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Utilizing Social Action Theory as a Framework to Determine Correlates of Illicit Drug Use Among Young Men Who Have Sex with Men

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Abstract

Background—Young men who have sex with men (YMSM) continue to be at elevated risk for substance use; however, models explaining this phenomenon have often focused on a limited array of explanatory constructs.

Purpose—This study utilizes Social Action Theory (SAT) as a framework to address gaps in research by documenting the social, behavioral, and demographic risk factors associated with illicit drug use among YMSM.

Methods—Structural equation modeling was used to apply SAT to a cross-sectional sample of 526 men from the Healthy Young Men Study, a longitudinal study of substance use and sexual risk behavior among YMSM in Los Angeles.

Results—The final model possessed very good fit statistics (CFI = 0.936, TLI = 0.925, RMSEA = 0.040) indicating that SAT is appropriate for use with YMSM.

Conclusions—Substance use interventions for YMSM could be enhanced by employing SAT as conceptualized in this study and using a multi-targeted strategy for impacting illicit drug use.

Keywords

Young Men Who Have Sex with Men (YMSM); Social Action Theory; Illicit Drug Use; Emerging Adults

Young men who have sex with men (YMSM) continue to be at elevated risk for substance use and abuse when compared to their heterosexual peers (Russell, Driscoll & Truong, 2002). YMSM are significantly more likely to report lifetime use of alcohol and drugs, including injectable drugs, as well as report use of marijuana and cocaine before 13 years of

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age (Kipke, et al., 2007; Wolitski, Valdiserri, Denning, and Levine, 2001). Risk factors associated with high levels of substance use include stressful life events (Clatts, Goldsamt, Neaigus, & Welle, 2003; Rosario, Schrimshaw, and Hunter, 2004), gay-related verbal harassment and discrimination (Rosario, Rotheram-Borus, and Reid, 1996), and involvement in gay-related social events (Kipke et al, 2007; Rosario, Schrimshaw, and Hunter, 2004).

Theoretically-based research concerning the determinants of drug risk behavior for high risk populations has been conducted from the perspective of the Health Belief Model (Ellickson, McCaffrey, Ghosh-Dastidar, & Longshore, 2003), the Theory of Reasoned Action (Sayeed, Fishbein, Hornik, Capella & Ahern, 2005), and Social-Cognitive Theory (Barkin, Smith, & Durant, 2002). Although this research has contributed to the understanding of substance use and abuse among high risk populations, these models have often focused on a relatively limited array of explanatory constructs and have produced contradictory theoretical perspectives (Noar & Zimmerman, 2005). Moreover, the vast majority of literature related to health behavior theory focuses on using the aforementioned theories to inform interventions rather than explicitly testing, building, or extending the theory under study (Painter, Borba, Hynes, Mays, & Glanz, 2008).

One theory that holds great promise as a comprehensive model to address illicit drug use among YMSM is Social Action Theory (SAT) (Ewart, 1991). The current study addresses gaps in research related to YMSM and illicit drug use/abuse by clarifying the interactions between illicit drug use/abuse, impulsivity, and coping strategies that enhance risky behaviors for an at-risk, under-represented population. By applying a SAT model, this paper will highlight the importance of theory testing and documentation of the social, behavioral, and demographic risk factors associated with illicit drug use among YMSM.

Background

The Health Belief Model (Ellickson, et al., 2003), the Theory of Reasoned Action (Sayeed, et al., 2005), and Social Cognitive Theory (Barkin, et al., 2002) have all guided behavioral risk prevention efforts. However, each of these theories has a relatively limited focus on factors impacting behavioral change. For example, the Health Belief Model solely focuses on cognitive factors impacting an individual's assessment and belief in health promoting behavior. In Social Cognitive Theory, attention is paid to the way the social environment impacts behavior. The Theory of Reasoned Action attempts to combine the previous two theories into one theory that addresses both individual attitudes and group norms that influence health behavior. Given the multitude of competing theoretical foci (from cognitive to environmental), the field could benefit from a comprehensive and well-integrated theory that captures and conceptualizes the range of factors involved in determining substance use risk taking among YMSM.

The risk behaviors of YMSM must be understood within the context of other health concerns (e.g., anxiety, substance abuse, childhood sexual abuse), population specific factors (e.g., the coming out process, gay related stress), and other theoretical factors (e.g., intentions to practice safe sex) (Rosario, Schrimshaw, & Hunter, 2006). Theories of YMSM risk behavior must also be responsive to the contextual, psychological, and social/interpersonal contexts of YMSM's lives. The development of successful theories requires an understanding of how these contexts shape YMSM's illicit drug use behaviors.

