

Implicit Hopelessness and Condom Use Frequency: Exploring Nonconscious Predictors of Sexual Risk Behavior¹

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Current models of affect and health posit that affective disturbance influences health through behavioral pathways. The current research explores this hypothesis in the domain of sexual risk behavior by testing explicit and implicit hopelessness as predictors of condom use. Male and female undergraduates ($n = 60$) completed implicit and explicit measures of depression, hopelessness, and self-reported condom use frequency. Findings revealed that implicit hopelessness predicted less condom use. However, this relationship was moderated by gender such that implicit hopelessness predicted less condom use for men, but not for women. The applicability of the findings to broader health theories is discussed.

Theorists have posited many models to explain the adoption of preventive health behaviors (e.g., health belief model: Becker & Rosenstock, 1984; subjective expected utility theory: Edwards, 1954; protection motivation theory: Maddux & Rogers, 1983; theory of reasoned action: Ajzen & Fishbein, 1980). Most theories of health behavior assume a rational process in the initiation of health behavior that is marked by a consideration of behavioral options, as well as an evaluation of the consequences or outcomes of those options (Gibbons, Gerrard, Blanton, & Russell, 1998). These social cognition models most often emphasize conscious cognitive factors because of their role in proximally determining social behavior, as well as mediating the relationship among a multitude of other variables (e.g., race, social class) and behavior (Conner & Norman, 2003). While these theories have demonstrated success in predicting a wide variety of health behaviors, they are especially useful in predicting goal-oriented, health-promoting behaviors (e.g., dieting, exercise, health screening) that fit well within a rational framework (Gibbons et al., 1998). Accordingly, researchers using these models have experienced difficulty in predicting health-compromising behavior (e.g., sexual risk behavior) because of the premise of rational forethought that

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underlies each of the models (Gibbons et al., 1998). Consequently, social cognition models have been criticized for focusing too closely on rational decision making alone (e.g., Ingham, 1994), especially within the context of behaviors that impair one's health or well-being (e.g., having sex without a condom; Gibbons et al., 1998).

More recently, psychologists have acknowledged the limits of consciousness and rationality in predicting behavior and, thus, have become increasingly interested in nonconscious influences on behavior (Nosek, Greenwald, & Banaji, 2006). Although less widely known, the study of implicit processes and theories in health represents a rapidly growing field because researchers recognize that implicit processes may fill a gap in previous health theories that rely on explicit assessment of constructs thought to predict health behavior (Krank & Swift, 1994; Nosek et al., 2006; Stacy, 1997). *Explicit measures* refer to self-reported attitudes and accounts of behavior, while *implicit measures* are those measurement techniques that avoid directly asking participants for information (Fazio & Olson, 2003). Unlike explicit measures, implicit measures can reveal traces of past experience that people are unwilling to communicate when directly asked for a verbal report (Fazio & Olson, 2003; Nosek et al., 2006). Moreover, implicit measures can unveil information that is not available to introspective access, even if people were motivated to retrieve and express it (Nosek et al., 2006). Thus, exploring the role of implicit cognition (i.e., thoughts and feelings that exist outside of conscious awareness or conscious control) can extend our understanding of the processes implicated in health behavior both by circumventing social desirability issues and by uncovering information that is unavailable to introspective access (Nosek et al., 2006).

Within the context of health behavior, nonconscious influences have been identified in health behavior and risk behavior, such as substance abuse, obesity, smoking, and sexual behavior. For example, Stacy (1995, 1997) identified memory activation (e.g., drug-related memory associations) as a predictor of alcohol and marijuana use. Roefs and Jansen (2002) found that obese people are characterized by a significantly stronger implicit negative attitude toward high-fat foods than are normal-weight controls. Swanson, Rudman, and Greenwald (2001) evidenced significant differences between smokers and nonsmokers in automatic associations regarding the valence of smoking and the degree to which smoking was associated with the self, relative to others. In the domain of sexual risk behavior, Stacy, Newcomb, and Ames (2000) established a relationship between implicit sexual cognitions (i.e., sex-related memory associations) and condom use.

In addition to examining nonconscious predictors, investigating the effects of affective disturbance extends beyond the limits of presuming rationality while predicting health behavior (Armitage, Conner, & Norman,

1999). Extant models of affect and health posit that affective disturbance (e.g., depression, hopelessness) influences health through behavioral pathways (e.g., health behavior; Cohen & Rodriguez, 1995). In addition to a direct effect on behavioral pathways, affective disturbance also influences cognitive pathways (e.g., interpretation of symptoms and health decision processes) that, in turn, influence behavioral pathways in ways that may encourage or discourage health behavior (Cohen & Rodriguez, 1995). For example, explicit assessments of affective disturbances generally, and depressive symptoms more specifically, have been linked to higher incidence rates of unhealthy behaviors (e.g., sedentary lifestyle, smoking, overeating; Goodman & Whitaker, 2002; Rosal et al., 2001).

The present research aims to extend this previous work by exploring the role of implicit (nonconscious) and explicit (conscious) affective disturbance (i.e., depression and hopelessness) in men's and women's proclivity toward condom use. Both general depressive symptoms and the more specific symptom of hopeless expectations regarding the future will be explored. Because these expectations can function automatically, hopelessness will be explored both nonconsciously and consciously. This study represents the first preliminary test of the link between implicit hopelessness and condom use.

