Health Psychology
2006, Vol. 25, No. 4, 455–461

0278-6133/06/$12.00 DOI: 10.1037/0278-6133.25.4.455

The Effects of HIV-Related Thought Suppression on Risk Behavior: Cognitive Escape in Men Who Have Sex With Men

Michael A. Hoyt, Carol J. Nemeroff, and David M. Huebner
Arizona State University

This study investigated the relationship between suppressing thoughts about HIV risk and several outcomes related to HIV risk, including sexual risk behavior and HIV prevention service use, in men who have sex with men (MSM). Synthesizing the ironic processing theory (D. M. Wegner, 1994) with a cognitive escape paradigm (D. J. McKirnan, D. G. Ostrow, & B. Hope, 1996), it was hypothesized that thought suppression might increase risk by leading MSM to "escape" from sexual safety norms and engage in risky sex behaviors and, via a paradoxical process, increase future use of community prevention services. Results from a sample of MSM ($N = 709$) indicated that thought suppression was positively related to concurrent sexual risk behavior and to future use of prevention services.

Keywords: thought suppression, ironic processing, HIV/AIDS, cognitive escape

The desire to escape from thoughts regarding risk of HIV infection has been linked to an increase in risky sexual behavior in gay men (McKirnan, Ostrow, & Hope, 1996; McKirnan, Vanable, Ostrow, & Hope, 2001). These findings have been attributed to a process whereby anxiety occurs just prior to sexual activity, as a result of the inherent conflict between pervasive messages involving strict social norms about safer sex practices and individual perceptions of self in relation to personal intentions toward safety. For instance, the social expectation to use condoms is likely to conflict with the individual notion that condoms restrict sexual pleasure. McKirnan et al. (1996) suggested that this conflict eventually leads to "coping fatigue," resulting in cognitive escape, or the motivation to evade self-awareness of personal vulnerability to HIV, increasing risky sexual behavior in the form of slips in safety practices. In fact, Williams, Elwood, and Bowen (2000) found that prolonged exposure to prevention norms is associated with increased cognitive escape from thoughts related to standards of safer sex. If replicable, this result would be ironic in that chronic exposure to education and prevention messages would actually motivate the individual to cognitively disengage from these messages. Such a paradoxical response could result from unconscious mechanisms associated with the process of thought suppression. However, current theories related to thought suppression (Wegner, Schneider, Carter, & White, 1987) suggest that disengagement through thought suppression processes cannot be sustained and may result in more intensified opposite effects over time. The current study integrates existing paradigms of cognitive escape with contemporary perspectives on thought suppression and examines the effects of suppressing thoughts related to HIV on sexual risk behaviors and the use of community-based prevention services in a population of men who have sex with men (MSM).

Frequently, the terms *suppression* and *repression* have mistakenly been used interchangeably (see Schwartz & Kline, 1997), and their distinctions continue to be debated (Erdelyi, 2001). Sigmund Freud (1915/1957) introduced repression as the movement of a thought from the conscious to the unconscious mind. However, as Wegner and Zanakos (1994) indicate, Freud's theory leaves many fundamental questions unanswered, particularly whether repression itself is a conscious or an unconscious process. It was Anna Freud (1946) who introduced the idea of suppression as the conscious counterpart to repression and clarified repression as an unconscious process. In more recent literature, repression has traditionally been viewed as a personality characteristic related to habitual coping mechanisms (Weinberger & Davidson, 1994). Further, Cramer (1998, 2000) discussed the differences between coping and defense mechanisms, likening suppression to coping as a conscious and effortful process carried out with the intent to solve a problem and repression to a defense mechanism occurring without conscious intentionality or attentional processes. For the purposes of the current study, thought suppression is considered to be the conscious, active process of attempting to move a thought from the conscious to the unconscious, typically because it is unwanted or troublesome. Here, suppression is often achieved through the concentration on, or repetition of, a more pleasant or perhaps neutral thought or activity (distraction). Further, the terms *thought suppression* and *escape* are used interchangeably.[1]

Michael A. Hoyt, Carol J. Nemeroff, and David M. Huebner, Department of Psychology, Arizona State University.

This research was supported in part by a grant from the Centers for Disease Control and Prevention to the Arizona Department of Health Services through Cooperative Agreement 99004. We acknowledge Rae Jean Proescholdbell, Linda Luecken, and Roger Millsap for their important contributions to this research.