Contextual Risk Factors: Age, Ethnicity

Developmental factors are likely to play an important role in the risk profiles and risk behavior trajectories of YMSM. Indeed, late adolescence and early adulthood is a period during which young people experiment with behaviors that often bring increased risk. There

is compelling evidence of age-related differences in predictors of risk behaviors throughout the developmental period that is now commonly referred to as “emerging adulthood,” between the ages of 18 and 26 years (Arnett, 2000). Theoretically, this is believed to be a distinct developmental period that brings contexts of risk that are different from both late adolescence and adulthood. Cultural factors may compound the tumultuous period of older adolescent development and contribute to YMSM's unwillingness to disclose their sexual identity, especially in the Latino and African American communities. Relationships among the social constructs of masculinity, sexual identification, and behavioral decision-making have not been adequately explored. However, African American MSM appear to be more likely to identify as heterosexual or bisexual and less likely to identify as gay than their Caucasian counterparts (Craib, 2000; Miller, Murphy, Clark, Hamuburger, & Moore, 2004; Siegel, 2004). Similarly, cultural norms, such as values attached to family and religion, may dictate that Latino MSM conceal their sexual identity to avoid disappointment or stigma (Herek, 2004). Although age and race/ethnicity are not a central focus of the present analysis, we include these variables as covariates as they have previously been shown to play an important role in risk behavior among YMSM.

Psychological Risk Factors: Impulsivity, Sensation Seeking, and Mental Health

Empirical evidence suggests the salience of individual personality factors in understanding illicit drug use. Several studies of YMSM have found that psychological distress is significantly associated with increased risk behaviors (Rosario, et al., 2006). In addition, impulsivity and sensation-seeking may serve as coping strategies for the regulation of negative affect and mental health issues (e.g., self-esteem, psychological distress) and may bear directly or indirectly on the illicit drug use behaviors of YMSM (Dudley, et al., 2004; Rosario, et al., 2006). Given the high rates of psychiatric co-morbidity among young gay, lesbian, and bisexual populations (Bontempo & D'Augelli, 2002), psychological factors such as social anxiety, rumination tendencies, and coping behaviors may play a key role in understanding associations with increased drug risk behavior (Hart & Heinberg, 2005; Pachankis & Goldfried, 2006; Tate, 2006).

Social/Interpersonal Risk Factors: Social Support and Peer Influence

Strong evidence suggests that youth experimenting with same-sex relationships are not afforded the same social support as their heterosexual peers (Rosario, Hunter, Maguen, Gwadz, & Smith, 2001; Rosario, Scrimshaw, Hunter, & Braun, 2006; Saewyc, et al., 2006). Indeed, YMSM, especially YMSM of color, may experience increased disapproval, discrimination, and homophobia in every arena of their lives (e.g., from their family, peers, racial/ethnic community, faith community, and from the predominately white gay community) (Rosario, et al., 2006, Rosario, et al., 2001, Saewyc, et al., 2006). While connectedness with family has repeatedly been found highly protective against drug use and other risky behaviors among young people (Rosenblum, et al., 2005; Sneed, Morisky, Rotheram-Borus, Ebin, Malotte, 2001), many YMSM find themselves feeling disconnected and isolated from their families because of their sexual identity (Rosario, et al., 2001; Rosario, et al., 2006; Saewyc, et al., 2006). Some YMSM may resist disclosure of their sexual identity out of fear of rejection by family and peers (Carpineto, Kubicek, Weiss, Iverson, & Kipke, 2008). Evidence suggests that lack of social support within social networks can negatively impact health (Ritt-Olson, et al., 2005). However, this effect may also be due to an individual's selection of friends as well as to the behaviors they attribute to their friends (Ewart, 2004; Ewart, 2009; La Greca, Prinstein, & Fetter, 2000). Shared norms around health behaviors (e.g., tobacco, alcohol and other drug use) are powerful sources of social influence with direct consequences for the behaviors of network members.

Social Action Theory

Social Action Theory (Ewart, 1991) addresses the critical gap left by other behavioral theories by providing a comprehensive model of behavioral change emphasizing environmental, social, and psychological mechanisms that result in sustained patterns of health promoting behavior (Maisto, Ewart, Connors, Funderburk, & Krennek, 2009). SAT has the potential to bridge a gap in utility and terminology across behavioral models because it presents a model of behavior change emphasizing the context in which health behavior occurs, developmentally driven self-regulatory processes, social interaction processes, and the mechanisms by which these variables result in health-promoting behavior (Gore-Felton et al., 2005; Lightfoot, Rotheram-Borus, Milburn, & Swendeman, 2005; Remien et al., 2003). In addition, SAT delineates the pathways through which environmental contexts impact social cognitive mechanisms and behavior. The explicit nature of these relationships is unique to this theory's framework in comparison to the aforementioned health promotion theories and provides a more holistic framework for looking at health-promoting behavior. (See Traube, Holloway, & Smith, in press, for a comprehensive review of the gaps left by these models). Social Action Theory proposes that health protective behaviors are a result of an interaction among three domains: (1) contextual influences such as background/demographics, life stressors and mental health; (2) self-change processes such as coping skills, self-efficacy and social support; and (3) action states including health behavior outcomes such as substance use and abuse. (See Figure 1)

Social Action Theory was originally developed as a general health promotion model for the adult population, and has been successfully applied to various health behaviors (Chen, Matthews, Salomon, & Ewart, 2002; Curbow, et al., 2005; Ewart, 1994, 2004; Ewart & Jorgensen, 2004; Fitzgerald, Brown, Sonnega, & Ewart, 2005; Fitzgerald, Haythornthwaite, Suchday, & Ewart, 2003; Johnson, Carrico, Chesney, Morin, 2008; Lightfoot, Rotheram-Borus, Milburn, Swendeman, 2005; MacGregor, et al., 2007). However, its application to drug related risk behaviors—and to YMSM risk behaviors in particular—has not been applied and tested. While a comprehensive model focusing on the complex interplay between environmental, social, and cognitive factors has the potential to make a significant contribution to our understanding of the pathways to illicit drug use in this population, more information is needed about the pathways between environmental, psychological, and social factors that contribute to the difficulties faced by youth who are part of a sexual minority.

