likely to lower their perceptions of the risks associated with smoking after relapsing. In an attempt to reduce the dissonance arousal produced by the two incompatible cognitions (i.e., I think smoking is risky and I am a smoker), when they were unable to quit smoking, they reduced their risk perceptions. Moreover, these lowered perceived risks were associated with less commitment to try another smoking quit attempt. What is important to realize is that it was the HSE relapers and not the HSE abstainers who lowered their risk perceptions. This suggests that the HSE relapers apparently perceived an incongruence between the realization of the dangers associated with smoking and their actual behavior (smoking) causing them to react and decrease their risk perceptions.
In addition to the predicted HSE relapsers defensiveness, a somewhat surprising result was found in the Gibbons, Eggleston, and Benthin (in press) study. Specifically, the study reported a tendency for the LSE abstainers (those who were able to stop smoking) to lower their perceptions of smoking risk if they were continue smoking (as did the HSE relapsers). This seemingly paradoxical finding could be interpreted as a general tendency for LSE people to devalue or denigrate behaviors or social groups that they are associated with—even when the behavior, the group, or the accomplishment is positive or worthwhile. This speculation is similar to Groucho Marx's observation, "I would never want to belong to a group that would have me as a member!". I have labeled this tendency of LSE individuals to devalue groups they belong to or behaviors they engage in--even when the behavior or group is appropriate--as "negative identification." For example, the LSE abstainers actually appeared to devalue their successful quit attempt somewhat by slightly lowering their perceptions of the dangers associated with smoking.

Boney McCoy, Gibbons, and Gerrard (1996) found similar evidence of cognitive distortion among HSE individuals. Despite comparable levels of actual sexual risk behavior (e.g., number of partners), HSE women in their study reported lower perceived vulnerability to STDs than did LSE women (cf. Perloff & Fetzer, 1986; cf. Weinstein, 1987; 1988). In addition, this study found that HSE women responded to the increased salience of their risk behavior (i.e., being asked to report the frequency of their sexual behavior, condom usage, etc.) by self-enhancing on other dimensions, such as their personalities and their pregnancy
prevention efforts. In other words, when HSE women were confronted with threatening information, by being asked to contemplate their own high-risk sexual behaviors, they tended to ignore this negative information and instead focus on their own positive attributes and abilities (e.g., I am smart, or I am special) and/or compensating behaviors (e.g., at least I choose "safe" partners). Similarly, Smith et al. (in press) found that HSE individuals were more likely than those with LSE to evaluate their personal sexual vulnerability (e.g., perceptions of becoming pregnant or getting a STD) in a self-serving manner. In this study, individuals had to make detailed lists of their past partners, number of sexual encounters, and birth control practices associated with these encounters. After reviewing their past risk behaviors, participants then answered perceived vulnerability items. Responses of the HSE individuals suggested they were ignoring their past risky behaviors (even after the review made these risk behaviors salient to them) and maintained their perceptions of low personal, sexual risk. In fact, some of the HSE individuals reacted to the information and decreased their perceptions of personal sexual risk.

**Threat: Sexual Risk Behaviors**

HSE individuals, in comparison with LSE individuals, have been found to alter their risk perceptions and perceived vulnerability estimates in a self-protective manner when they perceive a threat. It seems likely, therefore, that HSE individuals would also interpret prevalence information that is inconsistent with their current attitudes or behaviors in a reactive manner. In other words, high-risk HSE individuals will be threatened by the
prevalence information (i.e., that more people than they originally thought were using condoms and that not as many people as they originally thought were having casual sex) and this should lead them to either ignore the information or perhaps even react to it.

Previous research has found that people alter their conceptions or prototypes of social categories depending on their own behaviors (Dunning, Perie, & Story, 1991). One motivation for altering cognitions is to try to justify beliefs or future behaviors (Klein & Kunda, 1992). For example, once a person begins smoking, they assume that many others are also smoking and attempt to justify their smoking with thoughts such as, "well, everybody I know is smoking." As suggested by Gerrard et al. (1996), behavioral experience influences people's perceptions and prevalence estimates. People engaging in a behavior overestimate the number of other people also engaging in the behavior, thereby altering their perception of the social norm. In other words, not all reasoning is rational and deliberate; rather, much reasoning is done in an attempt to justify behaviors (cf. Ditto & Lopez, 1992). Thus, depending on their own sexual experience, individuals can decide what pieces of prevalence information to emphasize or deemphasize in order to arrive at the prevalence estimates that make them feel less deviant.

Because the prevalence information presented in the current study will be accurate and because people tend to overestimate casual sex rates and underestimate condom usage (Eggleston et al., 1996), the prevalence information should be incongruent to many of the participants. I have proposed four different responses to persuasive messages as a function of
self-esteem and current behavior. First, those participants who are engaging in casual sex (i.e., sex with more than one partner) and not consistently using condoms should perceive an incongruence between their own behaviors and attitudes compared to the prevalence information that is presented. This incongruence between personal experience and the prevalence information should increase the likelihood that high-risk, HSE individuals will engage in motivated processing and react to the information by ignoring or downplaying it and not altering their prototypes. Thus, it is predicted that HSE individuals who have been engaging in high-risk sexual behaviors will show the most amount of reactance to the information. Second, HSE individuals who are not engaging in high-risk sexual behaviors will engage in a positive identification process and increase their favorability of the condom user prototype and decrease the favorability of the casual sex prototype. I proposed that positive identification occurs when HSE individuals who become part of a group or engage in a behavior, increase the value of the group or behavior to accentuate their positive aspects (cf. McFarland & Miller, 1990). Third, it is further predicted that LSE individuals who already engage in low-risk sexual behaviors may engage in negative identification and slightly decrease the favorability of the condom user prototype and slightly increase the favorability of the casual sex prototype. And fourth, high-risk LSE individuals should be the most persuaded by the information (even when the information may be threatening) and engage in an appropriate response by decreasing the favorability of the casual sex prototype and increasing the favorability of the condom user prototype. Thus, the model to be tested in the
current study is one of moderated mediation (see Figure 2), such that self-esteem and sexual risk will moderate the norm to prototype link. It should be noted, these four labels are based on the hypothesized cognitive mediators, not the outcome. For example, both the reactance and the negative identification groups are proposed to respond similarly to the information, but for different underlying cognitive reasons.

![Proposed moderated mediation model](image)

**Figure 2.** Proposed moderated mediation model.
Predictions and Purposes

The following is a list of the primary predictions and purposes of the current study.

(1) The primary purpose of this study was to determine if sexual prototypes are malleable. Specifically, repeated measures Analyses of Variance (ANOVAs) were conducted to assess if the casual sex prototype could be made less favorable and the condom user prototype could be made more favorable. In addition, it was predicted that the CS prototype (a negative image) would be easier to alter than would the CU prototype (a positive image). (2) The second goal of this study was to determine the differential impact of anecdotal versus statistical information messages on prototypes, BI, and BW. It was predicted that anecdotal information (i.e., vivid, anecdotal accounts) would have a greater impact on these cognitions than would statistical information (i.e., statistics and percentages). (3) It was further predicted that moderation by self-esteem and sexual risk would occur on the prototypes (i.e., the four different responses outlined above). The specific design to assess this moderation was a 2 (self-esteem) X 2 (sexual risk) X 3 (prevalence information condition) X 2 (time) factorial. (4) A Self-esteem X Sexual risk interaction was also predicted on BW and BI; a similar pattern to the prototype change predictions was proposed. Specifically, the high-risk HSE individuals should ignore the information and not alter their sexual BI and BW. It is possible that high risk HSE participants might even show some signs of reactance by increasing their BW and BI to engage in risky sex. Low-risk HSE individuals would engage in a positive identification and decrease BW and BI. High-risk LSE individuals would
appropriately respond and decrease BI and BW. And, low-risk LSE individuals would engage in negative identification and slightly increase BW and BI. Moreover, as suggested by Gibbons et al (in press), it was proposed that BW would be easier to alter than BI. These researchers found that prototypes were more related to BW than they were to BI. Because the current study is designed to modify prototypes, it is predicted that this modification will, in turn, have a greater influence on BW than on BI. (5) Correlational analyses were also conducted to test the prediction that prototypes are related to BI and BW, and that changes in prototypes are correlated with changes in BW and BI. It was proposed that decreasing the favorability of CS prototype would be correlated with a decrease in CS BI and BW. Conversely, it was proposed that increasing the favorability of the CU prototype would be correlated with an increase in condom use BW and BI. (6) Regression analyses were also conducted to test for two proposed mediation models: first, to determine if a change in prevalence estimates mediates the relation from prevalence information (statistical or anecdotal) to the prototype relation; second, to determine if prototype changes mediate the path from prevalence estimates to BI and BW.
METHOD

Study Overview

Participants first completed self-esteem, sexual prototypes, prevalence perceptions, sexual risk behaviors, and sexual attitude measures in a large scale pre-screening session (mass-testing—T1). Mass-testing is conducted early in the semester and is composed of primarily freshmen and sophomores in either introduction to psychology, social psychology, or developmental psychology classes. They were then asked to sign up for a study involving "rating magazine articles and/or audio tapes about communication issues." Upon arriving for the study, participants were randomly assigned to one of three conditions: an anecdotal audio tape condition (a fictitious discussion group consisting of five ISU women talking about their sexual behaviors and attitudes), a statistical audio tape condition (a summary of statistics and percentages about ISU sexual behaviors and attitudes), or a control condition (no audio tape). The experimenter explained that the tapes were examples of communication messages and that the study was intended to assess the influence of communication methods (written and/or audio) on the impact of the information. Participants were also informed that they would rate the communication messages on a variety of dimensions. After listening to the audio tape (or nothing in the control condition), they were asked to complete some background information, as well as their sexual prototypes, sexual prevalence perceptions, and sexual behavior items. Following this questionnaire, they assessed the tape and completed a recall test. This experimental protocol received approval by the ISU Human Subjects Committee.
Participants

The sample used in the current study consisted of 244 undergraduate women from Iowa State University who participated for extra credit in a psychology course. Only female participants were used in the current study for two reasons: a) because women tend to be the primary decision makers about contraception (Gerrard, Breda, & Gibbons, 1990) and b) because of the anticipated methodological problems of using men due to their tendency to avoid discussing sexual issues (Hedges, 1994). Two women were excluded from the analyses because they announced verbally during the experiment that they were highly suspicious as to the actual meaning of the study because they had participated in other research projects in the same laboratory. An additional six women were excluded based on an open-ended written response at the end of the study in which they stated being very suspicious. Five women were eliminated from the analyses because they were married and/or over the age of 25, and one woman was eliminated from the analyses because she reported being a lesbian. Thus, the final sample used in the current study consisted of 230 undergraduate (predominately freshmen and sophomores), single women with an average age of 19. There were 12 between subject cells, ranging in size from 16-23 participants each. Participants were recruited through a sign up sheet on a research recruitment board. To assure an adequate sample size of approximately equal numbers in each cell, potential participants were later called by members of the research team. All participants were treated
in accordance with the guidelines established by the American Psychological Association for
the ethical treatment of human participants (1981).

