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A Cognitive Analysis of College Students' Explanations for Engaging in Unprotected Sexual Intercourse

Lucia F. O'Sullivan, Ph.D.¹, Wadiya Udell, Ph.D.², Vernique A. Montrose, B.A.³, Patricia Antonello, Ph.D.⁴, and Susie Hoffman, Dr.P.H.⁵

¹Department of Psychology, University of New Brunswick

²Department of Interdisciplinary Arts and Sciences, University of Washington Bothell

³Department of Sociomedical Sciences, Columbia University

⁴Department of Health & Nutrition Sciences, Brooklyn College

⁵HIV Center for Clinical and Behavioral Studies, Columbia University and the New York State Psychiatric Institute

Abstract

Young adults, including college students, engage in high levels of unprotected sexual activity despite relatively high rates of HIV/STI and pregnancy-related knowledge. Little is known about the cognitive strategies young people use to explain this inconsistency. The current study examined young people's explanations for engaging in unprotected sexual activity in their committed relationships. Sixty-three young adults (32 women and 31 men) completed daily diaries over a three-week period, providing a total of 1,284 daily reports tracking their condom use and non-use during intercourse. Diary collection was followed by in-depth interviews designed to explore participants' decision-making regarding their participation in sexual intercourse unprotected against infection or unwanted pregnancy. Less than one-quarter (24%) used condoms consistently; similar rates used contraception consistently. Participants primarily viewed condoms as a means of preventing pregnancy; few described disease prevention as a main motivation for their use. Analysis of the cognitions underlying their explanations for condom and contraception non-use were classified as (1) general biased risk evaluation, (2) biased evidence evaluation, (3) endorsement of poor alternatives, (4) focus on spurious justifications, (5) dismissing risk, and (6) ignoring risk. Prevention interventions should incorporate methods to challenge young people to acknowledge personal risk and commit themselves to taking steps to reduce this risk.

Keywords

Cognitions; unprotected sexual intercourse; STI; diaries; pregnancy; prevention

INTRODUCTION

High school students are the target of a vast amount of informational and educational material on the consequences of unprotected sexual behavior, that is, behavior not protected by condom use. In North America, almost all high schools provide HIV/AIDS education as part of mandatory health education curricula. For example, the 2007 Youth Risk and Behavior Surveillance System survey found that 89.5% of U.S. students in grades 9–12

reported that they received some education in school about AIDS or HIV infection (CDC, 2007a). Upon entering college, however, young people are less connected to organized prevention efforts (Bradner, Ku, & Lindberg, 2000). Yet, there are many indices suggesting high rates of unprotected sexual activity in this group. For instance, rates of sexually transmitted infection (STI) are highest among young adults (i.e., adults less than 25 years) compared to all other age groups (CDC, 2007b), as are rates of abortion (Jones, Darroch, & Henshaw, 2002). A national study determined that one in three sexually active people will contract a sexually transmitted infection by the time they are 24 (Kaiser Family Foundation, 1998). The Centers for Disease Control and Prevention (1995) found that nearly one-third of college women attending four-year institutions have experienced a pregnancy (CDC, 1995). Although pregnancy rates among adolescents have dropped significantly since 1990, rates among women in their 20s have increased with 38% of pregnancies in 2004 to women under age 25 (Ventura, Abma, Mosher, & Henshaw, 2008). Each of these findings indicate that sexual health education is still required at these later ages.

Relationship status is not necessarily a protective factor for young people. Rates of consistent condom use are typically lowest among those in committed relationships compared to those in non-committed relationships (Anderson, 2003; de Visser & Smith, 2001; van Empelen & Kok, 2006; Woolf & Maisto, 2008). One study showed that 62% of young adults report using a condom outside of a committed relationship, whereas only 19% report using a condom within an established relationship (Anderson, Wilson, Doll, Jones, & Barker, 1999). Risk for STIs would be close to nil if individuals could be assured that their partners were monogamous and entered the relationship without pre-existing infection. However, rates of concurrent partnerships among those who indicate that they are in a committed relationship are high among college students (Barta & Kiene, 2005; Grello, Welsh, & Harper, 2006), and many STIs in this population go undiagnosed for months, sometimes years (Donovan, 2004; McKay, 2006).

Young adults understand that condoms, when consistently and correctly applied, are one of the only means available for preventing STIs (Bazargan, Kelly, Stein, Husaini, & Bazargan, 2000; Lance, 2001). Yet, they engage in unprotected sexual intercourse despite awareness that the associated unwanted health outcomes are largely preventable, and despite interest in and motivation to avoid these risks (Lance, 2001; Langer & Girard, 1999; van Empelen & Gerjo, 2008).

