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Examining the Conditions under which Internalized Homophobia is Associated with Substance Use and Condomless Sex in Young MSM: The Moderating Role of Impulsivity

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Abstract

Background—Internalized homophobia (IH) is the internalization of homophobic attitudes by sexual minorities due to social bias. IH has been inconsistently related to substance use and unprotected sex for young men who have sex with men (YMSM).

Purpose—We examined negative urgency (the tendency to act impulsively in response to negative emotional experiences), positive urgency (the tendency to act impulsively in response to positive emotional experiences), and sensation seeking as independent moderators of the association of IH with binge drinking, drug use, and condomless anal sex.

Methods—Data were collected from 450 YMSM (mean age = 18.9) over the course of 18 months (baseline, 6-, 12-, and 18-month follow-up).

Results—Hierarchical generalized linear modeling revealed that there was a significant moderation for binge drinking and receptive condomless anal sex, with the association between IH and these risk behaviors increased for those with higher levels of negative urgency and positive urgency.

Conclusions—IH is important to the negative health outcomes of binge drinking and condomless anal sex for individuals high in negative and/or positive urgency, who may act

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impulsively to avoid subjective negative experiences or in the face of positive emotional experiences. Future research is needed to further establish additional conditions under which IH may be important to understanding risk behaviors in YMSM, which is essential to developing targeted prevention and intervention efforts.

Keywords

internalized homophobia; substance use; drug use; men who have sex with men; gay men; risky sex

Research has shown that men who have sex with men (MSM) are disproportionately impacted by health issues compared to heterosexuals, including alcohol use (1), drug use (2, 3), and HIV (4). Partially, these disparities may be accounted for by minority stress – the unique stressors encountered by minority groups (5) – which may increase risky behaviors. One minority stressor that has received attention in relation to alcohol use, drug use, and risky sexual behaviors is internalized homophobia (IH; 6). IH refers to the internalization of negative views of oneself or others who are sexual minorities as a product of living within a heterosexist society (7). As reviewed below, there have been many mixed findings on the relation between IH and these risky behaviors, highlighting the need to further examine potential moderators of these associations to understand for whom these relationships may exist.

Minority Stress: IH in Relation to Risky Behaviors

IH is one of the minority stressors that have been expanded upon in Meyer's minority stress model (5). Minority stress more generally refers to the unique stressors that impact minority groups above and beyond the general stressors that all individuals encounter. For sexual minorities, including MSM, these stressors include distal experiences, such as harassment and discrimination, as well as several proximal components. These proximal minority stressors include identity concealment, expectations of rejection, and IH. The majority of research on these proximal minority stressors has focused on IH, although there is still a need for more research on how this minority stressor relates to risk outcomes as we will outline below.

Studies have revealed mixed findings on the association between IH and alcohol and drug use. For example, some researchers have found IH to be associated with more alcohol use (8, 9), whereas other studies have not found significant associations (10–12). These conflicting findings also exist for drug use, with some researchers finding IH associated with more drug use (11) and abuse (9), whereas others have found either no significant relations with drug use (10) or even negative associations (12). There are likely many reasons for these mixed findings, including the use of outdated measures of IH, use of IH scales that are not well validated, and varied measurement of alcohol and drug use. Alternatively, it could be the case that an association between IH and substance use exists for some individuals and not others, which could lead to a null result. The literature in this area is in need of further examination to truly differentiate if IH is related to alcohol and drug use and, if so, for whom and under what circumstances.

Research on the relation between IH and condomless sex among MSM also has been fairly mixed. In a meta-analysis of the research examining IH and risky sex among MSM, Newcomb and Mustanski found only a small effect size and questioned the usefulness of further examining IH as a direct correlate of risky sexual behaviors (13). Even so, individual studies have found IH to be related to greater rates of condomless anal sex and higher numbers of anal sex partners (8, 10, 14). These inconsistencies in the literature on the relation between IH and condomless sex may reflect a need for more nuanced studies, such as examining indirect effects or moderating variables (15, 16). For example, using structural equation modeling, IH has been related to condomless sex through the mediating variable of increased experiences of difficult sexual situations (e.g., having sex under the influence of substances or to avoid losing a partner; 17). Further highlighting the complex relation between IH and risky sex, Smolenski, Stigler, Ross, and Rosser found that greater compulsive sexual behavior and lower numbers of sexual partners each mediated the association between IH and condomless sex (18). These seemingly conflicting findings resulted in not finding a significant direct association between IH and condomless sex and could be one reason for mixed findings more broadly in the literature. These studies show that there may be conditions under which IH is related to condomless anal sex for MSM that are in need of further exploration.

Impulsivity as a Moderator of the IH-Risky Behavior Association

Impulsivity has several components, including urgency (both negative and positive urgency), sensation seeking, lack of planning, and lack of persistence (19), which may be important to risk behaviors. Of particular interest in relation to IH are urgency and sensation seeking given their connection to affective experiences. IH is characterized by a sense of shame about one's self and thus a negative emotional experience of one's self as a result of social stigma and marginalization. Because of this connection to emotional experience, we have limited our evaluation of impulsivity to the urgency and sensation seeking components of impulsivity. Furthermore, research has indicated that these aspects of impulsivity are distinct from one another, showing that negative and positive urgency are related to risk behaviors when in different emotional states (i.e., when in distress and when in positive mood states, respectively; 20, 21). Given the distinctions between these aspects of urgency, as well as distinctions with sensation seeking (20), they may differentially contribute to the association between IH and risk behaviors—especially considering that there may be interactions between one's environmental experiences and the effects of impulsivity traits (21).

