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SEXUALITY-RELATED RISKS ARE JUDGED MORE HARSHLY THAN COMPARABLE HEALTH RISKS

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ABSTRACT. Objectives: In three studies, the authors examined the extent to which STIs and sexual behavior were perceived negatively compared to objectively riskier behaviors. Methods: In Study 1, participants estimated the risk of death as a result of contracting HIV from one instance of unprotected sex (with a noninjection drug user) relative to the risk of death as a result of an automobile accident (a 300 mile drive). In Study 2a, participants read one of two vignettes, in which a target either unknowingly transmitted an STI (chlamydia) or a nonsexual disease (H1N1) to another person through a sexual encounter. In Study 2b, participants read one of 12 vignettes; the type of disease (chlamydia or H1N1), severity of the disease outcome (mild, moderate, or severe), and sex of transmitter (female or male) were manipulated. In Study 3, state-level public health and driving websites were coded for risk-reduction recommendations. Results: In Studies 1 and 2, participants rated the target who transmitted chlamydia more negatively than the target who transmitted H1N1; participants also perceived the target who transmitted chlamydia with a mild severity outcome (the sexual partner took antibiotics for one week) more negatively than the target who transmitted H1N1 with a severe outcome (the sexual partner died from contracting H1N1; Study 2). In Study 3, most state-level public health websites promoted safety through a recommendation that the public abstain from sex; no similar recommendations were provided on driving websites (an objectively riskier behavior). Conclusions: The stigmatization of STIs is beyond the degree of severity (relative to other diseases) and viewed as unjustifiably risky (relative to other risky activities).

KEYWORDS. Sexually transmitted infections, stigma, risky behavior, decision making

Sexually transmitted infections (STIs) continue to be a major health concern in the Americas and throughout the world (see Holmes, 2011; Kulczycki, 2014). For example, in 2008 there were an estimated 126 million new cases of curable STIs in North and South America. (World Health Organization, 2013). The question posed in the current research is whether, despite the seriousness of these diseases, the focus on STI reduction has resulted in a stigmatization of STIs beyond their degree of severity (i.e., relative to other diseases) and an interpretation of sexual activity as unduly risky (i.e., relative to other risky activities). Such a finding would be consistent with ample evidence for cognitive biases in the face of health and other types of risk or threat (see Tversky & Kahneman, 1974; Wheatley & Haidt, 2005, for examples). However, we suggest that irrespective of general biases toward overestimating risk, these overestimations happen disproportionately with regard to matters associated with sex and STIs. Specifically, we aimed to obtain a better understanding of how the general public
and public health officials, assess risk—and if the assessments of risk for STIs are rational vis-à-vis other health risks.

**STIGMATIZATION OF STIS**

Fifty years ago, STIs were among several sources of profound stigmatization and considered a blemish to one’s character (Goffman, 1963). Ample evidence indicates that STIs are still stigmatized (see Bickford, Barton, & Mandalia, 2007; Cunningham, Kerrigan, Jennings, & Ellen, 2009; Fortenberry et al., 2002, for examples). The stigma surrounding STIs is blamed for a host of issues, including postponed treatment of STIs and psychological morbidity (Cassidy, Meadows, Catalan, & Barton, 1997; Cunningham et al., 2009). Additionally, stigmatization looms large in health contexts because it prevents those with diseases from seeking care, engenders fear of those who have diseases, causes prejudice against entire groups or communities, and has led to violence against stigmatized groups (see Perry & Donini-Lenhoff, 2010, for a review). Thus, when STIs are stigmatized, it prevents people who suspect they may have STIs from getting tested or informing their partners about the possibility of disease exposure. Moreover, stigmatizing behaviors leads to increases rather than decreases in those behaviors—thus, stigmatizing sex or the acquisition of STIs likely leads to increased transmission of STIs.

Although STIs are a major health concern in North America, sexual activity may still be perceived as having levels of risk out of proportion to the actual risk of the behavior. That is, the main method of STI transmission is through partnered sex; therefore, for people to assume that sexual interactions afford a certain level of risk is accurate. However, a faulty corollary of this finding would be that partnered sex itself is riskier than other activities of objectively equal or greater risk. That is, if STIs are perceived to be easier to transmit than they objectively are, or as more physically harmful than they actually are—relative to other risks—it stands to reason that sexual activity itself may also be perceived as objectively riskier than it is. Moreover, the current research tests hypotheses based on a broader set of findings within the social sciences indicating that people make faulty assumptions about risk (e.g., Tversky & Kahneman, 1974). Prior research has shown that people inaccurately overestimate risks. The current research determined whether people are especially likely to overestimate risk with regard to STIs and to be even more inaccurate in their perception of STI risk than of other risks. Notably, as addressed above, stigma is well known to have negative effects on health behaviors. Therefore, a reduction of stigma surrounding STIs would likely result in fewer cases of STIs.