This pattern indicates that knowledge of and motivation to avoid infection, although fundamental, are not sufficient to produce actual changes in behavior. Moreover, when young people do report using prevention methods, closer assessments often reveal that they do not do so accurately, consistently, or at all (Zenilman et al., 1995). For example, a large body of research has revealed a range of condom use errors common among young people, including inaccurate and delayed application (Crosby, DiClemente, Yarber, Snow & Troutman, 2008; Yarber et al., 2007). Moreover, young people often falsely believe that the use of hormonal methods—the most widespread use of contraception in this population (Alan Guttmacher Institute, 2008)—provides protection against infection when it, in fact, provides none whatsoever (Elders, 2008). Young adults' perceptions of susceptibility and perceptions of safety from infection are unrelated to their risk factors (e.g., number of partners, consistency of condom use, alcohol and drug use during sex) (O'Sullivan, Udell, & Patel, 2006). Each of these factors suggests the need to explore further how young people make decisions affecting their sexual health.

Discrepancies in Reports and Actual Behaviors

Researchers have examined the range of psychosocial and circumstantial factors associated with young people's participation in unprotected sexual activity. These factors are

categorized across many dimensions, including drug and alcohol use (Poulin & Graham, 2001; Roberts & Kennedy, 2006), relationship/intimacy factors (Aalsma, Fortenberry, Sayegh, & Orr, 2006; Civic, 1999; Prince & Bernard, 1998), pleasure and performance issues (Crosby, Graham, Yarber, & Sanders, 2004), cultural beliefs about condom use and transmission of infection (Braithwaite & Thomas, 2001; Duncan, Harrison, Toldson, Malaka, & Sithole, 2005), low perceived susceptibility (Civic, 2000; Opt & Loffredo, 2004), lack of preparation (van Empelen & Kok, 2008) and poor access or lack of availability (Fenaughty & Namyniuk, 2004; Sneed et al., 2001).

Notably missing from the literature, however, is information regarding how young people understand or explain the discrepancy between knowing the importance of using condoms during intercourse and implementing this prevention behavior. A guiding premise of this study was that young adults understand what constitutes protected sex and endorse a standard regarding consistent use of protection via condoms, but that a range of psychosocial and circumstantial factors challenge this standard. What we sought to determine here was how young people explain those choices in light of this standard.

To this end, we drew from both an empirical and theoretical foundation from the social cognitive literature. This literature demonstrates how individuals are vulnerable to an over-reliance on heuristics (Kahneman & Tversky, 1972) and faulty reasoning when making risk-related decisions (Tversky & Kahneman, 1981). According to cognitive dissonance theory, fallacies in reasoning are particularly common in situations where individuals experience dissonance regarding discrepancies between attitudinal ideals and behavioral manifestations (Petty, Wegener, & Fabrigar, 1997). Moreover, a long history of research demonstrates that people often hold inflated beliefs about their abilities (Metcalf, 1998) and are motivated to reason in ways that maintain, enhance, and protect their self-esteem (Baumeister, 1998; Baumeister, Campbell, Krueger, & Vohs, 2003). Based on this social cognitive literature, we propose that when people receive discrepant information about their stated ideals and actual behaviors, they are motivated to develop explanations that activate self-verification efforts to restore a sense that they are, given their circumstances, making right or reasonable choices.

Researchers have studied a number of strategies that individuals use to preserve positive self-conceptions, such as underestimating the occurrence of past and future negative events in favor of positive events (Kunda, 1990) and taking undue credit for positive events, but not negative events (i.e., self-serving bias) (Sedikides, Campbell, Reeder, & Elliot, 1998). Other patterns include ignoring, forgetting, denying, or reinterpreting discrepant information as well as encoding and recalling preferentially confirming events (Conway & Pleydell-Pearce, 2000; Crano & Prislin, 2006). Unrealistic positive perceptions may lead people to ignore legitimate risks and fail to take measures to offset those risks—a tendency of particular significance in the study of decisions to engage in unprotected sexual activity.

To our knowledge, previous research has not addressed which cognitive strategies may be associated with explanations regarding one's participation in unprotected sexual activity. Information regarding the cognitive strategies that individuals use to explain their choices may inform the literature regarding discrepancies in self-reports and actual behavior and ultimately help to identify practical points of intervention in prevention efforts.