Instruments

Self-Esteem

The self-esteem measure was the 10 item Rosenberg (1965) self-esteem inventory, which assessed general feelings of self-worth (see Appendix A). The participants answered these 10 items on a 7-point scale. The alpha for the SE index was .91.

Sexual Prototypes

The current study assessed two sexual prototypes— one was the typical person who has casual sex with more than one partner and the other was the typical person who consistently uses condoms. Participants rated how much each of 12 adjectives (e.g., smart, cool, careless, unattractive) described how they viewed that type of person from (1) = not very characteristic to (7) = very characteristic (Gibbons & Gerrard, 1995). In addition, participants rated how similar they were to the prototype from (1) = not very similar to (7) = very similar (see Appendix B). Prototypes were originally construed as being a combination of both favorability and similarity. Therefore, the prototype score was calculated by taking the mean of the favorability adjectives and multiplying this mean by the similarity item (Gibbons & Gerrard, 1995). Hence, the prototype scores could range from 1 to 49. Alphas for the condom user favorability and the casual sex favorability indexes were .86 and .86, respectively at T1, and .85 and .84, respectively at T2.
If participants were missing one of the 12 prototype adjectives, a mean prototype favorability score was calculated for the 11 items. If participants were missing more than one adjective, they did not receive a prototype score and were eliminated from the analyses involving that prototype. Seven participants did not receive a CU prototype score at T1 and eight students did not receive a CU prototype score at T2. Seventeen participants did not receive a CS prototype score at T1 and 13 students did not receive a CS prototype score at Time 2. At T2, the order of the prototypes was counterbalanced and approximately equal numbers of people skipped the CU and the CS prototype (eight and 13). At T1, however, the CS prototype was at the end of a questionnaire and more participants skipped the CS prototype than the CU (17 versus seven), this difference is due presumably to time constraints at Time 1.

**Sexual Behaviors and Prevalence Perceptions**

In mass-testing and then again at the experimental session, participants were asked about their own relevant sexual behaviors, including if they were in a relationship, the number of sexual partners they had had, the type of birth control they used the last time they had sexual intercourse, the type of birth control they usually use, if they use condoms, and their sexual orientation (see Appendix C). Although, it was not predicted that these items would change, they were necessary to insure that people who were selected as "high-risk" or "low-risk" had not changed categories in the four to 12 weeks between T1 and the experimental session.
Participants' prevalence perceptions were assessed at both mass-testing and the experimental session. These items assessed their estimation of the number of their friends who: have had sexual intercourse, have had casual sex, and consistently use condoms (see Appendix D).

**Intentions and Willingness**

At T1 and T2 participants were also asked their sexual intentions, and their willingness to engage in sex with multiple partners and to have sex without a condom (see Appendix E). A standard No Condom Willingness Index was assessed with the following scenario: "Suppose you were alone with a man or woman who you found attractive and he/she wanted to have sex, but you did not have a condom. How willing would you be to ______ (From (1) = not at all willing to (7) = very willing)?" The participants responded to the following three questions: 1.) Go ahead but use a method like withdrawing the penis before ejaculation. 2.) Not have sex. and 3.) Go ahead and have sex anyway without a condom. Question #2 was reverse coded to produce a total No Condom Willingness" index (alpha = .73 at Time 1 and .70 at Time 2). The No Condom Willingness has been used in past research (Gibbons & Gerrard, 1995; in press).

Three items were added together to calculate an exploratory Multiple Partner Willingness index. Specifically, the following scenario was posed to the participants: "Suppose you were currently sexually active with one person but began to find another person sexually attractive. How willing would you be to ______ (From (1) = not at all willing
to (7) = very willing)\)? This was followed by the following three questions: 1.) Ignore your feelings about the second person and not have sex with them. 2.) Break up with the first person to pursue a relationship with the other person. 3.) Go ahead and have a sexual relationship with both people. Questions #1 and #2 were reverse coded to produce a total Multiple Partner Willingness. This index had not been used in previous research and unfortunately the alphas were very low (.22 at Time 1 and .20 at Time 2); therefore, this index was discarded and will not be discussed in the results section.

An additional single willingness question was used to assess casual sex willingness. The item stated, "If you met someone at a party or bar and you really liked them, do you think you might have sex with them that night?" from (1) = not at all willing to (7) = very willing. A similar willingness question was asked which was the same as the above item with the modification that the clause without using birth control was added. This item had virtually no variance, however: 94% of the subjects responded with a "1" (not at all willing), and so this last item was not included in the analyses.

A casual sex willingness index was calculated by adding the standardized standard three item "No Condom Willingness" index and the standardized single item willingness item. This 4 item willingness index had an alpha of .67 at both T1 and T2. To summarize, the casual sex willingness index consisted of two willingness items and the remaining two willingness items were not used in the analyses because of low reliability and lack of variance.
The intention items asked, "Do you plan to have sex in the next year with more than one partner?" and "Do you plan to have sex in the next year without using a condom?" from (1) = "I definitely will not" to (7) = "I definitely will".

Audio-tapes

Two audio tapes, one anecdotal, the other statistical were used as the prevalence information manipulation. The statistics presented in the articles were figures obtained from the Eggleston et al. (1996) study. The same general percentages were presented in both the anecdotal and statistical articles, but were presented either in the form of a fictitious group of five women discussing sexual issues or as a statistical summary of sexual behaviors of 200 ISU students. For example, a percentage of 78% in the statistic tape was transformed to 4 out of the 5 women in the anecdotal tape (see Appendix F for the transcripts of these audio tapes). The transcripts did not present either a "pro-sex" or a "con-sex" attitude, but rather an accurate representation of sexual behaviors and attitudes as expressed by the 500 Iowa State University students who completed the surveys in the Eggleston et al. (1996) study. It should be noted that although efforts were made to make the anecdotal and statistical summaries as comparable as possible, they are certainly not identical. Comparing the two will not provide a direct test of anecdotes and statistics, as was the case in previous studies (e.g., Borgida & Nisbett, 1977). For intervention purposes, however, realism and external validity were chosen over parallelism and statistical validity.

After listening to the audio information, individuals evaluated the tapes by answering
the following three questions: how typical were the people in the audio tapes, and how interesting and informative were the clips? They were also given a corresponding recall test. Of course, the control group did not complete the evaluation questionnaire or the recall test (see Appendix G and H). Before these audio tapes were used in the experimental sessions, they were pilot tested with a sample of 40 women. Efforts were made during pilot testing to ensure that the two messages were equated as much as possible in terms of length, comprehension, and retention. It is difficult to equate the anecdotal and statistical articles in regard to retention or recall. Just by the nature of anecdotal information (i.e., being vivid and salient), this information may be easier to recall. The pilot studies made attempts, however, to equate the two articles as much as possible in regard to at least short-term memory. What the current study is proposing is that the anecdotal information will have an impact on change in prototypes and willingness and that this change is not due simply to better recall of the articles. Therefore, items to assess recall were administered at the experimental sessions. Although the main effect for condition may not be meaningful, the Risk Index by Self-esteem interaction was assessed. It was predicted that the high-risk, high self-esteem individuals would do worse on the recall than would the other groups because they may ignore the threatening information.

Procedure

Participants who completed mass-testing were eligible to sign up for the study. The sign-up sheet indicated that the study involved reading transcripts and/or listening to audio
tapes, and that the purpose of the study was to examine communication issues and campus behaviors. The experimental sessions were approximately 4 to 12 weeks after the mass-testing session (this time interval was measured and was controlled for in the analyses).

Participants were scheduled in individual laboratory rooms with a maximum of four participants per session. Upon arrival at the laboratory, participants were greeted by the experimenter and randomly assigned to one of the three prevalence information conditions (i.e., anecdotal, statistical, or no information control). During the last two weeks of the study, the primary experimenter assigned subjects to conditions prior to participation to ensure equal cell sizes. The research assistants conducting the study were blind to participants' self-esteem levels or sexual risk.

After participants listened to the audio tapes (or did not listen to the tapes in the control group), completed the dependent measures (e.g., prototypes, willingness, intentions, prevalence perceptions, and sexual behaviors), assessed the message, and completed the corresponding recall test (of course, the control condition did not assess the message or complete a recall test), they were debriefed by the experimenter. Specifically, participants were told that the study was concerned with the influence of prevalence information on a variety of sexual cognitions and behaviors. It was also explained that the anecdotal message was fictitious (although the underlying information had been obtained by previous studies). See Appendix I for the complete research script and debriefing.
RESULTS

The primary analyses in this study were repeated measures ANOVAs that were conducted on the two prototype measures (condom user [CU] and casual sex [CS]), and the BI and BW items. These analyses were intended to assess change in these measures, and to determine if this change was moderated by self-esteem and sexual risk. For the repeated measures, SE scores were divided via a typical median split. Participants who scored a 58 or less on the scale were labeled low self-esteem and those scoring above 58 were labeled high self-esteem. This split is typical of college students such that this sample tends to have very high self-esteem scores (Baumeister, 1993). A dichotomous risk index was calculated such that the "low-risk" category consisted of individuals with either no sexual experience or sexually active individuals who had only one partner and always used a condom. The "high-risk" category consisted of sexually active individuals who either had more than one partner or had sex more than a few times without using a condom.² Thus, to reiterate, the final design was a 2 (SE category: high/low) X 2 (Risk Index: low risk/ high risk) X 3 (Prevalence Information Condition: Anecdotal /Statistical/Control) X 2 (Time period: mass-testing/follow-up) factorial, with three between subject factors and one within subject factor (i.e., time). The means and standard deviations for the major variables of interest are presented in Table 1.