**THE CURRENT RESEARCH**

We posited the risk that people attribute to sexual activity is disproportionate to actual risk levels for such behaviors, and, by the same token, the stigma toward STIs is disproportionate to the actual health damages that STIs cause, relative to other diseases. The goal of the current research is not to replicate findings that illustrate stigma associated with STIs, but rather to contextualize the degree of stigma by comparing it to stigma associated with other health risks. In other words, we suggest that culturally shared assumptions regarding the danger associated with sexual behaviors and STIs are inappropriate given the actual levels of danger and the actual health consequences of STIs. Potentially, attempts to prevent STI transmission may have resulted in an irrational concern about both STIs and the activities that cause them (i.e., sexual encounters). The goals of the present research were to assess the degree of risk associated with sexual versus nonsexual activities and to address the stigma ascribed to the transmission of STIs versus the transmission of nonsexual diseases. Public health officials may operate as if STIs are a relatively greater risk than they truly are. Hence, officials may behave as if the transmission of STIs is relatively more serious than other health concerns with equal or less objective risk. Likewise, we hypothesized that the general public shares these misperceptions: we suggest that people perceive a level of risk associated with
sexual behaviors that is out of proportion to the actual risk associated with sex. By the same token, we investigated the possibility that people would ascribe more negative associations to those who transmit STIs relative to those who transmit nonsexual diseases that have an equal or greater objective risk.

To assess the relatively negative and risky perceptions of STIs versus other adverse outcomes of sexual behavior, we took three different approaches. First, we asked participants to make explicit judgments about one of two risky behaviors—one of which was associated with STIs (i.e., unprotected sex) and another that was not (i.e., driving). Second, we conducted person perception studies to assess how negatively people who transmit STIs (through sex) are perceived relative to those who transmit another (nonsexual) disease. If STIs are perceived more negatively than equivalently dangerous (or more dangerous) diseases, we reasoned that people who transmit STIs would be perceived more negatively than those who transmit non-sexual diseases. Third, we examined government public health and safety websites to determine the portrayal of the risk of STIs versus the portrayal of the risk of other potentially dangerous behaviors (i.e., driving). Together, these studies can provide insight as to whether STIs and sexual activities are perceived as unduly risky and stigmatized unfairly relative to other (nonsexual) activities and outcomes.

STUDY 1

In Study 1, we approached the risk associated with sexual behavior versus another risky behavior in a direct and straightforward way. We asked participants to compare the risk of death from driving a car for approximately 300 miles (as a result of a car accident) to the risk of death (HIV/AIDS-related cause of death) from acquiring HIV from engagement in one instance of unprotected sex with a noninjection drug user. On average, a person is 20 times more likely to die in an auto accident (as the driver) traveling the distance from Detroit, Michigan, to Chicago, Illinois (approximately 300 miles), than to die from HIV/AIDS contracted as a result of a single act of unprotected intercourse with a noninjection drug user (Centers for Disease Control and Prevention, 2013; Rodger et al., 2013; United States National Highway Traffic Safety Administration, 2009). Therefore, ascribing greater risk to the sexual activity than to the driving activity would be consistent with our hypothesis that sexual activity is perceived as unjustifiably risky (i.e., riskier than is warranted by objective standards). Specifically, we chose driving as a comparable activity because it is a behavior that can have immediate, measurably negative consequences (such as injury or death) just as engaging in sex can (i.e., contracting STIs, including those that can lead to permanent health problems or pregnancy). Other health behaviors, such as smoking, have only cumulative effects, making them a poor comparison to sexual activity and STIs. Thus, we chose driving as a comparison.

Method

Participants and procedure

A total of 681 participants (78% female) were recruited from a web-based classified advertisement website (i.e., craigslist.org). Participants were recruited from the volunteers section of craigslist. Participants completed a brief online questionnaire. The largely American sample was 81% White, 5% African American, 3% Latina/o, and 3% Asian American. The average age was 34.6 years (SD = 12.9, in a range from 18 to 71 years old).

Measures

In a between-subjects design, participants were randomly assigned to estimate either the number of people (out of 1,000) who could be expected to die as a result of a car accident while driving from Detroit to Chicago (a 300 mile trip) or the number of people (out of 1,000) who could be expected to die (from an HIV/AIDS-related cause) as a result of contracting HIV from one incident of sex without a condom. Specifically, participants were randomly
assigned to assess the risk of one of the following events:

(1) Assume that 1,000 people had unprotected intercourse (sex without a condom) yesterday. None of the 1,000 people who had sex were previous intravenous drug users. How many of these 1,000 individuals who had unprotected sex would you expect to die from HIV contracted from the sexual encounter? (sex condition);

(2) Assume that 1,000 people drove from Detroit, Michigan, to Chicago, Illinois. (300 mile distance) yesterday. How many of these 1,000 individuals who drove from Detroit to Chicago would you expect to die on the trip as a result of a car accident? (driving condition)

Results and Discussion

All analyses in this and subsequent studies were conducted in the statistical program SPSS version 21. All participants in this and subsequent studies that completed the entire questionnaire were retained for analysis. We utilized Qualtrics, an online software program (survey platform), to conduct this study and all subsequent studies. This survey platform allowed us to exclude participants who did not answer all of the items in the survey. We had no missing data in any of the reported studies because participants were required to answer each question before proceeding to the next page of the survey (unless, of course, they dropped out of the survey).

