Running Head: CONTRIBUTORS TO CONDOM USE

Impulsive Contributors to Steady and Casual Partner Condom Use in an At-Risk Sample and Implications for HIV Prevention

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ABSTRACT

Since the discovery of HIV, behavioral scientists targeting sexual risk reduction have focused exclusively on thoughtful, explicit attitudinal processes, but recent theorizing about more non-conscious, implicit processes introduces avenues for understanding condom use. The current research examined the contributions of implicit and explicit condom attitudes in condom use for individuals undergoing HIV-testing. Explicit attitudes and implicit condom-sex associations predicted steady partner condom use and use under the influence of alcohol or drugs. Implicit condom-disease associations and explicit attitudes also predicted casual partner condom use. Thus, implicit condom associations are critical condom use predictors. The results inform interventions by suggesting that, when motivation or ability for processing is low, implicit associations reflecting disease prevention messages must be balanced by exposure to positive condom associations.

Key Words: condom use, attitudes, implicit, HIV, intervention

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Despite the widespread awareness that condom use is the primary way to prevent sexually transmitted infections, for many individuals condom use is still inconsistent (Wanigarate, Billington, & Williams, 1997). As such, researchers now realize that consistent condom use may be difficult for sexually active individuals. In fact, it is in large part the discrepancy between people's awareness that they need to use condoms and their actual condom use that has made the HIV pandemic so challenging to eliminate. In the current article, we suggest one process that may provide the basis for a fundamentally new understanding of inconsistent condom use: namely, impulse-driven attitudinal processes. Two decades of HIV research have yielded substantial understanding of how condom attitudes translate to behavioral intentions and, in turn, to behavior (e.g., Fishbein & Middlestadt, 1989). Yet, some researchers have suggested that impulse-based processes dictate behavior for some limited groups of individuals (e.g., those high in sensation seeking and sexual impulsivity, Kalichman & Cain, 2004; Parsons, Bimbi, & Halkitis, 2001). However, a way to measure condom attitudes that are based in impulsive processes, and most importantly, a theoretical basis for understanding the role impulsive processes play in condom use for *all* individuals has been previously unavailable.

Many theoretical models applied to HIV prevention include very deliberate, explicit attitude and intention-based predictors of HIV-related risk behavior. For example, the Theory of Planned Behavior (Ajzen, 1991) emphasizes the importance of explicit attitudes, subjective norms, and behavioral control as predictors of an individual's behavioral intentions. When proponents of this model apply its tenets to HIV prevention, they argue that condom use occurs as a result of thought-intensive, intention-based processes. If individuals have a positive attitude about, feel that the social norms support, and feel like they can control condom use behavior,

they are likely to form an intention to use, and subsequently actually use, a condom during the next sexual encounter. Other common HIV prevention models also recognize the role of explicit, intention-based condom attitudes as crucial determinants of behavior (e.g., Fishbein & Middlestadt, 1989; Fisher & Fisher, 1992, 2000). Because there has been such an emphasis on these explicit processes in the HIV prevention literature, we do not spend much time outlining each of these related theoretical perspectives in their entirety here.

Instead, we wish to focus on new advances in attitudes research that have revealed that deliberative, intention-based processes are not the only behavioral predictors of interest. Recent dual process models suggest that both "implicit associations" as well as the more commonly investigated explicit attitudes can determine behavior. Implicit attitudes have been described as an "underlying automatic evaluation" (Greenwald, McGhee, & Schwartz, 1998) that many consider to be "hot" or affectively-based. Such attitudes are in contrast to explicit, deliberative attitudes that are based on "cold," thoughtful cognitions. Because of the non-thoughtful, emotionally-based nature of implicit attitudes, they are assessed using quick, reaction time-oriented stimulus categorization measures rather than conventional, self-report questionnaire measures. Implicit, reaction time-based attitude measures offer benefits over more conventional methods of attitudinal assessment. These measures are more sensitive to subtle nuances in responses to particular attitude objects. In addition, the within-subjects nature of implicit measurement provides robust statistical power that allows for detection of attitudinal differences, even with small sample sizes.