Correspondence concerning this article should be addressed to Michael A. Hoyt, Department of Psychology, Arizona State University, Box 871104, Tempe, AZ 85287-1104. E-mail: mhoyt4@asu.edu

[1] In the present study, these terms are not meant to necessarily encompass avoidant coping mechanisms, denial, or other behavioral escape strategies such as those associated with therapeutic intervention. Such constructs are qualitatively different and may operate via different processes. Further, there are many strategies allowing individuals to avoid a health-related threat that may use different social–cognitive mechanisms and have different effects on risk behavior.

In 1987, Wegner et al. conducted the classic white bear experiment, in which participants in one condition were instructed to not think about a white bear while providing stream of consciousness thoughts for 5 min. This was followed by 5 min of verbalizing stream of consciousness thoughts while actively trying to think of a white bear. Participants in the second condition completed the same two tasks in reverse order. They found that participants who engaged in thought suppression in the initial phase produced more thoughts of a white bear during the expression phase than did participants who were not asked to initially suppress thoughts. That is, the act of suppressing thoughts actually increased the expression of these thoughts during the period that followed, implying that the act of suppressing cognitions heightens accessibility of thoughts beyond the level of accessibility associated with never having suppressed. The authors called this the rebound effect. Wegner and Smart (1997) presented a model of "deep cognitive activation," in which they held, on the basis of Freud's works, that thoughts can be activated without conscious knowledge and can influence emotional, behavioral, and cognitive expression via unconscious influences when an individual attempts to control his or her own mental activity (see also Wegner & Erber, 1992).

According to Wegner (1994), and again weighing heavily on the basis of Freudian theory, an attempt to control cognitive activity through conscious escape (suppression) activates the "unconscious ironic monitoring process," which searches the deep level to catch the unwanted thought before it breaks through to conscious awareness. The result is that the very thoughts that are least desirable become more highly accessible to the conscious mind, and more difficult to avoid, than would occur without suppression (hence the term *ironic*). Individuals who attempt to suppress certain thoughts soon become overwhelmingly preoccupied with them[2] (Lavy & van den Hout, 1990; Salkovskis & Campbell, 1993; Wegner et al., 1987). This in turn may lead to increased unwanted emotional, cognitive, and behavioral expression so that cognitive escape might, in fact, be a pathway to risk behaviors and other negative affective and cognitive consequences. Lazarus (1966) postulated that if an individual cannot remove a threat from the immediate environment, motivation to cognitively escape might result. This inclination may be particularly common given that cognitive escape most often requires less energy than behavior modification and may be particularly strong with behaviors based in powerful motivational systems (e.g., sex, drugs). If HIV-related thought suppression is associated with sexual risk behaviors, this cognitive process could be systematically undermining education and prevention efforts, many of which have proven to be ineffective time and again.

This study aimed to examine the effects of thought suppression on behaviors associated with risk and prevention of HIV infection in a population of MSM. In addition, we sought to examine this relationship over time, which has not yet been explored. The present study builds on the extensive literature in this area of health psychology by beginning to examine the health-relevant behavioral consequences of thought suppression. We hypothesized that thought suppression would be positively related to sexual risk behavior via cognitive escape processes that lead an individual to temporarily "forget about" HIV risk. However, we proposed that ironic processes would ultimately reactivate the availability of HIV-related thoughts, therefore yielding a positive association with the use of community prevention services over time.

Method

The Heads Up Project conducted an extensive investigation to examine the subjective experiences of MSM as well as their awareness, use, and opinions of local HIV prevention services in central Arizona. The goal was to recruit a sample of men who were diverse with respect to age, ethnicity, education, income, HIV status, intravenous drug use, and residence (i.e., urban vs. rural). The project included several phases of data collection, including interviews with local AIDS service organizations, initial focus groups with the target population, pilot testing of the instrument, and two waves of data collection, 6 months apart, with the target sample. Cognitive escape from thoughts of HIV emerged from the initial phase as a relevant issue to explore, and many of the questionnaire items were written to capture material that emerged from pilot interviews and focus groups. The instrument and methodology were approved by the Arizona State University Institutional Review Board and the Arizona Department of Health Services' Ethics Board.