To determine if participants ascribed greater levels of risk to sexual activity than would be warranted based on objective levels of risk, we conducted a t-test comparing the number of people (out of 1,000) expected to die by driving from Detroit, Michigan, to Chicago, Illinois, versus the number of people expected to die from contracting HIV (and subsequently die of a HIV/AIDS-related cause) through one instance of unprotected intercourse (out of 1,000). Participants believed that approximately 17 times as many people would die as a result of contracting HIV through one sexual encounter ($M = 71.79, SD = 160.58$) as would die in a car accident driving from Detroit to Chicago ($M = 4.19, SD = 14.73$), and this was a large effect, $t(353.17) = 7.82, p < .001, d = .83$. (Note, of course, that these rates are highly exaggerated by the participants—a finding well known in risk assessment literature.) In other words, participant impressions of the riskiness of unprotected sex vis-à-vis driving were highly inaccurate. Although participants overestimated the risk of both events, they estimated especially high risk of death via contracting HIV through one instance of unprotected sexual intercourse. This finding suggests that participants were biased in their assessments of the risk associated with unprotected sex. Additionally, this finding is consistent with our hypothesis that culturally shared levels of risk associated with sexual activities are out of step with the actual levels of risk of these behaviors. Participants have an irrationally negative perception of the dangers associated with sexual activity—even more irrational than typical biases toward the overestimation of risk. Specifically, participants viewed unprotected sex as more risky than the more mundane, but more dangerous, activity of driving.

STUDIES 2A AND 2B

In the next two studies, we examined the stigma surrounding the transmission of STIs. In this study, we addressed the ways in which spreading an STI (versus a nonsexual disease) reflected on the individual who transmitted the disease. This study can, therefore, provide us with insight into the ways in which the stigma about STIs plays out, while holding the mechanism of transfer (i.e., sex) constant. We hypothesized that a target person who transmitted an STI through sexual activity would be perceived more negatively than a person who transmitted another (nonsexual) disease through sexual activity. We adopted this indirect means of assessing attitudes toward STIs to mitigate the tendency of people to provide socially desirable responses when asked directly about their opinions.
Specifically, we used chlamydia as the STI that was transmitted because it is one of the most frequently reported STIs in the United States (Centers for Disease Control and Prevention, 2008), and, therefore, we expected participants to have a knowledge of the disease. Moreover, symptoms of chlamydia can go undetected for long periods of time, as those infected may mistake the symptoms for other physical problems such as urinary tract infections. It is, thus, plausible that a person may delay seeking treatment because s/he is unaware of the infection. Similarly, H1N1 (swine flu) also has symptoms that can easily be mistaken for other ailments such as the common cold or allergies. Unlike chlamydia, in severe cases, H1N1 can be fatal. That is, chlamydia is a relatively benign STI because it is treatable and has no long-lasting health consequences when treated promptly. This is in sharp contrast to genital herpes, genital warts, or HIV, which are permanent afflictions. Unlike chlamydia, in severe cases, H1N1 can be fatal. That is, chlamydia is a relatively benign STI because it is treatable and has no long-lasting health consequences when treated promptly. This is in sharp contrast to genital herpes, genital warts, or HIV, which are permanent afflictions. By contrast, H1N1 can cost people weeks of work or school, render them bedridden, and even cause death. If we find that people have more negative associations with the transmission of chlamydia than with the transmission of H1N1, it again suggests an irrational reaction to STIs. Chlamydia, when treated, has minimal health effects. Therefore, using this comparison makes it more difficult to demonstrate predicted effects. It would be easier to find the predicted effects with more serious untreatable STIs, which would have detrimental effects arguably worse than those of H1N1; using chlamydia as a target disease provides a more stringent test of the hypothesis than other STIs.

STUDY 2A

In Study 2a, we investigated whether a person who transmits an STI would be perceived more negatively than a person who transmits a nonsexual infection. To the extent that STIs are differentially and unjustifiably stigmatized, we hypothesized that a person who transmits a sexual disease would be perceived more negatively than one who transmits a nonsexual disease. In this study, the transmitter was unaware of the presence of a disease. This facet of the story prevented assessments of risk from being made based on intentional or malicious transmission of any disease. We examined whether accidental transmission of sexual and nonsexual diseases would be perceived differently. Likewise, we made clear in this study that in both scenarios, the diseases (one sexual and one nonsexual) were, in the particular situation that we provided, transmitted through sexual activity.

Method

Participants and procedure

Participants (N = 310; 62% female) were recruited in the same method as in Study 1, via a web-based classified advertisement site. The sample was 79% White, 4% African American, and 3% Latina/o. The mean age was 34 years (SD = 13.7, range 18–78). Participants completed the brief questionnaire on line.

Experimental design

This study was a two-group experiment in which participants either read about an individual (target) transmitting H1N1 or chlamydia. As in Study 1, the authors generated the vignette and dependent variables for Study 2a (and Study 2b, below) because no published measures addressed this topic.

