Published in final edited form as:

Arch Sex Behav. 2014 May ; 43(4): 669–683. doi:10.1007/s10508-014-0261-y.

The Role of Maladaptive Cognitions in Hypersexuality among Highly Sexually Active Gay and Bisexual Men

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Abstract

Cognitive appraisals about sex may represent an important component of the maintenance and treatment of hypersexuality, but they are not currently represented in conceptual models of hypersexuality. Therefore, we validated a measure of maladaptive cognitions about sex and examined its unique ability to predict hypersexuality. Qualitative interviews with a pilot sample of 60 highly sexually active gay and bisexual men and expert review of items yielded a pool of 17 items regarding maladaptive cognitions about sex. A separate sample of 202 highly sexually active gay and bisexual men completed measures of sexual inhibition and excitation, impulsivity, emotional dysregulation, depression and anxiety, sexual compulsivity, the Hypersexual Disorder Screening Inventory proposed by the American Psychiatric Association's *DSM-5* Workgroup on Sexual and Gender Identity Disorders (2010). Factor analysis confirmed the presence of three subscales: perceived sexual needs, sexual costs, and sexual control efficacy. Structural equation modeling results were consistent with a cognitive model of hypersexuality whereby magnifying the necessity of sex and disqualifying the benefits of sex partially predicted minimized self-efficacy for controlling one's sexual behavior, all of which predicted problematic hypersexuality. In multivariate logistic regression, disqualifying the benefits of sex predicted unique variance in hypersexuality, even after adjusting for the role of core constructs of existing research on hypersexuality, AOR = 1.78, 95% CI 1.02, 3.10. Results suggest the utility of a cognitive approach for better understanding hypersexuality and the importance of developing treatment

approaches that encourage adaptive appraisals regarding the outcomes of sex and one's ability to control his sexual behavior.

Keywords

hypersexuality; maladaptive cognitions; gay and bisexual men; mental health

INTRODUCTION

Problematic hypersexuality is a clinical syndrome characterized by recurrent, hard to control sexual fantasies, urges, or behaviors associated with significant personal distress and adverse consequences (Kafka, 2010). Increasing interest in understanding and treating problematic hypersexuality necessitates the identification of its key predictors and suitable treatment targets. Existing conceptual understandings of problematic hypersexuality draw on compulsivity, impulse control, emotion regulation, and addiction models of behavioral excess (Kafka, 2010; Kingston & Firestone, 2008). A notable gap in this literature includes maladaptive cognitions about sex, by which we mean those thoughts that are formed across development and that characterize an individual's rigidly biased or non-functional attitudes, beliefs, and expectations about sex, its meanings, and its consequences.

Although maladaptive cognitions play a key role in understanding the etiology, maintenance, and treatment of many mental health disorders, including those most comorbid with hypersexuality (Raymond, Coleman, & Miner, 2003), the role of such cognitions in problematic hypersexuality has yet to be explored. Maladaptive cognitions in other mental health disorders, such as major depression and dysthymia (Beck, Rush, Shaw, & Emery, 1987), social anxiety (Clark & Wells, 1995), generalized anxiety disorder (Wells, 1999), substance use (Witkiewitz & Marlatt, 2004), and impulse control disorders, including pathological gambling (Sharpe & Tarrier, 1993) and kleptomania (Kohn, 2006), describe inaccurate appraisals of the meaning of situations, the consequences of one's behavior, or one's ability to exert control over life circumstances or personal behavior (Beck et al., 1987). Drawing on cognitive models of these other mental health disorders (e.g., Sharpe & Tarrier, 1993), we hypothesized that maladaptive cognitions about sex might contain, for example, inaccurate estimates about the meaning or outcomes of sex or one's ability to exert control over his sexual behavior.

We reviewed existing conceptual models of problematic hypersexuality and found that, while these models currently do not explicitly reference maladaptive cognitions, they nonetheless allow a possibly important role for cognitions in understanding the etiology, maintenance, and treatment of hypersexuality. For example, compulsivity models of hypersexuality (Coleman, 1987, 1990) emphasize the use of sex to minimize or avoid threatening emotional states, such as anxiety. Relevant cognitive processes in this model might include biased threat appraisal and magnifications of the perceived necessity of sex (e.g., to resolve negative emotions). Further, impulse control models of problematic behaviors ranging from pathological gambling to substance use recognize biased perceptions of reward size, reward contingencies, and reward delays as driving impulsive behavior

(Sharpe & Tarrier, 1993; Witkiewitz & Marlatt, 2004). Impulse control models of problematic hypersexuality (e.g., Raymond et al., 2003), therefore, might also benefit from considering the role played by biased perceptions of self-control and personal risk (Logue, 1988; Mischel & Baker, 1975). Emotion regulation models of hypersexuality (Bancroft & Vukadinovic, 2004; Kingston & Firestone, 2008) allow for maladaptive cognitions, such as biased meaning appraisals of emotion-eliciting events (e.g., Joormann & Siemer, 2011). Finally, addiction models of hypersexuality (Carnes, 1983; Goodman, 1997), in which problematic hypersexuality represents a increasing misuse of sexual behavior for regulating negative emotions, could allow for cognitive biases regarding the positive or negative consequences of sex, inaccurate beliefs about the ability of sex to serve self-regulatory functions, or misperceptions of one's ability to control his sexual behavior.

While current treatment approaches for problematic hypersexuality primarily focus on modified 12-step (e.g., Carnes, 1983; Pincus, 1989), medication (e.g., Kafka & Prentky, 1992), and behavioral approaches (e.g., Gold & Heffner, 1998), a few additional approaches do suggest the importance of targeting maladaptive cognitions en route to reducing hypersexual behavior. Although cognitively focused treatment suggestions stem from case studies and clinical guidance, rather than randomized controlled trials, they are consistent with the potential role of maladaptive cognitions in the conceptual models reviewed above. For example, case studies and clinical guidance for treating hypersexuality discuss therapeutically addressing overestimates of the necessity of sex and underestimates of one's ability to control one's sexual behavior, alongside enhancing personal coping and emotion regulation skills (e.g., Shepherd, 2010; Weiss, 2004). This focus on reducing these specific sex-related biased appraisals is also consistent with established treatment approaches for problematic sexuality other than hypersexuality (e.g., exhibitionism, fetishism) (Murphy & Page, 2008; Wincze, 2000).