Methods

The data analyzed for the present study come from the first wave of the Healthy Young Men (HYM) study, a longitudinal study of substance use and sexual risk behavior among YMSM in Los Angeles, California. The original study followed an ethnically diverse cohort of YMSM every six months between February 2005 and January 2008, culminating in five waves of data, although only data from the first (baseline) wave were used in the present analysis.

Participants

YMSM were eligible to participate if they met the following criteria: (1) were male; (2) were between 18 and 24 years of age; (3) were Latino of Mexican descent, Black, or White; (4) identified as gay or bisexual or reported previous sexual experience with men; and (5) lived in Los Angeles County and planned to live in the area for at least 6 months following baseline assessment. Five hundred twenty-six young men were recruited at baseline and included in the present analysis. The sample was 39% Latino of Mexican descent ($n = 205$), 24% African American ($n = 126$), and 37% White ($n = 195$). The mean age of YMSM in the sample was approximately 20 years of age. Three percent were HIV positive ($n = 15$), 80%

were HIV negative ($n = 420$), and 17% did not know their HIV status ($n = 90$). All young men who agreed to participate in the study signed informed consent documents. The study was approved by the Committee on Clinical Investigations of Children's Hospital Los Angeles.

Procedures

Participants were recruited through a venue-based sampling strategy that has been used successfully with similar populations (MacKellar, Valleroy, Karon, Lemp, & Janssen, 1996; Muhib, Lin, Stueve, Miller, Ford, Johnson, et al., 2001). Using a stratified probability sampling design, participants were recruited from 36 different public venues that had been previously identified as settings in which YMSM spend time and/or “hang out”, including bars/clubs (50%), Pride festivals (14%), special events/private parties (14%), social service agencies (11%), and high-traffic street locations (11%). The survey itself was administered later at a location convenient to the participant, at either the project office or a public venue that provided Internet connectivity. Before beginning the survey, the interviewer reviewed the purpose of the study and the participation requirements and obtained the respondent's written informed consent. The survey asked questions about a variety of topics, including family background, substance use history, sexual behavior, and a number of cognitive and psychological variables, and were administered using audio computer assisted interview technology that allowed the participant to enter responses directly into the computer while hearing the questions asked through headphones. This method has been shown to reduce self-report bias of sensitive information (de Leeuw, 2000). Participants were given \$35 as compensation for their time.

Measures

Demographics—Single-item demographic variables represented the respondent's age in years, residential status (living at home with family vs. other), and race/ethnicity. Age was a continuous variable. Residential status and race/ethnicity were dummy coded (residential status: 1 = live at home, 0 = other; African American race/ethnicity: African American = 1, White = 0, Latino = 0; and Latino race/ethnicity: Latino = 1, White = 0, African American = 0).

Action Contexts—Five variables were used as indicators of the action contexts latent variable: (1) experiences of social/sexual racism, (2) experiences of institutional racism, (3) witnessing violence, (4) history of physical abuse, and (5) experiences of homophobia. Social/sexual racism was measured by taking the mean score across six items about respondents' experiences of sexualized racism and racism in social situations (Cronbach's $\alpha = 0.81$). These items included: “How often have you been made to feel uncomfortable in a gay bar or club because of your race or ethnicity?”, “How often have you had trouble finding lover relationships because of your race or ethnicity?”, “In sexual relationships, how often do you find that people pay more attention to your race or ethnicity than to who you are as a person?” “How often have you been turned down for sex because of your race or ethnicity?” “How often did you hear sexual comments about your race or ethnicity?” “How often have you been made to feel sexually objectified (like a piece of meat) because of your race or ethnicity?” Responses were scored using a 4-point scale (1 = “never”, 2 = “once or twice”, 3 = “a few times”, 4 = “many times”). Responses were coded so that higher scores on the mean variable represented greater levels of social/sexual racism.

Institutional racism was measured by taking the mean score across three items about respondents' experiences of discrimination and/or racism ($\alpha = 0.70$). These items included: “How often have you been treated rudely or unfairly because of your race or ethnicity?” “How often have you been harassed by police because of your race or ethnicity?” “How

often have you been turned down for a job because of your race or ethnicity?" (1 = "never", 2 = "once or twice", 3 = "a few times", 4 = "many times"). Responses were coded so that higher scores on the mean variable represented greater levels of institutional racism.

Witnessing violence was measured using a dichotomous variable representing whether respondents had ever witnessed violence in their home. Abuse history was a dichotomous variable representing whether respondents had ever been physically abused. Both variables asked participants if the violence they witnessed or abuse they experienced in their home involved hitting so hard that it left a bruise or required medical attention. Experience of homophobia was measured by a single item that asked respondents to indicate how often they had to pretend to be heterosexual in order to be accepted. Response options ranged from 1 ("never") to 4 ("many times"). This variable was coded so that higher scores represented more experiences of homophobia.

