

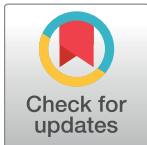
RESEARCH ARTICLE

Psychological distress, health protection, and sexual practices among young men who have sex with men: Using social action theory to guide HIV prevention efforts

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Data Availability Statement: In order to protect participant privacy data cannot be made publicly available. Instead, for researchers who meet the criteria for access to confidential data, data are available from the National Addiction & HIV Data Archive Program (NAHDAP) at the Interuniversity Consortium for Political and Social Research (ICPSR) at the University of Michigan. Interested researchers may request data access by visiting: <http://www.icpsr.umich.edu/icpsrweb/NAHDAP/index.jsp>.

Abstract

The present study addresses gaps in the literature related to theory development for young men who have sex with men (YMSM) sexual practices through the application and modification of Social Action Theory. Data come from the Healthy Young Men study (N = 526), which longitudinally tracked a diverse cohort of YMSM ages 18–24 to characterize risk and protective factors associated with drug use and sexual practices. Structural equation modeling examined the applicability of, and any necessary modifications to a YMSM-focused version of Social Action Theory. The final model displayed excellent fit (CFI = 0.955, TLI = 0.947, RMSEA = 0.037) and suggested concordance between social support and personal capacity for sexual health promotion. For YMSM, practicing health promotion and avoiding practices that may put them at risk for HIV was associated with both social isolation and psychological distress ($\beta = -0.372$, $t = -4.601$, $p < 0.001$); psychological distress is an internalized response to environmental and cognitive factors and sexual practices are an externalized response. Results point to the utility of Social Action Theory as a useful model for understanding sexual practices among YMSM, the application of which shows health protective sexual practices are a function of sociocognitive factors that are influenced by environmental contexts. Social Action Theory can help prevention scientists better address the needs of this vulnerable population.

Introduction

HIV incidence and prevalence among men who have sex with men (MSM) is alarmingly high and increasing prevention efforts for this population are a national priority [1]. MSM have been disproportionately impacted by HIV/AIDS, with transmission in this community accounting for 67% of all new infections, even though MSM represent less than 2% of the

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general population [2]. Young men who have sex with men (YMSM) are at particular risk for HIV infection [3, 4], with prevalence rates ranging from 2% to 14% across major U.S. metropolitan areas [5–8]. Epidemiological and behavioral research suggests a significant and growing number of YMSM engage in sexual practices that may put them at risk for acquiring HIV despite substantial investments in prevention interventions targeted to this population [6, 7].

There is a dearth of targeted evidence-based interventions for YMSM to help combat these threats to their health and well-being [3, 9–12]. Systematic development of theory has been identified as a crucial step for efficacious behavioral prevention interventions [13], as the design of new prevention efforts that are responsive to the developmental, social, and interpersonal contexts for YMSM requires a theoretical understanding of how these contexts shape their sexual practices. The purpose of the present study is to address gaps in the literature related to theory testing and the documentation of social, behavioral, and demographic risk factors associated with sexual practices among YMSM. Through application and modification of Social Action Theory [14], we will clarify the interplay between environmental and socio-cognitive processes affecting sexual practices of YMSM to guide intervention development for this high-priority population.

Contexts that influence, constrain, facilitate or shape sexual practices among YMSM

Developmental factors are likely to play an important role in the sexual practices and trajectories of YMSM. Late adolescence and early adulthood is a period during in which young people experiment with behaviors that often present increased risk for negative health outcomes (e.g., drug use). This period of ‘emerging adulthood,’ between the ages of 18 and 26 years, is also a time when young people explore new roles and relationships, establish more intimate attachments, initiate sexual relationships, and define their sexual identity, both privately and publicly [15, 16].

Strong evidence suggests that young people experimenting with same-sex relationships are not afforded the same social support as their heterosexual peers [17]. YMSM may experience disapproval, discrimination, and homophobia from their families, peers, racial/ethnic communities, and faith communities; and for YMSM of color, from the predominately white gay community [18]. While connectedness with family has repeatedly been found to be highly protective against drug use and sexual practices that put young people at risk for HIV [19–22], many YMSM find themselves feeling disconnected and isolated from their families due to implicit or explicit disapproval of their sexual identity. At the same time, gay communities may become important sources of social support for YMSM; however, integration into gay male community contexts may also convey risk due to syndemic factors that put young people at risk for HIV [23].

Several studies of adult and young MSM have found that psychological distress is significantly associated with more risky sexual practices [24–26]. Given the high rates of overlapping psychiatric diagnoses among young gay, lesbian, and bisexual populations [27], psychological factors may play a key role in understanding associations with increased engagement in sexual practices that put YMSM at risk for HIV [26]. Data suggest that feelings of self-esteem, self-efficacy, and social support can result in improved mental health for young gay and bisexual men [17] as well as heterosexual emerging adults [28]. Conversely, emerging adults who feel isolated and have a low sense of self-worth and reduced ability to engage in consequential thinking may display poor mental health and subsequent increased risk behavior [29].