As research regarding the nature and assessment of problematic hypersexuality accumulates (Kafka, 2010), thereby encouraging the proliferation of treatment approaches for this syndrome, it is necessary to identify all possible factors in its maintenance and treatment, including the potential role of maladaptive cognitions. It is important to note that by maladaptive cognitions about sex, we mean those rigidly biased or maladaptive thoughts that are formed across development and that characterize an individual's current attitudes, beliefs, and expectations about sex, its contexts, meanings, and consequences. In this way, our construct is aligned with the definition and role of maladaptive cognitive across other mental health concerns, such as substance use, pathological gambling, and major depression (e.g., Beck et al., 1987). This definition of maladaptive cognitions does not include sexual fantasies, images, or thought intrusions. Existing conceptual models of hypersexuality instead conceptualize these events as antecedent stimuli, rather than cognitive processes maintaining hypersexuality that are amenable to standard cognitively-based treatment approaches.

Problematic hypersexuality is a particular concern for gay, bisexual, and other MSM given the unique psychosocial factors driving this problem among this group, including minority stressors across development (Parsons, Grov, & Golub, 2012; Parsons et al., 2008) and the relationship between problematic hypersexuality and HIV risk (Dodge et al., 2008; Grov,

Parsons, & Bimbi, 2010). In addition to experiencing disproportionate problems with hypersexuality compared to heterosexual men (Baum & Fishman, 1994; Missildine, Feldstein, Punzalan, & Parsons, 2005), gay and bisexual men contend with elevated rates of other factors shown to be associated with both hypersexuality and maladaptive cognitive processes, including childhood sexual abuse (Purcell et al., 2007) and stressors related to social prejudice and stigma (Muench & Parsons, 2004; Pincus, 1989). These stressors combine with mental health problems, such as problematic hypersexuality, to form a synergistic cluster of risks, or syndemic, that simultaneously threaten the health of this group of individuals (Parsons et al., 2012; Stall et al., 2003). Thus, the identification of treatable components of any one of these health risks has the potential to disrupt the health-depleting cascade of interrelated risks facing members of this population.

The Present Study

Based on the assumption that maladaptive cognitions about sex occupy a primary role in the maintenance of problematic hypersexuality, we sought to create a valid measure for capturing this construct and to test its ability to predict previously unexplored, unique variance in hypersexuality after adjusting for the key correlates of hypersexuality identified in research to date. This first investigation into the role of maladaptive cognitions about sex in predicting problematic hypersexuality represents a high priority research aim given the possibility that some current treatment approaches for this condition may fail to address the potentially important role of cognitions about sex or inadvertently encourage cognitions that maintain hypersexuality (e.g., the belief that one is not in control of his sexual behavior). By creating a psychometrically sound measure of maladaptive cognitions about sex and examining its ability to predict unique and previously unexplained variance in problematic hypersexuality, we hoped to advance a more complete picture of this problem and offer a novel treatment target shown to be effective for many mental health disorders.

The aims and hypotheses of this study included the following:

Aim 1. Generate items for inclusion in a measure of maladaptive cognitions about sex among gay and bisexual men.

Aim 2. Establish the factor structure of the items, identify discrete subscales, and identify the structural relationship among the subscales.

Aim 3. Establish the ability of maladaptive cognitions about sex to predict unique variance in problematic hypersexuality adjusting for key predictors that have been established in previous research. We hypothesized that maladaptive cognitions about sex would significantly predict problematic hypersexuality, as operationally defined by the *Diagnostic and Statistical Manual of Mental Disorders (DSM-5)* Workgroup on Sexual and Gender Identity Disorders (American Psychiatric Association, 2010), adjusting for (1) symptoms of depression and anxiety, (2) impulsivity (Schwartz & Abramowitz, 2003), (3) emotional dysregulation, (4) problems with sexual inhibition and excitation (Bancroft & Vukadinovic, 2004), and (5) sexual compulsivity (Kalichman & Rompa, 1995, 2001).

METHOD

Analyses for this article were conducted on data from an ongoing study of highly sexually active gay- and bisexually-identified men in New York City focused on issues of hypersexuality. The primary goal of the study was to enroll gay and bisexual men who were similar with regard to sexual behavior but who differed in the extent to which their sexual thoughts and behaviors were causing problems in their lives—the defining feature of hypersexuality. Analyses for this article focused on an initial cohort of 202 men who were enrolled in the project.

Participants and Procedure

Beginning in February 2011, we began enrolling participants utilizing a combination of recruitment strategies: (1) respondent-driven sampling; (2) internet-based advertisements on social and sexual networking websites; (3) email blasts through New York City gay sex party listservs; and (4), active recruitment in New York City venues, such as gay bars/clubs and sex parties. Participants recruited from the internet or in active venue-based recruitment shifts were pre-screened utilizing a brief survey either via the online survey site Qualtrics (www.qualtrics.com) or a mobile survey via iPod Touch, respectively. This pre-screen assessed number of sex partners in addition to variables relevant to other studies for which we were screening. All participants completed a brief, phone-based screening interview to confirm eligibility, which was defined as: (1) at least 18 years of age; (2) biologically male and self-identified as male; (3) a minimum of nine different male sexual partners in the prior 90 days, with at least two in the prior 30 days; (4) self-identification as gay, bisexual, or some other non-heterosexual identity (e.g., queer); and (5) daily access to the internet in order to complete internet-based assessments (i.e., at-home surveys, daily diary).

Participants were excluded from the project if they demonstrated evidence of serious cognitive or psychiatric impairment that would interfere with their participation or limit their ability to provide informed consent, as indicated by a score of 23 or lower on the Mini-Mental Status Examination (MMSE) (Folstein, Folstein, & McHugh, 1975) or evidence of active and unmanaged symptoms on the psychotic symptoms or suicidality sections of the Structured Clinical Interview for the DSM-IV-IR (SCID) (First, Spitzer, Gibbon, & Williams, 2002).

We operationalized highly sexually active as having at least nine sexual partners in the 90 days prior to enrollment, with at least two of these partners being within the prior 30 days. These cutoffs were based on prior research (Grov et al., 2010; Parsons, Bimbi, & Halkitis, 2001; Parsons et al., 2008), including a probability-based sample of urban MSM (Stall et al., 2002, 2003) that found that 9 partners was more than 2–3 times the average number of sexual partners among sexually active gay and bisexual men. For the purposes of this study, sexual partners were defined as contact with any male partner with whom the participant engaged in sexual activity that had the potential to lead to orgasm, which included, but was not limited to, receptive/insertive anal intercourse, receptive/insertive oral intercourse, receiving or performing anal stimulation manually or orally, and mutual masturbation. All eligibility criteria were confirmed at the baseline appointment, with sex criteria being

confirmed using the timeline follow-back interview in which a calendar is used to recall one's daily sexual behavior (Sobell & Sobell, 1992).