Prior research has demonstrated that implicit associations and explicit attitudes toward an object can both exist within an individual, but may be in opposition to one another (Wilson, Lindsey, & Schooler, 2000). With regard to condoms, for example, individuals may explicitly endorse condoms, but implicitly harbor negative associations with condoms (e.g., disease,

embarrassment, discomfort). These negative associations may hinder actual condom use behavior when ability and/or motivation to process information is low. In fact, past research in other domains (e.g., stereotypes and prejudice) has demonstrated that implicit associations with an attitude object can predict behavior above and beyond explicit attitudes (e.g., Bargh, Chen, & Burrows, 1996; Bessenoff & Sherman, 2000; McConnell & Liebold, 2001). Yet, minimal research has examined the link between implicit condom associations and condom use.

In shifting the focus of research on implicit associations to condoms, there are two primary questions for investigation: How do implicit condom associations form, and do they predict condom use behavior? We suggest that implicit condom associations form, in part, via direct experience with condoms. Many useful HIV interventions include a component of direct experience with condoms, and a recent meta-analysis demonstrated that, within an intervention, an active skills training component is instrumental to sexual risk reduction (Smoak, Scott-Sheldon, Johnson & Carey, 2006). If an individual's direct experience with condoms is positive (such as when a condom is eroticized and becomes associated with positive sexual experiences; see Scott-Sheldon & Johnson, 2006), implicit associations with condoms are likely to be positive. Conversely, if an individual's direct experience with condoms is negative (because the person experiences it as detracting from sexual pleasure, or as a source of embarrassment), implicit associations with condoms are likely to be negative (Rudman, 2004). For individuals with no direct condom experience, implicit attitudes will likely be formed based on the limited associations seen in the environment (e.g., via exposure to condoms in pharmacies as something associated with disease and embarrassing health conditions; Scott-Sheldon, Glasford, Marsh, & Lust, 2006).

Once individuals develop implicit condom associations, when are they likely to guide condom use behavior? Strack and Deutsch (2004) have recently outlined circumstances under

which behavior is likely to be guided by more deliberative, explicit attitudes (which operate within the "deliberative" cognitive system) and when it is likely to be guided by more impulsive, automatic implicit associations (which operate within the "impulsive" cognitive system). Specifically, these authors suggest that the deliberative system is likely to guide behavior when cognitive capacity is above a minimal threshold and situational constraints allow for deliberation. Conversely, behavioral decisions guided by the impulsive system are uncalculated decisions, reflecting spontaneous, quick emotional responses (Buck, 1999; Epstein, Lipson, Holstein, & Huh, 1992; Metcalfe & Mischel, 1999; Strack & Deutsch, 2004). Because the impulsive system requires a minimal capacity to operate, it is always engaged. Therefore, when cognitive capacity is low or situational constraints limit motivation to process, operation of the deliberative system will be limited, and the positive or negative associations present in the impulsive system are likely to guide behavior instead.

Sexual encounters provide unique circumstances under which to study the relative contributions of the deliberative and impulsive systems toward behavior because some sexual encounters are deliberate and planned, whereas others are more spontaneous. Following the logic of Strack and Deutsch (2004), in sexual encounters that are planned, the deliberative system (represented by explicit attitudes) should guide condom use behavior. In sexual encounters that are spontaneous and unplanned (often with casual sex partners; e.g., Marsh, Scott-Sheldon, Johnson, Smith-McLallen & Smoak, 2006), the impulsive system (represented by implicit associations) should guide condom use behavior. In addition, the deliberative system may be undercut in casual sex encounters because the arousal level in these encounters is likely to be high due to partner attractiveness (Agocha & Cooper, 1999) or the novelty of the situation.