The Current Study

The current study required young adults to collect prospective diary data regarding their sexual interactions over a three-week period and then to complete a qualitative interview regarding their decisions to use or not use condoms during sexual activity. A central goal of this study was to examine how young adults make decisions to engage in unprotected sexual

activity and to identify cognitive strategies young people use in explaining these decisions. A research question guiding the study was whether explanations reveal self-verification efforts among individuals acknowledging discrepancies between their ideals (protected sexual activity) and actual behavior (unprotected sexual activity). Given the salience of pregnancy prevention over disease prevention in this age group (Cooper, Agocha, & Powers, 1999), we assessed cognitive strategies in relation to both. However, as public health specialists vehemently stress (Mantell, Hoffman, Exner, Stein & Atkins, 2003), unless condoms are used for each occasion of sexual intercourse, it does not matter what type of birth control is practiced, individuals are unprotected from infection. Other researchers, as noted above, have documented the range of psychosocial and circumstantial factors that make it difficult for young people to be consistent in their condom use; therefore, these factors were not the focus here. Rather, we explored the cognitive factors characterizing how young people understand the choices they make regarding unprotected sexual intercourse. Although it is impossible to assess an individual's actual sexual risk, our participants could not be assured that they were at no risk whatsoever by engaging in unprotected sexual intercourse.

We adopted a mixed-methods approach to studying young people's participation in unprotected sexual activity. We used daily diary collection, which is a method that has been used extensively in the study of sexual behavior of young adults (Hensel, Fortenberry, Harezlak, Anderson, & Orr, 2003; Leigh et al., 2008; Mustanski, 2007). An advantage of this method over retrospective survey methods is that it permits sampling across events over an extended period of time without relying on longer-term recall or self-reports of "typical" days. In addition, daily journal methods do not require frequent contact with the investigator during data collection and allow respondents maximum flexibility in terms of time and location for completing the information (Morrison, Leigh, & Gillmore, 1999). The data generated from this form of self-report were used in subsequent individual interviews. We compared participants' daily diaries with their subsequent interviews to obtain some index of how reliably these individuals were in reporting consistency in condom use, understanding that these concordance data would not indicate which reports (if either) were valid. We also assessed whether condom use would be more closely associated with pregnancy or disease prevention for this sample of young adults.

METHOD

Participants

The sample comprised 63 young adults (31 men and 32 women) recruited from a public college in New York City using fliers distributed at several common student areas. The fliers explained that we were conducting a study on "sex, relationships, and romance," and that we were seeking individuals who were 18–24 years and in a sexually active, heterosexual relationship at the time of the study. Approximately 160 fliers were distributed on the campus over a one-month period. Interested students were encouraged to approach study personnel at the study offices for more information. An additional 12 men and 6 women were dropped from the analyses because they did not complete at least 15 of the 21 days of diary data collection. Those who reported 14 or fewer days were not different from the sample retained in the analyses in terms of key background and sexual variables (age, number of sexual partners, length of primary relationship). The mean number of diary entries of the 63 participants was 20.4 (median = 21.0), with 45 (71.4%) completing all 21 days of entries. A total of 1,284 daily reports were generated.

Participants ranged in age from 18 through 24 years ($M = 20.4$ years). They represented an ethnically diverse sample: 35% identified as African American/Black, 41% as White, and 22% as Hispanic or Latino. The remainder indicated "other." Over half (60%) of the

participants were born in the United States, 12% were born in Europe, 12% in the Caribbean, and 15% in South American, Asia, or Africa. Fifty-three (91%) participants attended school full time and 65% was employed part time. All were residents of neighborhoods with some of the highest rates of HIV in the United States (New York City Department of Health, 2001).

Fifty-two (83%) of the participants were never married and not living with a partner, six (10%) were never married and living with a partner, and five (8%) were married and living with a partner. About half (49%) of the sample had been involved with their partner less than one year, whereas the remainder were involved for 1–2 years (14%), 2–3 years (11%), or more (25%). The median length of involvement was over one year (17.0 months). All of the female participants and all but two of the male participants reported being in a monogamous relationship in the two months preceding the study. The two men reported casual relationships with someone other than their primary partner. Three respondents indicated that they had children (two of these had two children, the third had one child). From formative work, we found that only 23% were using an effective means of contraception for pregnancy prevention (primarily oral contraceptives), although a few indicated that they were not doing so as consistently as required to provide full protection from pregnancy. The remainder indicated that they used nothing, withdrawal, or tried to estimate “safe days.” Men reported a mean of 6.61 ($SD = 5.52$; range, 1–20) and women reported a mean of 4.61 ($SD = 4.29$, range, 1–16) past sexual partners.

Measures

Background and Sexual/Relationship Histories—Basic demographic information was assessed, including age, ethnicity, household income, relationship type, and duration.

Structured Daily Diaries—Respondents recorded each day whether they had engaged in sexual activity and, if so, the type of sexual activity in which they had engaged. For each report of sexual intercourse, respondents indicated whether they had used a condom on that occasion. Respondents were instructed to report the first occasion of sexual activity each day on their forms as soon after the first incident as possible or at the end of the day if no sexual activity had occurred. Completing the daily forms required approximately five minutes or less a day.