Hopelessness and Sexual Risk Behavior

Hopeless expectations concerning the future are a fundamental component of depression. In Beck's (1967) model of depression, there are three components that are theorized to contribute to depressed mood and the other affective and motivational correlates of depression: negative view of the self, of the world, and of the future. According to Abramson, Metalsky, and Alloy (1989), *hopelessness* refers to the expectation that "highly desired outcomes will not occur or that highly aversive outcomes will occur and that no response in one's repertoire will change the likelihood of the occurrence of these outcomes" (p. 359). Hopeless expectations regarding the future are especially salient in the decision to engage in health behaviors in that an individual is unlikely to engage in a behavior if he or she does not have a hopeful outlook regarding the future, as people's health behaviors are tied to future outcomes. When an event becomes inevitable (e.g., a negative future), then it also becomes counterintuitive to expend effort or engage in behavior that may prevent the undesired outcome.

In a more general sense, if an individual has a pessimistic view concerning his or her future, he or she may not engage in behaviors to protect that future. Bolland (2003) examined the role of explicit hopelessness in health behavior by testing whether adolescents living in the inner city react to their futures by

abandoning hope and subsequently engaging in high levels of risk behavior. Bolland found that almost 50% of boys and 25% of girls had moderate or severe feelings of hopelessness. Moreover, explicit hopelessness predicted violent and aggressive behavior, substance use, accidental injury, and, importantly, sexual behavior.

With the exception of Bolland (2003), few studies have examined the link between hopelessness and risk behavior. However, several studies examining explicit depression have suggested that depression is tied to risk behaviors such that more depressive symptoms predict more risk behavior (Allgower, Wardle, & Steptoe, 2001; Brooks, Harris, Thrall, & Woods, 2002; Yarcheski, Mahon, & Yarcheski, 2004). More specifically, depression has been linked to sexual risk behavior, such as choosing risky partners and infrequent condom use (Brown et al., 2006; Mazzaferro et al., 2006; Rohde, Noell, Ochs, & Seeley, 2001; Shrier, Harris, Sternberg, & Beardslee, 2001; Stiffman, Dore, Earls, & Cunningham, 1992). Shrier and colleagues (2001) found that young men's, but not young women's, explicit depression predicted infrequent condom use.

Implicit Hopelessness

Previous work has found that some people have an automatic tendency for hopelessness (Andersen, Spielman, & Bargh, 1992). Accordingly, we propose that hopelessness may operate at a nonconscious level to affect condom use. Moreover, automatic associations may help explain health behaviors that are not well represented by health theories that rely on rational decision processes (Stacy, 1995, 1997). Thus, we believe that an implicit measure of hopelessness will be a more sensitive predictor of sexual health behavior (i.e., condom use).

Although there has been extensive research on the role of explicit perceptions related to sexual health behavior (for a meta-analysis, see Albarracin, Johnson, Fishbein, & Muellerleile, 2001; Basen-Engquist, 1992), there has been markedly less research on nonconscious influences on sexual health behavior. Marsh, Johnson, and Scott-Sheldon (2001) examined implicit and explicit attitudinal predictors of sexual behavior. Interestingly, explicit measures (i.e., target-specific attitude measures and affective attitude measures) predicted condom use with committed partners; while implicit measures (i.e., Implicit Association Test or IAT; Greenwald, McGhee, & Schwartz, 1998), assessing the automatic association of condom images with "good" compared to non-condom objects with "bad" predicted condom use with casual partners (Marsh et al., 2001).

Czopp, Monteith, Zimmerman, and Lynam (2004) reported similar results when using vignettes indicative of either a high-cue or a low-cue

situation to test whether explicit or implicit attitudes are predictive of condom use. In the high-cue situation, participants listened to a scenario in which he or she flirts with a coworker at a bar for several hours before going to his or her apartment for a drink and, eventually, sex. In the low-cue situation, participants listened to a scenario in which he or she goes to dinner and a movie with a girlfriend or boyfriend of 8 months before going to his or her apartment for a drink and, eventually, sex. Czopp and colleagues (2004) found that implicit attitudes toward condoms predicted condom use in the low-cue situation, while explicit attitudes toward condoms predicted condom use in the high-cue situation. Taken together, these studies suggest that implicit attitudes may be predictive of condom use, especially in situations in which deliberate and rational thought is not primed, which may be characteristic of most sexual behavior (Stacy et al., 2000).

The Present Study

Because sexual activity is often spontaneous, rather than planned (Brooks-Gunn & Furstenberg, 1989; Brown, DiClemente, & Reynolds, 1991; Loewenstein & Furstenberg, 1991), rational models of health behavior may overlook perceptions that are predictive of condom use. Accordingly, the present study seeks to examine perceptions related to the future as predictors of condom use. More specifically, we will evaluate the association between implicit and explicit assessments of hopelessness and condom use, while controlling for implicit and explicit depressive symptoms. We hypothesize that implicit hopelessness will predict condom use.