In addition, drug and alcohol use, which more often occurs preceding a casual sexual encounter (Kalichman et. al, 1994; Latkin, Mandell, Oziemkowska, Vlahov, & Celentano, 1994)

often lessens cognitive capacity and narrows attentional focus (Steele & Josephs, 1990). If alcohol use occurs prior to a sexual encounter, it is likely that only the most salient situational cues would be noticed. For example, under the influence of alcohol, the attractiveness of an available sexual partner may be more likely to undercut the deliberation of cues to sexual risk, which may be more subtle or even nonexistent in the environment (MacDonald, Zanna, & Fong, 1998). As such, we believe that because alcohol undermines the ability to deliberate fully about the sexual risk posed by a potential partner, condom use under the influence of alcohol should be at least partly influenced by implicit associations.

As previously mentioned, research investigating whether implicit condom associations predict condom use behavior has been minimal. Marsh, Johnson, and Scott-Sheldon (2001) assessed college students' implicit condom associations, explicit attitudes and condom use intentions. As predicted, explicit attitudes predicted condom use with steady partners but not casual partners. The more important finding, however, was that implicit condom associations were the only significant predictors of casual partner condom use.

In another study that investigated college student condom use with steady and casual partners over a period of six months, condom use with steady partners was predicted by explicit condom attitudes at baseline. Condom use with casual partners, however, was predicted by both explicit condom attitudes and implicit condom associations (Marsh et al., 2006). In this study, implicit and explicit measures had interactive effects such that positive evaluations of condoms on one type of measure outweighed negative evaluations of condoms on the other type of measure. In other words, if individuals did not explicitly endorse condom use but demonstrated positive implicit associations, condom use levels were still high. Finally, Czopp, Monteith, Zimmerman, and Lynam (2004) found that participants with negative implicit and explicit attitudes toward condoms reported that individuals in hypothetical vignettes were less likely to

use condoms during sexual encounters.

If implicit condom associations contribute to an understanding of condom use decision making, the implications for the HIV prevention literature are apparent. More specifically, if positive implicit associations with condoms predict more condom use, especially in high risk situations, interventions that bolster these implicit positive associations would be maximally beneficial. In addition, it would be informative to the HIV prevention literature to examine the implicit link between condoms and negative concepts like disease. If condom use is diminished because of the disease/condom implicit association, interventions would perhaps benefit from a lesser emphasis on the negative concepts with which condoms can be associated. Thus, the investigation of these questions in an at-risk sample is imperative to the HIV prevention literature.

The Present Research

We conducted the current research with multiple goals in mind. First, we wanted to further investigate the circumstances under which implicit condom associations are likely to predict condom use. Second, all of the literature in this area to date has used college student samples. In the current research, we investigated the relative contributions of implicit and explicit condom attitudes on steady and casual partner condom use in individuals who presented themselves for HIV counseling and testing at a local clinic. Using a sample of individuals who are about to be tested for HIV provided a unique context in which to assess implicit condom associations. Individuals who seek HIV testing perceive themselves, at least at some level, as sexually “at risk.” In other words, if there is absolutely no way in which one could have contracted HIV, HIV testing is not warranted. For this reason, we labeled this sample as at least partially “at risk;” thus, examining the relative contributions of implicit and explicit condom attitudes toward condom use in this sample will be both novel and informative for

interventionists.

Finally, in the current study, we used implicit measures more specific to the subtleties of condom use than those previously used in this line of research. Past research in this area has only assessed globally positive and negative associations with condoms, but recent findings indicate that individuals' associations with condoms are multifaceted, including sexual, disease-related, and contraceptive associations (see Scott-Sheldon, Marsh, Johnson & Glasford, 2005). As such, we assessed specific types of implicit condom associations, which may be important in predicting condom use in different contexts. Participants' implicit associations between disease and condoms were of particular importance in this study. These associations are particularly intriguing because exposure to messages associating condoms with disease prevention—a link critical to intention-driven behavior within the deliberative system—could cause condoms to evoke paradoxically *negative* emotional associations (because of the consequences of disease) in the impulsive system (Strack & Deutsch, 2004). Because the impulsive system works on a quick, automatic basis, often every aspect of meaning but the most salient one is not perceived. For example, in the deliberative system, individuals may consciously realize that using condoms prevents disease (condoms = "not" disease). Strack and Deutsch argue that the "not" portion of the association is likely to be higher order, and, as such, may not be considered in the more impulsive, implicit assessment of condom associations. In the current study, we also assessed participants' associations between condoms and sexually exciting images. This latter measure was designed to determine whether condoms were readily linked to positive emotions associated with sex.