Theoretical gaps in addressing YMSM sexual practices. Scholars largely agree that HIV interventions should be theoretically driven [30] and several meta-analyses of HIV prevention

interventions for adolescents demonstrate a positive association between theory-based interventions and efficacy [31–33]. In a systematic review of HIV interventions for black MSM, nine of the twelve interventions reviewed were identified as being theory-driven [34]. While the importance of theoretically-driven interventions is clear, the theories often used to guide HIV interventions rely heavily on individualistic models of health behavior [30, 34, 35]. For example, in a meta-analysis of HIV intervention studies for adolescents published from 1997 to 2011 [30], the authors note the popularity of the Health Belief Model [36], the Theory of Reasoned Action [37, 38], and Social Cognitive Theory [39]. Designing interventions that are responsive to the developmental, social, and interpersonal contexts for YMSM requires a theoretical understanding of how these contexts influence YMSM's sexual practices. Although this research has contributed to the understanding of sexual practices among vulnerable populations, these models often focused on a relatively limited array of explanatory constructs and produced contradictory theoretical perspectives [40].

For example, the Health Belief Model and the Theory of Reasoned Action are often criticized for their focus on individual-level processes, without attention to the social environment in which individuals are embedded [41]. These models have the potential to stigmatize individuals through their emphasis on the role of personal responsibility in producing negative health outcomes. Social Cognitive Theory improves upon individualistic health behavior models by explicitly naming the environment as one of three key factors in its model of triadic reciprocal causation, along with personal factors (e.g. cognitive, affective) and behavior. Indeed, Bandura's work, along with others, arguably gave rise to the concept of social determinants of health, which focuses on the upstream factors (e.g., poverty, housing) that produce negative health outcomes [42]. More holistic models, such as Minority Stress Theory, focus on the unique experiences of sexual and gender minority people, and make major contributions to understanding the multi-level factors that produce health disparities in lesbian, gay, bisexual and transgender people. Minority Stress Theory includes social determinants of health in the form of *distal* factors (e.g., discrimination, victimization) as well as individual-level *proximal* factors and social contextual factors (e.g., community connectedness, affiliation) [43, 44]. However, conceptualizing stress as the major driver of negative health outcomes for LGBT people may de-emphasize the importance of other cognitive and psychological processes that have been shown important in previous research, such as self-efficacy [45–48].

Given the multitude of competing theoretical standpoints, prevention science may benefit from a comprehensive and well-integrated theory that captures and conceptualizes the range of factors associated with sexual risk-taking among YMSM. Social Action Theory [14] holds great promise to this end [49–51]. Developed as a health promotion theory for behavioral medicine, Social Action Theory extends existing sexual health-related sociocognitive models [52–55] by specifically targeting contextual influences on sexual practices. As depicted in Fig 1, Social Action Theory proposes that health protective behaviors are a result of interaction among three domains: 1) contextual influences, such as background, demographics, life stressors, and mental health factors including positive and negative affect; 2) self-change processes, such as social support, health expectancies, and self-efficacy; and 3) action states, including health behavior outcomes such sexual practices. As Ewart originally conceptualized the model, a person's contextual influences (action contexts) impact their self-change processes (i.e., social support, health expectancies, self-efficacy), which in turn impact their actual health behavior or action [14].

The relevance of Social Action Theory to HIV prevention among YMSM is unique and important because it focuses on the complex interplay between environment, social support, cognitions, and mental health. Additionally, this theory extends beyond previous health behavior theories in describing a vast array of constructs (e.g., motivational influences, generative capabilities), which is especially useful given the multiple determinants of sexual practices for