Motivational Appraisals—Three variables were used as indicators of motivational appraisals: (1) friends' risk behavior; (2) health values; and (3) health risk expectancies. Friends' risk behavior was calculated by taking the mean score across five items related to drug use and sexual risk behavior of respondents' five closest friends. The items included: "How many of [your friends] have tried drugs?", "How many of [your friends] use drugs at least once a month?", "How many [of your friends] smoke pot regularly?", "How many of [your friends] like to get stoned or high on other drugs before/while having sex?", and "How many of [your friends] like to get drunk before/while having sex?". Each item was scored on a four-point scale and reverse coded so that higher scores represented fewer friends who had engaged in risk behaviors ($\alpha = 0.81$).

Health as a value was measured using a 3-item scale designed to measure the value respondents placed on their health (Lau, Hartman, & Ware, 1986). Each item was measured with a 4-point Likert-type scale that asked respondents to rate how true each of the following statements were: "I am willing to make sacrifices to be healthy", "A big part of happiness is health", and "My health is one of my biggest concerns". Responses ranged from 1 ("completely true") to 4 ("not true"). Items were reverse coded and a mean was taken across all three items so that higher scores indicated higher health values ($\alpha = 0.67$).

Health risk outcome expectancies were measured by taking a mean score across five items that asked respondents to rate their perceived risk for negative health outcomes compared to other YMSM of the same age. Specifically, participants were asked to rate their risk for "getting HIV", "getting herpes", "becoming addicted to drugs", "becoming an alcoholic", and "getting hepatitis". Responses were scored on a five point scale with higher scores representing lower risk expectancies (1 = "I am much more at risk", 2 = "I am more at risk", 3 = "I am at about the same risk", 4 = "I am less at risk", 5 = "I am at much less risk") ($\alpha = 0.82$).

Generative Capabilities—Two variables were used as indicators of generative capabilities: (1) protective strategies against HIV, and (2) self-efficacy for HIV prevention. Protective strategies against HIV was measured using a 9-item scale designed to measure the respondents' likelihood of using a condom with a sexual partner given a variety of circumstances, such as "finding out that your partner is HIV-positive", "being drunk or high on drugs", and "having just met your partner that night". Respondents were asked to rate their likelihood of using a condom on a three point scale (1 = "not use a condom", 2 = "maybe use a condom", and 3 = "definitely use a condom"). Negatively worded items were recoded so that higher scores on the protective strategies variable represented a greater likelihood of employing protective strategies against HIV. Cronbach's α for the protective strategies scale was 0.88.

Self-efficacy for HIV prevention was measured using a 9-item scale that asked respondents to rate how sure they were that they could engage in behavior to prevent HIV transmission in a variety of situations. These situations included “talking to your partner about safer sex”, “wearing a condom comfortably”, and “telling your partner that you will not have sexual intercourse”. Each item was scored on a 4-point scale (1 = “couldn't do it”, 2 = “unsure”, 3 = “sure”, 4 = “very sure”). A mean score was computed across all items so that higher scores represented greater self-efficacy for HIV prevention ($\alpha = 0.79$).

Social Interaction—Three items were used as indicators for social interaction: (1) family support, (2) family closeness, and (3) friend support. Family support was measured using 4 items that assessed respondents' perceived support from family. These items included: “My family really tries to help me”, “I get the emotional support I need from my family”, “I can talk about my problems with my family”, and “My family is willing to help me make decisions”. These items were scored on a 4-point Likert-type scale (1 = “strongly disagree”, 2 = “disagree”, 3 = “agree”, 4 = “strongly agree”), coded so that higher scores represented higher levels of family support. Cronbach's α for family support was 0.87.

Family closeness was measured using 4 items that assessed respondents' perceived closeness to their family. These items included: “I have at least one person in my family who defends me if someone says hurtful things”, “I trust my family”, “My family provides me with a lot of support”, and “I would do anything for my family”. Each of these items was scored dichotomously and then summed to create a composite variable (ranging from 0 to 4) where higher scores represented higher levels of family closeness; Cronbach's α was 0.69.

Friend support was measured using 4 items that assessed respondents' perceived support from their friends. These items included: “My friends really try to help me”; “I can count on my friends when things go wrong”, “I have friends with whom I can share my joys and sorrows”, and “I can talk about my problems with my friends”. These items were scored on a 4-point Likert-type scale (1 = “strongly disagree”, 2 = “disagree”, 3 = “agree”, 4 = “strongly agree”). Items were coded so that higher scores represented higher levels of friend support. Cronbach's α for friend support was 0.85.

Psychological Distress—Four variables were used as indicators for the psychological distress (i.e., poor mental health) latent variable: (1) depression, (2) stress, (3) suicidality, and (4) hopelessness. Depression was assessed using the 20-item Center for Epidemiologic studies Depression Scale (CESD, Radloff, 1977) whereby participants were asked if they had experienced depressive symptoms within the past week using a 4-point scale (“less than a day or never”, “1-2 days”, “3-4 days”, “5-7 days”). A total score was calculated by summing the items ($\alpha = 0.90$). Higher scores represent higher levels of depression.