Method

Participants

Study participants were 60 undergraduates (22 male, 38 female) from a university participant pool. They received course credit for their participation. Participants ranged in age from 17 to 27 years, with a mean age of almost 18.9 years ($SD = 1.9$). With regard to ethnicity, 67% of the sample identified themselves as Caucasian, 12% as Hispanic/Latin American, 8% as Black/African American, 8% as Asian, and 5% as "Other." All of the participants had engaged in sexual intercourse during the past year, and 62% ($n = 37$) had used a condom the last time that they had sex (i.e., responded *Yes* to "Did you use a condom the last time you had sexual intercourse?"). Participants were mostly dating one person exclusively at the time of the study ($n = 37$; 62%).

Materials

Implicit Measures

The IAT (Greenwald et al., 1998) utilizes differences in response latency to assess automatic associations. This computer task is based on the premise that the strength of the association between two concepts will be reflected in the ease of responding to exemplars of both concepts when responses are mapped onto the same key press (e.g., responding to an example of a flower and an example of a pleasant word by pressing the “;” key). In the task, facilitation is indexed by response latency, or the speed that the exemplars can be sorted into their respective categories. The faster the categorization is made, the stronger is the association between the concepts.

Take the example of a practice IAT developed by Greenwald et al. (1998), assessing implicit attitudes toward flowers, relative to insects. During the IAT, the participant is seated at a computer and places one finger from his or her left hand on the “A” key and one finger from his or her right hand on the “;” key. There are practice blocks for the participant to become comfortable with the task and critical blocks to collect data. In the critical blocks, the two keys (i.e., “A” and “;”) each correspond to two concepts (i.e., there are exemplars from four concepts that must be categorized to one of two keys). For example, in one block, the “A” key corresponds to the categories *flower* and *good*, while the “;” key corresponds to the categories *insect* and *bad*. Exemplars of each of the four categories (e.g., *flower*: daffodil, rose; *good*: sunshine, paradise; *insect*: cricket, bug; *bad*: evil, war) appear one at a time in the middle of the screen. The participant must categorize the exemplars as quickly and as accurately as possible.

In a second critical block, the task is the same, but the pairing of the categories has changed such that the “A” key corresponds to *flower* and *bad*, while the “;” key corresponds to *insect* and *good*. Again, participants must categorize exemplars as quickly and as accurately as possible. In the aforementioned example, most participants would categorize the exemplars more quickly when *flower* and *good*, and *insect* and *bad* were mapped onto the same key press than when the reverse pairings existed. A difference score of the average response latencies in the two blocks would reflect stronger automatic associations between *flower* and *good*, and between *insect* and *bad*, which would be interpreted as an automatic preference for flower over insect. For the present study, we used an IAT created by Friedman, Nosek, Miller, Gordon, and Banaji (2004) to measure implicit hopelessness and depression.

Implicit hopelessness. Hopelessness is characterized as an association of the future with negative meaning (Friedman et al., 2004). To measure this construct implicitly, the concepts *future* and *past* were categorized with the

evaluations *sad* and *happy*. Participants were said to display implicit hopelessness to the extent that the association of *future* with *sad* was stronger than the association of *future* with *happy*. The observed scores reflect negative associations with the future, relative to negative associations with the past. That is, a difference score is created by subtracting response latency on the compatible task (e.g., pairing of *past* with *sad*, and *future* with *happy*) from response latency on the noncompatible task (e.g., pairing of *future* with *sad*, and *past* with *happy*). Thus, positive milliseconds represent faster performance on the compatible task, while negative milliseconds represent faster performance on the noncompatible task. This ensures that implicit hopelessness is not encompassed by negative views of the past and future, but negative views of the future that are above and beyond negative views of the past (for a list of exemplars, see Appendix A).

Implicit depression. Depression is characterized as an association of the self with sadness (Friedman et al., 2004). To measure this construct implicitly, the concepts *self* and *other* were categorized with the evaluations *sad* and *happy*. Stronger associations of the *self* with *sad*—compared to the *self* with *happy*—were interpreted as an indicator of implicit depression (for a list of exemplars, see Appendix B).

Explicit Measures

Hopelessness. Hopelessness was measured with the Life Orientation Test–Revised (LOT-R; Scheier, Carver, & Bridges, 1994), which assesses pessimistic–optimistic orientations. The LOT is a six-item self-report measure (along with four filler items) assessing generalized expectancies for positive versus negative outcomes. Of the six scored items, three are worded in a positive direction (e.g., “In uncertain times, I usually expect the best”) and three items are worded in a negative direction (e.g., “I hardly ever expect things to go my way”). Items worded in a positive direction were reverse-scored such that higher scores indicate greater hopelessness. Responses were rated on a 5-point scale ranging from 0 (*strongly disagree*) to 4 (*strongly agree*). In the present study, the LOT-R demonstrated good internal consistency ($\alpha = .84$).