Qualitative Interviews—Qualitative interviews drew heavily on the daily diaries to explore participants' cognitions around condom use behaviors, decision-making, and associated attitudes. Interviewers used a number of guiding questions from a protocol developed by a team of experts in the field to address specific sexual occasions that were reported in the diaries, including “Tell me why you used (didn't use) condoms”; “How did the choice to use (or not use) condoms come about?”; “Tell me about situations in which you have talked about condom use with your partner.” For those participants who reported not using condoms, the interviewer also asked “Did you ever use condoms in this relationship?” With regard to contraception, all participants were asked, “How did the choice to prevent or not prevent pregnancy come about?” Interviewers used prompts, as needed, to ensure that participants expanded upon the decisions surrounding both recent and early condom and contraception efforts. The protocol was revised in an iterative fashion upon subsequent interviews, as recommended by Berg (1988) to ensure complete coverage of the topics.

Excerpts of the transcribed interviews that related to sexual intercourse that was unprotected from infection and/or pregnancy were extracted for analysis. A coding system was developed by two experts in the field. Several domains of interest emerged after reviewing

the transcripts. Our data analytic approach involved initially examining study transcripts to identify primary coding categories. Coding categories were then organized into a formal template. Next, transcripts were formally content coded by two trained raters until Kappa scores of at least .80 were reached across themes. Raters were unaware of participants' identity and diary responses while completing the coding. Excerpts that did not appear to fit into the original template were discussed and modifications were made when deemed appropriate. Our thematic categories were refined, merged, or subdivided when suggested by associations, overlap, or diversions in the data (Hall & Stevens 1991; Sandelowski, 1986). Individual data patterns are described to obtain a general understanding of the range of participants' explanations for condom non-use. In addition, illustrative quotes are included to help summarize each of the main themes that emerged from the data.

Procedure

Eligible individuals who provided consent received training in completing the daily diary forms and completed the background and sexual questionnaires in private. All participants received \$10 for completing the initial training and survey. Each participant was given three weeks' worth of daily diary forms to complete. Participants returned a form by mail each day to the study offices to ensure privacy of their responses and consistent completion. Study personnel contacted participants if three consecutive days' of forms were missing to remind them to complete them in a timely manner and to address any problems or questions that may have arisen since the training.

Participants were scheduled to meet with a trained interviewer (matched in terms of gender and ethnicity) to complete an individual qualitative interview after returning diaries for the three-week period. All interviews were conducted within 10 days of the interviews; the majority within 2–3 days of the end of the diary reporting period. The qualitative interviews were conducted in English. Each lasted approximately 90 minutes and was audiotaped for transcription and analysis. Participants received \$30 for completing the diaries and \$25 for the interview. All transcripts were proofed for accuracy by two independent reviewers. All procedures were approved in full by our institutional ethics review boards.

Data Analysis

Condom use was the focus of our analysis as it is the most accessible means of dual protection; those using other forms of contraception but no barrier method were considered to have engaged in unprotected sexual activity, in line with current views of dual protection specialists (Mantell et al., 1999). Proportions of intercourse occasions that were protected by condom use during the three weeks of diary monitoring were calculated. As an index of reliability, we assessed concordance in participants' reports of their consistency in condom use from the diary reports of condom use over the preceding three-week period to their in-depth interviews using the Kappa statistic. We calculated the numbers of participants whose interview responses indicated that they associated condom use with pregnancy versus disease prevention, or both. We examined gender differences in reports of sexual activity and consistency of condom use (consistent, inconsistent, and non-use) using analysis of variance and chi-square analyses. Gender differences in pregnancy attitudes were analyzed using Fisher's exact test because of one cell size that was smaller than five.

RESULTS

Diary Data

During the three weeks of daily diary monitoring, participants reported an average of 6.0 intercourse occasions ($SD = 3.32$; range, 1–18), with no differences by gender, ($F(1, 59) < 1$). These findings indicate that participants were engaging in relatively high levels of sexual

activity. The proportion of intercourse occasions that involved condom use was calculated for each individual; reports revealed little consistent condom use. When sorted in terms of consistent (100% of occasions), non-use (0% of occasions), and inconsistent use, a higher proportion of men than women reported inconsistent condom use over the three-week period (41% and 16%, respectively) and a higher proportion of women than men reported non-use of condoms (55% versus 23%, respectively), $\chi^2(2) = 7.13, p < .05$. No gender differences in consistent condom use were noted in diary reports. Interview data were also sorted into the three categories of use (consistent, inconsistent and non-use); no gender differences were found across categories, $\chi^2(2) = 2.59, p > .05$.