As indicated earlier, regression analyses were also conducted to determine if changes in prevalence estimates acted as mediators between the form of prevalence information and
Table 1
Means, SDs, and Ranges of major variables

<table>
<thead>
<tr>
<th></th>
<th>Mean</th>
<th>SD</th>
<th>Range</th>
<th>N</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1 CU Prototype</td>
<td>24.20</td>
<td>11.20</td>
<td>1-49</td>
<td>229</td>
</tr>
<tr>
<td>T2 CU Prototype</td>
<td>25.22</td>
<td>10.90</td>
<td>1-49</td>
<td>228</td>
</tr>
<tr>
<td>T1 CS Prototype</td>
<td>9.07</td>
<td>7.69</td>
<td>1-49</td>
<td>219</td>
</tr>
<tr>
<td>T2 CS Prototype</td>
<td>7.40</td>
<td>6.61</td>
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<td>223</td>
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<tr>
<td>T1 CS Willingness</td>
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<td>.71</td>
<td>1-7</td>
<td>229</td>
</tr>
<tr>
<td>T2 CS Willingness</td>
<td>1.20</td>
<td>.65</td>
<td>1-7</td>
<td>230</td>
</tr>
<tr>
<td>T1 CS Will. Index</td>
<td>4.66</td>
<td>3.12</td>
<td>3-20</td>
<td>229</td>
</tr>
<tr>
<td>T2 CS Will. Index</td>
<td>4.41</td>
<td>2.32</td>
<td>3-16</td>
<td>230</td>
</tr>
<tr>
<td>T1 CU Intention</td>
<td>2.72</td>
<td>2.16</td>
<td>1-7</td>
<td>230</td>
</tr>
<tr>
<td>T2 CU Intention</td>
<td>2.58</td>
<td>2.19</td>
<td>1-7</td>
<td>230</td>
</tr>
<tr>
<td>T1 CS Intention</td>
<td>1.62</td>
<td>1.15</td>
<td>1-7</td>
<td>230</td>
</tr>
<tr>
<td>T2 CS Intention</td>
<td>1.51</td>
<td>0.99</td>
<td>1-6</td>
<td>230</td>
</tr>
<tr>
<td>Had Sex(^a)</td>
<td>3.30</td>
<td>2.20</td>
<td>1-7</td>
<td>230</td>
</tr>
<tr>
<td><strong>Among Sexually Active Individuals:</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sex No Condom(^b)</td>
<td>2.80</td>
<td>1.30</td>
<td>1-5</td>
<td>148</td>
</tr>
<tr>
<td>Sex # Partners(^c)</td>
<td>3.10</td>
<td>1.60</td>
<td>1-9</td>
<td>148</td>
</tr>
</tbody>
</table>

\(^a\) Had sex = sexual frequency (from 1 = never, 3 = less than once per semester, 7 = More than 3 times a week)

\(^b\) Sex No Condom = sex without a condom (from 1 = never to 5 = all the time)

\(^c\) Sex # Partners = sex with multiple partners (from 1 = one to 9 = more than 8)
changes in prototype perceptions. Then, a second set of regressions was conducted to
determine if prototypes mediated the relation between prevalence information and BI or
BW.¹

The following results section will first present repeated measure ANOVAs to assess
change in norm perceptions of casual sex and condom use. This will be followed by a
MANOVA and individual ANOVAs to assess change in the CU prototype, CS prototype,
willingness, and intentions. Results from the test evaluations and recall test will then be
presented to assess if high-risk HSE individuals ignored the information more than LSE
individuals. Correlations will then be presented regarding BI and BW. Finally, the
mediation regression analyses will be reported.

Manipulation Check: Was Pluralistic Ignorance Reduced?

The first set of analyses presented are essentially manipulation checks. It was
proposed that participants would overestimate the number of their friends who were having
sex, the number of friends having multiple partners, and the number of friends having sex
without using a condom. Overestimation was operationally defined by comparing the
participants' reports of how many people were engaging in the behaviors with the actual
behavioral reports provided by all participants at T1. Overestimation was determined by first
figuring the actual percentage of the sample who indicated they were engaging in the
behaviors: 64% indicated they were having sex, 35% had more than one partner, and 49%
had sex without using a condom. The next step was to assess the average norm
perceptions. As can be seen in Table 2, the mean was 5.36 (or between "many" and "most") at Time 1 and 5.38 at Time 2 on the question of friends having had sex. At Time 1, the mean was 4.04 (or about half) on the question of friends having had more than 1 partner. This overestimation dropped to 3.66 (or few to about half) at Time 2. When asked how many friends had sex without using a condom, the mean answer was 3.55 (few to about half) at Time 1 and the mean was 3.64 (few to about half) at Time 2. Contrary to predictions, only one variable showed a tendency for overestimation—the multiple partner item. It should be noted, however, that the scales were different (i.e., a 7 point scale compared to a percentage). In addition, perhaps the overestimation would have been more detectable if the prevalence questions assessed peers rather than friends. Therefore this comparison only provides an estimate of overestimation tendencies.

Change in prevalence estimates was proposed as one possible route to altering prototypes, BI, and BW, and the forthcoming analyses were conducted to determine if prevalence estimates did change during the study. Repeated measure ANOVAs were conducted on the three friend prevalence questions to assess change. No time effect was found for friends having sex ($F (1, 209) = 1.38, p = .24, M_s = 5.36 \text{ versus } 5.38$). In addition, no other main effects or interactions reached significance on this item. There was also no significant main effect for Time on perceptions of Friends having sex without using condoms ($F (1,209) = .72, p = .40, M_s = 3.55 \text{ versus } 3.64$). The one significant effect on this item was a Risk X Time interaction ($F (1,209) = 7.24, p \leq .01$), such that low-
Table 2
Analyses Regarding Norm Misperception

<table>
<thead>
<tr>
<th>Prevalence Question</th>
<th>actual</th>
<th>perceived mean</th>
<th>mean</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>%</td>
<td>T1</td>
<td>T2</td>
</tr>
<tr>
<td>1) How many friends have had sex?</td>
<td>64%</td>
<td>5.36</td>
<td>5.38</td>
</tr>
<tr>
<td>2) How many friends have had more than 1 partner?</td>
<td>35%</td>
<td>4.05</td>
<td>3.66</td>
</tr>
<tr>
<td>3) How many friends have had sex without using a condom?</td>
<td>49%</td>
<td>3.55</td>
<td>3.64</td>
</tr>
</tbody>
</table>

Note: 1
Scale
1 = none
2 = very few
3 = few
4 = about half
5 = many
6 = most
7 = almost all
risk individuals slightly decreased their perceptions of friends not using condoms from Time 1 to Time 2 ($M_s = 2.97$ versus $2.90$, $p = $ ns; all reported t-tests in this manuscript are protected t-tests), whereas high-risk individuals increased their perceptions ($M_s = 4.09$ versus $4.40$; $t(209) = 2.58$, $p \leq .02$). There was a main effect for time on the question involving the number of friends having sex with multiple partners ($F(1, 209) = 17.18$, $p \leq .001$), such that prevalence estimates dropped from Time 1 to Time 2 ($M_s = 4.05$ versus $3.66$; $t(209) = 4.62$, $p \leq .001$). There were no other significant main effects or interactions on this item.

When and in what form will prevalence information be most influential?

It was predicted that anecdotal information would have more of an influence on change in prototypes, BI, and BW from Time 1 to Time 2 than would statistical information, and that both the anecdotal and statistical information would have a greater impact than would the no information control group. Thus, a Prevalence Information X Time interaction was predicted. In all of the analyses, however, there was no evidence that the anecdotal condition had a greater influence than the statistical condition, or that these two conditions were more influential than the control group on prototypes, BI, or BW (all $F$s $< 2.5$, $p$s $> .20$). There were a few significant interactions involving Condition (with Risk or SE) on some of the items, but these interactions generally involved unpredicted and uninterpretable patterns of results. Therefore, Condition as a factor will be dropped from all subsequently reported analyses on prototypes, BI, and BW. Condition effects will be presented, however, on questions related to assessing the tapes and recall questions.
Changes in Prototypes and Willingness

It was predicted that a similar pattern for the SE X Risk X Time interaction would occur on the two prototypes and the willingness item. Therefore, a MANOVA was conducted with these three variables. Specifically a 2 (SE) X 2 (risk) X 2 (time) X 3 (variable dimension) repeated measure MANOVA was performed. For this MANOVA, the CU prototype was reverse coded so that a high score represented low CU favorability, high CS favorability, and high CS willingness. On this MANOVA, the Time main effect did not reach significance ($F (1, 191) = 3.51, p < .10$). The predicted SE X Risk X Time interaction was significant ($F (1, 191) = 9.19, p < .005$). The SE X Risk X Time X Dimension did not reach significance ($F (3, 573) = 2.23, p < .10$). This last non-significant interaction suggests that the three variables were changing in a similar manner.

To assess the unique patterns on the three variables, however, the following analyses will present repeated measures on the CU, CS prototype, and willingness items separately. The pattern on the two prototypes was generally as anticipated and was in opposite directions. The two prototypes are clearly independent as indicated by their low correlations ($r = .13, p < .10$ at Time 1, $r = .01, p = ns$ at Time 2, and $r = .01, p = ns$ for the change from T1 to T2 scores).
Changes in Prototypes

Change in the Condom User Prototype

The CU Prototype did not significantly become more favorable over time ($M_s = 23.92$ versus 24.85; $F(1, 209) = 1.58$, $p < .25$). When just the three groups who were expected to increase their CU favorability (i.e., excluding the high risk HSE participants) were analyzed, however, there was a significant increase over time ($t(155) = 2.20$, $p < .05$). A SE X Time interaction was found ($F(1, 209) = 4.20$, $p < .04$) such that LSE individuals decreased prototype favorability and HSE individuals increased prototype favorability. The predicted SE X Risk X Time did not reach significance ($F(1, 209) = 2.85$, $p < .09$). As indicated in Table 3, the pattern of means was such that the low-risk HSE individuals reported the greatest increase in CU favorability ($t(209) = 3.02$, $p < .01$)—support for the positive identification hypothesis.

Change in the Casual Sex Prototype

The CS prototype tended to become more negative over time (Time main effect, $F(1, 197) = 3.18$, $p < .08$, $M_s = 8.40$ versus 7.51). As with the CU prototype, when just the three groups who were expected to decrease their willingness were analyzed, however, there was a significant decrease over time ($t(150) = 5.43$, $p < .001$). The SE X Time interaction was not significant. There was a Risk X Time interaction ($F(1, 197) = 4.01$, $p < .05$), but this 2-way interaction was difficult to interpret in light of the 3-way interaction. The predicted SE X
Table 3
Means for the SE X Risk X Time Repeated Measure ANOVA on the CU Prototype

<table>
<thead>
<tr>
<th></th>
<th>Low Self-Esteem</th>
<th>High Self-Esteem</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Risk</td>
<td>Risk</td>
</tr>
<tr>
<td>Time 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>22.22 (12.67)</td>
<td>19.39 (11.96)</td>
</tr>
<tr>
<td>High</td>
<td>26.38 (9.19)</td>
<td>27.34 (8.49)</td>
</tr>
<tr>
<td>Time 2</td>
<td>21.19 (10.74)</td>
<td>23.98** (13.99)</td>
</tr>
<tr>
<td>Change Scores:</td>
<td>-1.03</td>
<td>4.59</td>
</tr>
<tr>
<td></td>
<td>-.15</td>
<td>.39</td>
</tr>
</tbody>
</table>

Note: Cell size 51-56

Standard deviations are in parentheses

** = a significant change over time, \( p \leq .01 \)

High score = favorable condom user prototype
Risk X Time interaction was found on the CS prototype ($F(1, 197) = 6.35, p \leq .01$). The pattern of these means was as predicted (see Table 4), specifically only among the high-risk, HSE group was there a tendency to increase the favorability of the casual sex prototype ($t(197) = 1.90, p \leq .06$)—although the $p$ value was only marginal, the fact that the high-risk, HSE group actually increased (rather than appropriately decreased) their favorability shows support for the reactance hypothesis. In the other three groups, the favorability of the casual sex prototype decreased as expected. In fact, when excluding the high-risk HSE group, the other three groups showed a significant decrease in CS prototype favorability over time ($t(197) = 5.43, p \leq .001$). In addition, the greatest amount of decrease in favorability was found among the low-risk, HSE individuals ($t(197) = 3.80, p \leq .001$)—support for the positive identification process. Finally, the high-risk, LSE individuals also decreased their perceptions of the CS prototype ($t(197) = 1.70, p \leq .10$)—marginal support for the appropriate response hypothesis. These repeated measure ANOVAs were also conducted on the prototype measures as ANCOVAs. In this case, the time 1 prototype scores were the covariates. The covariate results were essentially the same as the repeated measures.

