



© Center for Health Disparities Research, School of Public Health, University of Nevada, Las Vegas

2014

## Predictors of Readiness to Quit Among a Diverse Sample of Sexual Minority Male Smokers

Alicia Kaye Matthews , *University of Illinois at Chicago*, Aliciak@uic.edu

Anna Hotton , *John H. Stroger Hospital of Cook County*

Frances Aranda , *University of Illinois at Chicago*

*See next page for additional authors*

Follow this and additional works at: <https://digitalscholarship.unlv.edu/jhdrp>



Part of the [Psychology Commons](#), and the [Public Health Commons](#)

### Recommended Citation

Matthews, Alicia Kaye; Hotton, Anna; Aranda, Frances; Kuhns, Lisa; Lee, Joseph G.L.; and Ross, Natalie (2014) "Predictors of Readiness to Quit Among a Diverse Sample of Sexual Minority Male Smokers,"

*Journal of Health Disparities Research and Practice*: Vol. 7 : Iss. 5 , Article 9.

Available at: <https://digitalscholarship.unlv.edu/jhdrp/vol7/iss5/9>

This Article is protected by copyright and/or related rights. It has been brought to you by Digital Scholarship@UNLV with permission from the rights-holder(s). You are free to use this Article in any way that is permitted by the copyright and related rights legislation that applies to your use. For other uses you need to obtain permission from the rights-holder(s) directly, unless additional rights are indicated by a Creative Commons license in the record and/or on the work itself.

This Article has been accepted for inclusion in *Journal of Health Disparities Research and Practice* by an authorized administrator of Digital Scholarship@UNLV. For more information, please contact [digitalscholarship@unlv.edu](mailto:digitalscholarship@unlv.edu).

---

# Predictors of Readiness to Quit Among a Diverse Sample of Sexual Minority Male Smokers

## Abstract

### ABSTRACT

**Introduction:** Readiness to quit smoking - a pattern of attitudes, intentions, and behaviors that reflect a likelihood of engaging in cessation activities—is a useful heuristic for understanding smoking disparities based on sexual orientation. This study examined demographic, tobacco-use patterns, psychosocial and cognitive factors associated with readiness to quit among gay and bisexual male smokers.

**Methods:** A cross-sectional survey was conducted as part of a larger Tobacco Elimination and Control Collaboration (Q-TECC) initiative in the lesbian, gay, bisexual, and transgender (LGBT) community. Readiness to quit was measured by a composite score created from four variables (motivation to quit, importance of quitting, plan to quit, and confidence in quitting) ( $\alpha=.87$ ,  $M=3.42$ ,  $SD=.96$ , range 1-5).

**Results:** The sexual minority smokers in the sample ( $N=208$ ;  $M=33$  years) were racially/ethnically diverse. Latino men had significantly lower levels of readiness to quit compared to African American and White men. Hierarchical linear regression analyses were performed to explore the relative contributions of sociodemographic, tobacco-use patterns, psychosocial and cognitive factors on Readiness to Quit. In the final model, the following variables were associated with readiness to quit scores: Latino ethnicity, fewer quit attempts, positive expectancies for the beneficial effects of smoking, and lower perceived importance of smoking as an important LGBT health issue. None of the psychosocial factors were associated with readiness to quit.

**Discussion:** Readiness to quit scores were largely predicted by modifiable attitudes, behaviors, and expectancies. Study findings have implications for improving outreach and awareness and for the development of effective treatment approaches.

## Keywords

Smoking; Gay and Bisexual Men; Health Disparities

## Cover Page Footnote

**FUNDING** This work was supported by a grant from the American Legacy Foundation (Grant #2667) (David McKirnan, PI, 2001). **DECLARATION OF INTERESTS** Contributing authors do not have any conflicts of interests to report associated with this study or its funding. **ACKNOWLEDGMENTS** We would like to thank Blase Masini and Michael Maloney for their input on an earlier version of this paper.

## Authors

Alicia Kaye Matthews, Anna Hotton, Frances Aranda, Lisa Kuhns, Joseph G.L. Lee, and Natalie Ross



**Journal of Health Disparities Research and Practice**  
**Volume 7, Issue 5, Spring 2014, pp. 130-144**  
© 2011 Center for Health Disparities Research  
School of Community Health Sciences  
University of Nevada, Las Vegas

## **Predictors of Readiness to Quit Among a Diverse Sample of Sexual Minority Male Smokers**

Alicia K. Matthews, Ph.D, University of Illinois at Chicago  
Anna Hotton, Ph.D., MPH, John H. Stroger Hospital of Cook County  
Frances Aranda, Ph.D., MPH, University of Illinois at Chicago  
Lisa Kuhns, Ph.D., MPH, Ann & Robert H. Lurie Children's Hospital of Chicago and Northwestern University Feinberg School of Medicine  
Joseph G. L. Lee, MPH, CPH, The University of North Carolina at Chapel Hill  
Natalie Ross, Howard Brown Health Center

### **ABSTRACT**

**Introduction:** Readiness to quit smoking - a pattern of attitudes, intentions, and behaviors that reflect a likelihood of engaging in cessation activities—is a useful heuristic for understanding smoking disparities based on sexual orientation. This study examined demographic, tobacco-use patterns, psychosocial and cognitive factors associated with readiness to quit among gay and bisexual male smokers.