Participation in the study involved both at-home (internet-based) and in-office assessments. After a member of the research staff confirmed participants' eligibility over the phone, participants were sent a link to complete an internet-based survey at home prior to their first in-office appointment that took approximately one hour to complete. Initial informed consent for completing the at-home survey was obtained as part of the online survey. Participants then completed a series of two baseline appointments at the research site and provided informed consent for their full participation in the year-long project at the beginning of their first face-to-face appointment. All procedures were reviewed and approved by the Institutional Review Board of the City University of New York. This article focuses exclusively on the baseline at-home survey data to examine the psychometric properties of a newly created instrument intended to measure maladaptive cognitions about sex.

Measures

Maladaptive Cognitions about Sex Scale—Prior to the development of the Maladaptive Cognitions about Sex Scale (MCAS) for its use within the current study, a pilot study, containing qualitative interviews with 60 men, was conducted. The qualitative interviews were subsequently transcribed verbatim. In addition to assessing general aspects of participants' sexuality, sexual behavior, and the context of one's sexual behavior, the interview also contained specific questions regarding the content of participants' typical thoughts before and after sex. The first author read each transcript in order to develop an assessment of the cognitive and behavioral factors that participants experiencing hypersexuality reported as problematic. As a result of this process, the first author developed a preliminary list of maladaptive cognitions that appeared to be associated with hypersexuality.

We subsequently utilized these maladaptive cognitions and an iterative free-listing approach to generate scale items meant to examine the extent to which people experience a variety of maladaptive cognitions. We consulted with clinical and social psychologists who are experts in the area of sexual behavior and sexual risk among gay and bisexual men who provided feedback on the content of the items and suggested revisions.

As a result of this iterative process, we developed three general domains of maladaptive cognitions that we hoped to capture: (1) magnifying the necessity of sex (i.e., Magnified Necessity subscale), (2) disqualifying the benefits of sex (i.e., Disqualified Benefits subscale), and (3) minimizing one's self-efficacy for controlling sexual thoughts and behaviors (i.e., Minimized Self-Efficacy subscale). We developed a total of 17 items: seven items pertaining to magnifying the necessity of sex (e.g., "I need sex to feel good about the way I look"), seven items pertaining to disqualifying the benefits of sex (e.g., "Sex leads to more harm than good"), and three items pertaining to minimizing sexual self-efficacy (e.g., "Just thinking about sex usually leads me to seek it out"). The cognitions captured in the scale are likely to only be maladaptive to the extent that they are the dominant mode of thinking about sex. As such, we utilized responses options that increased in intensity from 1

(*Never*) to 5 (*All of the time*) to capture the extent that thoughts were becoming increasingly polarized in an all-or-nothing fashion that is typical of maladaptive thoughts.

All quantitative measures used for these analyses were completed as part of the at-home survey. After providing consent to continue with the survey, participants completed the sexual compulsivity and hypersexuality measures and the demographic questionnaire, followed by each of the additional measures. All measures were grouped into thematic blocks (e.g., stigma, sexuality, mental health) and the order of blocks within the survey and measures within blocks were both randomized in order to evenly distribute the order effects that can result from serial positioning and priming.

Demographics—Participants were asked to report several demographic characteristics, including age, race/ethnicity, sexual orientation, educational background, relationship status, and HIV status. With the exception of age, which was assessed using a free-response format, demographic characteristics were assessed using standard predefined response options and, when necessary, were condensed into meaningful categories (Table 1).

Problematic Hypersexuality—Participants completed the Hypersexual Disorder Screening Inventory (HDSI), an instrument proposed by the American Psychiatric Association's *DSM-5* Workgroup on Sexual and Gender Identity Disorders (2010). The scale consists of a total of seven items split into two sections (sections A and B) measuring criteria met within the prior six months. Section A consisted of five items measuring recurrent and intense sexual fantasies, urges, and behaviors (e.g., "During the past 6 months, I have used sexual fantasies and sexual behavior to cope with difficult feelings, for example, worry, sadness, boredom, frustration, guilt, or shame") and Section B consisted of two items measuring distress and impairment as a result of these fantasies, urges, and behaviors (e.g., "During the past 6 months, frequent and intense sexual fantasies, urges and behavior have caused significant problems for me in personal, social, work, or other important areas of my life"). Responses were scored from 0 (*Never true*) to 4 (*Almost always true*), which were summed to provide a total severity score ranging from 0 to 28. Items demonstrated evidence of strong internal consistency in this sample ($\alpha = 0.90$). Polythetic diagnostic criteria have been proposed that require recoding response into dichotomies whereby values of 3 or 4 were coded as 1 and all others were coded as 0. Following the recoding, a positive screening for hypersexuality was operationalized as the presence of at least 4 of 5 positively keyed variables in Section A and at least 1 of 2 in Section B. Prior research has found that the scale and its cutoff have strong reliability (Parsons et al., 2013).

Sexual Inhibition and Excitation—Participants completed the brief, 14-item version of the Sexual Inhibition and Sexual Excitation Scales (Bancroft, Graham, Janssen, & Sanders, 2009; Bancroft & Janssen, 2000), which measures the two processes that are theorized to underlie the sexual response (i.e., excitation and inhibition). The measure consisted of six items that assessed arousal resulting from social situations (e.g., "When a sexually attractive stranger accidentally touches me, I easily become aroused"), four items that assessed inhibition resulting from concerns about being unable to perform sexually (e.g., "When I have a distracting thought, I easily lose my erection"), and four items that assessed inhibition resulting from potentially negative consequences of sexual performance (e.g., "If I

am masturbating on my own and I realize that someone is likely to come into the room at any moment, I will lose my erection”). Response options ranged from 1 (*Strongly disagree*) to 4 (*Strongly Agree*). For the purpose of our analyses, responses to the items from each subscale were averaged to form one index of excitation and two indices of inhibition (i.e., “Sexual Inhibition I” corresponding to concerns about being unable to perform sexually and “Sexual Inhibition II” corresponding to inhibition resulting from potentially negative experiences). Internal consistency for these three subscales ranged from 0.70 to 0.81.

Impulsivity—Participants completed the 30-item Barratt Impulsiveness Scale version 11 (BIS-11) (Patton, Stanford, & Barratt, 1995). The scale contains items that measure six specific types of impulsiveness that load onto three general domains: attentional impulsiveness (e.g., “I have racing thoughts”), motor impulsiveness (e.g., “I spend or charge more than I earn”), and non-planning impulsiveness (e.g., “I am more interested in the present than in the future”). Response options ranged from 1 (*Rarely/never*) to 4 (*Almost always/Always*) which were summed across items to obtain a total score for impulsiveness that could range from 30 to 120. Internal consistency for this scale was good ($\alpha = 0.84$).