Stressful life events were measured by asking participants if they had experienced stressful events during the previous 3 months, using a 35-item instrument that was developed with adult MSM (Nott & Vedhara, 1995). In addition to using items from the established scale, the scale was adapted for YMSM by adding eight items generated from qualitative data during the formative phase of the HYM study. Participants were asked to indicate how many stressful events they had experienced in the past 3 months. Examples of stressful events included “arguments with a partner”, “financial hardship”, “illness of a family member”, “changes at work that were difficult to handle”, and “being forced to move”. A total score was calculated by summing the number of items checked, so that higher scores represented greater stress.

Suicidality was assessed with a single item asking respondents if during the past 12 months they had “seriously considered attempting suicide.” Hopelessness was assessed with a single

item asking respondents if during the past 12 months they had “felt so sad or hopeless almost every day for 2 weeks or more in a row that you stopped doing some usual activities”.

Health Protective Behavior—Two items were used as indicators of health protective behavior: (1) exercise frequency and (2) cigarette smoking frequency and intensity. Exercise frequency was asked with a single item from the Youth Risk Behavior Surveillance System (YRBSS, CDC, 2005), which asked respondents to indicate on how many days in the past 7 days they had participated in physical activity. Higher scores indicated greater frequency of physical activity.

Cigarette smoking was measured by a single composite variable based on frequency and intensity of use. A series of questions asked participants about their lifetime, past 3-month, and past 30-day use of cigarettes. Participants were assigned to one of four groups based on the number of days they smoked in the last 30 days (frequency) and average number of cigarettes they smoked on any one day (intensity): Lifetime non-users were defined as having never smoking cigarettes; lifetime users were defined as having smoked but not in the past 30 days, light users were defined as having smoked 15 days or less in the past month and 1/2 a pack of cigarettes per day or less; and frequent or heavy users were defined as having smoked greater than 15 days in the past month or greater than 1/2 a pack of cigarettes per day. Groups were recoded so that higher scores represented lower frequency and/or intensity of cigarette smoking (1 = frequent or heavy smokers, 2 = light users, 3 = lifetime users, 4 = non-users).

Illicit Drug Use—Participants were asked about their lifetime, past 3-month, and past 30-day use of a variety of illicit drugs, including crack, cocaine, crystal/methamphetamine, ecstasy, poppers, GHB, Ketamine, “other forms of speed”, LSD, PCP, heroin, mushrooms, and prescription drugs without a physician's order (i.e., anti-anxiety, depressants, anti-depressant/sedatives, opiate/narcotics, and attention deficit disorder medications). Alcohol and marijuana were excluded from the illicit drug use category given that both substances are readily available and commonly used within the general population of adolescents and young adults. A composite variable was created to reflect the frequency and intensity of drug use (1 = lifetime non-use, 2 = prior lifetime use, but no use in the past 30 days, 3 = light use, operationalized as 1-2 drugs in the past 30 days, used less frequently than once per week, 4 = frequent or heavy use in the past 30 days, operationalized as 1-2 drugs in the past 30 days, used once per week or more, or 3+ drugs in the past 30 days regardless of frequency).

Data Analysis

For this study we used structural equation modeling (SEM) with latent variables (Bentler, 2007; Kline, 2004). SEM is a multivariate technique often used to test theoretical models. When the associations among underlying theoretical constructs are represented by latent variables, latent variable modeling decreases measurement error that may be present when using single indicator variables, such as in path analysis. Therefore, SEM may provide more reliable results that reveal relationships among the theoretical constructs, which in turn account for covariance among the individual measured variables. In the present study, the latent variables described in Ewart's articles on SAT (Ewart, 1991; Ewart, 1994; Ewart, 2004; Ewart, 2009 Ewart & Jorgensen, 2004) and operationalized for HIV related drug use behavior by Lightfoot, et al. (2005), were created using the pre-existing variables from the HYM study data described above. The latent variable analyses were conducted using Mplus statistical software (Muthén & Muthén, 2007).

Data analysis took place in two stages: (1) measurement modeling using confirmatory factor analysis (CFA), and (2) structural modeling. Individual CFA modeling was performed for each of the latent constructs named above. The latent variables were tested to ensure that the hypothesized indicators of the latent construct significantly loaded onto the latent variable. Once satisfactory measurement models had been established for each of the latent variables, the overall measurement model was tested and evaluated for how well the proposed model fit the empirical data. Statistical goodness-of-fit indices, including CFI, TLI and RMSEA were used to assess model fit. Values approaching 0.95 are considered desirable for CFI and TLI (Hu & Bentler, 1999). RMSEA values less than 0.06 indicated a close fitting model (Ullman & Bentler, 2004).

Once the measurement model had been established, SEM was used to establish a path model in which the latent variables representing constructs from SAT were associated with risk for illicit drug use. All hypothesized paths were tested simultaneously, and non-significant paths were removed systematically until all paths were significant and the model fit statistics (i.e., CFI, TLI, and RMSEA values) were as good as possible. Modification indices produced by Mplus were considered for inclusion in the model in order to increase model fit. Once the best fitting model was established, covariates were introduced. If a covariate was statistically significantly associated with illicit drug use, that covariate was retained in the final model. If a covariate was not associated with the outcome variable, that covariate was dropped from the model.