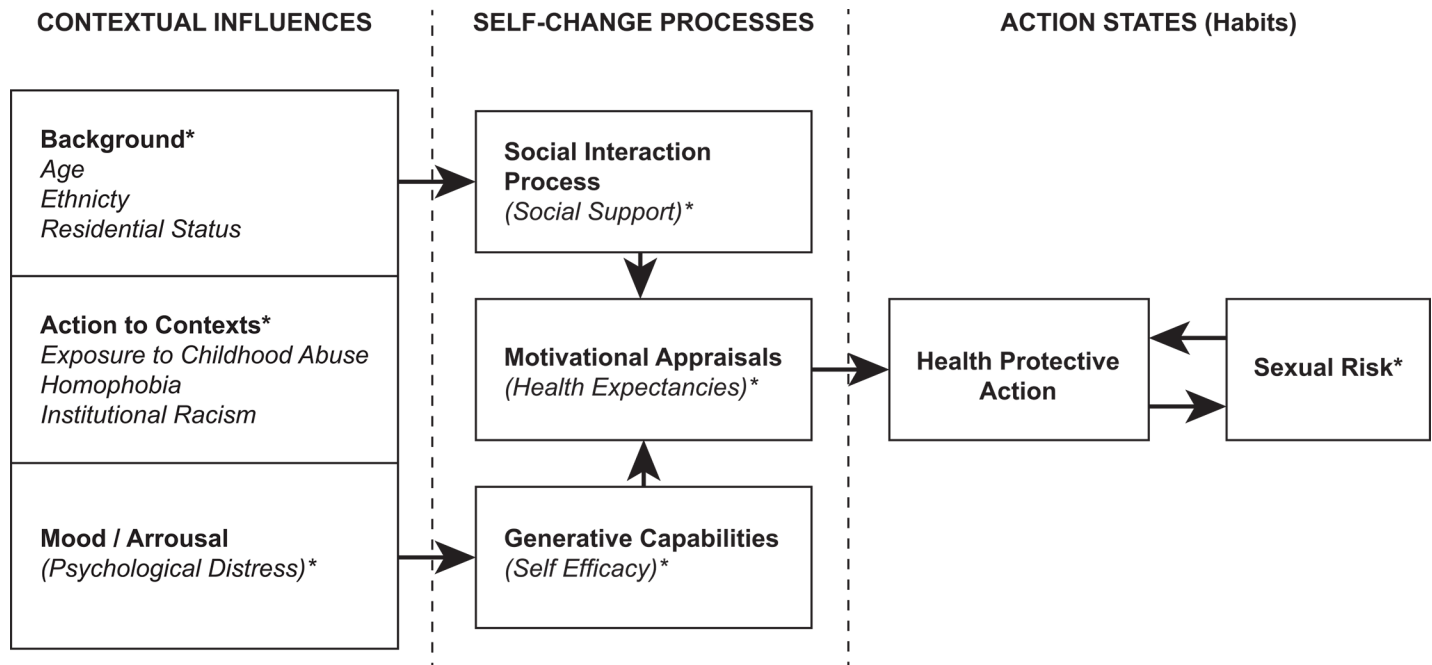


Fig 1. Application of Social Action Theory to sex risk for YMSM. (*) Latent variable title used in current study to aid readability and conceptualization. Adapted from Ewart, 1991; Gore-Felton et al., 2005.

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YMSM. Despite this, few HIV prevention interventions targeting YMSM and adolescents in general have made use of this valuable theory [30, 34, 35]. Of the few studies that have used Social Action Theory, few have involved HIV-negative YMSM specifically. Instead, many studies using Social Action Theory have focused on youth and adults living with HIV/AIDS with the aim of identifying factors associated with HIV transmission risk behavior, disclosure, treatment adherence [56–63]. Two studies using Social Action Theory involving high-risk, HIV-negative individuals focused on sexual risk behaviors among adults [64, 65].

While a comprehensive model focusing on environmental, social, and cognitive factors has the potential to make a significant contribution to our understanding of the pathways to HIV transmission among YMSM, more information is needed about the associations and pathways between environmental, psychological, and social factors that contribute to the difficulties faced by sexual minority youth (for an in-depth discussion of the merit of Social Action Theory versus other behavioral health theories, see Traube, Holloway, & Smith, 2011) [66]. However, Social Action Theory requires modification to resolve some inconsistencies specific to emerging adult development. Specifically, the role of mental health in Social Action Theory contradicts relationships reflected in the literature where mental health and subsequent sexual practices that may put individuals at risk for acquiring STIs, including HIV, is depicted as an outcome of stressful life events and poor coping mechanisms, rather than a precursor to such events, for emerging adults. In the original Social Action Theory model, psychological and mental health variables were termed “mood/arousal” and positioned as contextual influences on self-change processes. Mood and arousal were believed to influence the retention of various types of health information as well as behavioral control. Emotional arousal was postulated to effect attention deployment such that under high arousal, individuals would be less able to detect stimuli, attend to their own behavior, or appraise the long-term consequences of personal decisions [14, 67]. Emotional distress was also thought to impair interpersonal problem-solving capabilities [68, 69], and behavioral control [70].

Recent theoretical models highlight the importance of underlying cognitive processes that might be responsible for elevated and persistent depression and poor mental health outcomes [71]. Thus, the present model positions psychological distress as a higher-level outcome of the cognitive processes specified by Social Action Theory rather than an online indicator of emotional status likely to interfere with decision-making on a moment-to-moment basis [72]. This paper explicitly considers health protective behavior, mental health, and sexual practices as outcomes of the contextual factors and self-change processes posited by Social Action Theory. The present analysis intends to test a model grounded in a modified version of Social Action Theory, previously established for YMSM substance use [73], to examine YMSM sexual risk outcomes.

Methods

The present study is a secondary analysis of baseline data from the Healthy Young Men (HYM) study, a longitudinal study of substance use and sexual practice among YMSM in Los Angeles, California (for a full description, see Ford et al., 2009; Kipke et al., 2007) [74, 75].