Vignettes. Participants read one of two vignettes, which were developed through pilot testing. Half of the participants were randomly selected to read the following vignette:

Sarah recently experienced a bad breakup with her long-term boyfriend. Later tonight, she is going to a party to meet up with Dan, a guy she has been interested in. Before leaving for the party, Sarah notices that she is experiencing some symptoms. She worries about this briefly, but decides it is probably another urinary tract infection. She attends the party, and has sex with Dan. Unbeknownst to Sarah, the symptoms she was experiencing the night before the party were a result of chlamydia. During the encounter, Sarah transmitted chlamydia to Dan.

The other half of participants read the same story, except that Sarah transmitted H1N1 to Dan,
rather than chlamydia, during the sexual encounter. In the H1N1 vignette, Sarah decided that her symptoms were “probably another bout of allergies” rather than a urinary tract infection.

**Measures**

After reading the story, participants completed semantic differential scales reflecting their impressions of Sarah. Each item was rated on a 6-point scale, and items were reverse scored as appropriate. Specifically, they completed a 5-item risk scale (alpha = .88) including the items risky-cautious, unsafe-safe, leads an unhealthy lifestyle-leads a healthy lifestyle, irresponsible-responsible, careful-careless; a 3-item general evaluation scale (alpha = .80) including the items dirty-clean, moral-immoral, and good-bad; and a 2-item selfishness scale (alpha = .73) with the items caring-hurtful and selfish-unselfish. Participants also completed the item smart-dumb. Participants then reported demographic information, information about whether they or anyone they knew had experienced H1N1 or an STI and a number of other exploratory items that did not yield conceptually interesting results and that, therefore, will not be discussed further.

**Results and Discussion**

Results were analyzed using a MANOVA with disease condition (chlamydia or H1N1) as the independent variable and each of the three scales, as well as the item smart-dumb, as dependent variables. The MANOVA revealed a significant effect of disease condition, $F(4, 304) = 4.47, p < .002$, partial eta-squared = .06. The value of the partial eta-squared represents a medium effect size. Each of the dependent variables contributed significantly to this effect. The means for the individual items are displayed in Table 1.

Thus, participants in this study responded more negatively to the target who transmitted an STI than to the target who transmitted H1N1, even though we made it explicit that in both cases the disease was transmitted during a sexual encounter and the targets were unaware that they had (and could transmit) a disease. That is, participants thought that the target transmitting chlamydia was more selfish, risky, and dumb than the target that transmitted H1N1. They also rated that target more negatively overall. These findings are consistent with the current hypothesis that people respond in unduly negative ways to people who transmit sexual diseases. In other words, the level of negativity is not proportional to the level of inconvenience associated with acquiring the disease. In this case, the physical outcomes of chlamydia, with treatment, are potentially far less consequential than those of H1N1, but the person who unknowingly transmitted chlamydia was perceived more negatively than the person who transmitted H1N1.

Of course, it is possible that participants were unaware of the potential seriousness of H1N1 or of the relative (physical) innocuousness of chlamydia (at least when treated promptly). We addressed this issue in the next study.

**STUDY 2B**

In Study 2b, we expanded upon Study 2a by addressing a potential limitation: participants might actually believe that the outcomes of chlamydia are more dire than those of H1N1. Thus, in Study 2b, we manipulated the severity of the outcome associated with acquiring the two types of infections. Additionally, in Study 2b, we manipulated the sex of the transmitter to determine the generalizability of the findings from Study 2a.

| TABLE 1. Study 2a—Means (Standard Deviations) of Comparisons Yielding Significant Differences Between Perceptions of Targets Transmitting H1N1 Versus Chlamydia |
|---------------------------------|-----------------|-----------------|
| DV                              | H1N1            | Chlamydia       |
| General evaluation scale        | 3.54 (0.96)     | 3.23 (1.09)     |
| Risk scale                      | 4.44 (0.89)     | 4.84 (0.87)     |
| Selfishness scale               | 3.59 (1.07)     | 3.87 (1.00)     |
| Smart-Dumb (item)               | 3.88 (1.27)     | 4.34 (1.19)     |
Method

Participants and procedure

Participants \((N = 1,158; 76\% \text{ female})\) were again recruited via web-based classified advertisement sites for an online study. The ethnic demographics were similar to the prior study: 75\% White, 5\% African American, and 4\% Latina/o, with other participants reporting another identity or choosing not to state their ethnicity. The mean age was 35 years old \((SD = 13.7)\).

Experimental design

Vignettes. Participants were randomly assigned to one of twelve vignettes. To develop the vignettes, the authors first generated some examples through group conversations. We provided two sets of 4–6 undergraduates with a draft of the vignettes. The undergraduates provided comments about anything that might be perceived as confusing in the vignettes. Then a nearly final set of vignettes was formatted into an online survey to make certain that the vignettes were clear. Because pilot participants found the vignettes clear, we proceeded with the experiment. Within each vignette, we varied disease \((H1N1 \text{ or chlamydia})\) and sex of transmitter \((\text{female or male})\) in a heterosexual sexual encounter. We also manipulated the severity of the outcome associated with acquiring the disease \((\text{mild or moderate})\). There were two additional severity outcomes that were only related to transmitting H1N1; thus, an H1N1-related vignette could also have a serious or fatal outcome. These conditions had no parallel in the chlamydia condition, because the real-world outcomes of chlamydia are never as serious as the potential outcomes of H1N1.