Difficulties with Emotion Regulation—Participants completed the 36-item Difficulties with Emotion Regulation Scale (DERS) (Gratz & Roemer, 2004) that measures general problems regulating emotions as well as six specific domains of difficulty with emotion regulation. Participants responded on a scale from 1 (*Almost never [0–10%]*) to 5 (*Almost always [91–100%]*) to each item and, for the purposes of this article, we utilized the full-scale score, calculated as the mean response across the 36 items. Internal consistency for this measure was strong ($\alpha = 0.94$).

Anxiety and Depression—Participants completed the 12-item Anxiety and Depression subscales of the Brief Symptom Inventory (BSI) (Derogatis, 1975), which contains a total of 53 items and nine symptom dimensions. Each of the two subscales contain six items intended to measure the symptoms of depression (e.g., “Feeling hopeless about the future”) or anxiety (e.g., “Feeling so restless you couldn’t sit well”) in the prior week. Responses options ranged from 0 (*Not at all*) to 4 (*Extremely*). Each subscale score was calculated by summing across the six items and the sums of both subscales were combined to form a score of more general mood-related and anxious symptomology. The two subscales were combined into a single index with strong internal consistency ($\alpha = 0.93$).

Sexual Compulsivity—Participants completed the Sexual Compulsivity Scale (SCS) (Kalichman et al., 1994; Kalichman & Rompa, 2001). The SCS is the most widely used measure of sexually compulsive behaviors, sexual preoccupations, and sexually intrusive thoughts with gay and bisexual men (Hook, Hook, Davis, Worthington, & Penberthy, 2010). It consists of 10 items (e.g., “My desires to have sex have disrupted my daily life”) which were rated on a Likert-type scale from 1 (*not at all like me*) to 4 (*very much like me*). Responses to each item were summed to derive an overall score (range 10–40). The SCS has been shown to have high reliability and validity across multiple studies. This scale had strong internal consistency ($\alpha = 0.89$).

Analysis Plan

We began by examining whether the three subscales that we derived from our reading of the transcripts and expert feedback--Magnified Necessity, Disqualified Benefits, and Minimized Self-Efficacy--accurately represented the structure of the MCAS scale. We further sought to test whether the Magnified Necessity and Disqualified Benefits subscales were orthogonal to each other. Using Mplus Version 6.12, we fit a confirmatory factor analysis (CFA) model to the data with Items 1–7 loading onto the Magnified Necessity subscale, Items 8–14 on the Disqualified Benefits subscale, and Items 15–17 on the Minimized Self-Efficacy subscale. Within the CFA, we examined standard indicators of model fit (Amtmann et al., 2010, 2012; Bentler, 1990; Hu & Bentler, 1999; Kline, 2010; Reise & Haviland, 2005; West, Finch, & Curran, 1995), which included comparative fit index (CFI) greater than 0.95, root mean square error of approximation (RMSEA) less than 0.06, Tucker Lewis index (TLI) greater than 0.95, and standardized root mean square residual (SRMR) less than 0.08. We also examined modification indices to detect items that had potential residual correlations and other elements of model misfit.

Using the resultant factors of the CFA, we next conducted a structural equation model (SEM) which allowed us to examine the structural relationships among the three subscales in addition to their relationships with screening positive for hypersexuality. We tested a model in which the Magnified Necessity and Disqualified Benefits subscales were uncorrelated. We regressed the latent minimized self-efficacy factor onto the latent Magnified Necessity and Disqualified Benefits factors (i.e., we examined whether these two subscales predicted the Minimized Self-Efficacy subscale). We regressed the manifest (i.e., observed) variable of hypersexuality screening result onto all three of the latent subscales of the MCAS (i.e., we examined whether the three subscales predicted screening positive for hypersexuality) and we tested for both direct and indirect effects of the Magnified Necessity and Disqualified Benefits subscales on hypersexuality screening (i.e., we examined whether the influence of these two subscales on hypersexuality screening was partially mediated through their relationship with Minimized Self-Efficacy).

We next conducted a series of exploratory analyses outside of the latent modeling framework using SPSS version 20. Based on the results of the CFA, we calculated subscale scores as the average response for all the items within the subscale. We utilized Pearson's correlation coefficients and analysis of variance (ANOVA) to examine the association between MCAS subscale scores and demographic characteristics. We next examined the bivariate associations of the three subscales with other theorized or empirically demonstrated psychosocial predictors of hypersexuality (i.e., sexual excitation, sexual inhibition, impulsivity, emotional dysregulation, depression/anxiety, and sexual compulsivity) using Pearson's correlation coefficients. Finally, we utilized logistic regression to examine the predictive utility of the MCAS subscale scores on hypersexuality screening results adjusting for the influence of the other previously mentioned psychosocial predictors as well as HIV status, a demonstrated confounding variable in the measurement of hypersexuality-related constructs (e.g., Grov et al., 2010; Parsons et al., 2012, 2013).

RESULTS

As can be seen in Table 1, the sample was highly diverse with regard to age, race/ethnicity, HIV status, and employment. A majority of the sample had at least some college or post-secondary education and most men were single at the time of their initial appointment. Despite the fact that we did not attempt to oversample any specific demographic characteristics, our sample was more diverse than the general population of MSM with regard to many factors, particularly HIV status (Smith et al., 2010).

Factor Analyses of the Maladaptive Cognitions about Sex Scale

The results of the CFA are shown in Table 2. We conducted an initial analysis with all items and then made iterative modifications to the scale based on model parameters and modification indices to eliminate psychometric complications such as local dependence (i.e., residual correlations between items) and cross-loading onto multiple factors. Although these problems can be easily dealt with statistically using latent variables, they present difficulties when attempting to use non-latent modeling such as simple linear regression with calculated subscale scores based on average item responses rather than factor analytic results. As such, these decisions were made in order to develop a scale that can be successfully utilized both within and outside of the latent modeling framework.

The initial factor loadings column in Table 2 displays both the unstandardized and standardized results of the CFA with all 17 items entered onto their respective factors. As can be seen in Table 2, the initial model did not fit the data well—the CFI and TLI were both less than 0.95 and the RMSEA was above 0.06. There were several sources of misfit for the original model. Items 8, 13, and 14 loaded poorly onto the Disqualified Benefits subscale relative to the other items and were thus removed from future iterations. Item 1 was removed due to a high residual correlation with Item 2 and Item 4 was removed due to residual correlation with several other items on the Magnified Necessity subscale. The presence of residual correlations suggests that, in addition to the factor of interest, the items shared another unmeasured construct in common which resulted in remaining covariation that was unexplained by the model which can bias non-latent uses of the scale that do not take their covariation into account. Item 12 was removed as a result of cross-loading onto the Minimized Self-Efficacy subscale as well as potential residual correlations with several items on that subscale.