Participants

A total of 526 subjects were recruited into the HYM study. Young men were eligible to participate if they were: male; 18 to 24 years old; self-identified as gay, bisexual, or uncertain about their sexual orientation and/or reported having had sex with another man; a resident of Los Angeles County and anticipated living in Los Angeles County for at least six months; and self-identified as Caucasian, African American, or Latino of Mexican descent.

Procedures

YMSM were recruited at public venues using the stratified probability sampling design developed by the Young Men's Study [76] and later modified by the Community Intervention Trials for Youth [77]. Study participants were recruited from 36 different public venues previously identified as settings frequented by YMSM. The survey was administered at a location convenient to the participant, either the project office or a public venue that provided Internet connectivity. The survey was administered in both English and Spanish using computer-assisted interview technologies that incorporated sound files, allowing participants to read questions on the computer while listening to the questions through headphones. Participants entered their responses directly into the computer. The survey took approximately 90 minutes to complete, and participants received \$35 as compensation for their time and effort. This research was approved by the Committee on Clinical Investigations at Children's Hospital Los Angeles; secondary data analysis was approved by the Institutional Review Board of the University of California, Los Angeles.

Measures

Sexual practices. The survey asked respondents about their sexual activity during the past three months, including number of sexual partners, if they had engaged in anal insertive and/or receptive sex, and condom use. Responses were combined to form a four-level index of sexual risk: 1 = no partners, 2 = consistent condom use for anal intercourse, 3 = insertive or receptive condomless anal intercourse with a single seroconcordant partner (here referring to both partners being HIV-negative), and 4 = condomless anal intercourse with a single serodiscordant partner or multiple partners of any HIV status.

Psychological distress latent factor. Respondents completed the Centers for Epidemiologic Studies Depression Scale (CES-D) as an indicator of their psychological distress [78].

Participants reported how often they had experienced up to 20 depressive symptoms within the past week ($\alpha = .90$). A total score was calculated by summing the items. Stressful life events were measured by asking participants if they had experienced stressful events during the previous three months using an instrument developed with an adult MSM population [79] and adapted for YMSM by adding items generated from qualitative data during the formative phase of the HYM study. Thirty binary items assessed the presence of a variety of stressors (e.g., family-related, partner-related, death-related, school/work-related, health-related, finance-related, physical/emotional threat-related, and sexuality-related), and responses were summed to indicate the participant's aggregate level of life stress. Two additional binary items (1 = yes, 0 = no) assessed whether, in the past 12 months, participants had seriously considered attempting suicide and/or felt so much hopelessness over a two-week period that they ceased their usual activities.

Health protection latent factor. Health-related measures included number of days in the past week that participants had engaged in exercise or physical activity [80]. Additionally, a cigarette use index was created from a series of questions ascertaining participants' history of smoking cigarettes (1 = lifetime non-users, 2 = prior users who had smoked previously but not in the past 30 days, 3 = light users who smoked 15 days or fewer in the past month and 1/2 a pack of cigarettes per day or less, and 4 = frequent or heavy users who smoked more than 15 days in the past month or more than 1/2 a pack of cigarettes per day). For inclusion in the health protection latent factor, the cigarette use index was recoded so that higher scores represented healthier behavior (i.e., less cigarette use).

Action contexts latent factor. Two binary measures (1 = yes, 0 = no) of exposure to abuse growing up assessed whether the participant had either witnessed or experienced physical abuse. Experiences of homophobia were measured with a single item asking respondents how often they had to pretend to be heterosexual in order to be accepted. Three items measured experiences of institutional forms of racism (e.g., "How often have you been turned down for a job because of your race or ethnicity?"; $\alpha = 0.70$), and six items measured experiences of social/sexual racism (e.g., experiences of racism in gay social settings and/or sexual relationships; $\alpha = 0.81$). All participants completed the racism measures, regardless of self-reported racial or ethnic group. Items measuring experiences of homophobia and racism used a four-point response format (1 = never, 2 = once or twice, 3 = a few times, 4 = many times).

Social support latent factor. Four items assessed family support (e.g., "I get the emotional help and support I need from my family"; $\alpha = 0.87$), and four items assessed perceived friend support (e.g., "I can count on my friends when things go wrong"; $\alpha = 0.85$). Both support scales were assessed with Likert-type items ranging from 1 = strongly disagree to 4 = strongly agree. Four additional binary items (1 = true, 0 = false) assessed the family's closeness (e.g., "My family provides me with a lot of support"; $\alpha = 0.69$).

Self-efficacy latent factor. A nine-item, four-point scale assessed participants' self-efficacy for condom use, such as wearing a condom comfortably or discussing condom use with a partner (1 = couldn't do it, 2 = unsure, 3 = sure, 4 = very sure; $\alpha = 0.79$). A separate nine-item, three-point scale assessed endorsement of protective strategies for condom use in specific situations, such as with an HIV-positive partner, when drunk or high, or when having just met a sexual partner the same night (1 = not use a condom, 2 = maybe use a condom, 3 = definitely use a condom; $\alpha = 0.88$).