**Methods:** A cross-sectional survey was conducted as part of a larger Tobacco Elimination and Control Collaboration (Q-TECC) initiative in the lesbian, gay, bisexual, and transgender (LGBT) community. Readiness to quit was measured by a composite score created from four variables (motivation to quit, importance of quitting, plan to quit, and confidence in quitting) ( $\alpha=.87$ ,  $M=3.42$ ,  $SD=.96$ , range 1-5).

**Results:** The sexual minority smokers in the sample ( $N=208$ ;  $M=33$  years) were racially/ethnically diverse. Latino men had significantly lower levels of readiness to quit compared to African American and White men. Hierarchical linear regression analyses were performed to explore the relative contributions of sociodemographic, tobacco-use patterns, psychosocial and cognitive factors on Readiness to Quit. In the final model, the following variables were associated with readiness to quit scores: Latino ethnicity, fewer quit attempts, positive expectancies for the beneficial effects of smoking, and lower perceived importance of smoking as an important LGBT health issue. None of the psychosocial factors were associated with readiness to quit.

**Discussion:** Readiness to quit scores were largely predicted by modifiable attitudes, behaviors, and expectancies. Study findings have implications for improving outreach and awareness and for the development of effective treatment approaches.

**Keywords:** Tobacco-use Dependence, Smoking-Entrenchment, Homosexuality, Race/Ethnicity, Health Disparities

## INTRODUCTION

Over the past four decades, smoking prevalence rates have decreased markedly in the United States (CDC, 2004). Nationwide, the National Health Interview Survey reported estimates of smoking prevalence among men at approximately 22% (half the rate of 1965) (CDC, 2012). Although rates of smoking have decreased, clear disparities in smoking rates exist (CDC, 2007). For example, research suggests that sexual minority men (SMM) (i.e., men who have sex with men [MSM] with or without gay/bisexual identity) have significantly higher smoking rates than heterosexual men (Lee et al., 2009; Gruskin, Greenwood, Matevia, Pollack, & Bye, 2007; McKirnan et al., 2006). Data from a population-based sample in California suggests that even after controlling for demographic characteristics known to influence smoking prevalence rates (i.e., age, SES), gay men were twice as likely to smoke compared to heterosexual men (OR 2.13; Tang et al., 2004). Smoking rates among SMM are even higher in urban areas such as Chicago (39% vs. 25% for all male smokers) (Greenwood et al., 2005).

The elevated rates of smoking among SMM are likely due to the combined influence of general and unique risk factors (Blosnich, Lee, & Horn, 2013). Unique risk factors include stress associated with homophobia and discrimination (Harding, Bensley, & Corrigan, 2004), a media environment saturated with tobacco images (Smith, Offen, & Malone, 2005, 2006), the cultural significance of bars as social venues (Gruskin, Byrne, Kools, & Altschuler, 2006; Leibel, Lee, Goldstein, & Ranney, 2011), direct marketing to the LGBT communities by tobacco companies (Stevens, Carlson, & Hinman, 2004), and community-wide receptivity to tobacco industry marketing (Dilley, Spigner, Boysun, Dent, & Pizacani, 2008). Further, concern about tobacco industry targeting and tobacco-use is low among LGBT community leaders and members (Offen, Smith, & Malone, 2008; Smith, Thomson, Offen, & Malone, 2008) and smoking is generally not seen as a significant health concern (Groves, Ventuneac, Rendina, Jimenez, & Parsons, 2012). Finally, sexual minority smokers are underrepresented in smoking cessation treatment research (Doolan & Froelicher, 2006) and are less likely to have access to smoking cessation services (McKirnan et al., 2006). As a consequence of these combined factors, sexual minority smokers may have become “entrenched” (Irvin & Brandon, 2000; Irvin, Hendricks, & Brandon, 2003) in their smoking behaviors and exhibit lower levels of readiness to quit than members of other groups. Examining factors associated with lower levels of readiness to quit among sexual minority smokers can inform smoking cessation research, treatment, and policy.