Negative urgency is defined as a personality trait that influences how a person behaves or responds when experiencing negative emotions or distress—particularly describing the tendency to act impulsively and in ways that are potentially harmful or hazardous (21). There are a variety of ways that negative urgency may come to influence an individual's behavior. This includes through compromising one's ability to cope in the face of negative emotion or by helping an individual avoid an immediate negative subjective experience through engaging in risky behaviors (22). This may be particularly important in relation to IH. Individuals with a negative sense of self who are also high in negative urgency may consciously or unconsciously avoid experiencing the negative emotions associated with IH through engaging in risky behaviors.

Positive urgency is defined as the tendency to react in impulsive ways when in a positive mood state (20). For individuals who experience IH, there may be ways that positive emotional experiences demand more of a reaction due to the ways that IH relates to a more global negative experience of one's self (23). Due to the contrast with the negative global emotional state of IH, individuals may be more likely to act impulsively on their positive emotional experiences. In this sense, it may not directly be the negative internal experience of IH that is important to understanding risk, but potentially the experiences of individuals who have some momentary alleviation of IH experiences when in a positive mood state.

Sensation seeking refers to the tendency to seek thrilling, novel experiences (20). Past research has indicated that sensation seeking is a distinct aspect of impulsivity from the urgency constructs (19). More specifically, sensation seeking may be related to engagement in risk behaviors, such as drinking, but it may not be predictive of problematic levels of these behaviors (19, 24), whereas urgency constructs may be better predictors of problematic levels of risk behaviors. Examining this construct along with negative and positive urgency will allow for greater depth of understanding whether it is a desire for exciting experiences or the mood related reactions that contribute to risk behaviors.

Research has documented the various negative outcomes associated with these aspects of impulsivity in samples that were not targeting sexual minorities and are presumably mostly heterosexual. For example, Berg, Latzman, Bliwise, and Lilienfeld conducted a meta-analysis of 115 studies which utilized the Urgency, Premeditation, Perseverance, and Sensation Seeking Impulsive Behavior Scale (UPPS) to measure various aspects of impulsivity, including negative urgency, positive urgency, and sensation seeking (22). They found significant effect sizes in the areas of suicidality, aggression, anxiety, borderline personality traits, disordered eating, depression, and alcohol and substance use for negative urgency. For positive urgency and sensation seeking, there were significant effect sizes for alcohol and substance use. And, in addition to being associated with a multitude of negative health outcomes, negative urgency also has been shown to increase the likelihood of negative life events as a result of the individual's risk behaviors (25).

Specific to substance use behaviors, it is likely that sensation seeking is related more generally to engaging in use of substances but that urgency is related to problematic levels of use (19, 24). Other research has shown that negative urgency may be related to hazardous drinking, average weekly alcohol use, average weekly marijuana use, average weekly tobacco use, and history of drug use (26). Similarly, positive urgency has been related to increased alcohol consumption (27) and illegal drug use (28). Additionally, individuals higher in negative urgency have been shown to have more negative alcohol related consequences (29). Negative urgency may be particularly important in relation to hazardous drinking (as opposed to general alcohol consumption) given that problematic drinking may involve more impulsivity (30), and has been found to be a mechanism that connects negative affect to problematic alcohol use (31).

In relation to risky sexual behaviors, the literature has been slightly more mixed, with some researchers proposing that other aspects of impulsivity are more strongly related to sexual risk taking (e.g., sexual compulsivity; 32). However, research also has shown negative and

positive urgency to be an important predictor of risky sexual behavior in heterosexual samples (28, 33–35). Additionally, Newcomb, Clerkin, and Mustanski found that although sensation seeking did not have a direct effect on condomless sex for MSM, it was a moderator of the relation between both alcohol and drug use and condomless sex (36). More specifically, the associations between both alcohol and drug use and condomless sex were strengthened for those higher in sensation seeking. Other researchers have found correlations between impulsive decision making and sensation seeking with the frequency of engaging in condomless sex for MSM (8). Given these mixed findings, more research is needed overall on the relation between urgency and risky sexual behaviors, especially with sexual minority samples who are at greater risk for negative consequences when engaging in condomless sex.

Clearly, negative and positive urgency, as well as sensation seeking, have broad implications for the health of individuals and are in need of further study in MSM. This study aimed to examine the moderating effect of negative urgency, positive urgency, and sensation seeking on the relation between IH and risky behaviors. Given the mixed findings for the relation between IH, alcohol use, drug use, and risky sexual behaviors, examining these aspects of impulsivity could reveal important individual level characteristics that may help to answer the question of for whom IH influences risky behaviors – especially given the connection between affect and these aspects of impulsivity, which may be important when understanding an emotional and affective minority stressor like IH.

Method

Participants and Procedures

Data for this study included four waves of data collected across 18 months (baseline, 6-, 12-, and 18-month follow-up) from Crew 450, an ongoing study investigating a syndemic of psychosocial issues related to HIV in young MSM. At baseline, there were 450 participants. Retention rates at the 6-, 12-, and 18-month follow-up were 85.8% ($N=386$), 80.7% ($N=363$), and 75.6% ($N=340$), respectively. For inclusion in the study, participants were: 1) between 16 and 20 years of age at baseline; 2) assigned male at birth; 3) spoke English; 4) had a previous sexual encounter with a man or identified as gay or bisexual; and 5) were available for follow-up for 2 years. The mean age of the sample at baseline was 18.9 years old ($SD=1.29$) and 25.8% of the participants were less than 18 years old. In terms of sexual orientation, about half of the sample (50.2%) identified as only gay/homosexual, with an additional 22.9% identifying as mostly gay/homosexual, 21.3% bisexual, 2.4% mostly heterosexual, 0.7% only heterosexual, and 2.4% who chose “other” as their sexual orientation. The majority of the sample were racial/ethnic minorities (82%), including 53.3% Black/African Americans, 20% Hispanic/Latinos, and 8.7% who chose “other” as their race/ethnicity.