Health expectancies latent factor. Five items assessing mean risk levels measured the number of the participants' close friends (up to five) who had tried drugs, used drugs at least once a week, smoked marijuana regularly, used drugs prior to or during sex, and/or drank alcohol prior to or during sex. This measure was reverse-scored such that higher scores represented fewer friends engaging in risk. Three items assessed health as a value to the participant

(e.g., “I am willing to make sacrifices to be healthy”; $\alpha = 0.67$) on a four-point Likert-type scale with response range 1 = not true to 4 = completely true. Finally, health risk health expectancies were measured with five items assessing the participant’s perceived risk for HIV infection, herpes infection, hepatitis infection, drug addiction, and alcoholism compared to other YMSM of the same age ($\alpha = 0.82$). This measure was also reverse-scored such that higher scores represented more positive health outcome expectancies.

Covariates: Sociodemographic measures. Dummy codes represented the respondents’ racial/ethnic category (African American: African American = 1, White = 0, Latino = 0; Latino: Latino = 1, White = 0, African American = 0), residential status (living at home with family = 1, other = 0), and a single continuous variable represented subjects’ age in years.

Analytic strategies

Structural equation modeling (SEM) with latent variables, a multivariate technique often used to test theoretical models, was the overarching approach to analysis [81, 82]. When the associations among underlying theoretical constructs are represented by latent variables, modeling may decrease measurement error 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 covariation among the individual measured variables. In the present study, the latent variables described in Ewart’s original text on Social Action Theory were created using the pre-existing variables from the HYM study data described above.

The analytic process began with confirmatory factor analysis (CFA) to verify that the indicators loaded as expected onto concise, interpretable latent factors consistent with Social Action Theory constructs (the ‘measurement model’). Subsequent regression paths were systematically added among the established latent variables and the (observed) sexual risk variable to investigate the interrelationships among Social Action Theory constructs and their effects on participants’ sexual practices. Nonsignificant paths were removed until the most parsimonious model was reached (the ‘structural model’). All analyses including imputation of missing data were conducted using full information maximum likelihood estimation in Mplus [83].

Results

CFA/Measurement model

Table 1 reports the means, standard deviations, and ranges for the measured variables. All proposed indicator variables loaded significantly ($p < 0.001$) on their hypothesized latent factors. Residual covariances were added between (1) the indicators representing violence and abuse histories in the action contexts latent variable, (2) the institutional racism and social/sexual racism indicators of the action contexts latent variable, and (3) the suicidality and hopelessness indicators of the psychological distress latent variable. The final measurement model displayed excellent fit (CFI = 0.963, TLI = 0.953, RMSEA = 0.038, $\chi^2(171) = 2933.56$, $p < 0.001$). Nearly two-thirds (64%) of participants did not indicate serodiscordant or multiple partners, giving us very good distribution on our primary analytical outcome.

Structural model

The model predicting sexual risk, presented in Fig 2, also displayed excellent fit and good explanatory power for sexual risk (CFI = 0.955, TLI = 0.947, RMSEA = 0.037; $\chi^2(178) = 304.85$, $p < 0.001$, $R^2 = 0.15$). Two statistically significant associations between latent variables emerged: health expectancies were positively associated with self-efficacy ($r = 0.412$, $p < 0.001$) and social support ($r = 0.037$, $p < 0.01$). Significant latent variable covariances between these

intermediary constructs indicated shared variance between health expectancies, self-efficacy, and social support.

Action contexts were significantly negatively associated with social support ($\beta = -0.551, t = -3.839, p < 0.001$) and marginally associated with self-efficacy ($\beta = -0.250, t = -1.819, p < 0.10$), suggesting that participants with greater experiences of violence and discrimination had both lowered perceptions of social support and less comfort with condom use as an HIV prevention strategy. Social support ($\beta = -0.458, t = -1.999, p < 0.05$) and self-efficacy ($\beta = -2.197, t = -2.580$,

Table 1. Descriptive statistics for observed and latent variables in the structural model.