**Change in Willingness and Intention**

**Change in Casual Sex Willingness**

Repeated measure ANOVAs were also conducted on the intention and willingness questions to assess change. On the "Casual Sex Willingness" index (the standard 3 item no condom index and the 1 item casual sex item) there were no significant main effects
Table 4

Means for the SE X Risk X Time Repeated Measure ANOVA on the CS Prototype

<table>
<thead>
<tr>
<th></th>
<th>Low Self-Esteem</th>
<th>High Self-Esteem</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Risk</td>
<td>Risk</td>
</tr>
<tr>
<td></td>
<td>Low</td>
<td>High</td>
</tr>
<tr>
<td>Time 1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>7.17 (5.14)</td>
<td>9.99 (6.97)</td>
</tr>
<tr>
<td>High</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Time 2</td>
<td>6.06 (4.55)</td>
<td>8.36* (6.71)</td>
</tr>
<tr>
<td></td>
<td>4.32** (2.89)</td>
<td>11.23* (9.20)</td>
</tr>
<tr>
<td>Change Scores</td>
<td>-1.11</td>
<td>-1.63</td>
</tr>
<tr>
<td></td>
<td>-2.69</td>
<td>1.85</td>
</tr>
</tbody>
</table>

Note: Cell size 49-51

Standard deviations are in parentheses

* = a change over time, p ≤ .10, ** = a significant change over time, p ≤ .05

High score = favorable casual sex prototype
including the Time main effect ($F(1, 222) = .36, p < .55$). When just the three groups who were expected to decrease their willingness (i.e., excluding the high risk HSE participants) were analyzed, however, there was a significant decrease over time ($t(170) = 3.18, p < .001$). The anticipated SE $X$ Risk $X$ Time interaction was significant ($F(1, 222) = 5.37, p = .02$). The pattern of means was also generally as predicted and is presented in Table 5. Specifically, only the high-risk, HSE individuals increased their willingness to have sex without a condom—support for reactance ($t(222) = 2.13, p < .05$). The greatest amount of decrease in CS willingness was among the high-risk, LSE individuals ($t(222) = 2.81, p < .01$)—providing support for the appropriate response hypothesis.

Change in Intention

There were no significant main effects or interactions for the condom use intention question. On the intention to have sex with multiple partners question, there was a significant main effect for Time ($F(1, 222) = 6.62, p < .01$), such that participants reported less intention to have sex with more than one partner from Time 1 to Time 2 ($M_1 = 1.61$ versus 1.48). None of the other main effects or interactions were significant on the intention items. The willingness and intention measures were also analyzed using ANCOVAs. In these analyses, willingness or intention at Time 1 was used as the covariate. The covariate analyses produced similar results to the repeated measure analyses.
Table 5
Means for the SE X Risk X Time

Repeated Measure ANOVA on the 4 Item Casual Sex Willingness Index

<table>
<thead>
<tr>
<th>Low Self-Esteem</th>
<th>High Self-Esteem</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Risk</td>
</tr>
<tr>
<td>Time 1</td>
<td></td>
</tr>
<tr>
<td>Low</td>
<td>-.34 (1.03)</td>
</tr>
<tr>
<td>High</td>
<td>.75 (2.10)</td>
</tr>
<tr>
<td>Time 2</td>
<td>-.38 (.89)</td>
</tr>
<tr>
<td></td>
<td>.30**(1.91)</td>
</tr>
<tr>
<td>Change Scores:</td>
<td>-.04</td>
</tr>
<tr>
<td></td>
<td>-.45</td>
</tr>
</tbody>
</table>

Note: Cell size = 54-59 Standard deviations are in parentheses
* = a significant change over time, \( p \leq .05 \); ** = \( p \leq .01 \)

High score = more casual sex willingness; index is the sum of two z scores
Recall Tests and Audio Tape Evaluations

Recall tests

After listening to the audio tapes and completing the questionnaires, participants were asked to complete a 7 item recall test (the control participants were not given this test). ANOVAs were conducted to test for the influence of risk status and SE on recall. A main effect was found on Risk status ($F(1,147) = 7.15, p < .01$), such that high-risk subjects answered fewer items correctly than did low-risk subjects ($M_s = 4.38$ versus $5.06$). There were no differences on the recall test as a function of self-esteem levels of the participants, nor was there a significant interaction effect. The repeated measures ANOVAs on prototypes, willingness, and intentions were conducted eliminating subjects who correctly answered 3 or fewer on the recall test; this did not alter the results.

Analyses were also conducted comparing the two conditions (the control group, of course, did not complete a tape recall). A main effect for Condition was found on this recall test ($F(1,152) = 8.16, p < .005$) such that participants in the anecdotal condition answered more items correctly ($M_s = 5.08$ versus $4.36$). Because the tests were not identical any direct comparisons between the two conditions can only be speculative.

Questions about the tapes

After listening to the tapes and completing the questionnaires, participants (except for those in the control condition) were asked three questions about the tapes: (1) Do you think the people's behaviors are typical of ISU college students? (2) Do you think the tape would
be interesting for college students?, and (3) Do you think the tape would be informative for ISU college students?. A MANOVA was conducted using all three of the tape evaluation questions in one analyses, however, there were no significant main effects or interactions.

Three separate 2 (SE) X 2 (risk index) X 2 (prevalence information condition) ANOVAs were then conducted. A SE by Risk index interaction was anticipated, as high-risk HSE individuals were expected to derogate the articles more than would (either high-risk or low-risk) LSE individuals. Specifically it was predicted that the high-risk HSE individual would find the behaviors portrayed on the tape as less typical, find the tape less interesting and less informative.

On the first question regarding typicality, no main effects or interactions were found. On the second question regarding interest, a main effect for Risk (F (1,147) = 9.22, p < .01) was found, such that high-risk individuals thought the tape was more interesting than did low-risk individuals (Ms = 5.36 versus 4.66). On the third question regarding how informative the tape was, there were no main effects or interactions for SE or Risk, but a main effect for condition was found. Specifically, participants reported the statistical tape as being more informative than the anecdotal tape (F (1,147) = 21.25, p < .001, Ms = 5.94 versus 4.96).

Correlations of Intention, Willingness, Prototypes, and Prevalence

Correlations of each main variable of interest at Time 1 and Time 2 were calculated. As can be seen from Table 6, the 4 item casual sex willingness index was
Table 6
Correlations of Time 1 and Time 2 Intention, Willingness, Prototypes, and Prevalence

<table>
<thead>
<tr>
<th></th>
<th>(A)</th>
<th>(B)</th>
<th>(C)</th>
<th>(D)</th>
<th>(E)</th>
<th>(F)</th>
<th>(G)</th>
<th>(H)</th>
<th>(I)</th>
<th>(J)</th>
<th>(K)</th>
<th>(L)</th>
<th>(M)</th>
</tr>
</thead>
<tbody>
<tr>
<td>(A)</td>
<td>T1 CS will. index</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(B)</td>
<td>T2 CS will. index</td>
<td>.61**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(C)</td>
<td>T1 CU intention</td>
<td>.21**</td>
<td>.21**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(D)</td>
<td>T2 CU intention</td>
<td>.17*</td>
<td>.22**</td>
<td>.81**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(E)</td>
<td>T1 CS intention</td>
<td>.21**</td>
<td>.30**</td>
<td>-.03</td>
<td>-.01</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(F)</td>
<td>T2 CS intention</td>
<td>.17*</td>
<td>.30**</td>
<td>-.01</td>
<td>.04</td>
<td>.74**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(G)</td>
<td>T1 CU Prototype</td>
<td>.12</td>
<td>.10</td>
<td>.07</td>
<td>.06</td>
<td>.08</td>
<td>.08</td>
<td>.50**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(H)</td>
<td>T2 CU Prototype</td>
<td>.11</td>
<td>.07</td>
<td>.06</td>
<td>.02</td>
<td>.08</td>
<td>.08</td>
<td>.50**</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(I)</td>
<td>T1 CS Prototype</td>
<td>.35**</td>
<td>.41**</td>
<td>.11</td>
<td>.09</td>
<td>.39**</td>
<td>.35**</td>
<td>-.16</td>
<td>.08</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(J)</td>
<td>T2 CS Prototype</td>
<td>.19**</td>
<td>.45**</td>
<td>.03</td>
<td>.07</td>
<td>.34**</td>
<td>.42**</td>
<td>.04</td>
<td>.01</td>
<td>.42**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(K)</td>
<td>T1 CU Prevalence</td>
<td>.17*</td>
<td>.11</td>
<td>.27**</td>
<td>.32**</td>
<td>.01</td>
<td>.14*</td>
<td>.07</td>
<td>.03</td>
<td>.11</td>
<td>.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(L)</td>
<td>T2 CU Prevalence</td>
<td>.21**</td>
<td>.14*</td>
<td>.32**</td>
<td>.40**</td>
<td>.06</td>
<td>.16*</td>
<td>.05</td>
<td>.01</td>
<td>.18**</td>
<td>.09</td>
<td>.64**</td>
<td></td>
</tr>
<tr>
<td>(M)</td>
<td>T1 CS Prevalence</td>
<td>.24**</td>
<td>.21**</td>
<td>.16*</td>
<td>.23**</td>
<td>.26**</td>
<td>.39**</td>
<td>.10</td>
<td>.10</td>
<td>.30**</td>
<td>.25**</td>
<td>.49**</td>
<td>.52**</td>
</tr>
<tr>
<td>(N)</td>
<td>T2 CS Prevalence</td>
<td>.27**</td>
<td>.25**</td>
<td>.17*</td>
<td>.22**</td>
<td>.26**</td>
<td>.34**</td>
<td>.10</td>
<td>.04</td>
<td>.28**</td>
<td>.27**</td>
<td>.36**</td>
<td>.64**</td>
</tr>
</tbody>
</table>

Note: Cell sizes ranged in size from 201-230 participants; * = p ≤ .05, ** = p ≤ .01
significantly correlated with the CS prototype ($r = .35$, $p < .001$ at Time 1, and $r = .45$, $p < .001$ at Time 2). The multiple partner intention item was also significantly correlated with the CS prototype ($r = .39$, $p < .001$ at Time 1, and $r = .42$, $p < .001$). The prevalence estimates were positively correlated with intention, willingness, and the CS prototype. In other words, perceived prevalence of lack of condom use and casual sex was associated with a greater willingness and intention to engage in these behaviors, and with a more favorable CS prototype rating.