### Conceptual Framework

The Transtheoretical Model of behavior change informs our understanding of an individual's readiness to act on a new healthier behavior such as smoking cessation (Prochaska & Velicer, 1997). According to the theory, individuals in the precontemplation stage do not intend to start the healthy behavior in the near future (within 6 months), and may be unaware of the need to change. Data suggestive of a generally lowered readiness to quit among current sexual minority smokers is emerging. For example, a proxy measure of stage of readiness for smoking cessation was included on the California LGBT Tobacco Use Survey (Bye et al., 2005). In this study, 48% of SMM were classified as unlikely to quit based on behavioral (no quit attempt for one or more days in the last year) or attitudinal (disagreement with a statement that they would like to stop smoking) questions. Findings also revealed that recent quit attempts were lower among SMM smokers than men in the general population. In a separate study, sexual minority smokers were more knowledgeable about the health risks of smoking but were less likely to have made a recent quit attempt compared to adult heterosexuals (Taylor & Leitman, 2001). Additionally, data from a population-based study suggest that compared to a general population

sample of men, fewer MSM were former smokers (Greenwood et al., 2005). Combined, these studies suggest a greater proportion of MSM smokers are in the precontemplation (lower stage of readiness) compared to their heterosexual counterparts.

#### Predictors of Lowered Readiness to Quit Smoking

Lowered readiness to quit smoking can be thought of as a pattern of attitudes, intentions, and perceived behavioral control that reflects a reduced likelihood of engaging in cessation activities (Coombs, Kozlowski, & Ferrence, 1989; Hughes, 1996; Irvin & Brandon, 2000; Irvin, Hendricks, & Brandon, 2003). Research on the predictors of smoking behaviors including readiness to quit among SMM smokers is scant (Burkhalter et al., 2009). Among men in general, it is clear that cessation behaviors are influenced by multiple levels of social-ecologic factors (USDHHS, 2001). Tobacco-use, in general, is strongly associated with measures of socioeconomic status, age (smoking initiation in late teens and generally decreasing prevalence over time), and living with mental illness (including depression, anxiety, and severe/persistent mental illness). Racial/ethnic minorities (vs. Whites) have greater burdens of smoking and the limited evidence suggests sexual minority with racial/ethnic backgrounds are more likely to be smokers compared to their straight counterparts (Blosnich, Jarrett, & Horn, 2011).

Current smoking status is also strongly associated with smoking cessation behaviors including more recent quit attempts (Lee & Kahende, 2007) and higher levels of nicotine dependency (Hughes, 2001). Psychosocial factors strongly influence smoking behaviors including alcohol consumption (Hashimoto et al., 2001; McKirnan et al., 2006), depressive symptoms (Breslau & Johnson, 2000; McKirnan et al., 2006) and support to quit smoking (Luker et al., 2007). Additionally, an individual's interest to quit smoking is influenced by cognitive factors such as smoking-related knowledge (Song, Statton & Glanz, 2008), expectancies (Ashare et al., 2007), deterrents to smoking (Levy et al., 2006) and stage of readiness for cessation (Prochaska & Velicer, 1997). Thus, any approach to examine readiness to quit smoking must account for as many of these factors as practical.

#### Specific Aims

The study aims were to measure readiness to quit smoking in a diverse sample of SMM and to examine the relationship between readiness to quit and demographic, tobacco-use variables, psychosocial and cognitive factors known to influence smoking behaviors among men in general. The measurement and identification of factors associated with readiness to quit smoking is important for the development of future tobacco control and cessation efforts in this highly disparate and underserved population of male smokers.

## **METHODS**

### Sample

Cross-sectional survey data on smoking behavior were collected as part of a larger Queer-Tobacco Elimination and Control Collaboration (Q-TECC) initiative conducted in Chicago (2004). The focus of the survey was to obtain data on smoking patterns and prevalence in the LGBT community to inform the development of targeted smoking cessation programming. A total of 957 surveys were completed. Of those, 592 were classified as SMM, defined as individuals who were assigned male sex at birth and who identified as gay or bisexual and/or reported sex with men in the previous 6 months. A total of 225 SMM were initially classified as current smokers. Seventeen ( $n=17$ ) SMM were excluded due to inconsistencies in answers to subsequent smoking-related questions that precluded classification of current smoking status or for unknown race/ethnicity. Thus, the final analytic sample size was 208.

### Recruitment

Recruitment for the Q-TECC study was conducted using established strategies for reaching hidden populations (e.g., snowball methods, membership lists, and street recruitment) (Buchting, Scout, Fagan & Rose, 2009). The survey was distributed at a broad range of events and venues (e.g., street fairs) and through informal social networks. Successful recruitment of racial/ethnic minorities was achieved through collaboration with three LGBT organizations: Calor, serving Latino SMM, Task Force AIDS Prevention, serving African American SMM, and Transgenesis Social Services, serving transgendered individuals. Surveys distributed by Calor were in English and Spanish.