For both the H1N1 and the chlamydia conditions, the following outcomes were included: that the recipient of the infection “got so sick that she [he] was hospitalized and nearly died from H1N1” \((\text{serious})\), or “became seriously ill and died of H1N1 two weeks after her [his] sexual encounter with [the transmitter]” \((\text{fatal})\). An example scenario is below, with a female transmitter of chlamydia and a mild outcome:

Christina recently experienced a bad breakup with her long-term boyfriend. Later tonight, she is going to a party to meet up with James, a guy she has been interested in. Before leaving for the party, Christina notices that she is experiencing some symptoms. She worries about this briefly, but thinks they might be the result of the long bike ride she took last night. She attends the party, and has sex with James. Unbeknownst to Christina, the symptoms she experienced before the party were a result of chlamydia. During the encounter, Christina transmitted chlamydia to James. Though Christina’s symptoms were mild, James got so sick that he had to go to the doctor and take medication for a week.

Measures

The measures were the same as Study 2a, including the general evaluation scale \((\alpha = .80)\), the risk scale \((\alpha = .90)\), the selfishness scale \((\alpha = .68)\), and the item smart-dumb.

Results and Discussion

Because we could not generate a complete factorial design because of the implausibility of chlamydia causing hospitalization or death, we analyzed the study in two ways. First, we conducted a 2 \((\text{Disease condition: chlamydia, } H1N1) \times 2 \text{ (Outcome severity: mild, moderate)}\) MANOVA, with the three scales and the item smart-dumb as dependent measures. This analysis was a full factorial design because the disease condition was fully crossed with the two levels of outcome severity mentioned above. Next we conducted a one-way MANOVA comparing only the severe and fatal outcomes for H1N1 to the mild outcome for chlamydia. We also initially conducted analyses examining both target sex and participant sex, but, as in Study 2a, no sex differences emerged, nor did...
sex interact with the other variables of interest. Hence, sex was not considered further.

The MANOVA revealed a significant effect only of disease condition, $F(4, 747) = 18.28, p < .0005$, partial eta-squared = .09. This is a medium-to-large effect. Regardless of the severity of the outcome, the target that transmitted chlamydia was perceived more negatively than the target that transmitted H1N1. Each of the dependent variables contributed significantly to this effect. Notably, the severity of the outcome overall, independent of disease condition, did not affect judgments of the target, $F(4, 747) = .57, p = ns$. The means for the individual DVs are listed in Table 2. Note that the mild and moderate conditions are collapsed because there were no differences.

To address the remaining two outcome conditions (serious and fatal), we selected the least severe outcome for chlamydia (i.e., the mild condition: having to take medication for a week) and compared it to the two most severe outcomes for H1N1 (the “serious” and “fatal” condition) via a one-way MANOVA. We compared the conditions utilizing post hoc tests. This approach has been used in other studies with incomplete factorial designs (see Fuegen, Biernat, Haines, & Deaux, 2004, for an example). Notice that in comparing the mildest condition for chlamydia to the two most serious conditions for H1N1, we are making it the most difficult to find the predicted results. Thus, this is the most stringent test of our hypothesis that STIs are unduly stigmatized.

The overall MANOVA was significant, $F(8, 544) = 2.12, p < .032$, partial eta-squared = .02. Each of the dependent variables contributed significantly to the effect. This effect is small, yet still conceptually very important. Tukey post hoc tests indicated that the direction of the effect was consistent with our hypothesis. Participants perceived the target who transmitted chlamydia (with the mild outcome of the recipient having to see a doctor and take medication for one week) as riskier, more negative, more selfish, and dumber than the target that transmitted H1N1 (with the severe outcome of the recipient going to the hospitalized and nearly dying from H1N1).

Participants also perceived the target that transmitted chlamydia with mild outcomes to be riskier and dumber than the target that transmitted H1N1 with the fatal outcome. That is, a target who gave someone chlamydia through sexual intercourse and caused the person to see a doctor and take antibiotics for a week was perceived as riskier, negative, selfish, and dumber than a person who gave someone H1N1 through sexual intercourse and caused the person to die. The exact configuration of all significant means is presented in Table 3.

We should note that even a finding of no difference between the H1N1 and chlamydia conditions would have been interesting, given that the outcomes for H1N1 were much more physically detrimental. However, the particular set of findings that emerged is quite remarkable. Within this sample, the stigma against transmitting chlamydia to someone was greater than that of transmitting fatal H1N1, and this occurred when the targets that transmitted the infection were equally knowledgeable about their own symptoms. This component of the study provides strong evidence for the hypothesis that people who transmit STIs are unjustly stigmatized in society.