Participants

To be eligible to participate in the Heads Up Survey, participants had to be men who identified as gay, bisexual, or two-spirited,[3] who reported sexual contact with another man in the past year, who were at least 18 years of age, and who lived in the surrounding metropolitan area at least 3 months out of the year. Participants were recruited with community and media advertisement, direct outreach efforts to the gay community, and snowballing methodology—a process in which a member of a target group is identified and asked to distribute surveys to his acquaintances within that target group. Recruitment and data collection methods were designed to facilitate participation by closeted and underrepresented groups of MSM.

There were 713 men who completed the original survey. Three items from the Minnesota Multiphasic Personality Inventory Infrequency Scale were used to screen for participants who were either responding randomly or carelessly or were overtly psychotic and presumably unable to respond reliably. On the basis of these criteria, 4 participants were dropped from the data set, yielding a final sample of 709 men for the original survey (Time 1 data collection).

Of the 709 men in the sample, 647 (91%) agreed to provide contact information and were mailed a follow-up survey approximately 6 months after they completed the initial survey (Time 2 data collection). Three hundred ninety-nine men completed the follow-up survey, which is approximately 62% of men who provided contact information and approximately 56% of men who completed the initial survey. Men who did not complete the follow-up survey (nonresponders) fell into two groups: (a) those to whom a follow-up survey could not be sent either because they did not provide contact information in the first place or because they later moved without forwarding address information and (b) those who received a survey and chose not to respond. Responders and nonresponders did not differ significantly in their rates of sexual risk behavior or service use, education, or HIV status. However, responders were older (mean age was 37 years vs. 33 years), wealthier, and more out than nonresponders. Additionally, African American men were less likely to be responders to

[2] The ironic processing system, as described, is clearly not an adaptive process, unlike most cognitive processes. Although the reason for this is not well understood, as noted, the theory is supported with empirical findings.

[3] *Two-spirited* is a Native American term that indicates that someone possesses both a male and a female spirit. It has been likened to being gay in the non-Native context (Tafoya, 2003).

the follow-up survey; no other ethnic differences were found. Table 1 presents key demographic information for the original and follow-up samples.

Procedures

Recruitment posters, cards, and copies of the survey itself were disseminated throughout the target area. Surveys were distributed widely as inserts in two gay-oriented magazines and were also available in several gay bars and retail establishments. In addition, snowballers and outreach staff for the project carried and distributed recruitment cards with telephone and Web site contact information as well as paper copies of the surveys. Potential participants could call in to have the survey items read aloud to them via a toll-free telephone number or could complete and submit the survey online, as alternatives to sending in a paper copy via return mail. The survey was available in English or Spanish. Participants could elect to receive $25 or entry into a cash prize raffle for their participation.

Measures

All of the following variables were measured at both Time 1 and Time 2.

Table 1
Demographic Characteristics of the Original and Follow-Up Samples

Demographic characteristic	Original (N = 709)	Follow-up (n = 399)
Age[a]	35 (SD = 11)	37 (SD = 11)
Education (%)		
Less than high school	4	4
High school grad	11	11
Some post-high school	45	44
College degree	40	41
Modal income	$25,000–$35,000	$25,000–$35,000
Ethnicity (%)		
White	71	76
Latino	13	13
African American[a]	8	4
Native American	6	5
Other	2	2
HIV positive at Time 1 (%)	12.8	
Sexual orientation (%)		
Gay	87	90
Bisexual	10	8
Straight	1	1
Two-spirited	< 1	< 1
Transgendered	< 1	—
Unsure	< 2	< 1
Extent of openness about sexual orientation[a] (%)		
Almost everyone knows	41	43
Only a few people know	17	15
Not anyone knows	2.7	2
Recruitment (%)		
Survey inserts	45	
Advertisements	30	
Outreach	18	
Snowballing	7	

Note. Despite identification, all participants reported sexual contact with another man in the previous 1 year. Data were not obtained at follow-up for transgender participants.
[a] Significant differences between Time 2 responders and nonresponders were found on these variables.