### Data Collection

Trained outreach workers solicited potential respondents at recruitment venues to complete an anonymous survey of health-related attitudes and behaviors. Respondents were consented verbally (written consent was waived for this study). Data were collected using a self-administered paper-and-pencil survey. The survey took approximately 15-minutes to complete. Participates received a \$5 incentive. The Institutional Review Boards of Howard Brown Health Center and the University of Illinois at Chicago approved all study procedures.

### Measures

The survey included standardized and newly developed items to measure smoking-related beliefs. All response categories were provided in simple check-box format or Likert-type rating scales. Efforts were made to ensure questionnaire literacy at the eighth-grade level or lower. The variables included in the current analyses included:

#### Readiness to Quit Smoking - Precontemplation Stage

The Theory of Planned Behavior (Miller, 2005) suggests that health behaviors are predicted by intentions to carry out a behavior, perceived behavioral control (i.e., the confidence or ability to carry out a behavior), and subjective norms associated with the behavior. In previous research, constructs from the Theory of Planned Behavior have been shown to predict 34% of the variance in sexual minority quit intentions (Burkhalter, Warren, Shuk, Primavera, & Ostroff, 2009). In the current study, readiness to quit in the Precontemplation stage was operationally defined to reflect: (1) Motivation to quit smoking, (2) Importance of quitting smoking in next 3-months, (3) Plans to quit smoking in next 3-months, and (4) Confidence in ability to quit smoking completely. Each item was rated on a 5-point Likert-type scale from 1="definitely yes" to 5="not at all." The readiness to quit score was calculated as the mean of the four items (range=1 to 5, alpha=.90), with higher scores reflecting lower readiness to quit smoking.

#### Sociodemographic Characteristics

*Demographic measures* included age, race/ethnicity (African American, Latino, White males), income and educational level, seen a provider in past 2-years, and HIV status (see Table 1 for details).

#### Tobacco-Use

*Tobacco-use* measures included current smoking status ("During the past 30-days, on how many days did you smoke cigarettes, even 1 or 2 puffs?") and number of cigarettes smoked per day in the past 30-days. Smokers were categorized as light smokers ( $\leq 10$  cigarettes per day), moderate (11-20 cigarettes per day) and heavy ( $\geq 21$  cigarettes per day). Participants were also asked "How many times in the past 12-months have you purposely stopped smoking for 1-day or longer."

*Nicotine Dependency* was measured by the six-item Fagerström Test for Nicotine Dependence (e.g., "How soon after waking up do you smoke your first cigarette?") (FTND; Heatherton et al., 1991). Scores ranged from 0 to 10; scores under 4 indicate a low level of dependence, 5 a moderate level, and

scores from 6-10 a high level of dependence ( $\alpha=.64$ ).

#### Psychosocial Factors

*Support to quit* was measured in the study by 2-items ( $\alpha=.87$ , e.g., “I have people around me who would help if I decide to quit”). Each item was rated on a 5-point Likert-type scale from 1=Do not agree at all to 5=Strongly agree. The support to quit variable was calculated as an average of the two items.

*Depression* was assessed with a 9-item version of the Center for Epidemiological Studies Depression Scale (CES-D; see Santor & Coyne, 1997). Participants rated the number of days they experienced each symptom over the previous week on a four-point scale ranging from 0=“Rarely or none to 3=“Most or all of the time.” Responses were dichotomized to 1, reflecting the presence (i.e., a rating of “moderate” to “most of the time”), or 0 for absence (rating of “rare/none” to “a little”) of a symptom. The 9-items were summed (range 0-9) with higher scores representing more depressive symptoms ( $\alpha=.90$ ).

*Frequency of Alcohol Consumption* was assessed with a single-item inquiring about alcohol-use in the past 6-months. This item was scored using a 7-point Likert-type scale ranging from 0 “never” to “nearly every day.” Frequency of alcohol-use was analyzed as greater than once a week versus less than once a week.

#### Cognitive Factors

*Smoking Related Beliefs* were measured using 14-items that represent attitudes about smoking theorized to predict smoking behavior. Exploratory factor analysis was conducted to identify sub-factors from among the attitudinal items. Principal components estimation was used for factor-extraction. An eigenvalue of 1 or greater was specified as the cut-off for identification of sub-factors. Factors were rotated using varimax rotation. The three distinct factors emerged with loadings on the rotated component matrix reflecting three separate dimensions: (1) The importance of smoking as a LGBT health issue (4-items,  $\alpha=.88$ , e.g., “Smoking is an important health issue in the LGBT community”), (2) Smoking expectations (8-items,  $\alpha=.80$ , e.g., “I smoke because it relaxes and calms me”), and (3) Smoking deterrents (2-items,  $\alpha=.69$ , e.g., “The high price of cigarettes is a reason not to smoke”). Each item was rated on a 5-point Likert-type scale from 1=“Do not agree at all” to 5= “Strongly agree.” For each sub-scale, belief scores were calculated as an average of all items.