Depressive symptoms. The Beck Depression Inventory (BDI; Beck, 1967) was administered to assess depressive symptoms. The BDI is a 21-item, self-report designed to rate characteristic attitudes and symptoms of depression. It includes items related to sadness, pessimism, sense of failure, dissatisfaction, and dislike of self. Participants indicate the level of each item corresponding to how they have been feeling the past week. Responses were rated on a 4-point scale ranging from 0 to 3, with higher scores indicating

stronger symptoms of depression. For example, the item related to sadness is comprised of four statements: 0 = *I do not feel sad*; 1 = *I feel sad*; 2 = *I am sad all the time and can't snap out of it*; and 3 = *I am so sad or unhappy that I can't stand it*. Internal consistency for the BDI has ranged from .73 to .92, with a mean of .86 (Beck, Steer, & Garbin, 1988). In the present study, the BDI demonstrated good internal consistency ($\alpha = .87$).

Condom use frequency. Condom use frequency was assessed with a single item (i.e., "Over the past year, of all the times you had sexual intercourse, how often did you use condoms?"). Responses were rated on a 9-point scale ranging from 0 (*never*) to 8 (*always*; adapted from Ross & Schumacher, 2004). In previous research, the condom use item demonstrated adequate test-retest reliability ($r = .62$; D. Ross, personal communication, April 25, 2007).

Demographics. A demographic questionnaire ascertained basic information (e.g., participant's age, sex, class year, race/ethnicity). Based on work suggesting that implicit attitudes might be a better predictor for casual sexual partners (Czopp et al., 2004; Marsh et al., 2001), we also assessed relationship status in the demographic questionnaire.

Procedure

Participants were recruited from introductory psychology classes at a large, public university. Participants were required to take part in research as a component of their course obligations. Thus, participants received course credit for their participation.

Upon arriving at the study site, participants were greeted and were asked to take two copies of a consent form. Following the informed consent procedure, participants were led to a computer for the implicit measures (Inquisit, 2006). The procedural design and data analysis of the implicit measures followed the standard format for the IAT outlined by Greenwald et al. (1998). The order of the two implicit tests, the order of the critical tasks within each test, and the order of the stimuli within each task were randomized across participants (Friedman et al., 2004). Instructions were given to participants to respond both as quickly and as accurately as possible during the IATs.

After the completion of the IATs, participants were given the packet of study questionnaires to complete. After participants turned in their completed questionnaires, they were given a debriefing statement detailing the specific hypotheses being tested and experimental methods used. Administration of the implicit and explicit measures took approximately 60 min to complete.

Results

Following the procedure outlined by Greenwald, Nosek, and Banaji (2003), the D statistic was computed, which has been shown to outperform the conventional scoring procedure (Greenwald et al., 2003; Nosek et al., 2006). The D statistic eliminates trials with latencies that are greater than 10,000 ms and eliminates participants with latencies that are less than 300 ms for more than 10% of the trials (Nosek et al., 2006). To adjust differences between means for the effect of underlying variability, the D statistic divides the difference between test block means by the standard deviation of all the latencies in the two test blocks (Greenwald et al., 2003).

Descriptive statistics for the implicit measures, psychological well-being, and condom use are presented in Table 1. Overall, participants showed happy associations with the future, relative to the past, on the measure of implicit hopelessness (i.e., implicit hopefulness). Likewise, participants showed happy associations with the self, relative to others, on the measure of implicit depression.

Table 2 shows bivariate correlations for the main variables of interest. To explore the hypothesis that implicit hopelessness may be a unique, independent predictor of condom use, we examined the correlations between implicit hopelessness and condom use. As expected, we found a significant correlation between implicit hopelessness and condom use. No correlation was found for implicit depression and condom use or any other of the explicit measures of psychological well-being (e.g., depression, hopelessness) and condom use.

To explore whether gender moderated these results and whether the relationship between implicit hopelessness and condom use persisted while

Table 1

Descriptive Statistics

Variable	M	SD	Range	Possible range
Implicit hopefulness (D)	0.41	0.29	-0.32-1.13	—
Implicit hopefulness (ms)	304.01	224.90	-517.80-831.89	—
Implicit depression (D)	0.25	0.17	-0.15-0.75	—
Implicit depression (ms)	196.62	123.92	-81.81-556.67	—
Hopelessness	8.98	4.20	1.00-18.00	0.00-24.00
Depression	7.00	6.30	0.00-39.00	0.00-66.00
Condom use	5.70	2.45	0.00-8.00	0.00-8.00

Table 2

Pearson Correlation Coefficients Among Main Study Variables

Variable	1	2	3	4	5	6	7
1. Age	—						
2. Gender	.14	—					
3. Relationship status	.06	-.10	—				
4. Implicit hopelessness (<i>D</i>)	.13	-.34**	.07	—			
5. Implicit depression (<i>D</i>)	.11	-.01	.04	.15	—		
6. Hopelessness	-.03	-.45**	-.06	.14	.05	—	
7. Depression	-.06	-.35**	.15	.19	-.09	.59**	—
8. Condom use	-.21	.11	.02	-.34**	-.17	-.18	-.08

***p* < .01.

controlling for demographic variables (e.g., age) and explicit assessments of psychological well-being (e.g., depression, hopelessness), we regressed frequency of condom use on gender, age, depression, hopelessness, implicit hopelessness, and the interaction of gender and implicit hopelessness. The interaction term was created by centering gender and implicit hopelessness and then multiplying gender by implicit hopelessness to test whether gender moderated the link between condom use and implicit hopelessness (Aiken & West, 1991). We found a significant main effect of implicit hopelessness ($\beta = -0.30, p < .05$) and a significant interaction between gender and implicit hopelessness ($\beta = -0.35, p < .01$). The results of this analysis are summarized in Table 3. Follow-up analyses reveal that implicit hopelessness predicts condom use for men ($\beta = -0.70, p < .001$), but not women ($\beta = 0.03, p > .05$). The results of these analyses are summarized in Table 4.