The final CFA model had significantly improved fit, with all indices other than the chi-square test statistic indicating strong fit to the data based on established thresholds. The Magnified Necessity subscale contained Items 2, 3, 5, 6, and 7; the Disqualified Benefits subscale contained Items 9–11; the Minimized Self-Efficacy subscale contained Items 15–17. The resultant factors were also improved by the removal of items—for example, the variance of the Disqualified Benefits factor more than doubled. Interestingly, the correlations of the Magnified Necessity and Disqualified Benefits subscales with the Minimized Self-Efficacy subscale did not change appreciably between the original and final models. The hypothesized lack of correlation between the Necessity and Benefits subscales was supported by the model. When allowed to vary freely and be estimated by the model,

the correlation was estimated to be 0.07, was non-significant, and worsened fit of the overall model.

Modeling the Association Between MCAS Subscales and Hypersexuality

Having confirmed the best-fitting structure for the three MCAS subscales, we next sought to test the structural relationships among them and hypersexuality screening results. Results of the SEM analysis are shown in Fig. 1. The SEM analysis confirmed a cognitive model of hypersexuality consistent with self-regulatory efficacy models of behavior, as described in the Discussion. Model fit was excellent, with all indicators exceeding minimum criteria for good fit. Both the Magnified Necessity and Disqualified Benefits subscales had significant direct effects on the Minimized Self-Efficacy subscale, suggesting that higher levels on these two factors were associated with more minimizing of one's sexual self-efficacy; the Magnified Necessity subscale was a considerably stronger predictor of Minimized Self-Efficacy than was the Disqualified Benefits subscale. All three subscales significantly predicted screening positive for hypersexuality and explained 45% of the variation in screening results. The influence of Magnified Necessity and Disqualified Benefits on screening positive for hypersexuality was partially mediated by Minimized Self-Efficacy—both had significant direct effects through Minimized Self-Efficacy. In all, Magnified Necessity was the strongest predictor of screening positive for hypersexuality with a total effect of 0.55 compared to 0.32 for Disqualified Benefits and 0.26 for Minimized Self-Efficacy.

Demographic Differences in the MCAS Subscales

Using a one-way ANOVA with Fisher's least significant difference (i.e., LSD) post-hoc tests, we found significant differences in scores on the Disqualified Benefits subscale by racial/ethnic background. Black men had higher scores on the Disqualified Benefits subscale than Latino ($p = .004$), White ($p = .02$), and men of unknown background ($p = .01$); Latino men had lower scores than multiracial men ($p = .04$) in addition to Black men; men who were multiracial had higher scores than men of unknown background ($p = .03$) in addition to Latino men. No significant racial/ethnic differences were found with regard to the Magnified Necessity or Minimized Self-Efficacy subscales and we did not identify any differences in the three MCAS subscales by HIV status, employment, educational attainment, or relationship status.

Bivariate Association of the MCAS Subscales with Relevant Psychosocial Variables

We next explored the bivariate correlations between the three MCAS subscales and other psychosocial variables that have been theoretically or empirically proposed to impact hypersexuality. As can be seen in Table 3, we found similar patterns of associations across the three subscales, with each having a significant and positive correlation with impulsivity, emotional dysregulation, depression/anxiety, and sexual compulsivity. The Magnified Necessity and Minimized Self-Efficacy subscales were significantly and positively associated with sexual excitation while the Disqualified Benefits subscale had a coefficient of nearly zero. All three MCAS subscales were significantly and positively associated with the Sexual Inhibition subscale corresponding to inhibition due to the threat of performance

failure (i.e., Sexual Inhibition I), while only the Disqualified Benefits subscale was associated with the Sexual Inhibition subscale related to inhibition resulting from the threat of performance consequences (i.e., Sexual Inhibition II). Many of the psychosocial variables also had strong associations with each other.

Logistic Regression Predicting Hypersexual Disorder Screening Inventory Outcomes

In our final analysis, we sought to examine how the newly developed MCAS constructs would operate when entered into a model simultaneously with these other theoretically and empirically based components of hypersexuality. The model was adjusted for HIV status, as HIV status has been demonstrated to be strongly associated with hypersexuality-related constructs such as sexual compulsivity (e.g., Grov et al., 2010; Parsons et al., 2012, 2013).

The results of the logistic regression are shown in Table 4. We found that, using this combination of variables as predictors, nearly 87% of the participants were correctly classified as either hypersexual or not by the model. Although each variable except one (i.e., Sexual Inhibition II) was associated with hypersexual classification in bivariate analyses, only four emerged as independently significant in the context of the multivariable model: being HIV-positive was associated with nearly three times the odds of hypersexual classification, a unit increase in depression and anxiety was associated with a 2.3 times increase in odds of hypersexual classification, and a unit increase in sexual compulsivity was associated with a 1.2 times increase in the odds of hypersexual classification. A one-unit increase in the newly developed MCAS Disqualified Benefits subscale score was associated with a 1.8 times increase in the odds of hypersexual classification after adjusting for all of the other psychosocial predictors within the model, demonstrating its unique role that has been previously unaccounted for in research on hypersexuality.

DISCUSSION

We sought to create the first scale capable of capturing maladaptive cognitions about sex among highly sexually active gay and bisexual men. Results of our in-depth qualitative interviews suggested three discrete subscales, supported by confirmatory factor analysis, including magnifying the necessity of sex, disqualifying the benefits of sex, and minimizing one's self-efficacy for controlling sexual thoughts and behaviors. The structural relationship of these subscales suggests a cognitive model of hypersexuality consistent with self-regulatory efficacy models of behavior (Bandura, 1982, 1997), as described below. Further, the fact that the Disqualified Benefits of sex subscale significantly predicted the proposed hypersexuality criteria after adjusting for the key variables of all existing conceptual models of hypersexuality (i.e., sexual excitation and inhibition, impulsivity, emotional dysregulation, depression and anxiety, and sexual compulsivity) suggests the importance of continued research and clinical focus on cognitive predictors of hypersexuality.