#### Data Analyses

We used SPSS version 20.0 (IBM, Chicago, IL), alpha-level of 0.05 for two-sided tests of significance, and listwise deletion to handle missing data. We dummy coded race/ethnicity with the reference group of Latino men. Hierarchical linear regression (HLR) was used to explore the relative contributions of demographic characteristics, tobacco-use patterns, psychosocial and cognitive factors in readiness to quit. Intercorrelations among all predictor variables were examined to assess potential multicollinearity among variables. Number of cigarettes smoked per day was incorporated in the nicotine dependency scale and was also excluded from further models. Adjusted  $R^2$  statistics were used to determine the overall contribution of each group of variables to the variance in readiness to quit, controlling for variables that had been entered in previous steps.  $F$ -tests for change in  $R^2$  were used to assess the statistical significance of the change in  $R^2$ .

## **RESULTS**

### Description of the Sample

Table 1 describes the demographic, tobacco-use, psychosocial and cognitive characteristics of the study participants. The mean age of participants was 32.9 years. The

majority of the participants was Latino (63.9%) and had a high school education or less (54.9%). Overall, three quarters (76%) of SMM in the sample smoked on a daily basis; however, over half of SMM were light smokers ( $\leq 10$  cigarettes daily) and the mean for nicotine dependency was 4.07 (SD 2.38) which is in the low range.

**Table 1: Sociodemographic Characteristics, Tobacco use, Psychosocial and Cognitive Factors**

$N = 208^a$

<i>Sociodemographics</i>	<i>M</i>	<i>SD</i>
Age in years (range 18-62)	32.9	9.1
	<i>n</i>	<i>%</i>
Education		
Less than high school	28	13.5
High School or GED	86	41.4
Some college, college or graduate degree	94	45.2
Income		
Less than \$10,999	18	8.7
\$11,000-\$20,999	24	11.7
\$21,000-\$30,999	85	41.3
\$40,000-\$49,999	60	29.1
More than \$50,000	19	9.2
Race		
White	35	16.8
African American	40	19.2
Latino/Hispanic	133	63.9
Saw a provider in past 2-years		
Yes	162	82.7
No	34	17.3
HIV status		
Positive	40	20.3
Negative	99	50.3
Unknown	58	24.9
<i>Tobacco-use /smoking cessation attitudes</i>	<i>n</i>	<i>%</i>
Cigarettes per day		
Less than 10	115	56.1
11-20	59	28.8
21-30	28	13.7
More than 31	3	1.5
Days smoked in the past 30 days		
10-19	12	5.8
20-29	38	18.3
All 30	158	76.0
Made attempts to quit in last 12-months		
Yes	80	38.7
No	127	61.3
Plans to quit in next 6-months		

136 Readiness to Quit Among Sexual Minority Male Smokers  
-Matthews et al.

Yes	63	32.0
No	134	68.0
	<i>M</i>	<i>SD</i>
Nicotine dependence (range 0-10)	4.07	2.38
<i>Psychosocial factors</i>	<i>M</i>	<i>SD</i>
Support to quit (range 1-5)	2.5	1.3
Depression (range 0-9)	2.76	2.90
	<i>n</i>	<i>%</i>
Alcohol-use frequency		
Once a week or less	161	22.6
Greater than once a week	47	77.4
	<i>M</i>	<i>SD</i>
Support to quit (range 1-5)	2.5	1.3
<i>Cognitive Factors</i>	<i>M</i>	<i>SD</i>
Smoking expectancies (range 1-4)	2.5	0.7
Knowledge of elevated smoking in LGBT (range 1-5)	3.0	1.1
Smoking deterrents (range 1-5)	2.2	1.0
Importance of smoking as LGBT health issue (range 1-5)	3.1	0.9

<sup>a</sup>Column totals may not equal 208 due to missing data

Psychosocial, Cognitive, and Readiness to Quit Indicators

Table 1 displays the means and standard deviations for the psychosocial and cognitive factors. Table 2 shows the mean and standard deviations for each of the individual items used to create the readiness to quit variable including the scale ( $M=3.42$ ,  $SD=.96$ , range 1-5). Among all smokers, a low percentage (32%) reported planning to quit smoking within the next 6-months.