Change scores from T1 to T2 in BI, BW, prototypes, and prevalence perceptions were also calculated. The change scores were then correlated with each other. The prevalence perception change scores were not significantly correlated with any of the other change scores. The CU prototype change score was not correlated with intentions or willingness. The CS prototype change score was not correlated with intentions, but it was correlated with the 4 item casual sex willingness index change score ($r = .17$, $p < .01$). This last correlation suggests that changing the casual sex image could result in a change in willingness to engage in casual sex. This implied regression is presented in the following section. It is also worthy noting that the BI change and the BW change did not significantly correlate with each other (BW change with CU intention change, $r = .06$, $p = .31$; BW change with CS intention change, $r = -.02$, $p = .80$). These nonsignificant correlations provide more evidence for the distinction between the willingness and intention constructs (Gibbons & Gerrard, in press; Gibbons, et al., in press; Gibbons et al., 1996).
Regressions

In addition to these repeated measures ANOVAs, regression analyses were conducted on the sexual dependent measures to assess possible mediation. Because of the lack of prevalence information effects in the ANOVAs, it was doubtful that the regressions would be significant. The first set of regressions assessed whether condition predicted prototypes, and if this relation was mediated by a change in prevalence perceptions. The second set of regressions was conducted to determine if a change in prevalence perceptions predicted willingness or intentions, and if this relation was mediated by a change in prototypes. For each of these sets, first the mediator was regressed on the independent variable, second the dependent variable was regressed on the mediator variable, third the dependent variable was regressed on the independent variable, and finally both the independent variable and the mediator variable were entered into the regression equation to predict the dependent variable (Baron & Kenny, 1986). In all cases, for mediation to be present, all four of these regressions must be significant. None of these regression paths were significant and thus there is no evidence in these analyses for mediation.

Based on the earlier results, namely the ANOVAs suggesting a change in the CS prototype and CS Willingness and the correlation between these two items, an additional regression was conducted. Specifically, a hierarchical regression was performed regressing the Time 2 CS Willingness item on the Time 1 CS Willingness item, the CS Prototype at Time 1, and finally the CS Prototype at Time 2. As predicted, the T1 CS Willingness item
was a significant predictor \( (\text{Beta} = .44, t = 7.74, p \leq .001) \) of willingness at Time 2. In addition, prototypes at both time periods were significant predictors of Time 2 CS Willingness \( (\text{Beta} = .15, t = 2.56, p \leq .01 \) at Time 1; and \( \text{Beta} = .31, t = 5.43, p \leq .001 \) at Time 2). The overall regression equation was also significant \( (F (3, 197) = 56.08, p \leq .001, R^2 = .46) \). This regression provides additional support for the prototype and willingness relation (Gibbons and Gerrard, in press). Specifically, changes in prototypes predict changes in willingness.
DISCUSSION

The following sections will summarize the results and discuss limitations of the study, directions, and possible interventions regarding each of the primary variables.

Prototypes

The primary purpose of this study was to determine if sexual prototypes are malleable. This primary hypothesis was supported such that the casual sex prototype tended to become less favorable and the condom user prototype tended to become more favorable over time. The current study is the first experimental study that has found that prototypes are amenable to change. This mutability effect extends the results of Gibbons and Gerrard (1995), Gibbons and Gerrard (in press), and Hedges et al., (1995). Specifically, these past chapters and studies hypothesized that people maintain prototypes, that they can be assessed, and that they are related to behaviors. The current study adds to the prototype research by suggesting that prototypes can be modified. More importantly, in so doing, it emphasizes the possibility that prototypes may prove useful in interventions.

Positive and Negative Prototypes

In the current study, I speculated that it would be easier to alter (derogate) a negative image (e.g., show the negative aspects of the casual sex image) than to alter (bolster) the favorability of a positive image (e.g., show the positive aspects of a condom user). This idea was supported with the current data such that the casual sex prototype (the negative image) was more easily altered than was the condom user prototype (the positive image). This
suggests that negative prototypes may be more malleable than positive prototypes. This may in part be due to the fact that it might be easier to conjure up the image of a negative person than a positive person. This may occur because people generally possess a negativity bias such that negative information is more impactful than positive information (Amabile & Glazebrook, 1981; cf. Ditto & Jemmott, 1989; Fiske, 1980, Simpson & Ostrom, 1976; Wojciszke, Bryce, & Borkeman, 1993).

The positive/negative difference in this study is consistent with other research. Specifically, the fact that the negative image was more mutable and more related to the willingness construct is congruent with the distancing hypothesis proposed by Gibbons and Gerrard (in press). Taylor (1991) reported that negative events evoke stronger physiological, cognitive, emotional, and social responses than do positive events. This researcher also proposed that unfavorable information regarding the self can be a powerful negative event that will evoke a strong response. In the current study, it appears that the negative image was producing a greater response and was more amenable to change and more related to willingness than was the positive image.

It should also be noted that this study did not provide a direct test of the negativity/positivity dimension because the prototypes were not on opposite ends of a single continuum. A more direct test of this dimension would have involved presenting a condom-user prototype versus a non-condom user prototype or a person who engages in casual sex versus one who does not. I chose not to test this, however, because it is very difficult to
conjure up an image of a person who does not do a behavior (e.g., the typical person who does not engage in casual sex; cf. Fazio et al. 1982). Certain images do not lend themselves to assessment because they either occur in very large numbers (e.g., the typical married person who has sex) or in very small numbers (e.g., the typical game show host from Iowa who has sex). In addition, the images that I chose in the current study seem to best lend themselves to interventions. Once again, I chose realism and external validity over parallelism and statistical validity. Future research could establish the ease of changing positive versus negative images and the subsequent relation to changes in willingness and behavior. Blanton, VandenEijnden, Buunk, and Gibbons (1996) have initiated this line of research. Specifically, these researchers have found that a negatively-framed image (e.g., someone engaging in "unsafe sex") provides a better prediction of willingness to engage in safe sex than a positively-framed image (e.g., someone engaging in "safe sex").

Interventions with Prototypes

It seems that if negative prototypes are more malleable than positive prototypes, they may also be more useful in interventions. Originally a prevalence change intervention was proposed, specifically, it was hypothesized that a change in prevalence would lead to a change in images, which, in turn, would result in a change in intentions and willingness. However, the results in this study found virtually no evidence that prevalence estimates lead to prototype change. Possible problems with the prevalence estimates provided in the current study will be discussed below. Suffice it to say that this prevalence information was a very
weak manipulation. Perhaps a stronger manipulation would have produced greater effects on the prototypes and subsequent willingness. Due to the results in this study, it is hypothesized that there are two separate avenues of behavior change. One route may be through prevalence information. The other, separate route to behavior change may be through image modification (see Figure 3). Perhaps the images of the typical drinker, condom user, etc. become more clear, stable, concrete, or personal as people gain experience with the

![Diagram](image)

Figure 3. Theoretical model of dual prototype and prevalence perception influence.
associated behavior and information. Future research could focus on changing these images by giving people information about the images, the consequences associated with the behaviors, and the myths or stereotypes associated with the images (e.g., by exposing the fact that men who have casual sex are stupid, not macho).

Willingness and Intention

In addition to assessing change in prototypes, the current study also assessed changes in willingness and intentions. It was found that both individuals' willingness and intentions did change as a function of being in the study. The results were consistent with past studies such that it was easier to change willingness than intentions (Gibbons & Gerrard, 1995; Gibbons et al., 1996; and Blanton et al, in press). Therefore, it seems that the willingness construct should be emphasized in future interventions. Two possible problems regarding willingness must be addressed, however, before using the construct in educational programs.

Methodological issues with the Willingness items

A limitation with this study involved the multiple partner willingness items. This three item scale, which was developed for the current study produced an alpha of only .20. Specifically, the second item about breaking up with first person to pursue a relationship with the second person did not correlate with the other items. Based on the usefulness of the willingness construct (as demonstrated by Gibbons & Gerrard, in press), and based on the interesting SE X Risk interaction found on the casual sex willingness index, if the MP willingness items had greater reliability and validity, perhaps more could have been done
with this item. Future research should develop standardized and reliable willingness measures. Moreover, more specific willingness items would also be useful for specific interventions. For example, willingness items should be developed for sexual interventions that could assess willingness to: use a condom, obtain a condom, ask a partner to use a condom, get an HIV test, or have multiple partners in the same week, in the same month, after meeting a person at a party, if it was certain that your current partner would never find out, etc.

Another limitation in regard to using the willingness construct involves subject selection. Specifically, in retrospect, it is possible to speculate that individuals who are in very serious, committed relationships and/or who are using the birth control pill will have a difficult time responding to these items. For example, it could be proposed that people who regarded their current relationship as very committed would have no variance in their willingness to engage in risky sexual behaviors (especially having multiple sex partners). In addition, participants in a very serious relationship may not be using condoms because they are either using an additional method of birth control (e.g., the pill), have been tested for STDs, believe themselves to be free of STDs, or perhaps they are not using any birth control because they are trying to get pregnant. Similarly birth control pill users may have a difficult time answering the willingness questions (especially using condoms) because they are more concerned with pregnancy prevention than STD prevention and therefore do not use condoms. Participants who were in a serious relationship may have had difficulty answering
any willingness items as well as providing accurate perceptions of their prototypes. In fact, eliminating the 30 subjects in the current study who reported being in a very serious relationship, strengthened the SE X Risk X Time interaction on the CU prototype, CS prototype, and willingness measures ($F (1, 187) = 4.96, p < .03; F (1, 175) = 15.39, p < .001; and $F (1, 196) = 8.80, p < .005$, respectively).

**Self-esteem**

The study was also designed to assess the moderating role of self-esteem and sexual risk on change in prototypes, BI, and BW. There was support for the hypothesis that self-esteem and sexual risk influenced prototype and BW change. In addition, it was found that as predicted, high-risk HSE individuals reacted to the information by slightly increasing the favorability of the casual sex prototype and increasing their willingness to have casual sex. It was also predicted that HSE individuals with low-risk sexual experiences would engage in positive identification and they did; specifically, they decreased the favorability of the casual sex prototype and increased the favorability of the condom user prototype. As predicted, high-risk LSE individuals showed evidence of "appropriate response" by decreasing the casual sex favorability and decreasing their willingness to have casual sex. Finally, there was some indication that LSE individuals with low-risk sexual experiences engaged in negative identification, in that they slightly decreased the favorability of the condom user prototype. This last hypothesis received the least support, however. In addition, there was no evidence that the high-risk HSE individuals derogated the information more than the LSE, low-risk
individuals did, as indicated on the tape evaluation questions. In addition, there was no evidence that self-esteem was related to recall of the tape information.

This study found results that are congruent with studies by Gerrard et al. (1991), Smith et al. (in press), Boney McCoy et al. (1996) study, and Gibbons, Eggleston, and Benthin (in press). Specifically, this study added to a growing body of literature that suggests that having high self-esteem can be detrimental to health behaviors. In fact, the most consistent results found in this study involved the Self-esteem X Risk Index interactions. This interaction was at least marginally significant on both prototypes and the willingness index. From a theoretical perspective, this study proposes four different responses that people engage in depending upon their self-esteem levels and behaviors. From an applied perspective, this study suggests different ways that individuals may respond to interventions depending on their self-esteem levels and behaviors. More specifically, it suggests that high-risk HSE individuals may need some focused intervention techniques before they will accept health information that they perceive as threatening.