Condom Use as Disease or Pregnancy Prevention

When asked how the decision to use or not use condoms came about, most participants' explanations (78%) spontaneously associated condom use with pregnancy prevention; less than half ($n = 30$; 48%) mentioned disease prevention spontaneously, that is, without a subsequent prompt from the interviewer about disease or infection. In fact, of the 30 participants who spontaneously associated condoms with disease prevention, only six mentioned STI prevention without also mentioning pregnancy prevention, suggesting that pregnancy prevention overall constituted the most salient reason for using condoms. When asked about how pregnancy would affect their lives, only one participant indicated that pregnancy was desirable. The majority ($n = 53$; 84%) indicated that pregnancy would be a negative outcome. For example, one woman explained: *"Oh, it's just because of the goals that we're trying to achieve that we can't really have a kid right now, even though we're not doing much to prevent it. But you know, right now is simply not, not a good time."* Three (5%) participants reported that pregnancy was unwanted, but would not be an extremely negative outcome if it were to occur. Fisher's exact test revealed no gender differences in pregnancy attitudes, $\Phi = -0.02, p > .05$.

Perceived Consistency in Condom Use Between Diary and In-Depth Interview Data

As indicated above, participants' interview responses were coded into categories of self-described consistency in condom use. Of the original 63 interviews, four participants were unclear about their consistency in condom use and their interviews, ultimately, could not be coded in this respect. Of the remaining 59 participants, 19 (32%) reported being consistent condom users, 15 (25%) reported being inconsistent, and 25 (42%) reported being non-users. The daily diary responses were masked coded from the interview data. Two participants reported no intercourse occasions during the three-week period based on diary data. Of the 57 participants for whom concordance could be compared, diary reports of condom use matched relatively well with participants' interview responses regarding their typical condom use consistency (see Table I). Forty-six (80.7%) of the 57 participants with intercourse occasions reported condom use patterns in their diaries that corresponded to their interview reports. The Kappa was 0.68, $p < .001$.

Fifteen participants reported consistent condom use both in their diaries and interview data and, thus, were not included in our analyses. (Their responses were relatively straightforward and tended to reflect the personal salience of preventing infection and unwanted pregnancy, as might be expected). The remaining three participants reported inconsistent condom use in their daily diary collection (i.e., at least one occasion of non-use of condoms during intercourse), yet reported being consistent condom users typically.¹

¹These interviews revealed that two of these participants did use condoms consistently, but put condoms on after engaging in a few minutes of unprotected intercourse (thus reporting both protected and unprotected intercourse for each sexual occasion in their diary data). The third participant insisted that his non-use on the one occasion was highly unusual, a one-time occasion, and would offer no further explanation. Thus, their data could not be included in the following analyses.

Explanations for Participation in Sexual Activity Unprotected by Condom Use

We next analyzed the interview data for the 39 participants who reported inconsistent or non-use of condoms in their relationships in their interview data (see Table I). Seven main codes representing cognitions underlying their explanations for condom and contraception non-use emerged. Of 124 excerpts, 115 were reliably coded into one of the six main themes. These were (1) general biased risk evaluation (22 excerpts), (2) biased evidence evaluation (8 excerpts), (3) endorsement of poor alternatives (24 excerpts), (4) focus on spurious justifications (22 excerpts), (5) dismissing risk (16 excerpts), and (6) ignoring risk (23 excerpts). Each of these is described below, using illustrative quotes to characterize the types of reasoning behind each explanation.

General Biased Risk Evaluation—Participants' explanations occasionally reflected faulty risk evaluation strategies in their arguments. This pattern has been described before, stemming from a series of seminal studies demonstrating the difficulties that people face in making decisions on the basis of subjective assessments of probabilities (Kahneman & Tversky, 1972; Tversky & Kahneman, 1973). In particular, these explanations revealed judgments about associated risk based on faulty or likely poor information, such as situational or contextual features or partner characteristics. As one woman explained:

I didn't know if he was with anyone else, or whatever... I know that we're just us and I know there's a chance that I can, God forbid, get pregnant or something [giggles]. I... I don't want that now. But, uhm, I mean, we just slowly like, got off of them [condoms], you know?

Similar to the findings from other studies (Hearn, O'Sullivan, El-Bassel, & Gilbert, 2005), common arguments along this line were that the closeness and intimacy that they felt toward a partner reduced their risk of pregnancy or disease. A closer examination of this belief reveals that intimacy is seen as having protective qualities making the individual invulnerable to infection. Equally biased in some respects is a view that safety can be easily assured. A female participant reported, "We have such a strong history together. I mean, AIDS doesn't care about history—I know this—but that's how I see it. We're just close."