**Table 2: Indicators of Readiness to Quit among MSM Smokers ( $N = 208$ )**

Variable	Mean	SD
Motivation to Quit Smoking	3.17	1.23
Importance of Quitting in Next 3 Months	3.46	1.11
Plans to Quit in Next 3 Months	3.47	1.09
Confidence in Ability to Quit Smoking	3.56	.95
Readiness to Quit Scale	3.42	.96

Note: Response options range from 1 = Definitely Yes to 5 = Not at all, higher scores indicate less readiness to quit

### Multivariable Models Predicting Smoking-Entrenchment

Table 3 shows the results of HLR models examining predictors of readiness to quit. In Step 1, age, income, education, race, provider visit, and HIV status were entered into the model. This set of variables accounted for 27% (adjusted  $R^2$ ) of the variance in readiness to quit ( $F [7, 175]=10.83, p<.001$ ). Race was the only significant demographic predictor in Step 1. African American and White SMM (versus Latino) had significantly lower levels of smoking-entrenchment.

In Step 2, tobacco-use included nicotine dependency and number of quit attempts in the previous 12-months were added. This model accounted for an additional 4% of variance in smoking-entrenchment ( $F [2, 173]=5.43, p<.01$ ) over and above that which was explained by the sociodemographic variables alone. Having made one or more quit attempts in the previous year was significantly and negatively associated with smoking-entrenchment.

In Step 3, psychosocial factors, including support to quit smoking, alcohol-use frequency, and depression were added. These variables did not explain any additional variance in smoking-entrenchment over that explained by the demographic and tobacco-use patterns.

Finally, cognitive factors were added which included expectancies for the positive effects of smoking, beliefs about smoking deterrents, and importance of smoking as an LGBT health issue. Together, these variables accounted for an additional 4% of variance in smoking-entrenchment above and beyond that which was explained by sociodemographics, tobacco-use patterns, and psychosocial factors ( $F [3, 167]=4.00, p<0.01$ ). Smoking related expectancies were positively associated with level of smoking-entrenchment ( $p< 0.01$ ). Viewing smoking as an important health issue for LGBT people was significant ( $p<.05$ ) and negatively associated with entrenchment. Overall, the final model accounted for 35% of the variation in smoking-entrenchment. We also tested for interactions between race/ethnicity and significant predictors from steps 1 through 4 but the findings were not significant. The small sample size for African Americans and Whites may have limited our ability to detect interactions in this sample.

**Table 3: Hierarchical Linear Regression of Readiness to Quit on Sociodemographics, Tobacco-Use, Psychosocial and Cognitive (N = 208)**

	Step 1		Step 2		Step 3		Step 4	
<b>Step 1: Sociodemographics</b>	Beta	SE	Beta	SE	Beta	SE	Beta	SE
Age	-.130	.007	-.129	.007	-.139*	.007	-.120	.007
High school education or less vs. College or graduate degree	-.016	.133	-.043	.131	-.037	.133	-.072	.131
Income	.097	.070	.083	.068	.091	.068	.059	.069
Race/ethnicity								
White non-Hispanic	-.418***	.179	-.371***	.178	-.340***	.207	-.283***	.213
African American	-.456***	.090	-.396***	.091	-.375***	.095	-.290***	.100
Hispanic/Latino (reference)	-----	-----	-----	-----	-----	-----	-----	-----
Saw a medical provider in the past 2years	.028	.167	.027	.162	.019	.1638	.013	.159
HIV status Positive Negative/Unknown	.036	.159	.025	.156	.035	.156	.045	.153
<b>Step 2: Tobacco-use</b>								
High nicotine dependence			.108	.026	.074	.027	.039	.027
≥ 1 quit attempt in past 12-months vs. none			-.168*	.133	-.174*	.133	-.155*	.132
<b>Step 3: Psychosocial factors</b>								
Support to quit					-.080	.053	-.051	.053
Alcohol-use frequency > once a week					.001	.153	.021	.151
Depression					.098	.021	.086	.021
<b>Step 4: Cognitive factors</b>								
Smoking expectancies							.241**	.102
Smoking deterrents							-.114	.072
Importance of smoking as an LGBT health issue							-.145*	.073
<b>Model R<sup>2</sup> (adjusted R<sup>2</sup>)</b>	0.30 (0.27)		0.34 (0.31)		0.36 (0.31)		0.40 (0.35)	
<b>F change</b>	10.83		5.43		1.26		4.00	
<b>df</b>	7, 175		2, 173		3, 170		3, 167	
<b>Change in R<sup>2</sup></b>	0.30		0.04		0.01		0.04	
<b>p-value</b>	0.000		0.005		0.291		0.009	

\* $p < .05$ ; \*\* $p < .01$ ;  $p < .001$

## DISCUSSION

Little is known about the factors associated with elevated smoking prevalence rates among SMM and even less is known about the factors that promote the maintenance of high smoking prevalence rates. To date, no published studies have reported on readiness to quit as a construct among sexual minority smokers, a community experiencing disparate smoking prevalence rates. This study fills a significant gap in the extant literature by operationalizing readiness to quit as a multi-dimensional construct that includes motivation to quit smoking, the importance of quitting, plans to quit, and confidence in one's ability to quit smoking.