Participants were recruited via incentivized snowball sampling, with some similarities to respondent driven sampling (37). There was an initial convenience sample (i.e., “seeds”) of 172 YMSM (38.2% of the sample) who were recruited using targeted in-person outreach at community venues, school, and other community organizations, as well as through geo-social network applications (i.e., Grindr, Jackd), and subsequent incentivized peer

recruitment. The study was approved by the Institutional Review Boards of the primary investigators' institutions with a waiver of parental permission under 45 CFR 46.408(c) (38). Participants provided their consent/assent to participate in the study and completed the surveys using computer-assisted self-interview technology. The participants were given \$70 to complete the baseline surveys, which were spread across two visits, and an additional \$45 at each follow-up wave of data collection.

Measures

Demographics—Participants reported their age, sex, and race/ethnicity. Participants also self-reported their sexual orientation using the following options: only gay/homosexual, mostly gay/homosexual, bisexual, mostly heterosexual, only heterosexual, or other. For sexual orientation, the participants in the mostly heterosexual, only heterosexual, and “other” categories were combined into one group (“other sexual orientation”) in order to control for sexual orientation in the analyses.

Internalized homophobia—This measure was adapted from the Homosexual Attitudes Inventory (39), a measure frequently used to measure IH (40). This included eight items which measured participants' discomfort with their sexual minority identity (e.g., “I have tried to stop being attracted to men.”). Responses were measured on a 4-point Likert scale from 1 (*Strongly Disagree*) to 4 (*Strongly Agree*) and responses were averaged with higher scores indicating greater IH. Cronbach's alpha in the current sample was .88 at baseline, and .90, .89, and .89 at the second, third, and fourth wave of data collection respectively. This scale was chosen to measure IH as we have conducted additional factor analyses on this measure to ensure that it is an adequate measure of IH, including exploratory and confirmatory factor analyses and assessments of convergent and discriminant validity across two samples (41).

Impulsivity—The negative urgency, positive urgency, and sensation seeking subscales of the UPPS-R (42) were used to measure participants' levels of impulsivity. The negative urgency subscale (12 items) measured participants' tendencies to act impulsively when experiencing negative emotions (e.g., “Sometimes when I feel bad, I can't seem to stop what I am doing even though it is making me feel worse.”). The positive urgency subscale (14 items) measured participants' tendencies to act impulsively when experiencing positive emotions (e.g., “I am surprised at the things I do while in a great mood.”). The sensation seeking subscale (12 items) assessed participants' desire to seek out new and exciting situations (e.g., “I sometimes like doing things that are a bit frightening.”). All subscales were rated on a 4-point Likert scale from 1 (*Agree Strongly*) to 4 (*Disagree Strongly*). A mean score was computed after reverse scoring items, such that higher scores indicated greater negative urgency, positive urgency, and impulsivity. Cronbach's alpha at baseline was .84 for the negative urgency subscale, .92 for the positive urgency subscale, and .82 for the sensation seeking subscale.

Binge drinking—Participants were asked to indicate how often they engaged in binge drinking using the item “During the past 6 months, how often did you have 5 or more drinks

containing alcohol within a two-hour period?” Response options ranged from 0 (*0 days*) to 9 (*Every day*), increasing incrementally across the response options.

Drug use—To assess use of drugs across the past 6 months, participants were asked the following: “During the past 6 months, how many times did you use [insert name of drug]?” These questions were repeated with the following substances: marijuana, cocaine, methamphetamines, prescription stimulants (either without a prescription or taking more than prescribed), prescription depressants (either without a prescription or taking more than prescribed), heroin, other opiates (e.g., morphine, codeine, Demerol), MDMA (ecstasy), psychedelics (e.g., PCP, LSD, mescaline, mushrooms), gamma hydroxybutyrate (GHB), ketamine, poppers, and other inhalants (e.g., glues, spray paint, cleaning fluids). Response options ranged from *0 Times* (1) to *Every Day or Almost Every Day* (7). Marijuana use was examined along the continuum of responses. Separately, a variable was created to measure drug use other than marijuana (hereafter referred to as “other drug use”) that indicated if a participant ever used any other drugs previously listed, besides marijuana, in the past 6 months (1 = any other drug use; 0 = no other drug use).

Sexual risk taking—The HIV-Risk Assessment for Sexual Partnerships (H-RASP) was used to measure sexual behavior at the level of sexual partnerships using a computerized self-administered interview (43). In these analyses, we calculated the total number of times participants engaged in insertive condomless anal sex and the total number of times participants engaged in receptive condomless anal sex at each wave. This data was gathered specifically for the last 3 sexual partners that participants reported at each wave. Participants who did not report engaging in sex received a zero on these items.

Statistical Analyses

Analyses were conducted using HLM software, which allows for the analysis of nested or multilevel data. We conducted hierarchical generalized linear models in this analysis to account for dependency in the data, as there were multiple waves of data collection with repeated measurement of study constructs within persons. In the analyses, Level 1 data included variables that were repeatedly measured at each of the four waves of data collection (i.e., binge drinking, marijuana use, other drug use, sexual risk, and IH), which were nested within participants. Level 2 data included between-subjects variables that did not vary over time (i.e., demographics, negative urgency, positive urgency, and sensation seeking). Negative urgency, positive urgency, and sensation seeking were included as stable variables because other research has documented these to be relatively stable constructs after some increases in impulsivity during adolescence (44). The use of hierarchical generalized linear modeling allowed for the analysis of the main-effects of independent variables at both Level 1 (i.e., IH) and Level 2 (i.e., negative urgency), in addition to estimating the moderating effects of Level 2 variables on Level 1 main effects (i.e., cross-level interaction, with variables centered at the mean; the moderating effect of the impulsivity variables on the association between IH and outcome variables). At Level 1, hierarchical generalized linear modeling makes use of all available data and is not impacted by missing data. At Level 2, participants are fully removed from the model if there is any missing data on the variables being examined. Additionally, hierarchical generalized linear modeling accounts for the

nesting of the Level 1 data within participants. In the analyses, we also allowed for random slopes to be estimated as opposed to fixed effects, due to having repeated measures of variables across four waves of data collection.