Biased Evidence Evaluation—In justifying their risky sexual behavior, some participants argued that a particular pattern of behavior, if not followed by negative outcomes, indicated to them that the practice was healthy or protective. For instance, some participants argued that because the female partner had consistently had her period each month, foregoing condoms and other contraception was not harmful and "must be working." Most of these justifications were examples of the cognitive strategy called affirming the consequence. Affirming the consequence refers to a logical reversal of the form "if P, then Q; Q, therefore P" (Baron, 1994). Essentially, arguments of this form follow the logic that as participants have yet to become pregnant or to contract an STI, the behaviors that they engaged in must be protective in some way or at least not very risky.

Less and less [used condoms], but it's, I think it's, you know, cause we are just with each other so it just kind of – and she hasn't gotten pregnant, so that, that thought kind of escapes your mind, you know? You could but you haven't so, you know, it's like that.

The problem with this reasoning is that the role of chance, a far more likely explanation for the same outcome (not getting pregnant or an STI), is highly under-estimated.

Endorsement of Poor Alternatives—Some participants justified their choice to forego condoms with their use of alternative prevention strategies, often acknowledged as poor or

risky alternatives. In particular, a large number of participants described using withdrawal as a means of preventing pregnancy. As one man said:

P: That was always the main issue, to prevent it. It [pregnancy] happened once.

And from then on we try to be extra careful.

I: Right. And what do you do to be careful?

P: Just pull out.

This example also reflects how irrational beliefs persist by overweighing evidence consistent with a favored belief (e.g., those who practice withdrawal might not experience pregnancy) and/or underweighing evidence against it (e.g., the couple has not consistently prevented pregnancy). Other common forms of reasoning displayed by participants included relying on select information (accurate or inaccurate) to justify actions while ignoring relevant information or failing to search impartially for evidence (Baron, 1994).

When I don't [use male condoms]? It's usually like after my period. I don't use a condom a week after my period. I don't use a condom because I read in a book that it says that like 14 days after your period, you ovulating. So between those 14 days I don't use one. And then when 14 days come, then I use it again.

Occasionally, a participant referred to praying or counting on good luck as the sole protective factors against pregnancy or STI. For instance,

I don't know, I just, I just know I'm not gonna' get pregnant until I want to. I just have this belief, I don't know. I don't know, I just have this, it's silly, but I never worry about pregnancy. There have been times that I have, like been late, and I will be like, 'Oh my God!' you know? But, I know it's not gonna' happen until I want it to.

Well, he pulls out, you know? And for sure, I don't, like I said, I'm not gonna' have a kid until I get married. It's very important. It's like, you know, and he pulls out all the time. Thank God, it works. I don't use any other contraceptive method, so that's the only one. ...Because he's not ready for it yet and I'm definitely not ready for it – especially before marriage. So...it's not gonna happen.

These last two examples are also representative of a logical fallacy called *post hoc ergo propter hoc* (or false cause fallacy). This fallacy takes the form of "if P → Q; P caused Q," whereby events that follow others are seen as being caused by their preceding events. These participants appear to argue that their strong belief that pregnancy cannot occur until they personally wanted it to occur.

Focus on Spurious Justifications—Common to many explanations for rejecting condoms and contraception was to focus on often relatively superficial negative side effects to justify foregoing protection, or to privilege positive effects, such as physical sensations of unprotected sex, despite also clearly reflecting participants' wishes to avoid pregnancy or disease. This pattern again reflects a tendency to call on confirming evidence, while disregarding disconfirming evidence in justifying a decision. One man described his decision to forego condoms this way:

Uh, one, the smell. Two, it's hard to keep condoms stored without, you know, her parents don't know that we, you know, have sex and stuff. And to keep the condoms in the dorm, her roommate's just gonna' think it's probably too disgusting. But we do have like a condom or two somewhere, but we don't use it.

A number of explanations given by participants for not using condoms revealed a greater focus on negative, short-term consequences of using condoms and contraception rather than on long-term consequences of pregnancy or contracting an STI. The majority of these views were experienced by participants who gave the importance of having pleasurable, non-interrupted sexual experiences more weight in their decision than possibly less pleasurable, but condom-protected sexual experiences. These may not reflect fallacies in reasoning so much as differential value systems. As one woman explained:

Um, I know this is very bad, but he, we rely lately on the pulling-out method. And I'm not on birth control or anything like that, so I guess it's really not reliable. We're not supposed to be doing it. I take a human sexuality class and she yells at me all the time, but we don't tend to it because it kinda' honestly kills it, you know? ...And it doesn't, I have less likely an occurrence of an orgasm with a condom than I do without one.

A male participant made the following case:

So that's why [condoms are not used]. You know I guess it's not safer. But it's normally like it's gonna' take me longer. You know what I'm saying? And the other way is just because it feels so much better without one, it's ridiculous, you know?