Using multivariable analyses, we examined the influence of sociodemographic characteristics, tobacco-use patterns, psychosocial and cognitive factors on level of readiness to quit. Race/ethnicity was an independent predictor of readiness to quit with Latino SMM (versus African American and White) reporting higher scores on our measure of being in the precontemplation stage of readiness to quit. These findings are strikingly different from what is known about smoking among Latino men. In the general population, Latino men are less likely to smoke compared to White or African American men (Siegel & Faigles, 1996) and one other study suggested that smoking prevalence rates of Latino men do not differ based on sexual orientation (Greenwood et al., 2005). Our study results may vary from the extant literature due to our recruitment approach. We purposely sought to increase the proportion of racial/ethnic minority individuals by partnering with community-based organizations serving the needs of LGBT individuals of color. Recent studies suggest that higher levels of connection to the LGBT may be associated with higher smoking prevalence rates (Holloway et al., 2012). Additional research is needed to replicate these study findings and to further examine the effect of the social environment and connection to the larger LGBT community is associated with smoking and other risk behaviors that may increase the likelihood of smoking (e.g., alcohol use).

Age was the other sociodemographic variable associated with readiness to quit with younger versus older smokers in our study obtaining higher precontemplation scores. These findings are in line with smoking trends in the general population (CDC, 2007) and the literature on smoking patterns among sexual minorities (Corliss et al., 2013). Current investigations are examining strategies to increase knowledge about risks associated with tobacco-use and strategies to increase motivation and engagement in smoking cessation treatment among youth and young adults (e.g., Curry, Mermelstein, Emery, et al., 2012).

In the general population, tobacco-use patterns are strongly associated with the maintenance of smoking behaviors and poor smoking cessation outcomes. For example, nicotine dependence is a factor that may partly explain the higher smoking rates in populations where smoking cessation efforts are prevalent (Fagerstrom et al., 1996); however, in our sample, higher levels of nicotine dependency were not associated with precontemplation scores. As one might expect, fewer quit attempts in the previous 12-months was predictive of higher precontemplation scores. Smoking research has shown that quit attempts are positively associated with smoking cessation outcomes with higher quit-rates among those making multiple quit attempts (Fiore, 2000). In this sample, 38.7% sexual minority smokers made a quit attempt in the previous 12-months that lasted one or more days. Additional research is needed to determine the barriers to smoking cessation among sexual minorities such as a lower likelihood of using evidence-based interventions, lower effectiveness of cessation programs for members of this population, or a higher relapse-rate relative to other smokers.

Surprisingly, after controlling for sociodemographic and tobacco-use none of our psychosocial factors were associated with level of readiness to quit. In a study of smoking among SMM, McKirnan and colleagues (2006) identified psychosocial factors including depression and heavy alcohol-use as

significant predictors of current smoking. However, cognitive factors seem to play a significant role in predicting readiness outcomes. Specifically, positive expectancies associated with smoking were associated with higher precontemplation scores. These findings are consistent with a recent study identifying the important role of positive-alcohol related expectancies on heavier alcohol use among sexual minority women (Matthews, Cho, Hughes, Wilsnack, Johnson, & Martin, 2013).

In the final model, a confluence of factors were associated with smoking-entrenchment including race/ethnicity, behavioral actions toward quitting, cognitive expectancies and the importance of smoking as a health issue of important for the LGBT community. The psychosocial variables measured in the study did not account for any increase in explained variance, suggesting that the factors associated with readiness to quit may differ from those that influence current smoking status (e.g., depression) or poor smoking cessation outcomes (e.g., nicotine dependence). Additional research is needed to further explore predictors of readiness to quit and whether these are unique from the factors associated with smoking initiation and maintenance.

#### Study Limitations

Our sample was relatively large and came from several geographic locations in Chicago—factors that strengthen generalizability. However, as with other volunteer-based studies, our sample may be biased toward healthier, more educated participants, and those comfortable with disclosing their sexual minority status. Many participants were recruited through bars and clubs, which resulted in an over sampling of those who are heavy drinkers and heavy smokers. Because of this, these data are not used to report smoking rates. Although our sample was racially/ethnically diverse, small sample sizes for the African American and White smokers may have made it difficult to detect whether the covariate effects on levels of readiness to quit was moderated by race/ethnicity (e.g., interactions). Additional studies with larger more representative samples are warranted. Finally, this study did not evaluate a number of key factors that may have helped to explain readiness to quit scores among SMM such as social networks or social settings (e.g., bars), or factors associated with minority stress (homophobia, racism, or discrimination).