Maximum likelihood estimation was utilized and estimates are reported from the population-average model using robust standard errors. Binge drinking was modeled with a Poisson distribution, accounting for overdispersion of the data (meaning that the standard deviation was larger than the mean). Marijuana use was modeled as a continuous variable. The other drug use variable was dichotomous, and we utilized a Bernoulli distribution to model this variable, accounting for overdispersion of the data. Lastly, the condomless anal sex variables were count variables, and we utilized a Poisson distribution to model these variables, also accounting for overdispersion of the data.

Results

Descriptive information regarding the rates of use of alcohol, marijuana, and other drug use have been reported in another manuscript (see 45). At baseline, 50% of the sample reported binge drinking in the past 6 months and 56.2% reported using marijuana in the past 6 months. The rates of using other drugs varied depending on the substance (45). At baseline, across all other substances, a total of 18.2% of the participants reported use during the previous 6 months. In regards to sexual risk taking, on average participants reported 2.36 condomless insertive anal sex acts and 5.1 condomless receptive anal sex acts at baseline.

Estimates of the main and moderating effects in the binge drinking and drug use analyses are presented in Table 1. Estimates for demographic variables are provided based on the first analysis examining negative urgency, as the estimates were similar across the analyses. There was a positive association between baseline age and binge drinking ($ERR = 1.10, p < .05$). In addition, participants who were White ($ERR = 2.37, p < .01$) and Latino ($ERR = 1.69, p < .01$) reported more frequent binge drinking relative to Black participants. There were no significant effects for sexual orientation in relation to binge drinking. However, bisexuals used marijuana more frequently than gay participants, and White participants used marijuana more frequently than Black participants. Analyses also revealed that White ($OR = 5.27, p < .01$) and Latino ($OR = 2.41, p < .01$) participants were more likely to engage in hard drug use compared to Black participants.

After controlling for age, race, and sexual orientation, there were several significant main effects for the impulsivity variables, as well as two moderating effects. In regards to binge drinking, negative urgency was positively associated with binge drinking frequency ($ERR = 1.32, p < .01$), as was positive urgency ($ERR = 1.19, p < .05$) and sensation seeking ($ERR = 1.61, p < .01$). Although sensation seeking did not emerge as a significant moderator, both negative ($ERR = 1.41, p < .01$) and positive urgency ($ERR = 1.34, p < .01$) moderated the association between IH and binge drinking. This moderation showed that individuals who had high levels of negative and positive urgency had an increase in binge drinking as their levels of IH increased (see Figures 1 and 2). Thus, even though there was a significant main effect of negative and positive urgency on binge drinking, this must be considered within the context of this moderating effect. Simple slopes analysis revealed a significant positive

association between IH and binge drinking for participants at one standard deviation above the mean of both negative and positive urgency. Further, we found a negative relationship between IH and binge drinking at one standard deviation below the mean of negative and positive urgency, but these relationships did not reach significance.

For marijuana use, both negative urgency and sensation seeking emerged as significant predictors of marijuana use, although there was not a significant association for positive urgency or any significant moderating effects of the impulsivity variables. For other drug use, sensation seeking ($OR = 1.55, p < .01$) emerged as the only significant predictor, again with no significant moderating effects of the impulsivity variables. In addition, we conducted sensitivity analyses on the other drug use models in which we removed prescription and other legal drugs from the outcome (i.e., prescription depressants/stimulants, Viagra, inhalants, poppers). The overall pattern of findings remained intact, except positive urgency became a significant predictor of other drug use. IH was not significantly associated with binge drinking, marijuana use, or other drug use.

As for the sexual risk taking analyses, estimates of the main and moderating effects are presented in Table 2. In regards to demographics, participants with an “other” sexual orientation engaged in less condomless insertive anal sex acts ($ERR = 0.34, p < .05$) than gay participants. Also, bisexual participants engaged in less condomless receptive anal sex acts ($ERR = 0.24, p < .01$) than gay participants. After controlling for age, race, and sexual orientation, there were no significant main effects for the impulsivity variables in relation to the condomless insertive anal sex acts or condomless receptive anal sex acts. However, there were two significant moderation analyses, wherein both negative ($ERR = 1.83, p < .05$) and positive urgency ($ERR = 1.42, p < .05$) moderated the association between IH and the number of condomless receptive anal sex acts. Individuals who had higher levels of negative and positive urgency had a positive association between IH and condomless receptive anal sex acts, whereas those at lower levels of negative and positive urgency exhibited a negative association between these variables (see Figure 3; results graphically were similar for negative and positive urgency, thus only one figure is provided). Simple slopes analyses revealed that these associations did not quite reach statistical significance at one standard deviation above and below the mean on the impulsivity variables.