Whereas some participants focused on the unpleasant aspects of condom use, others focused on the potential negative effects of birth control pills or other hormone methods. Despite having expressed a desire to prevent pregnancy, these participants placed greater value on preventing the potential side effects of using birth control than on pregnancy prevention. One woman said:

Like, he's the first person I ever had unprotected sex with. I'm the first person he ever had unprotected sex. Yeah, I think anyway. And, uhm, I don't wanna' get pregnant, you know what I'm saying? I don't wanna' go through that thing... And I don't wanna' go on the pill, I don't wanna' do any of that stuff.

This example also represents a fallacy of presumption, specifically a bifurcation fallacy (or false dilemma) whereby the individual truncates his or her view into two options (e.g., use condoms or go on oral contraceptives) when there is at least one other option available (e.g., use other contraception, practice abstinence, adopt female condoms). This fallacy occurs when an individual uses a false range of choices in their argument (Damer, 2008).

Dismissing Risk—Unlike the previous justifications whereby participants frequently acknowledged that their behaviors or beliefs were not truly providing protection against pregnancy or disease, some participants actively dismissed risks altogether when asked to explain how the choice to use or not use protection came about. There were two main forms that characterized this type of justification. The first form was an expression of invulnerability or “magical thinking” (Wohl & Enzle, 2002) that indicated that somehow the participant viewed their thoughts or beliefs as providing immunity to the negative outcomes that others might experience. A male participant explained, “Well, from the beginning we used the withdrawal method. And I mean, even though I know the risk factors of it, you kind of have a little notion that it's not gonna happen to you, so you never really think of putting it [on.]” The concept of illusory control (Thompson et al., 2004) is related here.

The second form of risk dismissal strategy was justifications minimizing the severity or importance of negative outcomes and the ease of finding a solution, such as an abortion, morning-after pill, or drug therapy, should those outcomes be experienced.

I mean, a lotta people don't really think about other precautions. At least a lotta times I don't, which is real stupid. ...And uh if it wasn't for, if you really thought about AIDS all the time, you know, you wouldn't walk outside without a condom on, and that kinda stuff. You know?

Media was just in my opinion was always a scare tactic, "AIDS is risin', AIDS is risin'. It's killin' all these people. It's killin' all these people!" I mean, you barely seen it though. You just hear about it, you know like this Isabel storm. 'Oh my God. Batten down the hatches. You're gonna lose buildings,' and all this, whatever shit. And then, you know, it doesn't do anything.

Ignoring Risk—Ignoring risk was far more passive than dismissing risk as those who dismissed risk appeared to argue quite clearly for their reasons for doing so. Although most participants were aware of the potential negative outcomes associated with engaging in unprotected sex, many found ways to disregard them.

Um, well we use condoms. But, um the main reason I can really think about me using condoms is 'cause there's like a voice in the back a my head – my father. ... And I have like my future in mind. I'm in school. I have no business having children or anything like that. (Later in the interview) The first time I didn't use a condom, was after alcohol use. After that point it's this level of, I guess, like where you're comfortable without using the condom, and you kinda' think it's okay. ... After that point I didn't use a condom, and like we, I practiced withdrawal.

The majority of these explanations revealed that participants either completely or indirectly ignored risk by focusing on sexual activities they considered to be safe. There were also, at times, examples of endorsement of poor alternatives.

It never really got resolved. Like, I wanted her to get—what's it called—to get on the pill. But she said she doesn't wanna' get on them because... uh, she might forget to use it. Because you have to use it every day, so we don't worry about it. And she told me she never wanted to talk about it...ever again. So, I never brought it up again.

For the explanations offered that completely ignored risk, humor was often used as a way to deflect personal concern away from the participants' behaviors.

So we talk about it, but we don't really talk about it, we just kind of mention it. You know we'll make jokes, she'll make jokes, 'Oh yeah when I'm pregnant you won't think it's so funny,' you know?

DISCUSSION

In the current study, young adults provided retrospective data regarding the consistency of recent condom use, monitored their sexual interactions using structured daily diaries over a three-week period, and then completed individual interviews regarding their decisions to use or not use condoms to prevent disease or pregnancy. Using explanations offered from those who never used condoms or used them inconsistently, we developed an initial typology of informal arguments. These arguments varied in strength both in terms of the extent to which they were endorsed and the extent to which they were more or less logically sound.

We proposed that the explanations that young people develop to explain unprotected sexual behavior would reflect self-verification efforts designed to restore a sense that one is making a reasonable choice in light of any number of intrapsychic, interpersonal, or circumstantial factors. In large part, this prediction was supported by the data. Although our typology reflects the interpretations we made of the qualitative data collected here, a number of

arguments were made that reflect some classic forms of errors in reasoning, most of which were used to justify, defend, or excuse a particular choice.