In the current study we hypothesized that individuals' implicit condom associations would explain variability in condom use behavior. Because past research has not fully explicated the differences in impulsivity with casual and steady sexual partners (nor looked at such

differences in higher risk samples), we examined condom use with both partner types to examine whether for a higher risk community sample, implicit measures would predict condom use behavior differently as a function of partner type. We also hypothesized that individuals' implicit condom associations would be more likely than explicit attitudes to predict condom use during sexual encounters occurring under the influence of alcohol or drugs. Again, in such encounters, the cognitive capacity needed for the engagement of the deliberative system is likely to be somewhat reduced.

METHOD

Participants

Participants were 30 individuals (26 males, average age = 29.8, range 18-53), recruited from the lobby of an HIV-testing clinic in a large city. Five participants self-identified as bisexual (4 males, 1 female), 17 males indicated that they only have sex with men, 7 participants were heterosexual (5 males, 2 females), and 1 female did not provide sexual orientation. Three participants were African American, 20 were White, 4 were Hispanic, 1 was Native American, 1 identified as "multiple ethnicities," and 1 did not specify ethnicity.

Measures

Participants completed two implicit measures that assessed associations between condoms and positive or negative stimuli. All images were 480 X 360 pixel color images (19 X 15 cm) presented against a black background on a computer screen. Many of the images have been used and normed in previous research (e.g., Marsh et al., 2001).

Associative priming task

The first implicit measure stems from a priming methodology that allows assessment of the extent to which pregnancy- or disease-related primes facilitate or inhibit categorization of condoms. This methodology, explained more fully below, assesses whether condoms are implicitly associated with disease. If condoms are associated with disease, participants should more quickly categorize condoms when preceded by disease-related primes. In addition, condom categorization after nature images provides a baseline assessment of individual's general categorization speed during the priming trials, for use in response latency analyses.

The priming task was a modified version of the procedure typically used to examine automatic associations between attitude objects and positive or negative stimuli by measuring how rapidly individuals categorize stimuli (Fazio, Sanbonmatsu, Powell, & Kardes, 1986). In our measures, we assessed the extent to which pregnancy and disease-related stimuli were associated with condoms.

Prior to the key priming trials, participants practiced categorizing 5 condom images as well as 5 stimuli from each of three filler categories: insects, flowers, and markers. In pilot testing, participants rated the stimuli on positivity or negativity so that equal numbers of positive and negative stimuli could be presented in this study. To complete the practice trials, participants categorized stimuli as belonging in a "store" (condoms and markers) or a "garden" (insects and flowers) by pressing the "z" and "m" keys on a keyboard. Participants were asked to respond to

the target image as quickly as possible without making too many errors. These initial trials allow participants to become used to the categorization task and instructions. Each stimulus was presented twice in randomized order for a total of 40 practice trials.

After the practice block, participants completed the critical priming trials. As before, participants categorized condoms (and control stimuli) but this time, target images were preceded by one of 40 primes presented at random, including 10 pregnancy (e.g. high-chair, babies crying, messy diaper), 10 disease (e.g. cemetery, person on life-support in a hospital bed), and 20 nature (e.g., mountains, trees) images. The nature-oriented primes served as a control category for comparative purposes. In order to mask the purpose of the priming task, condoms were presented as target images in only one fourth of the 160 critical priming trials: 10 pregnancy association trials, 10 disease association trials, and 20 control (nature) trials. Prior research has demonstrated that if participants realize what associations are being measured, they may reduce their categorization speed in an attempt to respond in a more socially desirable manner (see discussion on the "fakeability" of the IAT in Nosek, Greenwald, & Banaji, in press), thereby reducing the likelihood that automatic associations between concepts are truly assessed. As such, we embedded the target stimuli of interest, condoms, among many other types of target stimuli in an attempt to keep the purpose of the priming task hidden.