Interventions with HSE individuals

Taken together, this and preceding studies suggest a number of different points that would be important to remember when dealing with high self-esteem people in intervention programs. First, researchers and intervention planners should acknowledge the fact that high-risk, HSE individuals may respond with a defensiveness and reactance to intervention attempts. Therefore, extremely direct fear appeals are not likely to work with high-risk HSE
individuals. A fear appeal would confront the HSE individual with their unwise behavior. Instead, a better approach with HSE individuals may involve an equal presentation of the information that provides both sides of an issue and the positive and negative aspects of engaging in the risk behavior and the risk preventive behaviors (cf. Rothman, Salovey, Antone, Keough, & Drake Martin, 1993). A follow-up study to the current experiment is currently being planned that will examine HSE individuals' reactions to a more intense intervention. That is, instead of just presenting information about prevalence rates, the follow-up study will present information that explicitly addresses the problems and negative consequences associated with casual sex.

It seems unlikely that HSE individuals would respond well to any intense intervention such as direct routes of persuasion used in many education programs (cf. Petty & Cacioppo's Elaboration Likelihood Model [ELM], 1981; Cacioppo, Petty, Feng Kao, & Rodriguez, 1986; Smith & Petty, 1996). According to the ELM, individuals who are involved with an issue pay more attention to the message content and the quality of the arguments (e.g., the central route of persuasion), and pay less attention to characteristics of the communicator such as attractiveness (e.g., the peripheral route of persuasion).

In the current study, it could be construed that people with sexual experience are more involved and thus should be processing at a central level. For LSE individuals, it is proposed that those who are sexually experienced would be more involved and thus process the information more carefully (i.e., the central route of persuasion). Conversely, LSE
individuals who are not sexually experienced, and therefore not as involved, will process the information less carefully (i.e., the peripheral route of persuasion). For the HSE individuals who are sexually experienced, however, it is proposed that they would feel threatened by the prevalence information and would not choose to process the information via the central route. This rationale was supported with the current research such that the high risk HSE participants reacted to the information and did not alter their cognitions in the "appropriate" manner. In summary, the sexual experience component of the current study fits in with the ELM model of persuasion. Self-esteem, however, does not consistently fit in with the "traditional" ELM model. A study specifically designed to test the role of SE and issue involvement on routes of persuasion would likely prove to be both theoretically interesting and useful in an applied setting.

It seems likely that high-risk HSE individuals would be most persuaded by less direct (and less threatening) routes of persuasion, such as having a very popular or very attractive person deliver the message. In addition, if high-risk HSE individuals did not feel that they were trying to be persuaded, they may be more likely to accept the information without reacting. Perhaps, group discussions could be developed that first allowed students to get to know each other personally, then had the groups discuss health issues, including the images of different people who engage in various risk behaviors, the consequences associated with the behaviors (both good and bad), the characteristics associated with the prototypes of these people (both good and bad), and the myths associated with these images and the behaviors. If
the information were discussed in an informal discussion group, the high-risk HSE individuals might be more likely to listen and accept information that came out naturally from other group members rather than from an "authority" figure whom they thought was trying to persuade them.

An additional issue regarding HSE individuals in an intervention involves when to intervene. It seems likely that not only the type of information and method of presentation are important but that the timing may be very important as well. One way to teach high-risk HSE individuals may be to take advantage of "teachable moments." Teachable moments are defined as different, specific times that attitudes are most susceptible to change, for example during life changes (going to college, a friend gets an STD, starting high school, a first date, etc.). This teachable moment idea was exemplified in the 1991 announcement that Magic Johnson had AIDS. After this announcement, there was a subsequent increase in people's knowledge about AIDS, a change in their perceptions of the type of person who gets AIDS, as well as a change in perceptions of personal vulnerability to AIDS (Penner & Fritzsche, 1993). One could speculate that part of the reason that teachable moments can alter attitudes is that self-esteem levels are temporarily lowered enough due to unusual circumstances, that HSE people are willing to listen to (and perhaps accept) threatening information. For example, a person with HSE levels may have a temporary decrease in their self-esteem when they first enter college due to the new situations and expectations they are encountering. During this temporary decrease in SE they may be more receptive to persuasive messages.
Prevalence Information: Anecdotal versus Statistical Information

An additional prediction in this study involved the idea that normative information could act to alter prototypes, BI, and BW and, further, that anecdotal information would have a greater influence on changing these sexual cognitions than would statistical information. There was no support for the hypothesis that the anecdotal information would be more impactful than would the statistical information.

One possible reason that the condition (tape) did not produce significant effects is because the assumption that people tend to harbor many misperceptions regarding sexual norms was wrong. In fact, the individuals in the current study were actually fairly accurate at estimating their friends' sexual behaviors and condom usage. There was only a tendency to overestimate the number of partners that their friends had. The prevalence information tapes were designed to correct misperceptions, but there were surprisingly few misperceptions to correct. Previous studies have found that people tend to misperceive their peers' behaviors more than their friends' behaviors (Gibbons & Gerrard, 1995). Perhaps greater norm misperceptions may have been detected if the current study had assessed perceptions of peer behaviors rather than friend behaviors.

Second, in previous studies comparing anecdotal information versus statistical information, the material involved issues such as selecting cars and school classes (Nisbett et al., 1976; Borgida & Nisbett, 1977). Sexual issues may be more personal and more important than class courses or Volvos. Perhaps people use information presented to them more when
deciding about general issues and are less likely to alter their ideas about sexual issues. Because class courses or Volvos may not be as threatening, one could speculate that SE would not moderate these decisions as it did in the current study. An interesting empirical question emerges: would someone who had high SE and truly loved Volvos react to negative information about Volvos (as risky high SE people do when confronted with information about sex)?

Third, it appears that the information provided in both tapes was not negative enough (i.e., did not present a negative message about not using condoms or engaging in casual sex). The material presented was taken from actual prevalence information from ISU students. In retrospect, more information should have been provided that focused on the negative consequences of having multiple partners and not using condoms. For example, STDs were only briefly mentioned in the audio tapes. Perhaps more emphasis should have been placed on the negative consequences associated with not using condoms (STD's, AIDS, pregnancy) and having casual sex (STD's, AIDS, emotional ramifications). Finally, related to this last idea about negative information, in the anecdotal audio tape, even the people who had multiple partners or who did not use condoms still had some other positive characteristics. Specifically, just because a person in the anecdotal tape reported that she did not use condoms, she may have still sounded intelligent, honest, caring, and decent. This might be very similar to the way prototypes develop in the real world. For instance, people who have
multiple partners and do not use condoms most likely do have other favorable characteristics (e.g., they might be attractive or popular), therefore these images are not entirely negative.

Conclusions

The prevalence information (presented in either the anecdotal or statistical form) did not influence the prototypes, BI, or BW. Therefore, the proposed mediation model of prevalence perceptions leading to changes in prototypes resulting in changes in intentions and willingness was not supported. The moderation of self-esteem and sexual risk was evident. In addition, based on the correlational and regression analyses, it appears that changing prototypes did result in a change in the associated willingness. The current study suggests that images and willingness are malleable. Future research should focus on image change and the role of self-esteem from both a theoretical and applied approach. One final issue regarding interventions is also worthy of consideration. Based on the research on pluralistic ignorance and norm misperception, it is necessary to critically assess some of the more popular and traditional safe-sex campaigns. An element common to many of these interventions is that they promote a message that states, "You all are having sex, You all are not using condoms, and You all are having casual sex." This message may actually lead to more norm misperceptions. The more individuals see these messages on television, hear the messages on the radio, and read these messages, the more common the behaviors may seem. Thus, although these "Everybody is doing it, and it is a big problem" messages may get attention, they also may cause people to overestimate prevalence perceptions, which may, in
turn, encourage the exact behavior the messages are trying to discourage. Similarly, researchers should critically assess the images of people engaging in risk behaviors as portrayed in the media. For example, the typical person who has multiple partners is often given the additional positive attributes of being popular and attractive (Brown & Eisenberg, 1995). Conversely, the image of people engaging in risk preventive behaviors are often portrayed in a negative light, such as the typical person who uses condoms being regarded as nerdy or boring (Miller Campbell, Peplau, & Chapman DeBro, 1992). Discovering the best way to present these images and addressing the different needs of certain participants (e.g., risky HSE individuals) in education campaigns that will act to alter prototypes and, in turn, willingness and the subsequent risk behaviors would prove useful from both a theoretical and an applied perspective.
NOTES

1 Analyses from Eggleston, Gibbons, and Gerrard (1996) found some differences in sexual behaviors between men and women. Specifically, women had less favorable perceptions of the typical person who has sex without birth control ($M_s = 38.8$ versus $35$, $t = 4.16, p < .001$); and less favorable perceptions of the typical person who has casual sex ($M_s = 44$ versus $38$, $t = 6.18, p < .001$). In addition, women reported that fewer people were engaging in sex without birth control or with multiple partners than did men (all $p < .03$). No gender differences emerged on sexual frequency, sexual behavior without birth control, sexual behavior with more than one partner, or intentions to have sex without birth control.

2 Additional analyses were conducted in which risk status was categorized in two alternative ways. First, it was categorized as either sexually active or non-sexually active. Second, risk status was categorized as 1 = non-sexually active, 2 = sexually active with one partner, always using condoms, and 3 = sexually active with more than one partner or having sex without consistently using condoms. Using the low versus high-risk index resulted in the most even cell size distribution for the ANOVAs. There were only minor differences in the results based on which risk index category was used.

3 The condition was also categorized as 1 = either anecdotal or statistical and 2 = control condition. This was done to determine if any form of prevalence information differed from no prevalence information. This dichotomous category did not produce different results from the three way category and made the means difficult to interpret.

4 All of the ANOVA and regression analyses were conducted controlling, via Analyses of covariance, for: differences in amount of elapsed time from Time 1 to Time 2, prevalence perceptions, amount of suspicion reported, and whether the participants changed in risk status from Time 1 to Time 2 (only 7 participants increased their sexual risk factor, e.g., becoming sexually active, having an additional partner or not using condoms). None of these covariates significantly altered the reported analyses.
APPENDIX A: ROSENBERG SELF-ESTEEM INVENTORY

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1) I feel that I'm a person of worth, at least on an equal plane with others.
2) I feel that I have a number of good qualities.
3) All in all, I'm inclined to feel that I'm a failure.
4) I am able to do things as well as most other people.
5) I feel that I do not have much to be proud of.
6) I take a positive attitude toward myself.
7) On the whole, I am satisfied with myself.
8) I wish I could have more respect for myself.
9) I certainly feel useless at times.
10) At time, I think I am no good at all.
APPENDIX B: PROTOTYPES

Some of the questions below concern "images" or "prototypes"—that is, ideas that people have about typical members of different groups. For example, we all have ideas about what typical movie stars are like or what the typical grandmother is like. When asked, we might say that we think the typical movie star is attractive or rich, or that the typical grandmother is sweet and frail. We are not saying that all movie stars or all grandmothers are exactly alike, but rather that many of them share certain characteristics. In these questions you will be asked to apply various words to the images you have for different kinds of people.

CASUAL SEX prototype

We'd like you to spend a few moments thinking about a person your age and gender who engages in casual sexual behavior (i.e., sex with multiple partners). We are not suggesting that these people are always alike. Rather we are interested in what traits you think this type of person is likely to have. Please use the following scale to rate each adjective.