When an individual believes that sex is associated with few benefits and much harm, yet still pursues it frequently as did the men in our sample, he is likely to develop beliefs of low personal efficacy for controlling his sexual behavior. In this way, he comes to see his behavior as driven, not by his own volition, by external circumstances beyond his control. Further, when an individual believes that sex is necessary for daily functioning—whether to

sleep, relax, cope, connect, or concentrate—he will consequently believe that these external needs, rather than his personal efficacy for regulating his sexual behavior, lead him to frequently seek sexual outlets. In this way, maladaptive outcome expectancies (i.e., disqualified benefits, magnified necessities) drive maladaptive perceptions of one's efficacy for sexual self-regulation (i.e., that one is not in control of his own sexual behavior), which in turn partially drive hypersexuality as shown in this study. Recent reformulations of Bandura's (1977) original model of behavioral self-efficacy (Williams, 2010) offer strong support for this structural framework (outcome expectancies → self-efficacy beliefs → behavior).

Among highly sexually active gay and bisexual men, believing that sex is a waste of time, more harm than good, and not worth the effort was associated with hypersexuality in a model adjusting for the major components of all existing models of hypersexuality. This finding implies that disqualifying the benefits of sex represents a primary predictor of hypersexuality that has gone unexplored in previous models. While personal distress is one of the defining features of hypersexuality, existing models of hypersexuality do not specify the source of this distress (Kafka, 2010). Our findings suggest that one potential source of distress may be maladaptive beliefs about the outcomes of sex, both positive and negative, and one's perceived lack of control over sexual behavior. Our finding of the particularly central role of only perceiving harm, not benefit, from sex was consistent with a recursive model of hypersexuality whereby problematic sexual behavior is maintained by its simultaneous ability to both cause cognitive distress (e.g., regret, shame) and to serve as a means of secondarily regulating, or coping with, this distress, even if temporarily. Future research that employs time-lagged models of the personal contexts and experiences surrounding sexual behavior (e.g., Hofmann, Baumeister, Förster, & Vohs, 2012; Shrier, Shih, Hacker, & de Moor, 2007) will be able to further clarify the function of problematic hypersexuality, including the potential for maladaptive cognitions about sex to serve as both an antecedent and consequent condition of sex.

Maladaptive Cognitions about Sex and Sexual Minority Male Development

Gay and bisexual men are significantly more likely to report maladaptive cognitions, such as low self-worth and hopelessness, across the life course than heterosexual men (e.g., Hatzenbuehler, 2009; Hatzenbuehler, McLaughlin, & Nolen-Hoeksema, 2008; Safren & G., 1999). Gay and bisexual men might experience more cognitive biases specifically about sex given their disproportionate exposure to childhood sexual abuse, minority stressors around their sexual orientation, and the secrecy and shame that often surrounds an emerging gay or bisexual identity across much of early development (D'Augelli, 2002; Lelutiu-Weinberger et al., 2011; Pachankis & Bernstein, 2012; Parsons et al., 2012; Stall et al., 2003). For example, childhood sexual abuse is associated with cognitive distress and rumination (Briere & Elliott, 2003), which in turn partially mediate the relationship between childhood sexual abuse and consumption behaviors, like eating and substance use, to cope with distress (Sarin & Nolen-Hoeksema, 2010). Further, hiding a core aspect of one's identity, such as one's sexual orientation, across an important period of development has been shown to powerfully shape one's self-concept and health behavior (Pachankis & Hatzenbuehler, 2013). While not directly tested here, a model that locates the source of maladaptive thoughts about sex in

adolescent development is consistent with developmental models of minority stress and other health behaviors. Inclusion of a measure of maladaptive cognitions about sex in studies of gay and bisexual men's development can further elucidate the role of cognition in models of gay and bisexual men's sexuality and the consequences of minority stress experiences.

Clinical Implications

Our findings regarding the contribution of magnified benefits, disqualified drawbacks, and minimized self-efficacy in a predictive model of hypersexuality were consistent with existing case studies and clinical guidance for treating this phenomenon (e.g., Shepherd, 2010; Weiss, 2004) as well as approaches to treating other sexual problems, such as exhibitionism and fetishism (Murphy & Page, 2008; Wincze, 2000). Cognitive approaches in these treatments facilitate accurate appraisals of the potential consequences of a given sexual activity and foster self-efficacy for controlling one's problematic sexual behavior. Further, treatment approaches for other behavioral excess problems (e.g., substance abuse, pathological gambling) employ cognitive restructuring techniques ranging from abstractly construing tempting stimuli (e.g., Hofmann, Deutsch, Lancaster, & Banaji, 2010) to interfering with the automatic processing of temptations (e.g., Wiers, Rinck, Kordts, Houben, & Strack, 2010). These techniques ultimately build self-efficacy for behavior change, more adaptive beliefs about the problem behavior, and self-control (Marlatt & Gordon, 1985). An intervention that aimed to facilitate insight into self-justifications for recent unprotected anal sex among men who have sex with men yielded a 60% reduction in unprotected anal sex among recipients compared to no change among a group who received standard HIV risk-reduction counseling (Dilley et al., 2007). The results of numerous relapse prevention studies examining other health-risk behaviors demonstrate that interventions that change cognitions about one's problematic behavior can, in fact, lead to reductions in that behavior.

Because our study could not establish causality, clinical implications must be drawn with caution. While reductions in maladaptive cognitions might precede reductions in hypersexual behavior, we cannot rule out the possibility that maladaptive cognitions might follow problematic behavior or that an unmeasured third variable might explain the relationship between cognition and behavior. Still, the results of the present study suggest that high levels of maladaptive thoughts about sex, especially disqualified benefits of sex, co-occur with more problematic hypersexuality. In fact, it is possible that the primary factor differentiating highly sexual active gay and bisexual men who screen positive and negative for hypersexuality may be the level of cognitive distress experienced by gay men with problematic hypersexuality although this possibility awaits empirical examination. Our results were also consistent with the possibility that a healthy cognitive perspective on sexuality might be inconsistent with recurrent, hard to control sexual fantasies, urges, and behaviors associated with significant personal distress and adverse consequences. Thus, our results suggest that treatment approaches that induce negative attitudes toward sexuality fail to highlight the benefits of sex and encourage the belief that one is not in control of his sexual behavior may unintentionally serve to perpetuate, rather than reduce, hypersexuality.

The results of this study approach, but largely circumvent, an important nomenclatural issue with clinical implications. Specifically, the reification of problematic hypersexuality in a standard diagnostic nomenclature and research agenda could be argued to pathologize a healthy aspect of human life. This argument may be especially important for gay and bisexual men, a group of individuals whose sexuality has been variably pathologized across modern history, a social problem which continues today (Gallup, 2012). However, the presence of extremely rigid or inaccurate thoughts about sex among gay and bisexual men represents a clinical problem in and of itself, potentially even a pathognomonic symptom of problematic hypersexuality, regardless of any argument for and against the moral or social value of intense sexual fantasies, urges, or behaviors. As a result, the identification and treatment of maladaptive thought content and associated cognitive processes about sex using valid measures and conceptual models represents a key mental health priority regardless of its association with a specific mental health problem. This study suggests that reducing the cognitive distress faced by men who experience problematic hypersexuality, rather than reducing levels of sexual behavior, may itself reduce problematic hypersexuality.