Thought suppression. Thought suppression was measured with the Suppression/Distraction subscale of the Cognitive Escape Scale, developed by Nemeroff, Hoyt, Huebner, and Proescholdbell (2006) as part of the Heads Up study. The Cognitive Escape Scale is a questionnaire measuring the general tendency and desire to escape from thoughts related to HIV/AIDS and is composed of multiple subscales. The Cognitive Escape Scale consists of four subscales or factors, including Thought Suppression/Distraction, Fatalism/Short-Term Thinking, Cognitive Alteration, and Cognitive Discomfort. (See Nemeroff et al., 2006, for more information regarding scale construction, factor structure, and items that compose the scale.) Items asked such questions as "How often do you [engage in behaviors such as] just try to put HIV/AIDS out of your mind?" Each item was measured on a 5-point response scale ranging from 1 (*never*) to 5 (*regularly*). Thought suppression scores were computed as the average score of the items composing the Thought Suppression/Distraction subscale (M = 2.16, range = 1.07). Correlation between Time 1 and Time 2 thought suppression scores suggested stability over a 6-month period (r = .611, $p < .01$). Cronbach's alpha was .84, suggesting adequate internal consistency reliability.

Sexual risk behavior. Sexual risk was defined as any unprotected receptive or insertive anal intercourse with a casual male partner, a nonmonogamous steady male partner, or a steady male partner of less than 6 months. Thus, our operationalization of risk was designed to assess behaviors that occurred with a partner whose HIV status would be difficult for participants to know definitely. Unprotected sex with a monogamous, steady partner of more than 6 months was not counted as sexual risk behavior. By this definition, 48% of the Time 1 sample (n = 322) had engaged in sexual risk behavior in the past 6 months.

Community prevention service use. Items created to assess the use of prevention services were designed to identify five theoretical levels of service use on the basis of initial pilot phases of the study. These levels are assumed to require increasing amounts of effort on the part of the participant. For the current study, service use was defined as self-reported service use in the prior 6 months. Levels included (1) passive service use, which refers to being the recipient of any prevention service without seeking it out (e.g., seeing a billboard, hearing an HIV prevention message on the radio, or being approached by an outreach worker when the recipient did nothing to seek out or initiate the contact (e.g., hearing an HIV prevention presentation without intending to do so, such as while in class); (2) information seeking, which refers to actively seeking out HIV prevention-related information (e.g., contacting the AIDS Hotline, approaching an outreach worker, picking up pamphlets or books, searching on the Internet); (3) HIV counseling and testing, which refers to actively seeking out and obtaining an HIV test and any counseling offered as part of the test; (4) structured service use, which refers to actively seeking out and using structured HIV prevention-related services, such as meeting with a counselor or attending a support group or skill-building workshop specifically geared toward HIV prevention; and finally, (5) volunteering, which refers to acting as a volunteer or activist for HIV prevention services. Service use scores were determined by dichotomizing each level of service use into *has used this level of service* or *has not used this level of service* during the prior 6-month period. Participants received a score from 0 to 5 reflecting their highest level of service use.

Demographics and HIV status. Participants self-reported their age, levels of education, income, and ethnicity. Participants also self-reported whether they had been tested for HIV in the past, and if so, what the result was. Men who had not ever been tested for HIV or who had not returned for their results were coded as HIV negative for the purposes of these analyses.

Data analysis. Analyses for the present study consisted of four multivariate hierarchical regression models, with thought suppression at Time 1 as the primary predictor. First, we constructed two cross-sectional models to see whether Time 1 thought suppression predicted both risk behavior and prevention service use at Time 1. Then, we constructed two longitu-

dinal models to determine whether Time 1 thought suppression predicted both risk behavior and prevention service use at Time 2, controlling for baseline levels of risk behavior and service use. For each model, we first entered any demographic characteristics that were associated with the outcome as a block, followed by thought suppression in the next block. For the longitudinal analyses, baseline levels of the criterion variables were entered with covariates in the first block.

Results

Descriptive Analyses

Descriptive statistics. Means, standard deviations, and intercorrelations for thought suppression and all psychosocial variables for the original and follow-up samples of measures are presented in Table 2. Because of the potential for HIV seropositivity to affect psychosocial variables related to sexual risk and prevention service use, *t* tests were performed, examining the differences between HIV-positive versus HIV-negative men on these variables. Significant differences were found in measures of thought suppression at Time 1, $t(669) = 9.029$, $p < .01$, community prevention service use at Time 1, $t(705) = 6.602$, $p < .01$, and community prevention service use at Time 2, $t(383) = 4.136$, $p < .01$. HIV-positive participants on average scored higher on these variables. Thus, HIV status was used as a covariate in all regression models.