1 2 3 4 5 6 7
not at all extremely

_____a. smart
_____b. confused
_____c. popular
_____d. immature
_____e. "cool" (sophisticated)
_____f. self-confident

_____g. independent
_____h. careless
_____i. unattractive
_____j. dull
_____k. considerate
_____l. self-centered

In general, how similar do you think you are to the type of person (your age and gender) who engages in casual sexual behavior (sex with multiple partners)?

not at all extremely

similar similar
We'd like you to spend a few moments thinking about a person your age and gender who consistently engages in "safer sex" by using a condom. We are not suggesting that these people are always alike. Rather we are interested in what traits you think this type of person is likely to have. Please use the following scale to rate each adjective.

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<td>not at all</td>
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- a. smart
- b. confused
- c. popular
- d. immature
- e. "cool" (sophisticated)
- f. self-confident
- g. independent
- h. careless
- i. unattractive
- j. dull
- k. considerate
- l. self-centered

In general, how similar do you think you are to the type of person (your age and gender) who engages in "safer sex" by consistently using a condom?

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<td>similar</td>
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APPENDIX C: BACKGROUND INFORMATION

Gender ___________ Age ______

What is your marital status?
A. Single  B. Married  C. Divorced  D. Separated

Are you currently in a romantic relationship (e.g., have a partner)?
Yes  No

If you are in a relationship, how would you characterize that relationship?
1  2  3  4  5  6  7
little commitment  very serious commitment

How often do you have sexual intercourse?
A.) Never—I have never been sexually active
B.) Currently, I am not sexually active
C.) Less than once per semester
D.) At least once per semester, but not as often as once a month
E.) At least once a month, but not as often as once a week
F.) At least once a week, but not more than three times a week
G.) More than three times a week

With how many people in the past 6 months have you had sexual intercourse?
A.) None  E.) Five
B.) One  F.) Six
C.) Two  G.) Seven
D.) Three  H.) Eight
E.) Four  I.) More than eight

With how many people have you ever had sexual intercourse?
A.) None  E.) Five
B.) One  F.) Six
C.) Two  G.) Seven
D.) Three  H.) Eight
E.) Four  I.) More than eight
If you have had sex, what type of birth control (if any) did you use the last time?

___ a.) None  ___ b.) the pill
___ c.) condom (rubber)  ___ d.) other (what kind?)

In the past 6 months, have you had sexual intercourse without using a condom?

A.) Never  B.) Once or twice  C.) Several times  D.) Many times  E.) all the time

Have you ever had sexual intercourse without using a condom?

A.) Never  B.) Once or twice  C.) Several times  D.) Many times  E.) all the time

What is your attitude regarding having casual sex (i.e., sex with multiple partners?)

A B C D E F G H I
Very unfavorable  Very favorable

What is your attitude regarding having sex consistently using condoms?

A B C D E F G H I
Very unfavorable  Very favorable

When you have sex, what percent of the time do you use a condom?

A B C D E F G H I
0% 50% 100% of the time

What is your sexual orientation?

A.) heterosexual  B.) bisexual  C.) homosexual  D.) don’t know
### APPENDIX D: PREVALENCE INFORMATION

**How many of your friends do you think have had sexual intercourse?**

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<tr>
<td>none</td>
<td>very few</td>
<td>few</td>
<td>about half</td>
<td>many</td>
<td>most</td>
<td>almost all</td>
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**How many of your friends do you think have had sexual intercourse with more than one partner?**

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<tr>
<td>none</td>
<td>very few</td>
<td>few</td>
<td>about half</td>
<td>many</td>
<td>most</td>
<td>almost all</td>
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**How many of your friends do you think have had sexual intercourse without using a condom?**

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<tr>
<td>none</td>
<td>very few</td>
<td>few</td>
<td>about half</td>
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APPENDIX E: INTENTIONS AND WILLINGNESS

BEHAVIORAL WILLINGNESS (BW)

Standard No Condom Willingness Index

1) Suppose you were alone with a man or woman who you found attractive and he/she wanted to have sex but you did not have a condom. How willing would you be to

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<tr>
<td>not at all willing</td>
<td>very willing</td>
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_______ a.) Go ahead but use a method like withdrawing the penis before ejaculation.

_______ b.) Not have sex.

_______ c.) Go ahead and have sex anyway without a condom

Exploratory Multiple Partner Willingness Index

2) Suppose you were currently sexually active with one person but began to find another person sexually attractive. How willing would you be to

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<td>not at all willing</td>
<td>very willing</td>
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_______ a.) Ignore your feelings about the second person and not have sex with them.

_______ b.) Break up with the first person to pursue a relationship with the other person.

_______ c.) Go ahead and have a sexual relationship with both people.

3) If you met someone at a party or bar and you really liked them, do you think you might have sex with them that night?

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<tr>
<td>I definitely would not</td>
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<td>I definitely would</td>
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I definitely would not
4) If you met someone at a party or bar and you really liked them, do you think you might have sex with them that night without using birth control?

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<td>I definitely would not</td>
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<td>2</td>
<td>I definitely would</td>
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<td>3</td>
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**Casual Sex Willingness**
The casual sex willingness was calculated by adding willingness items 1 and 3. Willingness items 2 and 4 were not included because of lack of reliability and variance, respectively.

**BEHAVIORAL INTENTIONS (BI)**

1) Do you plan to have sex in the next year without using a condom?

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<td>1</td>
<td>I definitely will not</td>
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<td>2</td>
<td>I definitely will</td>
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2) Do you plan to have sex in the next year with more than one partner?

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APPENDIX F: AUDIO TAPE TRANSCRIPTS

Introduction

The following is an example of an article and/or tape recording that some graduate students in the Psychology and Communication departments have been working on. Specifically, we are interested in the impact of either written information, audio information, or combining written and audio information on the recall, impact, and interest of the material presented. After you have read and/or listened to the information which pertains to issues that are important for college students, we will ask you to rate the information on how informative and interesting it was. In addition, we will be giving you a recall test to assess what you can remember about the information presented.

As you're reading and/or listening to the tape and/or transcript, I'd like you to think carefully about the information that is being provided. In other words, think about who these people are that the tape and/or transcript is referring to; what it is the people in the tape and/or transcript are discussing; what are the people in the tape and/or transcript doing; and why are the people in the tape and/or transcript doing what they are discussing.

In other words, we want you to really involve yourself in your reading and/or listening and really think about the information, the people, the behaviors, and the topic presented to you.

Anecdotal Tape

Should I have sex now or should I wait?

Should I have sex with this particular person?

What (if any) types of birth control should and will I use?

These are some of the very difficult questions that most college students have to deal with. Many freshmen find that going to college is like entering a foreign country. For most, it's the first time they have ever really been away from home—and away from parents and rules. College is a chance to try new things. Drinking, tattoos, smoking, drug use, and sex are just some of the options that can be explored.

Graduate students from the psychology and communication departments recently held a series of informal discussion groups with groups of Iowa State University freshman and sophomores who volunteered to answer questions about their attitudes toward sex and their sexual behaviors. They were told that their names would be kept confidential and that the information they provided would be used as part of an article and audio tape about their attitudes toward sex and their sexual behaviors. The following discussion is from one of these groups. Specifically, you will read and hear the last 5 minutes of the 30 minute
discussion group. This group of 5 women is typical of ISU under-graduate women. We chose this particular tape because this group seemed the most interested and had the most open discussion. Because we were taping their discussion, we asked them to chose fictitious names to protect their identity. They chose: Courtney, Jennifer, Beth, Monica, and Heather.

Group leader (GL): OK, so far we have found out that of the 5 of you here, 3 members of this group have had sexual intercourse in either their current or past relationships. Let's talk more about relationships now. How would you describe your relationship Courtney?

Courtney: My relationship is pretty serious, my boyfriend and I are really committed to each other......I think that's probably why we decided to have sex.

GL: Does anybody else want to talk about their relationship?

......

How about you Jennifer, what about your relationship?

Jennifer: My relationship is pretty serious too,......but I don't plan to have sex with my boyfriend for awhile......I'm trying to take my time. I don't want to rush anything and I just don't think I'm quite ready for that yet.
I am pretty sure that I'm not going to have sex at least until I'm engaged, and I might just wait until I'm married.

GL: OK, now that we have talked a little bit about commitment and relationships, let's talk about something more difficult. Specifically, condoms and birth control. I know these may be difficult things to talk about, but so far the discussion is going great.
Earlier when we talked about birth control, we found out that 4 out of the 5 of you though that using condoms consistently was very important. Does anyone want to talk more about using condoms?

Okay......anyone......
Okay, how about you Courtney, I know you said you used condoms earlier in our discussion, why don't you go ahead and talk about why you use condoms?

Courtney: Alright......Yeah......I almost always use condoms. I'm really worried that I may get an STD or become pregnant. So I pretty much use condoms all of the time (plus, I'm on the pill). I'm not saying I'm more likely than other people to get pregnant or get a STD or anything, but I just think everyone has to think about these things.

Being in college is definitely not a good time to pregnant, and I don't think there is ever a good time to get an STD.
GL: Yeah...Ok Well, Beth, I see you look like you agree with Courtney. Do you also use condoms?

Beth: Although I'm not having sex right now, when I do have sex, I always use a condom. You know, well... I got an STD, chlamydia, from my first boyfriend. And, ever since then I decided to pretty much always use a condom.

Some people think it's embarrassing to use a condom or even talk about them, but it's a lot more embarrassing to get an STD. You know, you really just can't be too careful.

GL: Okay, does anyone else want to talk about STDs...or worrying about getting an STD?

Alright, well, Monica, I know earlier you said you were having sex with a few different guys, do you always use a condom with these partners?

Monica: I always worry about getting pregnant or getting an STD, but I still have sex without using a condom... I don't know if it's because condoms aren't always there, or if it's just the mood, you know, the moment, or whatever.

But, I still have sex with these guys, sometimes without a condom.

We just don't always seem to use them.

I also know a lot of people think I 'sleep around' too much, and they think it's especially bad because I don't always use condoms.

I probably shouldn't do it, but... You know, you just don't want always think about it or you don't want to be the one to stop and say, 'hey, let's get a condom,'.... there's always something.

GL: Heather, I know that you have never had sex, but what do you think about Monica's thoughts on casual sex?

Heather: Well, it's weird... My situation is so much different than ah... Monica's mean, she's having sex with a few guys... and I'm not having any. You know, I wouldn't want people to think I had too many partners, and at the same time, I don't tell very many people that I never had sex.

I really don't think it is other people's business if I am having sex or not.

I think a lot of people who haven't had sex just lie and say they have had sex or else they just don't talk about it.

A lot of people think that having sex will make you different, change your personality somehow. Sometimes I think that might be true.

But, I just don't feel like I'm ready to have sex quite yet.

GL: Jennifer do you have something to add to that?
Jennifer: I might feel more, ah I don’t know, different maybe better after sex, and my boyfriend would probably like to have sex (well, I think he would like to), but I just think I would feel wrong if I did it before I was 100% sure.

GL: Monica, I see that you are shaking your head.