Variables	Mean (SD) or N (%)
<i>Observed Variables</i>	
Age in years (range: 18–24)	20.14 (1.58)
Residential status—live with family	281 (53%)
Race/ethnicity:	
African American	125 (24%)
Latino of Mexican descent	205 (39%)
White	195 (27%)
Sexual behavior:	
No partners	86 (18%)
Protected AI	216 (46%)
Single-partner seroconcordant UAI	45 (10%)
Serodiscordant or multiple partners UAI	125 (26%)
<i>Latent variables</i>	
Action contexts	
Social/sexual racism (range: 1–4)	1.64 (0.58)
Institutional racism (range: 1–4)	1.45 (0.61)
History of witnessing physical abuse (binary)	104 (20%)
History of experiencing physical abuse (binary)	133 (25%)
Experiences of homophobia (range: 1–4)	2.50 (1.17)
Health expectancies	
Low friends' sexual/drug use practices (range: 1–4)*	3.14 (0.65)
Health values (range: 1–4)	3.44 (0.56)
Low health risk expectancies (range: 1–5)*	3.97 (0.81)
Self-efficacy	
Self-efficacy for HIV prevention (range: 10–32)	28.52 (3.79)
Protective strategies (range: 1–3)	2.57 (0.44)
Social support	
Family support (range: 1–4)	3.00 (0.71)
Friend support (range: 1–4)	3.51 (0.51)
Family closeness (range: 0–4)	3.21 (1.14)
Health protective behaviors	
Exercise (range: 1–8)	3.81 (2.04)
Less cigarette smoking (range: 1–4)*	2.61 (1.16)
Psychological distress	
Depressive symptoms score (range: 0–54)	15.04 (10.55)
Stressful life events (range: 0–21)	6.53 (3.93)
Suicidality (binary)	53 (10%)
Hopelessness (binary)	160 (31%)

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

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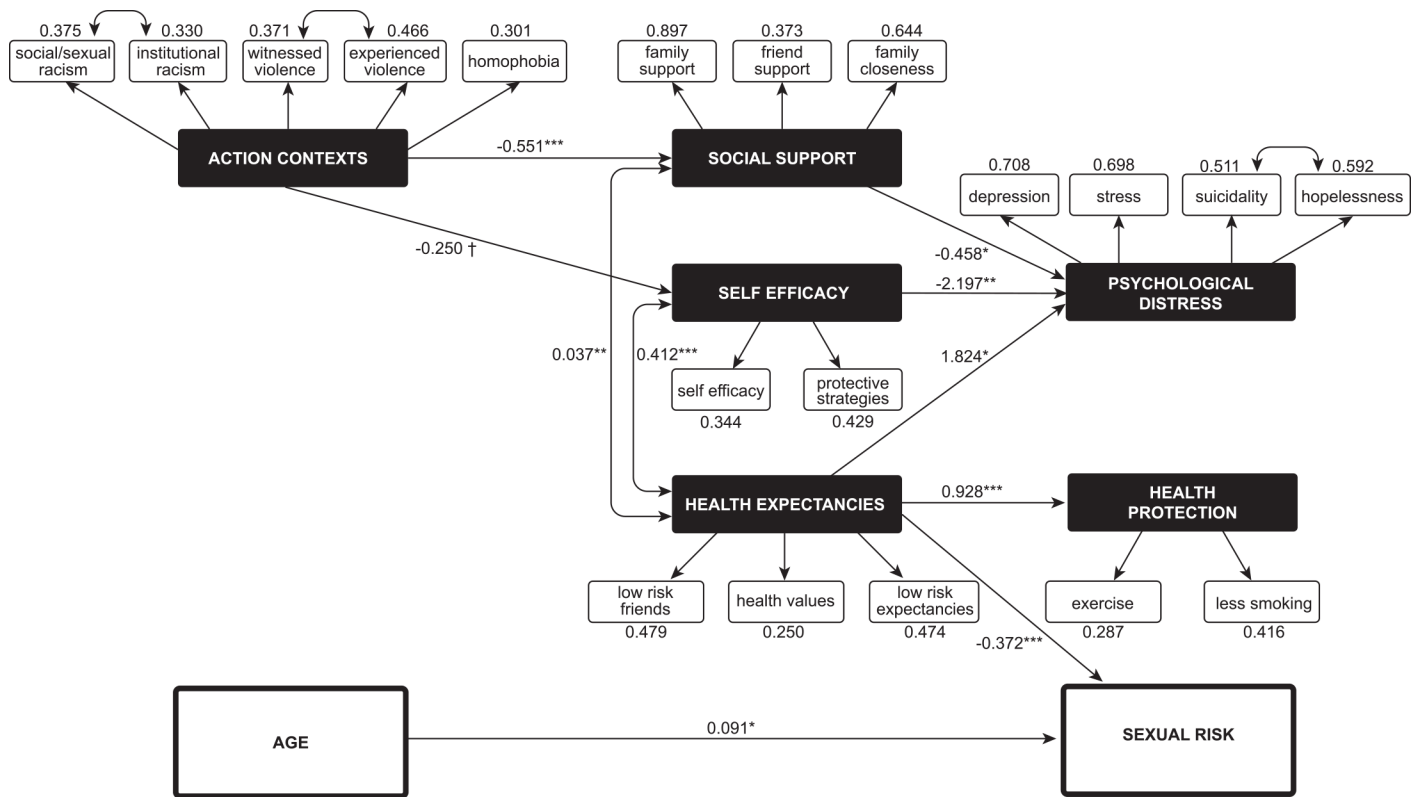


Fig 2. Social Action Theory variables predicting sexual risk among YMSM. (†) $p < 0.10$. (*) $p < 0.05$. (**) $p < 0.01$. (***) $p < 0.01$.