During each trial, participants were instructed to focus attention on an orienting stimulus (+) that remained in the center of the screen for 2500 milliseconds. Participants were then told that once the orienting stimulus disappeared, an image would appear on the screen. Participants were instructed to ignore the image, which was a pregnancy-, disease-, or control (nature) related prime that remained on the screen for 315 milliseconds. The prime was then masked for 100 milliseconds before a to-be-categorized target image appeared. The target image remained on the screen until the participant responded or the trial timed out (2500 milliseconds). After the

participant's response, the orienting stimulus (+) reappeared in the center of the screen for 2500 milliseconds, signifying the start of the next trial.

Implicit association test

The second implicit association measure used in this study was an Implicit Association Test (IAT), first proposed by Greenwald, McGhee, and Schwartz (1998). The purpose of the IAT is to indirectly assess the associative strength among concepts during blocks of trials in which participants categorize stimuli belonging to one of four categories using two response keys. Two categories are identified by each response key. The logic of the IAT is that when concepts are strongly associated and are paired on the same response key, the categorization task is easier (and therefore, faster response times are recorded) than when two weakly associated concepts are paired on the same response key (thus, slower response times are recorded).

We used the IAT to assess associations between sexy images of couples (matched to participants' sexual orientation and ethnicity) and condoms. There were 40 trials in each of two critical blocks. These critical blocks were preceded by practice blocks. During one critical block, the categories of "condoms" and "people" were paired on the same key (and the control categories of "pill" and "cartoon" were paired on the other key). The other critical block paired condoms and cartoon images on the same key (with "pills" and "people" paired on the other key). The difference in response time on the two critical blocks is used to calculate implicit condom attitudes.

Critical block order and the keys associated with each category were counterbalanced across participants. Within each block, stimulus presentation order was randomized. Immediately after the individual responded, the next stimulus picture appeared.

Explicit condom attitude measures

Various self-report items were assessed at the conclusion of the implicit measures.

Participants' attitudes toward condom use with both steady and casual partners were assessed using four semantic differential items for each partner type.

Risky sexual behavior

Participants also reported the percentage of time they were under the influence of alcohol or drugs while having sex over the last three months. We also assessed condom use under the influence of alcohol or drugs over the last three months. If participants had not had a sexual encounter in the last three months, they chose "Does not apply: I have not had sex in the last 3 months" for both items.

Condom use and intentions

Participants self-reported their steady and casual partner condom use intentions. Participants also indicated levels of actual condom use with steady and casual partners over the last three months. As before, if participants had not had a sexual encounter in the last three months with the type of partner specified, they chose "Does not apply: I have not had sex with a steady / casual partner in the last 3 months."

Demographics

Participants also provided gender, sexual orientation, age, and ethnicity.

Procedure

Participants were recruited for a study about "how people categorize words and pictures" after their HIV test was completed. When this study was conducted, this particular clinic was not using rapid result testing, so participants did not know their results until one week later. Participants were told that the study included some questionnaire measures that would help researchers design future HIV interventions. If the participant agreed to participate, they were introduced to the research assistants, and the study procedures were explained to them. Participants completed all measures via a laptop computer, alone in a separate, enclosed room of

the HIV-testing clinic. The research assistants were available to assist if clarification was needed. Afterwards, the research assistant thanked participants and provided $10 compensation.

RESULTS

Calculation of Implicit Effects

Priming scores and IAT effects were calculated using standard procedures (e.g., Brendl, Markman, & Messner, 2001; Greenwald et al., 1998; Rudman, Greenwald, Mellott, & Schwartz, 1999). Higher values on the priming task indicate that participants categorized condoms more quickly after disease (or pregnancy) primes relative to control primes, implying stronger associations between disease or pregnancy and condoms than on the control trials (nature and condoms). Larger values on the IAT indicate that participants associated condoms and sexy images more readily than condoms and cartoon characters, indicating stronger associations between condoms and sex.