Discussion

We hypothesized that implicit hopelessness would be a unique, independent predictor of condom use, controlling for explicit hopeless and depressive symptoms. Specifically, we hypothesized that automatic associations between the concepts *future* and *sad* (i.e., implicit hopelessness), controlling for explicit psychological distress (i.e., hopelessness, depression), would predict condom use. The hypothesis was supported: Implicit hopelessness predicted condom use. Moreover, this relationship was moderated by gender such that implicit hopelessness predicted men’s condom use, but not women’s.

Table 3

Summary of Results of Hierarchical Regression Analysis Predicting Condom Use Frequency

Predictor variable	Condom use frequency				
	ΔR^2	ΔF for R^2	B	$SE B$	β
Step 1	.06	1.96 ^a			
Age			-0.30	0.17	-0.23
Gender			0.71	0.65	0.14
Step 2	.10	2.22 ^b			
Age			-0.23	0.17	-0.18
Gender			-0.20	0.76	-0.04
Depression			0.01	0.06	0.32
Hopelessness			-0.64	0.57	-0.18
Implicit hopelessness			-2.61	1.17	-0.30*
Step 3	.11	8.16 ^{c**}			
Age			-0.35	0.16	-0.27*
Gender			-0.36	0.72	-0.07
Depression			0.03	0.06	0.08
Hopelessness			-0.71	0.53	-0.20
Implicit hopelessness			-2.23	1.10	-0.30*
Gender \times Implicit Hopelessness			-6.46	2.26	-0.35**

^a*dfs* = 2, 57. ^b*dfs* = 3, 54. ^c*dfs* = 1, 53.

* $p < .05$. ** $p < .01$.

These preliminary findings support the notion that health-behavior decisions may not be solely the product of a rational cost-benefit analysis (Gibbons et al., 1998; Ingham, 1994). Rather, the findings suggest that automatic associations between concepts (i.e., *future* and *sad*) may influence health behavior (i.e., condom use). Thus, these results are in accordance with research that has evidenced implicit cognition as a predictor of condom use (Czopp et al., 2004; Marsh et al., 2001; Stacy et al., 2000). Furthermore, these findings extend previous associations of condom use with implicit attitudes regarding condoms to include implicit attitudes indicative of psychological distress (i.e., hopelessness). These findings are supported by previous research that found explicit mental-health symptoms (e.g., suicidality, depression) to be related to AIDS risk behaviors (Brown et al., 2006;

Table 4

Follow-Up Regression Analyses Revealing Gender Differences

Predictor variable	Condom use (men)			Condom use (women)		
	<i>B</i>	<i>SE B</i>	β	<i>B</i>	<i>SE B</i>	β
Age	-0.27	0.25	-0.20	-0.41	0.22	-0.33*
Hopelessness	-1.12	0.95	-0.25	-0.51	0.69	-0.14
Depression	0.05	0.17	0.06	0.03	0.07	0.76
Implicit hopelessness	-6.24	1.49	-0.70***	0.30	1.64	0.03

p* < .05. **p* < .001.

Mazzaferro et al., 2006; Rohde et al., 2001; Shrier et al., 2001; Stiffman et al., 1992).

Moreover, the findings are relevant to the more general health literature evidencing the association of implicit processes with health behavior (Roefs & Jansen, 2002; Stacy, 1995, 1997; Swanson et al., 2001). Specifically, attending to implicit cognition can facilitate the explanation of health behaviors that are not easily accounted for by theories focusing on rational processes (Stacy et al., 2000). Additionally, the different results for the implicit and explicit measures support the utility of assessing multiple components of attitudes and beliefs. For example, Teachman and Brownell (2001) found implicit anti-fat bias among health professionals who did not evidence explicit anti-fat bias, which suggests that multiple assessment strategies can be particularly useful when investigating attitudes and behaviors that may be influenced by social desirability.

Unexpectedly, implicit depression was not associated with condom use. One reason for this might be that hopelessness may actually precede depression (Abramson et al., 1989). In the present sample, reported depression levels were low (i.e., mean score for BDI was 7.00). Based on minimum cutoff scores for clinical depression (Beck et al., 1988), the current sample was well within the normal range for depressive symptoms. However, it is plausible that some of the sample may have perceived the future in such a way (i.e., associating the future with sadness) that served to precipitate depression. Hopelessness may be sufficient to instigate the onset of depression at a future time point (Abramson et al., 1989).

Therefore, implicit hopelessness may be a more sensitive measure of negative mood in this nonclinical population. It is also possible that the implicit depression measure itself was not sensitive enough to assess the

construct. A possible weakness of the implicit depression was the use of "other" as the comparison category as a result of the ambiguity associated with this category. It is unclear whom participants conceived of as "other," which complicates the interpretation of the relative IAT score (Pinter & Greenwald, 2005).