Results

CFA / Measurement model

Table 1 reports the means, standard deviations, ranges, and standardized factor loadings for the measured variables. All proposed indicator variables loaded significantly ($p < 0.001$) on their hypothesized latent factors. Correlations were added between (1) the indicators representing witnessing violence in the home and abuse histories in the action contexts latent variable; (2) the social/sexual racism and institutional racism indicators of the action contexts latent variable; and (3) the hopelessness and suicidality indicators of the mental health latent variable. The fit of the final measurement model was excellent (CFI = 0.963, TLI = 0.953, RMSEA = 0.038).

Structural model

The final structural model possessed very good fit statistics (CFI = 0.936, TLI = 0.925, RMSEA = 0.040). Results of the analysis with only significant paths included are depicted in Figure 2. Three statistically significant correlations between latent variables emerged: (1) motivational appraisals was positively correlated with generative capabilities ($r = 0.398$, $p < 0.001$); (2) motivational appraisals was positively correlated with social interaction ($r = 0.043$, $p < 0.01$); and (3) generative capabilities was positively correlated with social interaction ($r = 0.253$, $p < 0.01$). Latent variable correlations between these three intermediary constructs indicate shared variance between motivational appraisals, generative capabilities, and social interaction.

Demographic and background characteristics had implications for reports of illicit drug use behavior: Age, race/ethnicity, and residential status were all significantly associated with illicit drug use. Older participants had higher levels of reported illicit drug use ($\beta = 0.103$, $t = 2.249$, $p < 0.05$), whereas belonging to a racial/ethnic minority group was protective against drug use (Latino: $\beta = -0.103$, $t = -1.998$, $p < 0.05$; Black: $\beta = -0.165$, $t = -3.207$, $p < 0.01$). Consistent with their less frequent reported use of illicit drugs, African American YMSM also had higher levels of health protective behaviors than white YMSM ($\beta = 0.352$, t

= 3.171, $p < 0.01$) although there were no differences in health protective behaviors between Latino and White YMSM. In addition, both Latino and African American YMSM had lower levels of psychological distress than white YMSM (Latino: $\beta = -0.211$, $t = -3.176$, $p < 0.01$; Black: $\beta = -0.387$, $t = -6.645$, $p < 0.001$). Finally, living at home with family was protective against illicit drug use ($\beta = -0.096$, $t = -1.992$, $p < 0.05$).

In addition to demographic variables, previous experiences of violence in the home and discrimination were significantly related to psychological distress. The action contexts latent variable was positively associated with psychological distress, indicating that those who had experienced abuse or witnessed violence in their home during childhood and/or those who had been confronted by discrimination and homophobia in adulthood had greater mental health difficulties ($\beta = 0.793$, $t = 5.020$, $p < 0.001$). Past traumatic events also had implications for the social support available to YMSM. High scores on the action contexts latent variable predicted lower scores on the social interaction latent variable ($\beta = -0.415$, $t = -5.074$, $p < 0.001$). This finding indicates that YMSM who face abuse and discrimination may be less likely to have close, supportive friends and family members in their lives.

Individual social-cognitive variables (i.e. motivational appraisals, generative capabilities, and social interaction), which are considered important predictors of health behaviors in Ewart's model, were also associated with health protective behaviors, psychological distress, and illicit drug risk behavior. Generative capabilities, the latent variable representing an individual's ability to employ strategies that have been shown to prevent risk behaviors, was negatively associated with the variable representing psychological distress ($\beta = -0.500$, $t = -5.418$, $p < 0.001$). This finding highlights the association between lower ability to protect oneself against health risk behavior while experiencing psychological distress. Motivational appraisals, which refer to an individual's ability to envision himself engaging in health protective behaviors and place himself in contexts that discourage health risk, was positively associated with health protective behaviors ($\beta = 0.976$, $t = 4.304$, $p < 0.001$) and negatively associated with reports of illicit drug use ($\beta = -0.557$, $t = -6.749$, $p < 0.001$). This finding suggests that YMSM who anticipate positive health outcomes, place more value on their health, and associate with friends who engage in less risk behavior, are more likely to behave in a way that promotes health and less likely to use illicit substances.

Discussion

The purpose of the present study was to test the utility of applying Social Action Theory as a comprehensive model to explain illicit drug risk behavior for young men who have sex with men (YMSM). The results suggest support for our conceptualization of Ewart's model of health risk behavior given the associations between intermediary social-cognitive variables (which were intercorrelated) and outcome variables. Additionally, this study sought to clarify relationships between background, psychological, and social/interpersonal contexts that enhance illicit drug use for YMSM. Given the complexity of findings for this at-risk, under-studied population, it is important to look at the role of each piece of the model to examine its relative influence over the holistic model.