Correlations

Initially, we correlated the key study variables and found that, consistent with prior research, the IAT score (assessing sex and condom associations) was not correlated with the priming measures (see Marsh et al., 2001, 2005). Explicit steady partner condom attitudes were associated with future steady partner condom use intentions ($r = .66$, $p < .02$); a similar correlation, though only marginally significant, was found between casual partner condom use attitudes and intentions ($r = .32$, $p < .10$). Also, future condom use intentions were significantly correlated with condom use over the last three months ($r = .48$, $p < .04$ for steady partners and $r = .46$, $p < .05$ for casual partners).

Steady Partner Condom Use

To explore whether implicit condom associations and explicit attitudes would predict steady partner condom use, we conducted hierarchical regression analyses. We first entered

explicit steady partner condom use attitudes. The second step included the Sex-Condom IAT score or, alternatively, the pregnancy- and disease-related scores from the priming measure.

As Table 1 indicates, the relation between explicit steady partner condom use attitudes and behavior was of moderate size (zero-order *r* of .32, Table 1 Step 1). In Step 2, the Sex-Condom IAT score was added as a predictor of steady partner condom use. In this regression, explicit attitudes were only a marginally reliable predictor of steady partner condom use (see Table 1, IAT Alternative Model, Step 2). As in Step 1, participants with more positive explicit attitudes reported more steady partner condom use. Responses on the IAT also predicted steady partner condom use; the increase in the percentage of variability accounted for was significant when the IAT score was added to the model (R^2 change of .228). The more participants implicitly associated condoms with sexy images, the more they reported steady partner condom use.

As an alternative Step 2 regression model, we added the priming measures to the explicit attitude model (shown in Step 1). This time, the change in variability accounted for from Step 1 to Step 2 was nonsignificant, and the overall fit of the model was not as good. Both the pregnancy and disease-related priming measures were only marginal predictors of steady partner condom use. More specifically, for individuals with stronger condom-pregnancy associations, steady partner condom use tended to be higher. In contrast, when disease-related primes led to faster categorization of condoms, steady partner condom use tended to be lower (see Step 2 Priming Alternative Model, Table 1). (For exploratory purposes, we also added the priming measures into the IAT Alternative Model; neither priming measure achieved statistical significance in that model.)

Casual Partner Condom Use

We next examined the links between explicit casual partner condom use attitudes,

implicit condom associations, and condom use with casual partners. As Table 2 indicates, explicit casual partner condom attitudes predicted condom use with casual partners (zero-order *r* of .48, Table 2 Step 1). In contrast to the results for steady partner condom use, positive sexual associations with condoms as measured by the Sex-Condom IAT score did not predict casual partner condom use (see Table 2 Step 2: IAT Alternative Model). As before, we then examined the contribution of the implicit priming measures to the prediction of casual partner condom use (see Table 2 Step 2: Priming Alternative Model). In this model, the condom-disease associations, as assessed by the priming measures, contributed significantly to the prediction of casual partner condom use beyond explicit attitudes (R^2 change of .230). More specifically, the more images of disease facilitated the categorization of condoms, the less participants reported using condoms with casual sex partners. (For exploratory purposes, we added the Sex-Condom IAT score into this model to determine whether it would become a significant predictor, but it did not.)

Condom Use Under the Influence

We also investigated whether explicit attitudes and implicit condom associations would predict condom use under the influence of alcohol or drugs. We hypothesized that, because alcohol or drugs undercut deliberative processing, condom use under the influence of alcohol or drugs should be predicted by implicit condom associations. Because we did not ask about condom use under the influence of alcohol or drugs with a specific partner type, it was not clear whether explicit attitudes toward condom use with steady or casual partners were a more logical predictor of this outcome. Zero-order correlations indicated that the casual partner condom attitude was not a moderate-sized predictor of condom use under the influence (r = .08, p = .73) but that steady partner condom attitude was at least marginally related (r = .35, p = .10). Thus, the steady partner condom use attitude was used in the regression analyses.

As before, we conducted two hierarchical regressions. As Table 3 indicates, the Sex-

Condom IAT score marginally predicted condom use under the influence of alcohol or drugs. The more individuals associated condoms with sexy images, the more likely they were to use condoms when under the influence of alcohol or drugs. More importantly, the overall amount of variability explained was marginally improved once the IAT was added to the model (R^2 change = .142). The implicit priming measures did not predict condom use under the influence.