Identification of demographic covariates. Pearson product–moment correlations were calculated between demographic characteristics and the criterion variables: sexual risk behavior and community prevention service use at both time points (see Table 2). Age was significantly correlated with risk behavior at both time points and was thus used as a covariate in analyses predicting risk. No other demographic characteristics were associated with risk behavior.

Additionally, to determine whether there were Covariate × Predictor interactions that should also be accounted for in the regression models, we created interaction terms and entered them into a regression equation with thought suppression. None of the identified covariates yielded significant Covariate × Predictor interactions. Thus, the effects of thought suppression on the outcomes did not appear to differ by participants' age or HIV status.

Hypotheses Tests

Risk behavior. To test whether thought suppression was associated cross-sectionally with sexual risk behavior, we regressed Time 1 risk behavior onto Time 1 thought suppression, with age and HIV status as covariates. As presented in Table 3, thought suppression was found to significantly predict concurrent sexual risk behavior over and above effects of age and HIV status.

To test the ability of thought suppression to predict future sexual risk behavior as measured at Time 2, we regressed risk behavior measured at Time 2 onto thought suppression at Time 1, controlling for age, HIV status, and Time 1 risk behavior. As presented in Table 3, thought suppression did not significantly predict future sexual risk behavior.

Community prevention service use. To test whether thought suppression was associated cross-sectionally with prevention service use, we regressed service use measured at Time 1 onto thought suppression at Time 1, with HIV status as a covariate. Thought suppression did not predict concurrent prevention service use. To test whether thought suppression predicted future community prevention service use, we regressed Time 2 prevention service use onto Time 1 thought suppression, controlling for HIV status and Time 1 prevention service use. As presented in Table 3, thought suppression did significantly predict future increased service use.

Discussion

This study examined self-reported behavioral outcomes in relation to suppression of HIV-related thoughts among MSM. We proposed that escaping from unwanted HIV-related thoughts through conscious attempts at thought suppression might result in the hyperaccessibility of those thoughts in a cognitive rebound effect (Wegner et al., 1987). As expected, our findings suggest that

Table 2
Descriptive Statistics and Intercorrelations Between Study Variables

Variable	*M*	*SD*	1	2	3	4	5	6	7	8	9	10
1. Thought Suppression score (Time 1)	2.15	0.84	—	.16***	.12*	.04	.17***	.33***	−.04	.01	−.09*	−.14***
2. Risk behavior (Time 1)	0.48	0.50		—	.42***	−.01	.02	.01	−.12**	.06	−.06	<.00
3. Risk behavior (Time 2)	0.40	0.49			—	.03	.01	.06	−.12*	−.03	−.09	−.03
4. Prevention service use (Time 1)	2.67	1.69				—	.45***	.24***	.04	<.00	.02	.02
5. Prevention service use (Time 2)	2.62	1.72					—	.21***	.02	.01	.01	.03
Potential covariates												
6. HIV status (Time 1)	0.13	0.33						—	.08*	.03	−.12**	−.12**
7. Age (Time 1)	35.25	11.07							—	−.22***	.29***	.33***
8. Ethnic minority status	0.27	0.45								—	−.14***	−.21***
9. Education	3.34	0.98									—	.41***
10. Income	4.35	2.31										—

Note. Range of $n = 382–709$. Sexual risk behavior, HIV status, and ethnic minority status are dichotomous variables, for which risky behavior was coded as 1 (*risk*) and 0 (*no risk*), HIV status was coded as 1 (*positive*) and 0 (*negative*), and ethnic status was coded as 1 (*minority*) and 0 (*nonminority*). In each of these instances the means represent the proportion of participants coded as 1. Education and income were measured on continuous scales ranging from 1 (*some high school*) to 5 (*professional or graduate degree*) and 1 (*$0–$8,000*) to 11 (*over $95,000*), respectively.
* $p < .05$. ** $p < .01$. *** $p < .001$.