Interestingly, the association of implicit hopelessness with condom use was moderated by gender such that implicit hopelessness predicted men's, but not women's condom use. Previous research conducted by Shrier et al. (2001) supports our finding. In a sample of 7th to 12th graders who had reported sexual intercourse in the last year, Shrier et al. found that depressive symptoms were associated with an increased risk of condom non-use at last sexual intercourse for boys, but not for girls. One possible reason for this gender difference might be the social context of sexual decision making. Men may have greater control over condom use than women. Thus, internal processes such as implicit hopelessness may play a more important role in this type of sexual risk behavior. This is consistent with research suggesting that women may experience less control over condom use and other sexual risk behaviors because of gender norms that are at play in sexual interactions (Wingood & DiClemente, 1995). Future research should test whether implicit hopelessness predicts other risk behaviors in women when the behavior is under the woman's control (e.g., female-specific contraceptive use).

Not so surprisingly, but still noteworthy, our explicit and implicit measures of affective disturbance were unrelated. Explicit and implicit measures of seemingly similar constructs frequently show little or no correlation with each other (e.g., Aberson, Shoemaker, & Tomolillo, 2004; Greenwald et al., 1998; Rudman, Greenwald, & McGhee, 2001). There are a host of factors that influence the relationship between implicit and explicit assessments, including motivational biases in explicit self-reports, lack of introspective access to implicitly assessed representations, factors influencing the retrieval of information from memory, method-related characteristics of the two measures, or complete independence of the underlying constructs (Fazio & Olson, 2003; Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005). Moreover, the lack of connection between implicit and explicit measures supports the notion that implicit and explicit constructs are theoretically distinct from one another, assessing different aspects of cognition (Fazio & Olson, 2003; Greenwald & Banaji, 1995).

The present research has limitations that should be acknowledged. First, the research design was correlational in nature. Therefore, associations between variables are merely associations, and not necessarily causal relations. However, prospective research examining the association between explicit affective disturbance and condom use supports the direction of our hypotheses. Brown et al. (2006) examined depressive symptoms as a

predictor of sexual risk among a community sample of African American adolescents and young adults. The researchers collected baseline data on demographics, psychosocial context, and depressive symptoms. At a 6-month follow-up, data were collected regarding sexual activity in the past 90 days. Results indicated that the odds that African American adolescents who reported depressive symptoms at baseline would report inconsistent condom use at 6-month follow-up were approximately 4 times greater than that of their peers who did not report depressive symptoms at baseline.

Unexpectedly, our explicit measures of affective disturbance did not predict condom use. One reason for the null finding for explicit depression may be that depression and condom use were assessed using different time frames. Depression was assessed for the previous week, while condom use was assessed for the previous year. Future research should employ a global assessment of depression. Moreover, the absence of a relationship between explicit measures and condom use could also be a result of the inability of explicit assessments to access information that was unavailable through introspection or that participants were unwilling to report (Fazio & Olson, 2003; Hofmann et al., 2005). Lastly, the power to detect a significant relationship between explicit measures of affective disturbance and condom use would be enhanced by a larger sample size.

An additional limitation of the present study is that we relied on a single-item, single time-point, self-report of condom use to examine sexual risk-taking behavior. Future studies might explore implicit measures of sexual risk attitudes or utilize bogus pipelines to increase the accuracy of self-reports by reducing socially desirable responding (Alexander & Fisher, 2003). Moreover, future studies should include additional measures of sexual risk-taking behavior to increase the validity and scope of the findings to other types of sexual risk-taking behavior. Important questions also remain regarding the generalizability of the findings. For example, do these findings generalize to adolescent populations and more ethnically diverse populations?

Although the research is not without its limitations, the present findings are an important first, albeit preliminary, step in identifying implicit hopelessness as a predictor of condom use with possible implications for general health risk behavior. Previous health theories far too often rely on rational decision-making processes, which are unable to explain health risk behavior. The present study offers another measure of affective disturbance—namely, hopelessness—and demonstrates its utility for predicting sexual risk behavior among young men. These results may provide additional methods to identify people who are likely to engage in sexual risk behaviors. In addition, our results suggest that a focus on hopelessness and its relation to health risk behavior is an important avenue for future research and possible interventions.