We also examined whether the impulsivity related variables (negative urgency, positive urgency, and sensation seeking) were significant predictors of each outcome when included simultaneously within the same analyses. In regards to drinking, negative urgency ($ERR = 1.31, p < .05$) and sensation seeking ($ERR = 1.57, p < .01$) were significant predictors of binge drinking, whereas positive urgency was not even though this was a significant predictor in the individual analyses above. For marijuana use, all three aspects of impulsivity were associated with frequency of use (coefficient = 0.89, -0.78, and 0.53, respectively for negative urgency, positive urgency, and sensation seeking). This differed from the individual analyses, wherein positive urgency was not a significant predictor of marijuana use. The results for other drug use remained the same as in the individual analyses above, wherein only sensation seeking was a significant predictor of drug use ($OR = 1.54, p < .01$). As for sexual risk outcomes, the results matched the individual analyses above with none of the impulsivity variables predicting insertive or receptive condomless anal sex acts.

Discussion

IH is a minority stressor that has a documented damaging effect on the mental health and well-being of sexual minorities (46), although the degree to which it influences engagement in other risky behaviors (e.g., alcohol use, drug use, risky sex) is less clear given the mixed findings in previous literature (6, 13). The current analyses found that IH was not directly associated with the examined risk behaviors, including binge drinking, marijuana use, other drug use, or risky sexual behavior. However, negative urgency and positive urgency were significant moderators of the association between IH and both binge drinking and receptive condomless anal sex, such that the association between IH and these risk behaviors was positive for those who were higher in both negative and positive urgency.

Even though it has been theorized that IH is related to substance use and sexual risk behavior (47), previous authors (10, 11) and this study have not supported this as a universal experience of all sexual minorities. Our results indicate that IH is not directly associated with substance use, including binge drinking, marijuana use, or other drug use. Instead, it is likely that contextual and individual level factors influence the degree to which IH is related to these negative outcomes. In this study, negative urgency and positive urgency proved to be significant moderators in the analysis examining binge drinking. As we found, the relation between IH and binge drinking was positive for those who had high negative and positive urgency, even though there was not a significant main effect for IH. In addition, unexpectedly, those who had low levels of negative and positive urgency, actually showed declines in their binge drinking as IH increased. This revealed that there may indeed be different effects of IH on binge drinking, depending on other variables that may not have been accounted for in prior research.

Given that negative urgency represents an impulsivity specific to avoiding subjective negative emotional experiences (which is part of the experience of IH), those who are high in negative urgency may have a difficult time modulating their emotions and engage in binge drinking as an avoidance strategy. Similarly, positive urgency represents impulsivity specific to experiencing positive emotional states and it may be that individuals who have high IH react more intensely to their positive moods because of the contrast to the negative states associated with IH. This reactivity may make it likely that individuals who have high IH engage in impulsive and risky behaviors in the context on both the negative and positive emotional states. In addition, for those individuals who are generally lower in their levels of urgency and impulsivity, it may be that IH is associated with less risk behaviors. This could be because these individuals may be less likely to be in settings that promote binge drinking (e.g., bar culture) due to the ways that IH impairs interpersonal connections.

Overall, negative urgency and sensation seeking appeared to be related to risky behaviors regardless of IH, being associated with more binge drinking, marijuana use, and other drug use (for sensation seeking only). This provides further support for the negative correlates of these aspects of impulsivity, extending the findings from previous studies that utilized primarily heterosexual samples (26). Even so, we did not find negative urgency to be a significant moderator in the marijuana and other drug use analyses and sensation seeking was not a significant moderator in any of the analyses. This is possibly because alcohol use

tends to be a more social and socially-acceptable activity than marijuana and other drug use. For young MSM, being in social contexts such as bars or other venues within the gay community, could increase activation of IH, which would then explain why negative urgency may amplify the effect of IH on binge-drinking. Alternatively, marijuana and other drugs are more difficult to access and MSM may turn to alcohol as a coping strategy more readily given that it is more available.

Additionally, our results indicate that there was not a significant association between IH and risky sexual behaviors. However, there may be significant associations depending on how risky sex is defined and measured, as well as depending on levels of negative and positive urgency. For example, when examining the frequency of insertive condomless anal sex we did not find a main effect for IH, negative urgency, positive urgency, or sensation seeking; nor did we find a significant moderating effect of these impulsivity variables. In contrast, there was a significant moderating effect of negative and positive urgency when examining the association between IH and receptive condomless anal sex, which indicated that the association between these variables was positive for those with higher IH and very high levels of negative and positive urgency. In addition, there was a negative relationship between IH and receptive condomless anal sex for people with very low levels of negative and positive urgency. This finding is particularly important because individuals who engage in receptive condomless anal sex are at increased risk for HIV transmission compared to those engaging in insertive condomless anal sex (48).

Similar to the findings for binge drinking, it may be that the lower levels of urgency and impulsivity result in IH decreasing the likelihood of engaging in this risk behavior. Given the ways that IH relates to stigma and bias against sexual minorities, it may be that YMSM without higher levels of impulsivity are inhibited sexually by those internalized negative messages about sexual minorities. In addition, these different effects could reflect the greater social stigma around being the receptive partner in a sexual encounter for male same-sex partners. This finding helps shed some light on mixed findings in the literature and suggests that IH may be associated with risky sexual behavior for some MSM under certain conditions.

This study provides support for continuing to examine IH in relation to alcohol use and risky sexual behaviors, particularly pursuing research that examines moderators of these relations to further understand under what conditions those relationships exist. This line of research may reveal important details about what might buffer against the detrimental effects of IH and who might be the most at risk for negative health outcomes in the face of IH. As we found, IH itself may not be a significant predictor of these risk behaviors, but combined with other individual characteristics, it may be. Beyond examining other individual level moderators of the relations between IH and negative health outcomes, future work also should include a focus on social and contextual factors. IH is an experience that is inherently connected to the social context in which MSM are living. As such, being in social contexts that are more homophobic or marginalizing of sexual minorities (e.g., unsupportive family environments) will likely trigger more intense internal discord for MSM who are managing IH. Given this, it is possible that there would be stronger associations with negative

outcomes within such contexts. This line of research would provide further support for improving the social atmosphere for young MSM in order to improve health outcomes.