Table 3
Results of Hierarchical Multiple Regression Analyses

Outcome and predictor variable	Logistic regression				
	B	*SE B*	OR (95% CI)	ΔR^2	Wald $\chi^2(2)$
Sexual risk behavior (Time 1)					
Block 1					
Age	−0.02	0.01	0.98** (0.96–0.99)		
HIV status	−0.29	0.27	0.75 (0.44–1.25)		
Block 2: Thought suppression (Time 1)	0.41	0.11	1.52*** (1.23–1.87)	.025	26.62***
Sexual risk behavior (Time 2)					
Block 1					
Age	−0.01	0.01	0.99 (0.97–1.01)		
HIV status	0.29	0.37	1.33 (0.65–2.74)		
Sexual risk behavior (Time 1)	1.93	0.25	6.89*** (4.25–11.19)		
Block 2: Thought suppression (Time 1)	0.15	0.16	1.16 (0.85–1.57)	.002	75.54***
	Ordinary-least-squares regression				
	B	*SE B*	β	ΔR^2	*F*
Prevention service use (Time 1)					
Block 1					
HIV status	1.25	0.21	0.24***		
Block 2: Thought suppression (Time 1)	−0.10	0.08	−0.04	0.0002	19.0***, *df*s = 2, 667
Prevention service use (Time 2)					
Block 1					
HIV status	0.26	0.25	0.05		
Prevention service use (Time 1)	0.42	0.05	0.42***	0.012	
Block 2: Thought suppression (Time 1)	0.24	0.10	0.12*		34.1***, *df*s = 3, 375

Note. Regression coefficients, Wald χ^2 values, and *F* statistics reflect values at the end of Block 2, with all variables entered into the equation. OR = odds ratio; CI = confidence interval; *SE* = standard error.
* $p < .05$. ** $p < .01$. *** $p < .001$.

suppressing HIV-related thoughts is associated with concurrent, but not future, increased sexual risk behavior. Conversely, thought suppression was associated with future increased use of HIV/AIDS-related community prevention services yet not concurrent use of these services. Although the magnitude of effects observed in this study is small, this pattern of results supports the hypothesized framework, in which suppressing HIV-related thoughts is associated with current health risk behaviors and a later rebound in attending to protective and preventive services.

McKirnan and colleagues' (McKirnan et al., 1996; McKirnan et al., 2001) original conceptualizations of the cognitive escape model of HIV were based on the premise that MSM are expected to remain cognitively self-aware of HIV risk during every sexual encounter in order to maintain a negative HIV status (Williams et al., 2000), as recommended by pervasive social norms toward safety and prevention messages aimed at this population. The model contends that the prime motivation for escape is relief from feelings of fear and personal vulnerability to HIV. Although thought suppression may be only one component of a more broadly conceptualized phenomenon of cognitive escape (see Nemeroff et al., 2006), the present study provides support for the association between cognitive escape and risk behavior, as thought suppression may lead to slips in safety practices that might otherwise be maintained.

Previous conceptualizations of the cognitive escape model do not include any escape-motivated protective behaviors. The discovery of an association between thought suppression and future use of community prevention services seems to suggest that individuals experience a return to perceived vulnerability from which they had previously escaped. This result calls for a reexamination and perhaps broadening of the cognitive escape model to include escape-motivated protective behavior and to address how processes unfold over a longer time frame. Such behavior, when considered in tandem with escape-motivated risk behavior, may suggest a pattern of behavior that includes continual cycles of risk and protective behaviors.

The ironic processing theory provides a basis for explaining the seemingly paradoxical effects by which escape is associated with both risky sexual behavior and increases in prevention service use. To date, this theory has not been well examined within the context of a specific population or within the framework of social and environmental factors unique to a specific health condition. Further, thought suppression has yet to be fully examined in real-life contexts and outside of carefully controlled laboratory studies. The present study offers some preliminary insight into the effects of thought suppression over time and in real-life application for a specific health population, HIV in MSM. These results suggest that a more extensive examination of how the ironic processing theory operates outside of the laboratory might be warranted. For instance, in laboratory studies, participants are instructed to suppress thoughts such as that of a white bear. Presumably, the participant's relationship with the concept of a white bear is innocuous and not personally threatening. Neither personal relevance of the suppressed thought content nor threat-motivated

suppression has been well studied in relation to the ironic processing theory. Future research on thought suppression as it occurs in personally relevant life contexts seems worthwhile. The use of daily diary studies or similar approaches would provide a more detailed examination of these effects in context.