References

- Aberson, C. L., Shoemaker, C., & Tomolillo, C. (2004). Implicit bias and contact: The role of interethnic friendships. *Journal of Social Psychology, 144*, 335–347.
- Abramson, L. Y., Metalsky, G. I., & Alloy, L. B. (1989). Hopelessness depression: A theory-based subtype of depression. *Psychological Review, 96*, 358–372.
- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Thousand Oaks, CA: Sage.
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting behavior*. Englewood Cliffs, NJ: Prentice Hall.
- Albarracín, D., Johnson, B. T., Fishbein, M., & Muellerleile, P. A. (2001). Theories of reasoned action and planned behavior as models of condom use: A meta-analysis. *Psychological Bulletin, 127*, 142–161.
- Alexander, M. G., & Fisher, T. D. (2003). Truth and consequences: Using the bogus pipeline to examine sex differences in self-reported sexuality. *Journal of Sex Research, 40*, 27–35.
- Allgower, A., Wardle, J., & Steptoe, A. (2001). Depressive symptoms, social support, and personal health behaviors in young men and women. *Health Psychology, 20*, 223–227.
- Andersen, S. M., Spielman, L. A., & Bargh, J. A. (1992). Future-event schemas and certainty about the future: Automaticity in depressives' future-event predictions. *Journal of Personality and Social Psychology, 63*, 711–723.
- Armitage, C. J., Conner, M., & Norman, P. (1999). Differential effects of mood on information processing: Evidence from the theories of reasoned action and planned behavior. *European Journal of Social Psychology, 29*, 419–433.
- Basen-Engquist, K. (1992). Psychosocial predictors of “safer sex” behaviors in young adults. *AIDS Education and Prevention, 4*, 120–134.
- Beck, A. T. (1967). *Depression: Clinical, experimental, and theoretical aspects*. New York: International Universities Press.
- Beck, A. T., Steer, R. A., & Garbin, M. G. (1988). Psychometric properties of the Beck Depression Inventory: Twenty-five years of evaluation. *Clinical Psychology Review, 8*, 77–100.
- Becker, M. H., & Rosenstock, I. M. (1984). Compliance with medical advice. In A. Steptoe & A. Mathews (Eds.), *Health care and human behavior* (pp. 175–208). London: Academic Press.
- Bolland, J. M. (2003). Hopelessness and risk behaviour among adolescents living in high-poverty inner-city neighborhoods. *Journal of Adolescence, 26*, 145–158.

- Brooks, T. L., Harris, S. K., Thrall, J. S., & Woods, E. R. (2002). Association of adolescent risk behaviors with mental health symptoms in high school students. *Journal of Adolescent Health, 31*, 240–246.
- Brooks-Gunn, J., & Furstenberg, F. F., Jr. (1989). Adolescent sexual behavior. *American Psychologist, 44*, 249–257.
- Brown, L. K., DiClemente, R. J., & Reynolds, L. A. (1991). HIV prevention for adolescents: Utility of the health belief model. *AIDS Education and Prevention, 3*, 50–59.
- Brown, L. K., Tolou-Shams, M., Lescano, C., Houck, C., Zeidman, J., Pugatch, D., et al. (2006). Depressive symptoms as a predictor of sexual risk among African American adolescents and young adults. *Journal of Adolescent Health, 39*, 444.e1–444.e8.
- Cohen, S., & Rodriguez, M. S. (1995). Pathways linking affective disturbances and physical disorders. *Health Psychology, 14*, 374–380.
- Conner, M., & Norman, P. (2003). The role of social cognition in health behaviors. In M. Conner & P. Norman (Eds.), *Predicting health behavior* (pp. 1–22). Philadelphia: Open University Press.
- Czopp, A. M., Monteith, M. J., Zimmerman, R. S., & Lynam, D. R. (2004). Implicit attitudes as potential protection from risky sex: Predicting condom use with the IAT. *Basic and Applied Social Psychology, 26*, 227–236.
- Edwards, W. (1954). The theory of decision making. *Psychological Bulletin, 51*, 380–417.
- Fazio, R. H., & Olson, M. A. (2003). Implicit measures in social cognition research: Their meaning and use. *Annual Review of Psychology, 54*, 297–327.
- Friedman, M. A., Nosek, B. A., Miller, I. W., Gordon, K. C., & Banaji, M. R. (2004). *Implicit hopelessness and severity of depressive symptoms*. Unpublished manuscript.
- Gibbons, F. X., Gerrard, M., Blanton, H., & Russell, D. W. (1998). Reasoned action and social reaction: Willingness and intention as independent predictors of health risk. *Journal of Personality and Social Psychology, 74*, 1164–1180.
- Goodman, E., & Whitaker, R. (2002). A prospective study of the role of depression in the development and persistence of adult obesity. *Pediatrics, 110*, 497–504.
- Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review, 102*, 4–27.
- Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The Implicit Association Test. *Journal of Personality and Social Psychology, 74*, 1464–1480.

- Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the Implicit Association Test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology, 85*, 197–216.
- Hofmann, W., Gawronski, B., Gschwendner, T., Le, H., & Schmitt, M. (2005). A meta-analysis on the correlation between the Implicit Association Test and explicit self-report measures. *Personality and Social Psychology Bulletin, 31*, 1369–1385.
- Ingham, R. (1994). Some speculations on the concept of rationality. *Advances in Medical Sociology, 4*, 89–111.
- Krank, M. D., & Swift, R. (1994). Unconscious influences of specific memories on alcohol outcome expectancies. *Alcoholism: Clinical and Experimental Research, 18*, 423.
- Loewenstein, G., & Furstenberg, F. (1991). Is teenage sexual behavior rational? *Journal of Applied Social Psychology, 21*, 957–986.
- Maddux, J. E., & Rogers, R. W. (1983). Protection motivation and self-efficacy: A revised theory of fear appeals and attitude change. *Journal of Experimental Social Psychology, 19*, 469–479.
- Marsh, K. L., Johnson, B. T., & Scott-Sheldon, L. A. J. (2001). Heart versus reason in condom use: Implicit versus explicit attitudinal predictors of sexual behavior. *Zeitschrift für Experimentelle Psychologie, 48*, 161–175.
- Mazzaferro, K. E., Murray, P. J., Ness, R. B., Bass, D. C., Tyus, N., & Cook, R. L. (2006). Depression, stress, and social support as predictors of high-risk sexual behaviors and STIs in young women. *Journal of Adolescent Health, 39*, 601–603.
- Millisecond Software, LLC. (2006). Inquisit 2.0.60616 [Computer software]. Seattle, WA: Author.
- Nosek, B. A., Greenwald, A. G., & Banaji, M. R. (2006). The Implicit Association Test at age 7: A methodological and conceptual review. In J. A. Bargh (Ed.), *Social psychology and the unconscious: The automaticity of higher mental processes* (pp. 265–292). New York: Psychology Press.
- Pinter, B., & Greenwald, A. G. (2005). Clarifying the role of the “other” category in the self-esteem IAT. *Experimental Psychology, 52*, 74–79.
- Roefs, A., & Jansen, A. (2002). Implicit and explicit attitudes toward high-fat foods in obesity. *Journal of Abnormal Psychology, 111*, 517–521.
- Rohde, P., Noell, J., Ochs, L., & Seeley, J. R. (2001). Depression, suicidal ideation, and STD-related risk in homeless older adolescents. *Journal of Adolescence, 24*, 447–460.
- Rosal, M. C., Ockene, J. K., Ma, Y., Hebert, J. R., Merriam, P. A., Matthews, C. E., et al. (2001). Behavioral risk factors among members of a health maintenance organization. *Preventive Medicine, 33*, 586–594.
- Ross, D., & Schumacher, J. E. (2004). Condom use assessment of persons in drug abuse treatment. *Journal of Community Health, 29*, 499–509.

- Rudman, L. A., Greenwald, A. G., & McGhee, D. E. (2001). Implicit self-concept and evaluative implicit gender stereotypes: Self and in-group share desirable traits. *Personality and Social Psychology Bulletin*, 27, 1164–1178.
- Scheier, M. F., Carver, C. S., & Bridges, M. W. (1994). Distinguishing optimism from neuroticism (and trait anxiety, self-mastery, and self-esteem): A reevaluation of the Life Orientation Test. *Journal of Personality and Social Psychology*, 67, 1063–1078.
- Shrier, L. A., Harris, S. K., Sternberg, M., & Beardslee, W. R. (2001). Associations of depression, self-esteem, and substance use with sexual risk among adolescents. *Preventive Medicine*, 33, 179–189.
- Stacy, A. W. (1995). Memory association and ambiguous cues in models of alcohol and marijuana use. *Experimental and Clinical Psychopharmacology*, 3, 183–194.
- Stacy, A. W. (1997). Memory activation and expectancy as prospective predictors of alcohol and marijuana use. *Journal of Abnormal Psychology*, 106, 61–73.
- Stacy, A. W., Newcomb, M. D., & Ames, S. L. (2000). Implicit cognition and HIV risk behavior. *Journal of Behavioral Medicine*, 23, 475–499.
- Stiffman, A. R., Dore, P., Earls, F., & Cunningham, R. (1992). The influence of mental health problems on AIDS-related risk behaviors in young adults. *Journal of Nervous and Mental Disease*, 180, 314–320.
- Swanson, J. E., Rudman, L. A., & Greenwald, A. G. (2001). Using the Implicit Association Test to investigate attitude–behavior consistency for stigmatized behavior. *Cognition and Emotion*, 15, 207–230.
- Teachman, B. A., & Brownell, K. D. (2001). Implicit anti-fat bias among health professionals: Is anyone immune? *International Journal of Obesity*, 25, 1525–1531.
- Wingood, G., & DiClemente, R. (1995). The role of gender relations in HIV prevention research for women [Letter to the editor]. *American Journal of Public Health*, 85, 592.
- Yarcheski, T. J., Mahon, N. E., & Yarcheski, A. (2004). Depression, optimism, and positive health practices in young adolescents. *Psychological Reports*, 95, 932–934.

Appendix A

Category Exemplars of Implicit Hopelessness IAT

<i>Past</i>	<i>Future</i>	<i>Sad</i>	<i>Happy</i>
Yesterday	Days ahead	Depressed	Smiling
Last year	Years ahead	Helpless	Glad
Last week	Tomorrow	Hopeless	Cheerful
Days ago	Next week	Gloomy	Joyful
Years ago	Next year	Withdrawn	Delighted

Note. IAT = Implicit Association Test.

Appendix B

Category Exemplars of Implicit Depression IAT

<i>Me</i>	<i>Not Me</i>	<i>Sad</i>	<i>Happy</i>
Me	They	Depressed	Smiling
I	Them	Helpless	Glad
Mine	Theirs	Hopeless	Cheerful
Myself	Their	Gloomy	Joyful
Self	Other	Withdrawn	Delighted

Note. IAT = Implicit Association Test.