Limitations

Two notable limitations of this study were the sampling approach and cross-sectional design. Although we were able to recruit a diverse sample of highly sexually active gay and bisexual men, all of these men lived in the New York City metropolitan area, were required to have access to the internet, and were highly educated. Future studies are needed to determine whether samples of non-urban or less-educated men who are highly sexually active maintain varying profiles of maladaptive cognitions that manifest potentially different associations with hypersexuality. A larger sample, additionally, would have yielded more power to detect significant predictors in our multivariable logistic model. Further, the cross-sectional approach used in the present study limited our ability to determine whether maladaptive cognitions about sex were a cause, an outcome, both, or neither of problematic hypersexuality. A longitudinal design that follows highly sexually active gay and bisexual men over a critical period before the development of problematic hypersexuality would provide the means necessary for identifying the temporal role of maladaptive cognitions about sex. As mentioned previously, these associations are likely to operate in feedback with each other and future work should utilize designs that are able to investigate co-occurring changes in sexual behavior, maladaptive cognitions, and hypersexuality. Further, ecological momentary sampling of cognitions before and after sexual encounters would allow for the identification of fluctuations in maladaptive cognitions about sex and their temporal influence on sexual behavior.

Finally, the Board of Trustees of the American Psychiatric Association decided against including Hypersexual Disorder either as a formal diagnosis or in the section of the manual for further study. However, ongoing research is needed to investigate the possible criteria of problematic hypersexuality as well as the instrument proposed to assess it, the Hypersexual Disorder Screening Inventory, our primary outcome measure. For the current analyses we focused on a self-report version of the scale rather than a clinician-administered scale. It is currently unknown whether differing modes of assessment meaningfully impact the scale's ability to classify hypersexuality. Investigations seeking to establish the most accurate

measurement approach to problematic hypersexuality are need to establish hypersexuality as a valid diagnostic taxon.

Conclusion

This study developed a more complete picture of hypersexuality than previously offered and expanded existing conceptual models of hypersexuality to include a focus on the importance of maladaptive cognitions about sex in explaining problematic hypersexuality. The identification of a three-factor structure of maladaptive cognitions about sex suggests a process through which maladaptive outcome expectancies explain sexual self-regulation fallacies, all three of which explain hypersexuality, at least in part. The identification of this model through an extensive psychometric process, including confirmatory factor analysis, structural equation modeling, and testing alongside established predictors of hypersexuality suggests the reliability and validity of this construct. The fact that maladaptive cognitions regarding disqualifying the benefits of sex explains the presence of hypersexuality across our sample of highly sexually active gay and bisexual men above key variables of previously established models of hypersexuality calls for future research and clinical approaches to reduce such thoughts to thereby reduce recurrent, hard to control sexual fantasies, urges, and behaviors associated with significant personal distress and adverse consequences.

Acknowledgments

This project was supported by a research grant from the National Institute of Mental Health (R01-MH087714; Jeffrey T. Parsons, Principal Investigator). H. Jonathon Rendina was supported, in part, by a National Institute of Mental Health Ruth L. Kirchstein Individual Predoctoral Fellowship (F31-MH095622). The content is solely the responsibility of the authors and does not necessarily represent the official views of the National Institutes of Health. The authors would like to acknowledge the contributions of the Pillow Talk Research Team: Ruben Jimenez, Joshua Guthals, and Brian Mustanski. We would also like to thank CHEST staff who played important roles in the implementation of the project: Chris Cruz, Fran Ferayorni, Sitaji Gurung, and Chris Hietikko, as well as our team of research assistants, recruiters, and interns. Finally, we thank Chris Ryan, Daniel Nardicio, and Stephan Adelson and the participants who volunteered their time for this study.

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Figure 1.

Structural Model of the Association Between Maladaptive Cognitions About Sex and problematic hypersexuality. Coefficients are reported in standardized format. Hypersexuality was entered as dichotomous, manifest variable and Probit regression with Weighted Least Squares Estimation was used. Covariance between Magnified Necessity and Disqualified Benefits was set to 0 and variances of each were scaled to 1 within the standardized results presented. * $p < .05$; ** $p < .01$; *** $p < .001$. Model Fit: Model χ^2 (df) = 51.60 (50), $p = .41$; CFI = 1.00; RMSEA = 0.01; Probability RMSEA .05 = 0.97; WRMR = 0.53.

Table 1

Demographic Characteristics of the Sample

Variable	<i>n</i>	%
Race/Ethnicity		
Black	33	16.3
Latino	30	14.9
White	114	56.4
Asian/Native Haw./Pac. Islander	4	2.0
Multiracial/Other	16	7.9
Other/Unknown	5	2.5
HIV Status		
Negative	121	59.9
Positive	81	40.1
Sexual Orientation		
Gay, queer, or homosexual	172	85.6
Bisexual	24	11.9
Other non-heterosexual identity	6	2.5
Employment Status		
Full-time	70	34.7
Part-time	50	24.8
On disability	23	11.4
Student (unemployed)	18	8.9
Unemployed	41	20.3
Highest Educational Attainment		
High school diploma/GED or less	23	11.4
Some college or Associate's degree	61	30.2
Bachelor's or other 4-year degree	66	32.7
Graduate degree	52	25.7
Relationship Status		
Single	159	78.7
Partnered	43	21.3
	<i>M</i>	<i>SD</i>
Age (in years)	37.03	11.35