DISCUSSION

This study examined the previously unexplored role of impulsive attitudinal processes in the condom use behavior of community members at risk of acquiring HIV. Moreover, this is the first study to examine more nuanced, implicit condom associations instead of globally positive and negative emotional reactions. In this study, we assessed the relative contributions of both implicit and explicit attitude measures in predicting condom use with steady partners, casual partners, and while under the influence of drugs or alcohol.

As predicted, explicit condom attitude measures predicted condom use with steady partners. The more individuals explicitly endorsed condoms, the more they used condoms with steady partners. In addition, sexual associations with condoms, as assessed by the IAT, also contributed to the prediction of steady partner condom use. As participants more closely associated condoms with sexy images, they reported more condom use with steady partners. In summary, the model containing both explicit condom attitudes and implicit sexual associations with condoms explained a more significant amount of the variance in steady partner condom use than did explicit condom attitudes alone. Interestingly, these results contradict our previous findings in two college samples. In the college samples, intention-based, explicit attitudes, along with past behavior were the sole predictors of steady partner condom use (Marsh et al., 2006). The current results suggest that the influence of the impulsive system on condom use with steady partners needs more careful attention since implicit associations influences steady partner

condom use differently depending on samples or measurement context (cf., Czopp, 2004).

In contrast, the results for casual partner condom use are more consistent with past research. Explicit condom attitude measures also predicted condom use with casual partners; the more individuals explicitly endorsed condoms, the more they used condoms with casual partners. Implicit condom-disease associations also significantly predicted condom use with casual partners. When disease-related primes facilitated condom categorization, participants reported *less* condom use with casual partners. This result becomes intuitive in light of Strack and Deutsch's (2004) model, which explains that the "not" part of associations is learned in the deliberative system (such as "condom use leads to not-disease"). When concepts are retrieved by the impulsive system, the "not" part of these associations is dropped; hence, condoms become linked to disease. In summary, the model containing both explicit condom attitudes and implicit condom-disease associations explained a more significant amount of the variance in casual partner condom use than did explicit condom attitudes alone.

Unfortunately, positive implicit associations between sex and condoms did not significantly predict casual partner condom use. However, the model containing both explicit condom attitudes and implicit sexual associations with condoms predicted behavior that has arguably the strongest impulsive-system activation: condom use under the influence of alcohol or drugs. This joint explicit-implicit model explained a more significant amount of the variance in condom use under the influence of alcohol or drugs than did explicit condom attitudes alone. Overall, the more participants implicitly associated condoms with sexy images and explicitly endorsed condom use, the greater their tendency was to use condoms while under the influence of alcohol or drugs.

Taken as a whole, the results from this study indicate that, in people seeking HIV-testing, implicit condom associations are critical predictors of condom use behavior with both steady and

casual partners, but few researchers and interventionists have considered these more impulsive, underlying constructs. More specifically, positive implicit associations with condoms (i.e., condoms associated with sexy images) seem to facilitate condom use, especially with steady partners, but negative implicit associations with condoms (i.e., condoms associated with disease) hinder condom use, especially with casual partners. These results are informative for future HIV-related interventions. It is, of course, impossible and undesirable to change the message that condoms prevent disease, particularly since this is presumably the reason individuals normally use condoms more often with casual than with steady partners (e.g., Misovich, Fisher, & Fisher, 1997). However, in circumstances where there is low motivation or ability to engage in deliberative processing and so the deliberative system is substantially undercut, having implicit associations that are *solely* based on disease prevention may be quite costly. In fact, a recent meta-analysis provides direct evidence that fear-based interventions (which are often based upon associating a lack of condom use with disease) are relatively unsuccessful at increasing condom use (Albarracín, Gillette, Earl, Glasman, Durantini & Ho, in press). Presumably, individuals exposed to these interventions implicitly associated condoms more with the negative concept of sexually transmitted diseases like HIV (and less with positive outcomes) and as a result, condom use was influenced accordingly.