### TABLE 2. Study 2b—Comparisons Yielding Significant Differences Between Perceptions of Targets in the H1N1 Condition and Chlamydia Condition

<table>
<thead>
<tr>
<th>DV</th>
<th>H1N1</th>
<th>Chlamydia</th>
</tr>
</thead>
<tbody>
<tr>
<td>General evaluation scale</td>
<td>3.20 (1.02)</td>
<td>3.56 (0.94)</td>
</tr>
<tr>
<td>Risk scale</td>
<td>4.36 (0.99)</td>
<td>4.89 (0.82)</td>
</tr>
<tr>
<td>Selfishness scale</td>
<td>3.65 (1.08)</td>
<td>3.97 (0.96)</td>
</tr>
<tr>
<td>Smart-Dumb (item)</td>
<td>3.78 (1.17)</td>
<td>4.34 (1.11)</td>
</tr>
</tbody>
</table>

### STUDY 3

To provide a final test of our hypothesis that STIs and sexual behaviors are ascribed a level of risk inconsistent with their actual levels of risk, and to move beyond the mere perceptions of research participants, we next conducted archival research to (indirectly) garner the impressions of public health officials of the risk of sexual activities versus the risk of driving.
Study 1, we determined that death resulting from an automobile accident was 20 times more likely than death (specifically HIV/AIDS-related) resulting from contracting HIV from one instance of unprotected sex with a non-injection drug user. Based on these estimates, driving is an objectively riskier activity than sexual activity—which is linked to far fewer deaths. However, we predicted that government public information websites would promote abstinence as the best way to avoid acquiring an STI, but that these websites would not promote abstinence from driving, even though driving is statistically, riskier.

We initially wanted to determine how often driving safely was mentioned on public health websites as a comparable condition; however, driving safely was not addressed on any of the 50 state public health websites in the United States. We would argue that driving is a public health concern; however, it is clearly not perceived to be within the purview of public health officials. We instead considered department of motor vehicle websites to compare the extent to which public health officials mention complete elimination of a risk behavior as a means to reduce risk.

Method

A research assistant identified Department of Public Health (DPH) websites and Department of Motor Vehicle (DMV) websites for each of the 50 states in the U.S. Next, two researchers investigated these sites for information about STI prevention (on public health websites) or car accident prevention (on DMV websites). The researchers identified whether STI prevention and abstinence from sex were mentioned on public health websites and whether car accident prevention and elimination of driving were mentioned on DMV websites. In each case, a second coder confirmed the information that the first coder identified with 100% accuracy.

Results and Discussion

STI prevention was mentioned on 43/50 state public health websites. Of those states mentioning STI prevention, 72% (31/43) specifically mentioned that abstinence (i.e., the elimination of sex entirely) is the most effective means of preventing the spread of STIs. Accident prevention was mentioned on 39/50 state DMV websites. Of those websites that mentioned accident prevention, none of the states mentioned elimination of driving as a means to avoid accidents. Thus, abstinence from sex was mentioned as a means to prevent the transmission of STIs 72% of the time, but abstinence from driving to prevent traffic accidents was mentioned 0% of the time. (Of course, because there is no variance in the DMV condition of the study, statistical tests cannot be performed and are not necessary to ascertain that there is a significant difference within the population of state DMV/DPH websites on this dimension.)

These findings illustrate an important finding: public information websites promote sexual activity as riskier than driving (although driving is objectively riskier than engaging in sex). However, the same authors did not create the text for both the DPH website and the DMV website. Thus, we cannot compare them side-by-side and make assumptions about the intentions of public health officials.

Some might argue that driving may be more crucial than sex in contemporary society. That is, one could argue, it is harder for an average person to negotiate life without driving than to...
negotiate life without sex. We, of course, recognize that driving is necessary for economic livelihood for many people (although public buses, for example, which pose substantially lesser risk, could often be substituted). On the other hand, sexuality is a biological drive; driving is not. Thus, forgoing sex could arguably be considered more “unnatural” and difficult for an individual than forgoing driving. Moreover, the dangers associated with driving are not just equivalent to, but are far greater than the dangers associated with sexual activity. Clearly many more lives could be saved by abstinence from driving than by abstinence from sex. Therefore, we suggest that public health officials’ reactions to STI transmission are inappropriately negative when compared to the actual threat posed by sexual activity.

We find it compelling that the removal of partnered sex from people’s repertoire of sexual activities is widely considered a strategy for preventing STIs, whereas eliminating driving to avoid fatal car accidents (a more common occurrence) is not suggested by public health officials as a means to reduce risk. The fact that partnered sexual activity was widely recommended to be eliminated but that driving, in the present study, never was, is consistent with the idea that not just the general public, but public health officials themselves, have assessed sex to be more risky than it objectively is (i.e., more risky relative to driving).