In addition, future research should examine the ability of various coping styles or skills to moderate the effects of IH on these negative health outcomes. Given the pervasiveness of homophobia socially, helping MSM to develop coping skills, such as being able to detach from negative thoughts related to the internalization of stigma, will increase their positive self-images and lead to better health outcomes. This is particularly important because personality level characteristics, such as negative urgency, are often stable and as we show here, can increase the associations with risk behaviors. In the face of these more stable characteristics, it may be helpful to include coping skills that incorporate an acceptance component or aspects of distress tolerance. Individuals who are managing impulsivity specifically related to their mood states may benefit from finding ways of detaching from those impulsive thoughts or tolerating their impulsivity when in these mood states.

Limitations and Strengths

This study provides important insights into understanding for whom IH influences risky behaviors. Even so, this study is not without limitations. Our sample was a convenience sample from an urban area and was composed of mostly racial minority participants. Although more research is needed on the experiences of racial minority MSM, these results may not be generalizable to all MSM. In addition, our sample only included participants who were assigned male at birth and therefore our results do not capture differences that may exist for sexual minority women or transgender individuals. Additionally, our sexual risk outcome did not take into account the type of relationship participants had with their partners. It is possible that this would change the degree to which IH is associated with condomless anal sex or the degree to which negative urgency may play a moderating role. Also, the measure of IH used the term “gay” when referencing sexual orientation related discomfort and future research is needed to understand whether this influenced responses by bisexual participants. Lastly, there are other possible moderators that could be examined in future work that may influence the association between IH and risk behaviors. These include other minority stressors (e.g., degree of outness), other personality level variables (e.g., traits such as narcissism), and interpersonal variables (e.g., degree of community connectedness with other MSM).

Despite these limitations, there were several strengths to this study. For one, we had a diverse sample of participants with four waves of data collection, which likely increased the precision of our measurement of the study variables. In addition, this study helps to understand the individual-level traits that may influence the degree to which IH leads to negative outcomes, which is a highly understudied area. As research on IH progresses, more nuanced investigations about the association between IH and health outcomes may help inform more targeted prevention and intervention strategies.

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References

1. Hughes TL. Alcohol use and alcohol-related problems among lesbians and gay men. *Annu Rev Nurs Res.* 2005; 23:283–325. [PubMed: 16353369]
2. Cochran SD, Ackerman D, Mays VM, Ross MW. Prevalence of non-medical drug use and dependence among homosexually active men and women in the US population. *Addiction.* 2004; 99:989–998. [PubMed: 15265096]
3. Trocki KF, Drabble LA, Midanik LT. Tobacco, marijuana, and sensation seeking: comparisons across gay, lesbian, bisexual, and heterosexual groups. *Psychol Addict Behav.* 2009; 23:620–631. [PubMed: 20025368]
4. CDC. U. DHHS. National HIV Behavioral Surveillance: HIV risk and testing behaviors among young MSM. Atlanta, US: 2009.
5. Meyer IH. Prejudice, social stress, and mental health in lesbian, gay, and bisexual populations: conceptual issues and research evidence. *Psychol Bull.* 2003; 129:674–697. [PubMed: 12956539]
6. Szymanski DM, Kashubeck S, Meyer J. Internalized heterosexism - Measurement, psychosocial correlates, and research directions. *Counseling Psychologist.* 2008; 36:525–574.
7. Shidlo, A. Internalized homophobia: Conceptual and empirical issues in measurement. In: Greene, B., Herek, G., editors. *Psychological perspective on lesbian and gay issues.* Thousand Oaks, CA: Sage Publications, Inc; 1994. p. 176-205.
8. Dudley MG, Rostosky SS, Korfhage BA, Zimmerman RS. Correlates of high-risk sexual behavior among young men who have sex with men. *AIDS Educ Prev.* 2004; 16:328–340. [PubMed: 15342335]
9. Weber GN. Using to numb the pain: Substance use and abuse among lesbian, gay, and bisexual individuals. *American Mental Health Counselors Association.* 2008:30.
10. Hatzenbuehler ML, Nolen-Hoeksema S, Erickson SJ. Minority stress predictors of HIV risk behavior, substance use, and depressive symptoms: Results from a prospective study of bereaved gay men. *Health Psychology.* 2008; 27:455–462. [PubMed: 18643003]
11. Hequembourg AL, Dearing RL. Exploring shame, guilt, and risky substance use among sexual minority men and women. *Journal of Homosexuality.* 2013; 60:615–638. [PubMed: 23469820]
12. Lea T, de Wit J, Reynolds R. Minority stress in lesbian, gay, and bisexual young adults in Australia: Associations with psychological distress, suicidality, and substance use. *Archives of Sexual Behavior.* 2014; 43:1571–1578. [PubMed: 24573397]
13. Newcomb ME, Mustanski B. Moderators of the relationship between internalized homophobia and risky sexual behavior in men who have sex with men: a meta-analysis. *Archives of Sexual Behavior.* 2011; 40:189–199. [PubMed: 19888643]
14. Amola O, Grimmatt MA. Sexual identity, mental health, hiv risk behaviors, and internalized homophobia among black men who have sex with men. *Journal of Counseling and Development.* 2015; 93:236–246.
15. Ross MW, Rosser BRS, Smolenski D. The importance of measuring internalized homophobia/homonegativity. *Archives of Sexual Behavior.* 2010; 39:1207–1208. [PubMed: 20464466]
16. Newcomb ME, Mustanski B. The importance of measuring internalized homophobia/homonegativity: reply to Ross, Rosser, and Smolenski (2010a). *Archives of Sexual Behavior.* 2010; 39:1209–1211.
17. Huebner DM, Kegeles SM, Rebchook GM, et al. Social oppression, psychological vulnerability, and unprotected intercourse among young black men who have sex with men. *Health Psychology.* 2014; 33:1568–1578. [PubMed: 24274807]
18. Smolenski DJ, Stigler MH, Ross MW, Rosser BRS. Direct and indirect associations between internalized homonegativity and high-risk sex. *Archives of Sexual Behavior.* 2011; 40:785–792. [PubMed: 21221754]
19. Smith GT, Fischer S, Cyders MA, Annus AM, Spillane NS. On the validity and utility of discriminating among impulsivity-like traits. *Assessment.* 2007; 14:155–170. [PubMed: 17504888]
20. Cyders MA, Smith GT. Mood-based rash action and its components: Positive and negative urgency. *Personality and Individual Differences.* 2007; 43:839–850.