Our results strongly concur with the emphasis of current models (e.g., Fisher & Fisher, 1992, 2000) on behavioral skills training and experiences. Behavioral skills experiences are important because familiarity and direct (positive) experience with condoms should yield more automatically accessible (Fazio & Zanna, 1981) positive condom associations. Moreover, our results also argue for intervention components that bolster specific positive associations with condoms. This claim is supported by a recent meta-analysis which found that interventions with condom eroticization components successfully increased condom use (Scott-Sheldon & Johnson,

2006). This synthesis also reported that such positive association-building interventions are surprisingly underutilized.

The eroticization of condoms is not the only possible positive condom associations that might be heightened. For example, individuals who associate condoms more readily with facial expressions indicating approval rather than facial expressions indicating disgust or anger might use condoms more consistently. Likewise, when condoms automatically evoke health-affirmation constructs, such positive associations at the impulsive level might be sufficient to overcome the negative emotions involved with necessarily linking condoms to disease prevention at the level of the deliberative system.

After decades of fruitful research using deliberate, explicit attitudes to promote HIV prevention, it appears time for the inclusion of more automatic, affective, implicit associations in models of HIV prevention. The current results suggest that considering implicit condom associations may be a promising way to sharpen our thinking about the effects of HIV interventions. Using implicit condom associations to explain additional variability in condom use behavior with both steady and casual partners may well be a key component in slowing the HIV epidemic.

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Table 1

Predicting Steady Partner Condom Use with Explicit and Implicit Attitude Measures

	β	t	p	R^2	R^2 Change
Step 1				.105	--
Explicit Attitude Measure	0.323	1.410	.177		
Step 2: IAT Alternative Model				.333	.228**
Explicit Attitude Measure	0.407	1.964	.067		
Sex-Condom IAT Score	0.485	2.339	.033		
Step 2: Priming Alternative Model				.284	.179
Explicit Attitude Measure	0.199	0.861	.403		
Pregnancy Facilitation Score	0.819	1.880	.080		
Disease Facilitation Score	-0.787	-1.853	.084		

Note. Higher scores on all measures mean more positive attitudes, stronger associations, and more condom use. N = 30. **Change in R^2 between Step 1 and Step 2 was significant, $p < .05$.

Table 2

Predicting Casual Partner Condom Use with Explicit and Implicit Attitude Measures

	β	t	p	R^2	R^2 Change
Step 1				.229	--
Explicit Attitude Measure	0.478	2.178	.045		
Step 2: IAT Alternative Model				.274	.045
Explicit Attitude Measure	0.442	1.979	.066		
Sex-Condom IAT Score	0.215	0.963	.351		
Step 2: Priming Alternative Model				.459	.230*
Explicit Attitude Measure	0.445	2.106	.054		
Pregnancy Facilitation Score	0.558	1.469	.164		
Disease Facilitation Score	-0.839	-2.300	.037		

Note. Higher scores on all measures mean more positive attitudes, stronger associations, and more condom use. N = 18. *Change in R^2 between Step 1 and Step 2 was marginally significant, $p < .08$.

Table 3

Predicting Condom Use Under the Influence with Explicit and Implicit Attitude Measures

	β	t	p	R^2	R^2 Change
Step 1					
				.125	--
Explicit Attitude Measure: Steady Partner	0.354	1.693	.106		
Step 2: IAT Alternative Model					
				.267	.142*
Explicit Attitude Measure: Steady Partner	0.414	2.082	.051		
Sex-Condom IAT Score	0.381	1.916	.070		
Step 2: Priming Alternative Model					
				.200	.075
Explicit Attitude Measure: Steady Partner	0.267	1.167	.258		
Pregnancy Facilitation Score	0.404	1.043	.311		
Disease Facilitation Score	-0.485	-1.296	.211		

Note. Higher scores on all measures mean more positive attitudes, stronger associations, and more condom use. N = 26. *Change in R^2 between Step 1 and Step 2 was marginally significant, $p < .08$.