General Discussion

In the current research, we expanded on findings indicating that STIs are stigmatized and considered whether the degree of stigmatization of STIs is appropriate for the actual negative outcomes associated with these diseases. We utilized a variety of methods to ascertain whether the transmission of STIs is perceived as relatively more harmful than other outcomes that are, by objective standards, of similar or greater risk. Across all four studies, we demonstrated that sexual behavior is perceived as riskier than other riskier activities. Specifically, in Study 1, we found that participants overestimated the risk of (HIV/AIDS-related) death from contracting HIV from one instance of unprotected sex with a noninjection drug user than from driving a 300 mile distance. In Studies 2a and 2b, we found that transmission of STIs was perceived more harshly than transmission of H1N1 (although transmitted sexually) with equally or more deleterious outcomes. Thus, this research goes beyond prior research by demonstrating that people ascribe more risk than is warranted to a variety of activities. In the current research, even though all participants ascribed more risk to both activities, this effect was exaggerated in the context of chlamydia. In Study 3, we found that while public health websites promote abstaining from sex to avoid acquiring an STI, a comparable strategy for avoiding driving (i.e., abstaining from driving) to reduce the risk of car accidents was never mentioned on motor vehicle websites.

Implications of Stigma for Sexual Health

What are the public health ramifications of this irrational (based on reactions to relative risks) fear of STIs? First, the basic research on stigma is quite clear on one issue—stigmatizing behaviors does not prevent unhealthy activities from occurring. For example, the more individuals experience stigma associated with their weight, the less likely they are to lose weight; thus, stigma does not encourage more positive health behaviors (see Puhl, Moss-Racusin, & Schwartz, 2007). Thus, we have every reason to suspect that stigmatizing STIs will be associated with poorer sexual health outcomes. Two very clear examples come to mind—if an individual suspects an STI but feels that the medical care professional will stigmatize him or her for contracting the STI, it is less likely that this person will seek medical treatment. Second, if an individual feels that a potential sexual partner will judge her for mentioning the presence of an infection, she will be less likely to mention it. Therefore, public health officials should take the relatively irrational stigmatization of STIs very seriously, purely from the perspective of disease prevention.

Likewise, in terms of financial and other resources utilized at a societal level, this
research speaks to a misplacement of priorities. For example, parents consistently block any attempts for their adolescents to engage in sexual contact and generally seem panicked about the sexual activity of teenagers, largely from a health perspective. Parents, in fact, often want to prevent any sexual contact, even contact that involves barrier protections. Yet a far graver risk to adolescents is driving. Parents who could prevent their teenagers from driving cars, for example, would do a greater service to the cause of keeping their children alive and healthy than those who prevent sexual contact.

In sum, the results of the present studies that the extensive public health focus on preventing STIs (both based on the amount of resources utilized for STI prevention and also in the importance of STI prevention in the American psyche) is inappropriate, given the actual level of risk posed by sexual activity.

**Theoretical Perspectives Addressing These Effects**

Although we believe we have provided evidence for the existence of a bias uniquely against sexual behaviors and STIs, the direct mechanism by which this bias is generated or perpetuated is not clear from the current research. Here we consider three possible explanations for this bias.

**Morality and disgust**

Research has shown that people have harsher moral judgments about issues that cause them disgust (Haidt, 2001; Rozin, Haidt, & McCauley, 2008; Wheatley & Haidt, 2005). Based on this literature, because STIs are associated with disgust, they could also promote harsher moral judgments. We suggest that assessments of sexual risk and judgments of character associated with STIs may be a form of moralism. Thus, perhaps because people are disgusted by STIs, they espouse more moralistic approaches to these diseases. Whether people are more disgusted by STIs than, say, H1N1 or by sexual behaviors than by driving behaviors, has not been definitively determined, but would seem plausible.

**Availability heuristic**

The availability heuristic refers to the idea that people’s beliefs regarding the frequency of an event are based on the ease with which instances or occurrences can be brought to mind (Tversky & Kahneman, 1974). An alternative explanation is simply that STIs and sexual activities are widely represented in our culture and, therefore, are more cognitively accessible than other diseases or dangerous nonsexual activities. For example, perhaps high school and college students are regularly educated about the importance of avoiding sex and the dangers of STIs, and public health announcements encountered in doctors’ offices and health clinics espouse the avoidance of sexual (but not driving) activities. Thus, because STIs and sexual behaviors are more cognitively accessible, they loom larger and, hence, yield more extreme judgments of sexual actors and sexual behaviors. This would provide an alternative (though not necessarily competing) explanation to arguments about moralism and disgust mentioned above.

**Relation of STIs to judgments of character and risk**

At an even more basic level, we have posited that stigmatization associated with the transmission of STIs is the governing force surrounding these biased judgments. In sum, we have proposed that biased judgments about STIs govern both the perceptions of sexual activities (because sexual activities are associated with the transmission of STIs) and judgments of character for individuals who have or transmit STIs; however, neither of these links has been directly made empirically. Yet given the current evidence, it would be useful to assess stigmatization of STIs specifically and then determine whether stigmatization of STIs specifically triggers the biased perceptions of sexual risk or of the personal character of those who transmit STIs.
Future Directions

One limitation of this research is that we only compared the risk of sex to the risk of driving, rather than to other behaviors that can affect health. Researchers would ideally assess the risk of STIs in comparison to other behaviors that can affect health. Unfortunately, it is difficult to estimate the risk of death for each behavioral incident in other health contexts. For example, it might be interesting to compare the risk of contracting HIV to the risk of getting heart disease. This would require an estimate of the risk of acquiring heart disease by, for example, eating a single hamburger. We could, in turn, compare this to the risk of engaging in a single act of unprotected sex. However, it is not feasible to estimate the risk of heart disease associated with a single incident of eating a hamburger.