Table 2

Initial and Final Confirmatory Factor Models of the Three MCAS Subscales

Item	Initial Factor Loadings				Final Factor Loadings			
	Unstd.	SE	Std.	SE	Unstd.	SE	Std.	SE
Magnified Necessity								
1. I need sex to sleep better	1.00	<i>a</i>	0.76	0.04	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>
2. I need sex to calm me down when I am stressed	1.01	0.09	0.80	0.03	1.00	<i>a</i>	0.75	0.04
3. I need sex to help cope with boredom	0.87	0.09	0.71	0.04	0.92	0.10	0.70	0.04
4. I need sex to feel good about the way I look	0.82	0.10	0.61	0.05	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>
5. I need sex to help me concentrate	0.90	0.09	0.72	0.04	0.95	0.10	0.71	0.04
6. I need sex to deepen my connection to others	0.84	0.11	0.59	0.05	0.90	0.11	0.60	0.05
7. I need sex to relax	0.86	0.09	0.72	0.04	0.96	0.10	0.76	0.04
Estimated Factor Variance	0.84	0.14	<i>b</i>	<i>b</i>	0.75	0.13	<i>b</i>	<i>b</i>
Disqualified Benefits								
8. I should not need to masturbate	1.00	<i>a</i>	0.44	0.06	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>
9. Sex is a waste of time	1.27	0.22	0.72	0.04	1.00	<i>a</i>	0.78	0.04
10. Sex leads to more harm than good	1.56	0.25	0.86	0.03	1.07	0.11	0.82	0.04
11. Sex isn't worth the effort	1.34	0.23	0.73	0.04	0.99	0.10	0.75	0.04
12. Sex leads to trouble	1.23	0.21	0.72	0.04	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>
13. If I could take a pill to reduce my sex drive, I would	1.02	0.21	0.48	0.06	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>
14. Sex is nothing more than two people using each other to meet their needs	0.84	0.19	0.41	0.06	<i>c</i>	<i>c</i>	<i>c</i>	<i>c</i>
Estimated Factor Variance	0.30	0.10	<i>b</i>	<i>b</i>	0.57	0.10	<i>b</i>	<i>b</i>
Minimized Self-Efficacy								
15. When a sexual image or fantasy enters my mind, I have a difficult time letting go of it	1.00	<i>a</i>	0.87	0.02	1.00	<i>a</i>	0.87	0.02
16. Once I start thinking about sex, I have a difficult time stopping	1.10	0.06	0.93	0.02	1.10	0.06	0.94	0.02
17. Just thinking about sex usually leads me to seek it out	0.89	0.06	0.79	0.03	0.89	0.06	0.79	0.03
Estimated Factor Variance	0.83	0.11	<i>b</i>	<i>b</i>	0.84	0.11	<i>b</i>	<i>b</i>
Estimated Covariances								
Magnified Necessity with Minimized Self-Efficacy	0.44	0.08	0.52	0.06	0.45	0.08	0.57	0.06
Disqualified Benefits with Minimized Self-Efficacy	0.13	0.04	0.26	0.07	0.12	0.05	0.17	0.07

Item	Initial Factor Loadings				Final Factor Loadings			
	Unstd.	SE	Std.	SE	Unstd.	SE	Std.	SE
	Model Fit				Model Fit			
CFI/TLI			0.90/0.88				0.98/0.97	
AIC/Adj. BIC			9067.68/9075.10				5714.57/5719.47	
Model χ^2 (df)			278.49 (117), $p < .001$				66.48 (42), $p < .01$	
RMSEA, 95% CI			0.08 [0.07, 0.10]				0.05 [0.03, 0.08]	
SMSR			0.10				0.05	

Note. Unstd. = Unstandardized. SE = Standard Error. Std. = Standardized.

^aStandard errors were not calculated for the first indicator per factor in the unstandardized model because its factor loading was fixed to 1 in order to establish the scale of the factor.

^bFactor variances were fixed to 1 within the standardized model and were not estimated.

^cThese items were removed from the final version of the scale.

Table 3
Bivariate Correlations and Descriptive Statistics for Hypersexual Disorder and Relevant Psychosocial Factors

Variable	1	2	3	4	5	6	7	8	9	10	11
1. Hypersexual Disorder Screening	--										
2. Sexual Excitation	0.20**	--									
3. Sexual Inhibition I	0.19**	0.12	--								
4. Sexual Inhibition II	0.08	0.12	0.39***	--							
5. Impulsivity	0.30***	0.10	0.18*	0.08	--						
6. Emotional Dysregulation	0.40***	0.14*	0.26***	0.11	0.58***	--					
7. Depression and Anxiety	0.43***	0.17*	0.27***	0.13	0.43***	0.60***	--				
8. Sexual Compulsivity	0.50***	0.22***	0.11	0.03	0.42***	0.41***	0.34***	--			
9. MCAS - Magnified Necessity	0.36***	0.36***	0.15*	0.03	0.31***	0.42***	0.43***	0.45***	--		
10. MCAS - Disqualified Benefits	0.22**	-0.02	0.14*	0.18*	0.23***	0.18**	0.21**	0.16*	0.06	--	
11. MCAS - Minimized Self-Efficacy	0.39***	0.51***	0.19**	0.13	0.34***	0.43***	0.42***	0.56***	0.51***	0.16*	--
% or M^a	20.3%	3.12	2.25	2.32	65.37	80.85	0.98	24.28	2.77	1.92	2.98
n or SD^a	41	0.54	0.60	0.63	10.99	23.09	0.84	7.09	0.90	0.85	0.97
Cronbach's α	b	0.81	0.74	0.70	0.84	0.94	0.93	0.89	0.83	0.83	0.90

Note.

^a For hypersexual disorder classification and HIV-positive status, the percentage and number of participants in the "yes" category for these dichotomous variables are displayed. For all other variables which have continuous distributions, means and SDs are displayed.

^b These two items were single-item dichotomous indicators and did not have corresponding alpha coefficients.

* p .05.

** p .01.

*** p .001.

Table 4

Logistic Regression Predicting Hypersexual Disorder Screening Inventory (HDSI) Screening Results with Relevant Psychosocial Indicators

Variable	B	AOR	95% CI
HIV-Positive Status ^a	1.05	2.86*	[1.03, 7.97]
Sexual Excitation	0.31	1.36	[0.50, 3.71]
Sexual Inhibition I	-0.09	0.92	[0.38, 2.19]
Sexual Inhibition II	0.06	1.07	[0.48, 2.34]
Impulsivity	-0.04	0.96	[0.91, 1.02]
Emotional Dysregulation	0.02	1.02	[0.99, 1.05]
Depression and Anxiety	0.83	2.30*	[1.16, 4.57]
Sexual Compulsivity	0.21	1.23***	[1.12, 1.35]
MCAS: Magnified Necessity	0.20	1.23	[0.64, 2.34]
MCAS: Disqualified Benefits	0.57	1.77*	[1.01, 3.10]
MCAS: Minimized Self-Efficacy	0.08	1.08	[0.53, 2.18]
Model Fit			
Model $\chi^2(df)$	87.84*** (11)		
Nagelkerke R^2	0.56		
-2 Log Likelihood	115.97		
% Correctly Classified on HDSI	86.1%		

Note. CI = Confidence Interval; AOR = Adjusted Odds Ratio.

^a HIV status is coded 1 = Positive, 0 = Negative.

* $p < .05$.

*** $p < .001$.