Action contexts

In the Social Action Theory framework of this study, experiences of childhood domestic violence, homophobia and discrimination were represented by the action contexts latent variable and were significantly related to psychological distress. This finding is consistent with Minority Stress Theory (Meyer, 2003), which posits that stress related to being part of a minority group is additive to general stressors that are experienced by all people; therefore, stigmatized people, including racial/ethnic minorities and sexual minorities, may experience higher levels of stress. Previous studies of young sexual minority populations have

demonstrated higher levels of depression and suicide among this group than their heterosexual counterparts (Rosario, et al, 2006). Our results are consistent with this earlier work and demonstrate the need for attention to experiences of violence, discrimination, and homophobia when formulating drug risk intervention efforts for YMSM (Gwadz, Clatts, Leonard, Goldsamt, L. 2004; Rosario, Scrimshaw, & Hinter, 2006).

Exacerbating the impact of action contexts, past traumatic events also had implications for the social support available to YMSM. High scores on the action contexts latent variable predicted lower scores on the social interaction latent variable. This finding indicates that YMSM who face abuse and discrimination may be less likely to have close, supportive friends and family members in their lives. This relationship, along with previous findings from the HYM study, paint an alarming picture of risk for YMSM. Evidence suggests that lack of social support within social networks can negatively impact health (Ritt-Olson, et al., 2005). This effect may also be due to an individual's selection of unsupportive friends as well as to the behaviors they attribute to those friends (i.e., tobacco, alcohol and other drug use) (La Greca, Prinstein, & Fetter, 2001).

Self-Change Processes

Perhaps the finding that holds the greatest potential of advancing behavioral health theory can be seen in the role of self change processes on illicit drug use. Prior behavioral models have focused individually on an individual's ability to employ health promoting strategies (generative capabilities), an individual's ability to envision himself in contexts that avoid risk and promote health (motivational appraisals), and an individual's normative peer groups and social support (social interactions). SAT improves upon these models by accounting for their impact simultaneously. This study indicates that among YMSM, motivational appraisals are directly related to health protective behavior and drug risk. While there is no direct effect of generative capabilities or social interaction on any of the outcome variables, the three self change processes are intercorrelated, indicating that the shared relationship between them ultimately impacts illicit drug use. The multidimensional targeting of behavior has been shown to provide great utility and success in predicting behavioral health outcomes (Chen, et al., 2002; Gore-Felton, et al., 2005; Lightfoot, et al., 2005; Sauro, Jorgensen, Ewart, Schum, & Gelling, 2005). Our results further highlight that the inclusion of multiple dimensions in Social Action Theory – specifically the social context, linkages between self-change and interpersonal environments, and macro-social and environmental influences – facilitates understanding of the complex nature of behavioral health risk in the YMSM population.

Background Variables/Covariates

Age, race/ethnicity and residential status were all significantly associated with illicit drug use. Consistent with nationally representative studies of age-of-onset distributions for substance abuse, older participants had higher levels of illicit drug use (Kessler et al., 2005). Residential status was an important predictor of substance use as shown in previous studies using the HYM data (Kipke, Weiss, & Wong, 2007); YMSM living at home had lower levels of self-reported illicit substance use than YMSM living elsewhere. However, belonging to a racial/ethnic minority group was associated with lower drug use behavior, which on its face may seem contradictory to previous studies demonstrating higher rates of substance use among racial/ethnic minorities (National Center of Health Statistics, 2010). To explain this finding, it is important to consider the data analysis strategy for the present study: Structural equation modeling uses simultaneous regression analyses to estimate paths between variables; thus, the results must be interpreted as the effect of one variable on another *after* adjusting for the effects of all other variables in the model. Because the action contexts variable accounted for the effects of homophobia and institutional and social-sexual

racism, the discrimination and homophobia that racial/ethnic minority youth experience have already been parsed out. Thus, the race/ethnicity effects in this model are only interpretable when action contexts are held constant; i.e., given a set of YMSM with the *same history* of violence witnessed in the home and discrimination, the African American and Latino young men in that set are less likely on average to engage in less illicit drug use than the Caucasian young men.

Implications

The results of this study show that our conceptualization of Social Action Theory (Ewart, 1991) is an appropriate, comprehensive model to explain illicit drug use behavior for young men who have sex with men (YMSM). The results also indicate that YMSM who are older, white, or have low social support are at increased risk for substance use. A complex relationship between a young man's ability to: employ health promoting strategies (generative capabilities); envision himself in situations of that promote health (motivational appraisals); and his normative peer groups and social support (social interactions) also plays a significant role in the individual's mental health, health behavior, and illicit drug use. These findings are of particular public health importance given that the sample represents men who are part of a sexual minority at elevated risk for substance abuse disorders. Risk for substance abuse also places YMSM at risk for HIV infection, mental health difficulties, and incarceration (Rosario, et. al., 2006). The National Institutes of Health (2006) have noted that behavioral research interventions should focus on simultaneous targeting of multiple risk factors, integrating behavioral interventions into the treatment environment, and intervening at multiple systems levels to inform research to develop efficacious health behavior interventions. The comprehensive nature of SAT allows interventionists to determine the most efficacious domains in which to intervene with YMSM. Moreover, SAT can help interventionists determine how attention to one area within the theory will impact other domains of interest.