For years, MSM have been the target of pervasive HIV education messages and prevention efforts. In general, such efforts have been successful in altering sexual behaviors and attitudes within this population, creating social norms toward sexual safety (Ekstrand & Coates, 1990; Kelly & Murphy, 1992). At the same time, however, MSM continue to account for a significant proportion of new HIV infections (Centers for Disease Control and Prevention, 2002) suggesting that targeted prevention efforts and health risk messages are being undermined by other factors. Many have proposed that optimism surrounding the efficacy of new HIV treatments could be one such factor that undermines prevention messages. Individual cognitive processes, such as cognitive escape, could also be important factors. It is interesting to note that treatment optimism itself might be a form of cognitive escape, as optimism about treatments could be a coping strategy men use to escape from anxiety they feel when their behaviors do not conform to existing prevention norms (Huebner & Gerend, 2001; Huebner, Rebchook, & Kegeles, 2004).

Prevention efforts often overrely on threat as a motivation for behavior change, and in the era of treatment optimism, some have called for a renewed emphasis on threat-focused prevention messages. Witte, Meyer, and Martell (2001) offer a discussion of the effectiveness of health risk messages that addresses the use of threat. The authors theorize that individuals who appraise health messages to be highly threatening will be more likely to avoid HIV-related thoughts when they experience low self-efficacy or feel that they cannot control the threat. In turn, they suggest, that when self-efficacy is high, avoidance may occur if the messages are not appraised as sufficiently threatening. HIV-specific coping efficacy was not measured in this study, nor was appraisal of specific health messages. However, this model provides a framework for understanding the role of cognitive factors, particularly thought suppression, in determining the potential effectiveness of prevention messages.

Given that the effect sizes observed in our overall sample were small, it is likely that thought suppression is relatively less important for some individuals and more important for others. Recent research suggests that individually tailored interventions might more effectively address individual differences in risk factors for HIV infection (Chesney et al., 2003). Such individualized clinical interventions could focus on fostering alternative coping responses to thought suppression (e.g., accessing social support, cognitive restructuring strategies to alter fear appraisal) and might be appropriate adjuncts to current prevention efforts. Further, expressive writing interventions specific to HIV prevention that are designed to address threat appraisal, as well as targeting moments of sexual safety decision making may also prove effective.

Several methodological and conceptual limitations should be considered when interpreting these findings. Only the attempt to suppress thoughts related to HIV was captured in the measure of thought suppression used in this study; however, the efficacy of thought suppression was not measured. Therefore, results should be interpreted on the basis of the understanding of thought suppression as an attempted pattern of coping rather than an observed cognitive process. Additionally, data for this study, particularly measures of thought suppression, were obtained solely by means of self-report, which depends exclusively on self-awareness of complex cognitive processes. It is also impossible to accurately determine precise moments of active thought suppression, allowing us only to hypothesize patterned events that should be more closely tested in future experimental research. Finally, given the limitations inherent in convenience sampling, care should be taken in generalizing the results of our study to the general population of MSM, particularly to African American and younger men, who we lost differentially to attrition at follow-up.

Despite these limitations, these results may have potential implications for prevention and education messages targeted to a population of MSM as well as to the ironic processing theory and its real-life usefulness. This study advances the understanding of the behavioral effects of thought suppression in relation to HIV risk, providing a new and more pragmatic application of the ironic processing theory, and establishes a foundation for future research. Although thought suppression has been a frequent topic of research in social and cognitive psychology, more studies using real-life observation of thought suppression applied to specific clinical and community-based problems are warranted. Identifying individual factors associated with increased likelihood to suppress threatening thoughts or proclivity toward specific cognitive reactions as coping patterns also might provide an area for future research. Further, the temporal order of patterned events suggested in this study needs to be more firmly established. Future investigations might also more fully consider the content and personal relevance of thoughts in examinations of thought suppression. In sum, future investigations should continue to explore the dynamic interplay between risk and protective behaviors as well as contextual factors within the cognitive escape model.

References

Centers for Disease Control and Prevention. (2002). Cases of HIV/AIDS in the United States, 2002. *HIV/AIDS Surveillance Report, 14,* 12–13.

Chesney, M. A., Koblin, B. A., Barresi, P. J., Husnik, M. J., Celum, C. L., Colfax, G., et al. (2003). An individually tailored intervention for HIV-prevention: Baseline data from the EXPLORE Study. *American Journal of Public Health, 93,* 933–938.

Cramer, P. (1998). Coping and defense mechanisms: What's the difference? *Journal of Personality, 66,* 919–946.

Cramer, P. (2000). Defense mechanisms in psychology today: Further processes for adaptation. *American Psychologist, 55,* 637–646.