21. Cyders MA, Smith GT. Emotion-based dispositions to rash action: positive and negative urgency. *Psychol Bull.* 2008; 134:807–828. [PubMed: 18954158]
22. Berg JM, Latzman RD, Bliwise NG, Lilienfeld SO. Parsing the heterogeneity of impulsivity: a meta-analytic review of the behavioral implications of the UPPS for psychopathology. *Psychological Assessment.* 2015; 27:1129–1146. [PubMed: 25822833]
23. Puckett JA, Levitt HM, Horne SG, Hayes-Skelton SA. Internalized heterosexism and psychological distress: The mediating role of self-criticism and community connectedness. *Psychology of Sexual Orientation and Gender Diversity.* 2015; 2:426–435.
24. Cyders MA, Flory K, Rainer S, Smith GT. The role of personality dispositions to risky behavior in predicting first-year college drinking. *Addiction.* 2009; 104:193–202. [PubMed: 19149813]
25. Liu RT, Kleiman EM. Impulsivity and the generation of negative life events: The role of negative urgency. *Personality and Individual Differences.* 2012; 53:609–612.
26. Kaiser AJ, Milich R, Lynam DR, Charnigo RJ. Negative urgency, distress tolerance, and substance abuse among college students. *Addictive Behaviors.* 2012; 37:1075–1083. [PubMed: 22698894]
27. Cyders MA, Zapolski TCB, Combs JL, et al. Experimental effect of positive urgency on negative outcomes from risk taking and on increased alcohol consumption. *Psychology of Addictive Behaviors.* 2010; 24:367–375. [PubMed: 20853921]
28. Zapolski TCB, Cyders MA, Smith GT. Positive urgency predicts illegal drug use and risky sexual behavior. *Psychology of Addictive Behaviors.* 2009; 23:348–354. [PubMed: 19586152]
29. LaBrie JW, Kenney SR, Napper LE, Miller K. Impulsivity and alcohol-related risk among college students: Examining urgency, sensation seeking and the moderating influence of beliefs about alcohol's role in the college experience. *Addictive Behaviors.* 2014; 39:159–164. [PubMed: 24120644]
30. Stautz K, Cooper A. Impulsivity-related personality traits and adolescent alcohol use: A meta-analytic review. *Clinical Psychology Review.* 2013; 33:574–592. [PubMed: 23563081]
31. Coskunpinar A, Dir AL, Karyadi KA, Koo C, Cyders MA. Mechanisms underlying the relationship between negative affectivity and problematic alcohol use. *Journal of Experimental Psychopathology.* 2013; 4:263–278.
32. Shuper PA, Joharchi N, Rehm J. Personality as a predictor of unprotected sexual behavior among people living with HIV/AIDS: A systematic review. *Aids and Behavior.* 2014; 18:398–410. [PubMed: 23835736]
33. Deckman T, DeWall CN. Negative urgency and risky sexual behaviors: A clarification of the relationship between impulsivity and risky sexual behavior. *Personality and Individual Differences.* 2011; 51:674–678.
34. Derefinko KJ, Peters JR, Eisenlohr-Moul TA, et al. Relations between trait impulsivity, behavioral impulsivity, physiological arousal, and risky sexual behavior among young men. *Archives of Sexual Behavior.* 2014; 43:1149–1158. [PubMed: 24958252]
35. Settles RE, Fischer S, Cyders MA, et al. Negative urgency: a personality predictor of externalizing behavior characterized by neuroticism, low conscientiousness, and disagreeableness. *Journal of Abnormal Psychology.* 2012; 121:160–172. [PubMed: 21859164]
36. Newcomb ME, Clerkin EM, Mustanski B. Sensation seeking moderates the effects of alcohol and drug use prior to sex on sexual risk in young men who have sex with men. *Aids and Behavior.* 2011; 15:565–575. [PubMed: 20960048]
37. Heckathorn DD. Respondent-driven sampling: A new approach to the study of hidden populations. *Social Problems.* 1997; 44:174–199.
38. Mustanski B. Ethical and regulatory issues with conducting sexuality research with LGBT adolescents: A call to action for a scientifically informed approach. *Archives of Sexual Behavior.* 2011; 40:673–686. [PubMed: 21528402]
39. Nungesser, LG. *Homosexual acts, actors, and identities.* New York, NY: Praeger; 1983.
40. Grey JA, Robinson BE, Coleman E, Bockting WO. A systematic review of instruments that measure attitudes toward homosexual men. *Journal of Sex Research.* 2013; 50:329–352. [PubMed: 23480076]
41. Puckett JA, Newcomb ME, Ryan D, Garofalo R, Mustanski B. Internalized and perceived stigma: A validation study of the constructs in a sample of young men who have sex with men [published