Second, although we suspect that these findings represent culturally shared assumptions about the risk of STIs, a representative sample of participants would be needed to make such a claim. In particular, the current sample was largely White, relatively young, and likely relatively affluent on average, given their access to the internet. However, because of our large sample sizes, we were able to access data from a wider range of ethnic groups and ages than most psychological research. For example, the mean age of our samples was about 15 years older than a traditional university sample.

Moreover, the methods by which we assessed these assumptions were indirect. Assessing attitudes toward STIs through person perception techniques is an effective way of demonstrating cultural phenomena, as indirect methods can avert issues of socially desirable responding that may emerge if participants were asked to compare directly the levels of risk associated with disparate activities. However, some researchers may argue that more direct means of assessing stigma are necessary to support the direct associations that we have hypothesized.

CONCLUSION

STIs are justifiably a widespread health concern; we fully support the belief that people should avoid unnecessary sexual risks by, for example, using a condom for every instance of intercourse. However, the current research suggests that the extremity of negative perceptions of STIs, and behaviors which lead to the transmission of STIs (i.e., sexual activity), are objectively unwarranted. Further research should investigate the reasons behind this bias and possible implications for public policy.

NOTES

1. These conditions were developed to provide the most stringent test of our hypotheses. There is a statistically greater chance of acquiring HIV than of dying from HIV. Therefore, it would be easier to support our predictions if we compared the probability of dying in a car crash to the probability of simply acquiring HIV, relative to the comparison we actually used (the probability of acquiring HIV and dying). Thus, we would expect our results to be even larger if we made a comparison between acquiring HIV and dying in a car crash. Moreover, we operationalized unprotected sex as a single act of sexual contact (intercourse) regardless of sex of partner (i.e., male-to-male, heterosexual male-to-female, and heterosexual female-to-male), consistent with the Centers for Disease Control’s (2013) transmission categories of HIV from 2010. Our pilot testing indicated that the vast majority of people, when asked what “having sex” means, think of “sex” as heterosexual sexual intercourse; however, our estimates also include male-to-male sexual contact. Based on prior research (Sanders & Reinisch, 1999), if participants were not thinking of penile-vaginal intercourse (or anal intercourse), they were thinking of other noncoital activities. Noncoital activities would pose even less risk than sexual intercourse, meaning that, if anything, the results would be magnified if considering a broader scope of activities as “sex.”

2. In 2009, there was a total of 2,979,321,000,000 miles driven and 17,640 driver deaths (United States National Highway Traffic Safety Administration,
The distance from Detroit, Michigan, to Chicago, Illinois, is approximately 300 miles. Assuming average U.S. road conditions, the probability of a (driver) death driving from Detroit to Chicago is $0.0000001776$ (calculation: $17,640 / 2,979,321,000,000 = x/300$). According to the Centers for Disease Control (2013), there were a total of 899,600 individuals infected with HIV in the transmission categories of male-to-male sexual contact and heterosexual contact in 2010 (those in the injection drug use transmission categories were excluded from the current prevalence rate). Thus, the HIV prevalence among noninjection drugs users was $350.88$ per 100,000 people (calculation: $899,600 / 256,384,408.60$). Note, the U.S. population figure was garnered from census data for people over 13 years of age (U.S. Census Bureau, as cited in Centers for Disease Control, 2013). Infectivity of HIV is not the same across individuals and situations; according to the Centers for Disease Control and Prevention (2013), the rate of HIV transmission in 2010 was 4.15 per 100 persons living with HIV in 2010. Thus, the estimate of engaging in one instance of unprotected sex and contracting HIV is $0.0001456152$ (calculation: $350.88/100,000 \times 0.0415$). To date, there is no figure available of the fatality rate of HIV/AIDS-related causes among those infected (for instance, the CDC provides the total number of deaths among those infected with HIV, but the causes are unknown). According to Rodger and colleagues (2013), among 3,280 well-controlled HIV-infected adults who were noninjection drug users (in SMART and ESPRIT clinical trials), 2 out of the total 62 deaths were attributed to AIDS-related causes (observed in 12,357 person-years of eligible follow-up). Note, the authors acknowledged that the ascertainment of HIV/AIDS-related deaths may be an underestimate. Moreover, we understand that not all individuals infected with HIV seek and adhere to treatment; however, this estimate of HIV/AIDS-related deaths (which did not include injection drug users) was the most accurate mortality rate we could locate. Thus, the probability of dying from HIV/AIDS (i.e., a HIV/AIDS-related cause) from acquiring HIV from one instance of unprotected sex with a noninjection drug user is $0.0000008878975608682$ (calculation: $0.0001456152 \times 0.0006097560975$). Taken together, the estimate for driver fatality (for a 300 mile trip) divided by the estimate of (HIV/AIDS-related) fatality from one instance of unprotected sexual intercourse with a noninjection drug user is $0.0000001776 / 0.00000008878975608682 = 20.003207$, or, approximately 20.

REFERENCES