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$p < 0.01$) were in turn significantly associated with reduced psychological distress, suggesting concordance between social support, personal capacity for HIV prevention, and mental health. Health expectancies, on the other hand, were positively related to psychological distress ($\beta = 1.824$, $t = 2.310$, $p < 0.05$), suggesting that motivations to avoid friends who engage in sexual and drug use practices associated with HIV transmission may have consequences to psychological wellbeing. However, health expectancies were positively related to health protective behaviors ($\beta = 0.928$, $t = 4.170$, $p < 0.001$) and negatively related to risk practices associated with HIV transmission ($\beta = -0.372$, $t = -4.601$, $p < 0.001$). These findings suggest a difference in risk factors for mental versus physical health, as positive health motivations were predictive of healthier behaviors, including lowered likelihood of engagement in risky sexual practices, despite being associated with increased psychological distress. Finally, age was significantly associated with sexual practices associated with HIV ($\beta = 0.091$, $t = 2.009$, $p < 0.05$), such that older participants were more likely to engage in sexual practices that may put them at risk for HIV acquisition. Race/ethnicity and residential status were also tested for association with sexual practices; however, neither were significant predictors of sexual practices and were excluded from the final model. In accordance with the Social Action Theory framework, the relationship between psychological distress and sexual risk was also examined; however, no association was found between these outcomes in our sample.

Discussion

The purpose of the present study was to test a model grounded in a modified version of Social Action Theory [14] to address the individual, contextual, and social correlates of sexual practices

of YMSM. Below we examine each segment of the model to interpret these complex findings for this under-studied population at high risk for HIV infection. It is important to note that nearly two-thirds of participants did not report engaging in the highest-risk sexual practices (condomless anal intercourse with a single serodiscordant partner or multiple partners of any HIV status). Our primary analytical outcome is nicely distributed for the types of analyses presented in this report, and reflects the full range of HIV risk experienced by YMSM in our study—including the lower-risk (but not perfectly protective) category of protected anal intercourse, a category representing 46% of our participants. We are thus able to model a more sensitive measure of sexual risk than found in prior work that relied on dichotomous indicators of risk, for example, a binary condom use measure without regard for number or type of partner(s). We believe the distribution on our primary analytical outcome strengthens our results by allowing for the interpretation of regression coefficients and associated predicted values along a continuum of risk.

Contextual influences

According to Ewart's conceptualization of Social Action Theory [14], individual behavior is based on the normative expectations of social settings comprised of background variables, action contexts, and psychological distress.

Background variables. In this study, age was the only significant background, or demographic, variable related to sexual practices. Older participants were more likely to engage in riskier sexual practices, which is consistent with findings reported about heterosexual adolescent and young adult sexual practices in the United States [5, 84]. Contrary to other epidemiological surveys [85], race/ethnicity and residential status were not significantly associated with sexual practices associated with HIV and were excluded from the final model.

Action contexts. Action contexts refer to the societal and institutional milieu which support or hinder the maintenance of health routines or habits. Action contexts were significantly negatively associated with the social support latent variable and marginally associated with self-efficacy, a cognitive mediating variable representing an individual's perceived ability to protect himself against HIV. This suggests that participants with greater experiences of violence and discrimination had both lowered perceptions of social support and less confidence in their abilities to use condoms as an HIV prevention strategy [86]. The variable representing homophobia as part of action contexts partially accounts for sexual stigma that is often faced by YMSM [87]. Minority Stress Theory conceptualizes multiple forms of sexual stigma as a key driver of health disparities among LGBT people [43, 44] and further work warrants additional integration of sexual stigma into action contexts, which may bolster the importance of action contexts on individual-level sociocognitive processes.

Self-change processes

In Social Action Theory, the outcome variables of interest—action states comprised of health risk and protective behaviors—arise from strategies individuals use when trying to regulate their behavior. The creation of these behaviors is prompted by the ability to make assessments (i.e., health expectancies) and translate them into strategies that are a function of health-relevant procedural and factual knowledge (i.e., self-efficacy) as well as the social support provided by those who influence the individual (i.e., social support) [14]. The constructs of self-efficacy and health expectancies are both key elements of Social Cognitive Theory and have been associated with sexual practices among YMSM [52]. In Social Action these individual-level cognitive processes influence behavioral health outcomes and are influenced by action contexts.

Social support and self-efficacy. In our test of Social Action Theory, increased social support and self-efficacy was associated with lower levels of psychological distress, suggesting a

relationship between social support, personal strategies for HIV prevention, and mental health. Given that YMSM who have supportive family and friends report less psychological distress, family- and peer-based interventions for this population may be useful. Additionally, interventions that increase self-efficacy and protective strategies may have the added benefit of reducing psychological distress as well as increasing safer sexual practices.