- online September 19, 2016]. *Sexuality Research and Social Policy*. 2016; doi: 10.1007/s13178-016-0258-5
42. Whiteside SP, Lynam DR. The Five Factor Model and impulsivity: using a structural model of personality to understand impulsivity. *Personality and Individual Differences*. 2001; 30:669–689.
43. Mustanski B, Starks T, Newcomb ME. Methods for the design and analysis of relationship and partner effects on sexual health. *Archives of Sexual Behavior*. 2014; 43:21–33. [PubMed: 24243003]
44. Littlefield AK, Stevens AK, Ellingson JM, King KM, Jackson KM. Changes in negative urgency, positive urgency, and sensation seeking across adolescence. *Personality and Individual Differences*. 2016; 90:332–337. [PubMed: 26949280]
45. Newcomb ME, Ryan DY, Greene GJ, Garofalo R, Mustanski M. Prevalence and patterns of smoking, alcohol use, and illicit drug use in young men who have sex with men. *Drug Alcohol Depend*. 2014; 141:65–71. [PubMed: 24907774]
46. Newcomb ME, Mustanski B. Internalized homophobia and internalizing mental health problems: A meta-analytic review. *Clinical Psychology Review*. 2010; 30:1019–1029. [PubMed: 20708315]
47. Brubaker MD, Garrett MT, Dew BJ. Examining the relationship between internalized heterosexism and substance abuse among lesbina, gay, and bisexual individuals: A critical review. *Journal of LGBT Issues in Counseling*. 2009; 3:62–89.
48. Beyrer C, Baral SD, Griensven FV, Goodreau SM, Chariyalertsak S, Wirtz AL, Brookmeyer R. Global epidemiology of HIV infection in men who have sex with men. *Lancet*. 2013; 380:367–377.

Figure 1. Moderating effect of negative urgency on the association between internalized homophobia and binge drinking. Negative urgency was measured on a continuous scale, with low and high negative urgency groups created by averaging the lower and upper quartiles of this scale. This was done for illustrative purposes.

Figure 2.

Moderating effect of positive urgency on the association between internalized homophobia and binge drinking. Positive urgency was measured on a continuous scale, with low and high positive urgency groups created by averaging the lower and upper quartiles of this scale. This was done for illustrative purposes.

Figure 3.

Moderating effect of negative urgency on the association between internalized homophobia and receptive condomless anal sex. Negative urgency was measured on a continuous scale, with low and high negative urgency groups created by averaging the lower and upper quartiles of this scale. This was done for illustrative purposes.

Table 1

Summary of Main and Moderating Effects on Binge Drinking, Marijuana Use, and Other Drug Use

Fixed Effect	Binge Drinking			Marijuana Use			Other Drug Use		
	ERR	95% CI	Coeff.	SE	OR.	95% CI			
Intercept	0.15 *	0.04–0.64	2.16	1.33	0.04 **	0.004–0.37			
Negative Urgency	1.32 **	1.10–1.57	0.36 *	0.16	1.26	0.95–1.67			
IH	1.07	0.94–1.20	0.06	0.11	0.94	0.75–1.18			
IH X Negative Urgency	1.41 **	1.18–1.69	0.23	0.16	0.88	0.60–1.30			
Intercept	0.12 **	0.03–0.57	2.28	1.34	0.03 **	0.003–0.35			
Positive Urgency	1.19 *	1.01–1.42	–0.10	0.14	1.09	0.89–1.33			
IH	1.07	0.95–1.21	0.08	0.11	0.95	0.76–1.18			
IH X Positive Urgency	1.34 **	1.13–1.60	0.21	0.16	0.93	0.70–1.22			
Intercept	0.20 *	0.04–0.95	2.59	1.34	0.05 *	0.005–0.53			
Sensation Seeking	1.61 **	1.34–1.93	0.48 **	0.15	1.55 **	1.21–2.00			
IH	1.14	1.00–1.30	0.08	0.11	0.95	0.76–1.18			
IH X Sensation Seeking	0.89	0.73–1.10	0.53	0.15	1.13	0.79–1.62			

Note. Analyses controlled for age, race, and sexual orientation. ERR = event rate ratio. CI = confidence interval. Coeff = coefficient estimate. SE = standard error. IH = internalized homophobia.

* $p < .05$

** $p < .01$

Table 2

Summary of Main and Moderating Effects on Condomless Anal Sex

Fixed Effect	Total # Condomless Insertive Anal Acts		Total # Condomless Receptive Anal Acts	
	ERR	95% CI	ERR	95% CI
Intercept	0.17	0.005–5.89	2.45	0.17–35.37
Negative Urgency	0.92	0.60–1.40	1.04	0.75–1.44
IH	1.32	0.59–2.93	1.21	0.86–1.72
IH X Negative Urgency	1.33	0.66–2.68	1.83 *	1.13–2.97
Intercept	0.25	0.007–9.91	2.28	0.18–28.95
Positive Urgency	0.77	0.58–1.02	1.23	0.96–1.56
IH	1.28	0.58–2.84	1.21	0.88–1.69
IH X Positive Urgency	1.21	0.49–2.96	1.42 *	1.02–1.99
Intercept	0.19	0.003–10.06	4.87	0.34–69.01
Sensation Seeking	1.35	0.88–2.06	1.24	0.92–1.67
IH	1.28	0.58–2.84	1.28	0.92–1.77
IH X Sensation Seeking	1.98	0.89–4.41	1.15	0.74–1.81

Note. Analyses controlled for age, race, and sexual orientation. ERR = event rate ratio. CI = confidence interval. IH = internalized homophobia.

*
 $p < .05$

**
 $p < .01$