Strengths and Limitations

A primary task for developing empirical knowledge about the relationship between YMSM's development and drug risk is to identify interdisciplinary, efficacious, and predictive theoretical models to guide research about behavior change. The results of this study are based on a large population-based sample of YMSM. The use of this study data offers an opportunity, not previously possible, to empirically validate Social Action Theory with a vulnerable sexual minority population. The importance of this research rests on its potential to further understanding of these and other factors and their influence on risk and protective behaviors related to illicit drug use among YMSM.

Despite these strengths, this study has some limitations. The data for this study was gathered using a venue based probability sampling design and therefore only includes YMSM who frequent selected venues. While this limits generalizability, it does produce a sample whose properties can be characterized among hard to sample populations (Muhib, et al., 2001). Due to issues of power, this study is cross sectional, thus limiting our ability to make inferences regarding proper temporal sequencing. Future studies should explore the longitudinal nature of drug risk for YMSM, particularly given the volatility of this developmental time period. Moreover, the data for this study comes from a larger study designed to characterize the individual, familial, social, and community level risk and protective factors associated with drug use and HIV risk for YMSM. Therefore, testing of the application of Social Action Theory is limited by the use of secondary data that was not gathered for this specific aim. Future studies about the application of SAT to health risk behavior should be designed with the intention of testing the theory and target data collection based on the domains in this

theory. History of sexual abuse, which has been associated with drug use/abuse in YMSM previously (Rosario, Scrimshaw, & Hunter, 2006), was not included in the action contexts latent variable, since the sexual abuse indicator did not load significantly on the latent construct. This was likely due to the low numbers of participants (9.5%) reporting previous sexual abuse. Finally, recall bias and social desirability bias may have contributed to both under- and over-reporting of substance use among respondents, as has been shown in previous epidemiologic studies of drug use among racially and ethnically diverse adult populations (Johnson & Fendrich, 2005).

Conclusion

The results of this study show that Social Action Theory is useful in examining the correlates of illicit drug use among YMSM. Our results suggest that numerous background characteristics including ethnicity, age, and living status, as well as various decision-making processes can place YMSM at risk for illicit drug use. Therefore, interventions for this population would benefit from employing SAT and using a multi-targeted strategy for impacting several areas of risk in order to prevent illicit drug use for YMSM during the unique developmental period of emerging adulthood.

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Figure 1.
Organization of Study Constructs and Measures Suggested by Social Action Theory (Ewart, 1991; Lightfoot, Rotheram-Borus, Milburn, & Swendeman, 2005).

Note: Circles represent latent variables; rectangles represent observed variables. Numbers along regression paths represent standardized regression coefficients; numbers above or below latent variable indicators represent factor loadings. CFI = 0.936, TLI = 0.925, RMSEA = 0.040, $R^2 = 0.364$.

Figure 2.
SAT variables predicting drug risk among YMSM

Table 1

Means, standard deviations, ranges, and factor loadings from the confirmatory factor analysis

Variables	Mean (SD) or N (%)	Factor loading ^I
<i>Observed Variables</i>		
Age in years (range: 18 – 24)	20.14 (1.58)	NA ²
Residential status – live with family	281 (53%)	NA
Race/ethnicity: African American	125 (24%)	NA
Latino of Mexican descent	205 (39%)	NA
White	195 (27%)	NA
Drug use: Lifetime non-use	269 (51%)	NA
Lifetime use but not in past 30 days	132 (25%)	NA
Light use in past 30 days	44 (8%)	NA
Frequent or heavy use in past 30 days	81 (16%)	NA
<i>Latent variables</i>		
Action contexts		
Social/sexual racism (range: 1 – 4)	1.64 (0.58)	0.393
Institutional racism (range: 1 – 4)	1.45 (0.61)	0.345
History of witnessing physical violence (binary)	104 (20%)	0.386
History of experiencing physical abuse (binary)	133 (25%)	0.479
Experiences of homophobia (range: 1 – 4)	2.50 (1.17)	0.309
Motivational appraisals		
Friend's risk behavior (range: 1 – 4) [*]	3.14 (0.65)	0.495
Health values (range: 1 – 4)	3.44 (0.56)	0.259
Health risk expectancies (range: 1 – 5) [*]	3.97 (0.81)	0.478
Generative capabilities		
Self-efficacy for HIV prevention (range: 10 – 32)	28.52 (3.79)	0.484
Protective strategies (range: 1 – 3)	2.57 (0.44)	0.453
Social interaction		
Family support (range: 1 – 4)	3.00 (0.71)	0.891
Friend support (range: 1 – 4)	3.51 (0.51)	0.384
Family closeness (range: 0 – 4)	3.21 (1.14)	0.636
Health protective behaviors		
Exercise (range: 1 – 8)	3.81 (2.04)	0.303
Cigarette smoking (range: 1 – 4) [*]	2.61 (1.16)	0.389
Psychological distress		
CES-D score (range: 0 – 54)	15.04 (10.55)	0.713
Stressful life events (range: 0 – 21)	6.53 (3.93)	0.687
Suicidality (binary)	53 (10%)	0.514
Hopelessness (binary)	160 (31%)	0.599

* Variables are reverse coded so that higher values indicate health protective constructs

¹ All factor loadings are standardized and significant at $p < 0.001$ level.

² NA, not applicable.