Health expectancies. Likewise, health expectancies were positively associated with health protective behaviors and negatively associated with risky sexual practices. However, individuals with greater health expectancies experienced more psychological distress. These findings suggest a difference in risk factors for mental versus physical health, as positive health motivations were related to healthier behaviors, including lower sexual practices that put YMSM at risk for HIV, despite being associated with an increase in psychological distress. One explanation for these seemingly contradictory findings may relate to the fact that while MSM communities have potential for supportive interaction, they also carry significant risks based on high base-rates of sexual practices and social norms which may put YMSM at risk for HIV [23]. When YMSM attempt to engage in health promotion they may need to avoid social networks where sexual practices that carry HIV risk are normative. Finally, health expectancies covaried with self-efficacy and social support, suggesting that the relationship between health expectancies and sexual practices is informed by the other self-change processes. These findings further support and validate the multidimensional targeting of behavior, which has been shown to successfully predict behavioral health outcomes [61, 88].

Action states. Considering the associations between intermediary self-change processes and the outcome variables within action states, the results of this study provide general support for Ewart's model for determining pathways to health protective behaviors and sexual practices that may put YMSM at risk for HIV. This model is more salient to the needs of YMSM when psychological distress is included as an action state. Specifically, psychological distress would be considered an internalizing response to environmental and cognitive factors while sexual practices would be an externalizing response. The application of Social Action Theory to determining sexual practices of YMSM shows that health protective behavior is a function of socio-cognitive factors that are influenced by environmental contexts. For YMSM, the choice of practicing health promotion and avoiding sexual practices that put them at risk for HIV may be related to both social isolation and psychological distress. Interestingly, psychological distress was not statistically significantly associated with sexual risk behavior. This null finding is consistent with other studies involving people living with HIV, including a recent multisite study that used Social Action Theory to understand sexual transmission risk [58], and studies involving at-risk adolescents [89–93]. One explanation for this may be our operationalization of psychological distress, which included relatively severe indicators of poor mental health (e.g., depression, suicidality, hopelessness). Those experiencing these issues may be more socially isolated and have fewer opportunities to engage in sexual practices. This relationship warrants additional attention in future research and others may consider a more expansive operationalization of psychological distress or may seek to explore specific mental health issues in relation to sexual practices that may put YMSM at risk for HIV.

Strengths and limitations

The results of the present study are based on a large probability sample of YMSM and offer an opportunity, not previously possible, to empirically validate Social Action Theory with a population of sexual minority youth. The importance of this research rests on its potential to further the understanding of these and other factors that influence sexual practices among YMSM in order to enhance behavioral prevention efforts with this population.

Despite these strengths, this study has some limitations. Due to issues of statistical power, this study is cross-sectional. Future studies should explore trajectories of sexual practices for YMSM, particularly given the volatility of the developmental period of emerging adulthood. Inquiry into the role of mental health symptoms as a precursor to, outcome of, or simultaneous force acting on both sides of the sociocognitive factors producing sexual practices has the potential to be particularly impactful. The data for this study come from a larger study designed to characterize the individual-, familial-, social-, and community-level factors associated with drug use and sexual practices of YMSM. Therefore, the test of the application of Social Action Theory is limited by the use of secondary data that was not gathered for the specific purpose of empirically validating Social Action Theory. For example, we were limited to a single item to measure internalized homophobia, one dimension of the complex psychological construct known as sexual stigma, which is not ideal. Future studies seeking to apply Social Action Theory to health practices with vulnerable populations should be designed, with the intention of testing the theory, and target data collection based on the exact specification of the domains in this theory as originally conceptualized by Ewart [14].

Data were collected from participants at gay-identified venues; therefore the data may not generalize to men who do not attend these venues, especially those who do not openly identify as gay or bisexual. The study data were gathered by self-report and may underestimate the true prevalence of sexual practices that put YMSM at risk for HIV, given that those practices may be perceived by many as socially undesirable. However, computer assisted interviewing technology may have helped minimize this bias.

Conclusion

Results from this study have important implications for the field of sexual health promotion, particularly efforts to create theoretically-driven interventions to prevent sexual practices that put YMSM at risk for HIV. Findings support the utility of Social Action Theory as a theoretical model for understanding sexual practices of YMSM. The model presented here highlights the unique relationships between environmental experiences, individual self-change processes, and mental health and sexual practices. Therefore, behavioral prevention interventions for this population may benefit from employing Social Action Theory and using a multi-targeted strategy for impacting several predictors of sexual practices among YMSM, particularly limited social support and psychological distress. Given the lack of inquiry into targeted theories for YMSM, this cross-sectional study can serve as a foundation for developing even more robust empirically-validated health behavior theories for this population.

In sum, efficacious behavioral prevention intervention development is particularly important for YMSM given that they are at a distinctive developmental time point between adolescence and adulthood marked by increased vulnerability and sexual practices that may put them at risk for HIV. Social Action Theory is especially useful for framing YMSM behavioral prevention interventions because it emphasizes the social context and its effect on the individual-level processes that lead to sexual practices that may put YMSM at risk for HIV.

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