Reasoning usually “takes place in the service of argumentation, that is, in the attempt to persuade yourself or others of a particular position” (Hahn & Oaksford, 2007, p. 705). In social psychology, the psychology of reasoning tends to focus on persuasion or attitude change (see for a review Crano & Prislin, 2006). However, the main focus of the current research was less on the content of the reasoning, but more on the structure of the message content and its interaction with belief. Indeed, we cannot assume that informal fallacies we identified in reasoning were, in fact, fallacious. There are arguments (explanations) that are logically invalid but considered acceptable, and there are arguments that are logically valid but considered unacceptable (Hahn & Oaksford, 2007). From the current study, an example of the former is that shared intimacy with a partner makes one safe from harm (clearly illogical, but widely experienced and reported, and hence in a sense, accepted). An example of the latter are explanations that uncompromised sexual pleasure and sexual functioning justify foregoing condoms (logical as a value system, but generally considered unacceptable--in the public health realm, at least).

For the most part, explanations offered by participants explaining inconsistent or non-use of condoms could reflect in large part social desirability factors or the larger family of bias corresponding to self-enhancement. The potential benefits and problems associated with self-enhancement have long been the subject of considerable controversy and debate in social psychology (Taylor, Lerner, Sherman, Sage, & McDowell, 2003). Although associated with enhanced mental functioning, proponents argue that these positive illusions or self-deception constitute little more than the suppression or dismissal of negative self-information (Paulhus, 1998; Taylor et al., 2003). A limitation of the self-report methods employed here was that we cannot truly assess whether the explanations offered by participants reflected their true motivations for engaging in unprotected sexual intercourse, constituting the impetus for an unhealthy choice, or whether the explanations offered were generated “on the spot” in light of the discrepant information and perceived need to justify one’s actions. This is, in part, a problem facing all research that relies on self-report methodologies (O’Sullivan, 2008). It is nonetheless important as the justifications can provide support for the inaccurate belief that people are engaging in safe sexual practices.

The reasons that participants offered were classified as general biased risk evaluation, biased evidence evaluation, endorsement of poor alternatives, focus on spurious justifications, dismissing, and ignoring risk. Underlying many explanations was the view that condoms were primarily for pregnancy rather than disease prevention, and that getting pregnant was an undesired outcome. Although the data were not presented here, we know from formative work that this population was well-aware that condoms do prevent STIs and act as dual protection method by also providing contraception (O’Sullivan, Udell, & Patel, 2006). Even so, less than one-quarter (24%) were consistent condom users.

For the remaining participants who acknowledged inconsistent reports, their arguments for doing so reflected a host of patterns of reasoning that were cause for concern, including assessing risk based on poor or faulty information, arguing that poor or unhealthy practices were, in fact, protective, underestimating the role of chance or luck in their avoidance of pregnancy or infection (to date) or overestimating the role of chance or luck in protecting them from these outcomes, over-weighting evidence consistent with a favored belief, and under-weighting or failing to consider evidence against it. Other patterns that emerged included seeing causal events where unwarranted, giving greater value to short-term consequences than to long-term consequences, truncating the range of options available to

them, perceiving themselves as invulnerable or exercising (illusory) control, minimizing the severity of risk outcomes or ignoring risk altogether.

Another limitation of the current study was that we have explored the explanations offered for unprotected sexual intercourse among a relatively small sample of young adults. The extent to which these explanations characterize other groups, including those outside of committed relationships, or in other forms of relationships, other age or ethnic groups, remains to be determined.

In sum, cognitive psychologists have identified a host of reasoning fallacies used by people when faced with information that contradicts their beliefs or preferences. Similarly, we have identified several patterns of reasoning used by our participants to support the belief that they were engaging in safe sexual practices when, in fact, they were not. None of these patterns of reasoning is more or less problematic than the others as each is used to explain non-use of condoms. However, they may vary in terms of how easily they are countered or discredited in some meaningful way useful to promoting adoption of protective methods. Although this remains to be seen in future research, such findings can inform pregnancy and HIV preventive intervention efforts. It is clear that in addition to encouraging young adults to question or challenge assumptions or beliefs underling their sexual practices, it would be worthwhile for interventions to highlight reasoning, and to encourage metacognitive thought relating to individuals' sexual practices.

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Table I

Correspondence in Diary Reports and Interviews Regarding Consistency in Condom Use

	Diary Reports		
	Consistent (100%) Use N = 18	Inconsistent Use N = 16	Non-Use (0%) N = 23
Interview Reports			
Consistent (100%) Use	15	3	0
Inconsistent Use	3	10	2
Non-Use	0	3	21

Note. N = 57. Four male participants' interview data on condom use consistency could not be coded; two male participants did not report at least one intercourse occasion during diary data collection.