Ekstrand, M., & Coates, T. (1990). Maintenance of safer sexual behaviors and predictors of risky sex: The San Francisco Men's Health Study. *American Journal of Public Health, 80,* 973–977.

Erdelyi, M. H. (2001). Defense processes can be conscious or unconscious. *American Psychologist, 56,* 761–762.

Freud, A. (1946). *The ego and the mechanisms of defense.* Oxford, England: International Universities Press.

Freud, S. (1957). Repression. In J. Strachey (Ed. & Trans.), *The standard edition of the complete psychological works of Sigmund Freud* (Vol. 14, pp. 146–158). London: Hogarth Press. (Original work published 1915)

Huebner, D. M., & Gerend, M. A. (2001). The relation between beliefs about drug treatments for HIV and sexual risk behavior in gay and bisexual men. *Annals of Behavioral Medicine, 23,* 304–312.

Huebner, D. M., Rebchook, G. M., & Kegeles, S. M. (2004). A longitudinal study of the association between treatment optimism and sexual risk behavior in young adult gay and bisexual men. *Journal of Acquired Immune Deficiency Syndrome, 37,* 1514–1519.

Kelly, J., & Murphy, D. (1992). Psychological interventions with AIDS and HIV: Prevention and treatment. *Journal of Consulting and Clinical Psychology, 60,* 576–585.

Lavy, E. H., & van den Hout, M. A. (1990). Thought suppression induces intrusions. *Behavioural Psychotherapy, 18,* 251–258.

Lazarus, R. S. (1966). *Psychological stress and the coping process.* New York: McGraw-Hill.

McKirnan, D. J., Ostrow, D. G., & Hope, B. (1996). Sex, drugs and escape: A psychological model of HIV-risk sexual behaviours. *AIDS Care, 8,* 655–669.

McKirnan, D. J., Vanable, P. A., Ostrow, D. G., & Hope, B. (2001). Expectancies of sexual escape and sexual risk among drug and alcohol-involved gay and bisexual men. *Journal of Substance Abuse, 13,* 137–154.

Nemeroff, C. J., Hoyt, M. A., Huebner, D. M., & Proescholdbell, R. J. (2006). *Cognitive escape: A new measure of HIV-related thought avoidance.* Manuscript in preparation.

Salkovskis, P. M., & Campbell, P. (1993). Thought suppression induces intrusion in naturally occurring negative intrusive thoughts. *Behaviour Research and Therapy, 32,* 1–8.

Schwartz, G. E., & Kline, J. (1997). Repression, emotional disclosure, and health: Theoretical, empirical, and clinical considerations. In J. W. Pennebaker (Ed.), *Emotion, disclosure, and health* (pp. 177–237). Washington, DC: American Psychological Association.

Tafoya, T. (2003). Native gay and lesbian issues: The two-spirited. In D. C. Kimmel & L. D. Garnets (Eds.), *Psychological perspectives on lesbian, gay, and bisexual experiences* (2nd ed., pp. 401–409). New York: Columbia University Press.

Wegner, D. M. (1994). Ironic processes of mental control. *Psychological Review, 101,* 34–52.

Wegner, D. M., & Erber, R. (1992). The hyperaccessibility of suppressed thoughts. *Journal of Personality and Social Psychology, 63,* 903–912.

Wegner, D. M., Schneider, D. J., Carter, S. R., & White, T. L. (1987). Paradoxical effects of thought suppression. *Journal of Personality and Social Psychology, 53,* 5–13.

Wegner, D. M., & Smart, L. (1997). Deep cognitive activation: A new approach to the unconscious. *Journal of Consulting and Clinical Psychology, 65,* 984–995.

Wegner, D. M., & Zanakos, S. (1994). Chronic thought suppression. *Journal of Personality, 62,* 615–640.

Weinberger, D. A., & Davidson, M. N. (1994). Styles of inhibiting emotional expression: Distinguishing repressive coping from impression management. *Journal of Personality, 62,* 587–613.

Williams, M. L., Elwood, W. N., & Bowen, A. M. (2000). Escape from risk: A qualitative exploration of relapse to unprotected anal sex among men who have sex with men. *Journal of Psychology and Human Sexuality, 11,* 25–49.

Witte, K., Meyer, G., & Martell, D. (2001). *Effective health risk message: A step-by-step guide.* Thousand Oaks, CA: Sage.