Monica: I don’t think having sex or not having sex makes people any different. I’m not any different because I have sex.
GL: Courtney, do you agree?

Courtney: Yeah, having sex doesn’t make you better or worse for that matter. You should only have sex if you think you’re ready. And I think you should try to use birth control and condoms.

GL: Well, I would like to thank the 5 of you for your time and honesty. You all have been really open and honest about some very difficult topics. In fact I think, this discussion group has been the best group that we have had so far—really open and I think you all had some good ideas.

Especially the idea that what makes a good or bad relationship is not the sex, but rather having a commitment with the person and being able to talk with your partner. Again, I just want to say what a good group this has been and I hope you didn’t find this too uncomfortable or embarrassing, does anyone have anything else you want to add?

Monica: Yeah, well, I don’t know about anyone else, but I thought it was pretty hard to talk about condoms, past partners, STDs, and birth control, and that kind of stuff. But, I think I learned something about these things...or at least thought some more about these issues...and these issues are important.

Announcer: Although these five women were all unique, they are typical of undergraduates here at Iowa State University. The issues they have to deal with, the problems they encounter, the decisions they must make are all very familiar to college students. How they deal with these issues can have a significant impact on them, and on their lives. Thank you for your participation in this part of the study.
Should I have sex now or should I wait?
Should I have sex with this particular person?
What (if any) types of birth control should and will I use?

These are some of the very difficult questions that most college students have to deal with. Many freshmen find that going to college is like entering a foreign country. For most, it's the first time they have ever really been away from home—and away from parents and rules. College is a chance to try new things. Drinking, tattoos, smoking, drug use, and sex are just some of the options that can be explored.

Graduate students from the psychology and communication departments recently administered questionnaires to 300 Iowa State University freshman and sophomores who volunteered to answer questions about their attitudes toward sex and their sexual behaviors. They were told that their names would be kept confidential and that the information they provided would be used as part of an article and audio tape about their attitudes toward sex and their sexual behaviors. The following are statistics from the results of these questionnaires which will proved information about their sexual attitudes and sexual behaviors.

**Relationships:**

* Of the students, approximately 60% (or 3/5) had engaged in sexual intercourse.

* 45% of the students said they were currently in a serious relationship.

**Condoms:**

* About 80% (or 4/5) of the students thought that using a condom consistently was very important.

* When asked about using condoms, 40% of the students reported that they almost always used a condom,

* 20% more reported that they occasionally use condoms.
STDs:

* 57% of the students expressed a great deal of worry over the consequences of sexual intercourse (e.g., STD=s, AIDS, pregnancy).

*Of the 300 students, 15% reported that they either had or currently have some type of sexually transmitted disease (STD); for example, chlamydia.

Partners:

*17% (or about 1/5) of the students reported having sex with more than one partner, whereas, 70% had only had one sexual partner in their life.

Having Sex:

* 15% of the respondents worried about their reputation or having people think that they “slept around” too much.

* About 30% of the students said that they would feel somewhat wrong about having sex.

* 45% of the students said they would feel different or that having sex would somehow change their personality.

Summary Open-Ended Comments:

* Finally, based on some open-ended comments, a large majority of students agreed with the following statements:

*What makes a good or bad relationship is not the sex, but rather being having a commitment with the person and being able to talk with your partner.

*It is very hard to talk about condoms, past partners, STD=s, and birth control, but these are very important issues.

Announcer: These were the results of 300 ISU students. These students were typical of undergraduates here at Iowa State University. The issues they have to deal with, the problems they encounter, the decisions they must make are all very familiar to college students. How they deal with these issues can have a significant impact on them, and on their lives. Thank you for your participation in this part of the study.
APPENDIX G: TAPE EVALUATIONS

1. Do you think the behaviors of the people in this transcript and/or audio tape are typical of ISU college students' sexual behaviors?
   
   A   B   C   D   E   F   G
   no, not at all   yes, very much

2. Do you think this transcript and/or audio tape would be interesting for college students to read and/or listen to?

   A   B   C   D   E   F   G
   no, not at all   yes, very much

3. Do you think this transcript and/or audio tape would be informative for college students to read?

   A   B   C   D   E   F   G
   no, not at all   yes, very much

4. What did you like or dislike about the transcript and/or audio tape? What suggestions, changes, or questions do you have?
APPENDIX H: RECALL TESTS

Anecdotal

1) How many of the students were having sex?
   a.) one out of the five
   b.) two out of the five
   c.) three out of the five
   d.) five out of the five

2) How many of the students described their relationship as very serious?
   a.) one out of the five
   b.) two out of the five
   c.) three out of the five
   d.) four out of the five

3) How many of the students thought that using a condom consistently was very important?
   a.) two out of the five
   b.) three out of the five
   c.) four out of the five
   d.) five out of the five

4) How many of the students had more than 1 sex partner?
   a.) one out of the five
   b.) two out of the five
   c.) three out of the five
   d.) four out of the five

5) What type of STD did Beth get from her first boyfriend?
   a.) herpes
   b.) gonorrhea
   c.) chlamydia
   d.) AIDS

6) What did Heather say about sex and personality?
   a.) she feels that a lot of people think that having sex will change your personality
   b.) she feels that a lot of people think that having sex will not change your personality
   c.) she didn't know what most people thought about sex and personality
   d.) she didn't care what most people thought about sex and personality

7) Why did Jennifer say that she isn't having sex?
   a.) her boyfriend doesn't want too
   b.) she might feel wrong, wants to be 100% sure before having sex
   c.) she got an STD from her first boyfriend
   d.) she doesn't think her relationship is serious enough
Statistics
1) How many of the students were having sex?
   a.) 50%
   b.) 60%
   c.) 70%
   d.) 80%

2) How many of the students described their relationship as very serious?
   a.) 25%
   b.) 35%
   c.) 45%
   d.) 55%

3) How many of the students thought that using a condom consistently was very important?
   a.) 60%
   b.) 70%
   c.) 80%
   d.) 90%

4) How many of the students had more than 1 sex partner?
   a.) 7%
   b.) 17%
   c.) 27%
   d.) 37%

5) What percentage of students reported having some type of STD?
   a.) 5%
   b.) 15%
   c.) 25%
   d.) 35%

6) What percent of students said that they would feel different, or that sex would somehow change their personality?
   a.) 25%
   b.) 35%
   c.) 45%
   d.) 55%

7) 30% of the students said that they would feel somewhat _____ about having sex.
   a.) excited
   b.) neutral
   c.) wrong
   d.) guilty
APPENDIX I: RESEARCH SCRIPT

EXPERIMENTER (EXP): Hi, are you here for experiment number 30?

EXP: (Take the participant to one of the research rooms. Tell them that there are 2-way mirrors in this laboratory, but they are not being used in this study. Also show them how to use the call button on the intercom system. Also tell them that they may have to press the button a few times because you may be in the other room.)

"In this experiment you will be asked to read a transcript and/or listen to an audio tape. After you do this, we will ask you to answer some questions about the messages. The articles are based on an important issue for college students (for example college smoking, sexual behaviors among college students, or alcohol use on campus).

If you would like to participate in this study, please read and sign the informed consent and this confidentiality disclaimer. (GIVE THEM PACKET A, AFTER THEY HAVE SIGNED IT COLLECT PACKET A)

RETURN WITH PACKET B AND THE TAPE.

In this study, we are interested in the impact of either written information, audio information, or combining written and audio information on the impact and interest of the material presented. After you have read the transcripts and or listened to the audio tape, we will return to have you assess the communication message.

Some participants will receive just the audio tape, just the written transcript, both the audio tape and the written tape, or neither the written or audio information.

You have been randomly assigned to receive XXXXX.

Please read the instruction sheet (hand them the laminated sheet), and after you have read it, please press the play button and listen to the tape.

After you are done with the tape, please press the call button and I will return with some more questionnaires. If I don't respond immediately, please press the call button again in about a minute. I may be in the other room talking to another participant."

(After the participant presses the call button, wait about 1 minutes. Return to the room, take the tape and give them PACKET C.

Okay, now that you are done listening to the tape we would like to get some information about you. (Show them the diagram of the Communication Process). As can be seen from this diagram, the communication process consists of 3 parts: Part 1 is The Source (or the Communicator), in the current study, the person(people) who you either read about or heard about in these articles was the source; Part 2 is the communication (or the message), in the
current study, the transcripts and/or audio tapes are the communication; and finally Part 3 is the Audience, the audience include the people receiving the communication, in the current study, that is you. Past research has found that the experiences and knowledge of an audience influence how they will respond to communication messages. Therefore, at this point we would like to get some information about our Audience. In other words, get some information about your past experiences and attitudes.

We will use your responses in two ways. First, if you currently exercise, for example, you may or may not like the article better than if you were not a regular exerciser. Second, we may use some of your responses for a follow-up study. Once again, I would like to assure you that all of your responses are confidential and only members of this research team will ever be allowed to see your answers. Anything thing that would ever be reported from this study would not use any names.

You can begin now. When you are done with this questionnaire, please press the call button.

(When the participant presses the call button return with PACKET D which contains the assessment and recall test—for the no tape control condition give them the statistical recall test and no assessment sheet.)

This is the last packet, when you are done with these short surveys, please press the call button.
(When they press the call button, return and pick up the questionnaires.

(When they are done with Recall test, begin debriefing, thank them, and give extra-credit form—make sure they know how to fill out the form and where to put the extra-credit.)
The purpose of this study is to see how people respond to information provided in written and audio messages or no messages. The group that didn't receive any information is called the control condition because we can compare their information with the people who did receive messages.

This part of the study is called the debriefing, this is the part of the study where I tell you everything about the study and you can ask any questions you would like. What we are actually interested in the current study is the difference between anecdotal and statistical information. Specifically, some audio tapes were an anecdotal story about several people, while other audio tapes were summary statistics based on many people's responses. The researchers in this study, predict that people will be more influenced by anecdotes (personal stories) rather than statistics (percentages and numbers).

All of the statistics were obtained by previous studies (for example from mass-testing) and some alterations were done by the primary investigator.

Only for those participants receiving the anecdotal information:
Although the statistics and information contained in the anecdotal tape were consistent with actual data, the tape itself was not an actual discussion group. In other words, the anecdotal tape was not really undergraduates discussing sexual attitudes and behaviors, but rather, it was a transcript written by the experimenter in this study. Moreover, the people in the tapes are all graduate students and research assistants who were playing this role. We hope that you don't feel upset by this misinformation, sometimes in studies it is necessary to initially tell you something that is not entirely true so we can get information about your true feelings about an issue.
Do you have any additional questions about the study?

Also, if you have any questions about actual sexual behaviors on campus, birth control, or STD's, we have included some brochures as well as the telephone number for the Iowa State University Health Center (this information is on the shelf). Making sexual decisions is a part of college for some students, and the health center can assist you with that.
In addition, we hope that the current research you have participated in can help us understand college students' sexual attitudes and sexual behaviors. Because we need to get information from many students (about 300) to understand this issue, we ask that you please don't discuss this research with any other people who may also participate in this study.
Thank you very much for your participation.
REFERENCES CITED