## **CONCLUSION**

This study fills a significant gap in the extant literature by examining factors associated with readiness to quit smoking among SMM. Study findings underscore the need for comprehensive community-based smoking initiatives aimed at increasing readiness to quit in this highly underserved population. For instance, SMM with lower readiness to quit may be more effectively targeted with motivational and behavioral strategies aimed at increasing stage of readiness for smoking cessation activities as these approaches have been effective in other populations (Rohsenow, Martin, Monti, et al., 2014; Asfar, Ebbert, Klesges, & Relyea, 2011). SMM with higher stage of readiness scores are more likely to benefit from initiatives that increase awareness of and access to effective smoking cessation treatment programs. Variations in readiness to quit scores were observed based on race/ethnicity. As such, attention must be made to cultural differences in the successful design, implementation, and effectiveness of community-based smoking cessation initiatives.

## **ACKNOWLEDGEMENTS**

This work was supported by a grant from the American Legacy Foundation (Grant #2667) (David McKirnan, PI, 2001).

We would like to thank Blase Masini and Michael Maloney for their input on an earlier version of this paper.

## REFERENCES

- Asfar, T., Ebbert, J. O., Klesges, R. C., & Relyea, G. E. (2011). Do smoking reduction interventions promote cessation in smokers not ready to quit? *Addictive behaviors*, *36*(7), 764-768.
- Ashare, R. L., Hawk, L. W., Cummings, K. M., O'Connor, R. J., Fix, B. V., & Schmidt, W. C. (2007). Smoking expectancies for flavored and non-flavored cigarettes among college students. *Addictive Behaviors*, *32*(6), 1252-1261.
- Blosnich, J., Lee, J. G., & Horn, K. (2013). A systematic review of the aetiology of tobacco disparities for sexual minorities. *Tobacco Control*, *22*(2), 66-73.
- Blosnich, J. R., Jarrett, T., & Horn, K. (2011). Racial and ethnic differences in current use of cigarettes, cigars, and hookahs among lesbian, gay, and bisexual young adults. *Nicotine & Tobacco Research*, *13*(6), 487-491.
- Breslau, N. & Johnson, E. O. (2000). Predicting smoking cessation and major depression in nicotine-dependent smokers. *American Journal of Public Health*, *90*(7), 1122-1127.
- Buchting, F. O., Scout, N. F. N., Fagan, P., & Rose, A. (2009). LGBT of color sampling methodology: strategies for data collection among small, hidden or hard-to-reach groups to reduce tobacco-related health disparities Retrieved Aug 3, 2012, from <http://www.tobaccodisparities.org>
- Burkhalter, J. E., Warren, B., Shuk, E., Primavera, L., & Ostroff, J. S. (2009). Intention to quit smoking among lesbian, gay, bisexual, and transgender smokers. *Nicotine & Tobacco Research*, *11*(11), 1312-1320.
- Centers for Disease Control and Prevention. (2004). Sustaining State Programs for Tobacco Control. Retrieved October 3, 2006, from <http://www.cdc.gov/tobacco/datahighlights/page5.htm>
- Centers for Disease Control and Prevention. (2007). Cancer - Lung Cancer Statistics. Retrieved October 2, 2006, from [http://apps.nccd.cdc.gov/emailform/print\\_table.asp](http://apps.nccd.cdc.gov/emailform/print_table.asp)
- Centers for Disease Control and Prevention (2012). Adult Cigarette Smoking in the United States: Current Estimate. Retrieved May 10, 2013, from [http://www.cdc.gov/tobacco/data\\_statistics/fact\\_sheets/adult\\_data/cig\\_smoking/#national](http://www.cdc.gov/tobacco/data_statistics/fact_sheets/adult_data/cig_smoking/#national)
- Coombs, R. B., Kozlowski, L. T., & Ferrence, R. G. (1989). *The future of tobacco use and smoking research*. New York: Wiley.
- Corliss, H. L., Wadler, B. M., Jun, H. J., Rosario, M., Wypij, D., Frazier, A. L., & Austin, S. B. (2013). Sexual-orientation disparities in cigarette smoking in a longitudinal cohort study of adolescents. *Nicotine & Tobacco Research*, *15*(1), 213-222.
- Curry, S. J., Mermelstein, R. J., Emery, S. L., Sporer, A. K., Berbaum, M. L., Campbell, R. T., ...Warnecke, R. B. (2013). A national evaluation of community-based youth cessation programs: End of program and twelve-month outcomes. *American Journal of Community Psychology*, *51*(1-2), 15-29.
- DiClemente, C. C., Prochaska, J. O., Fairhurst, S. K., Velicer, W. F., Velasquez, M. M., & Rossi, J. S. (1991). The process of smoking cessation: an analysis of precontemplation, contemplation, and preparation stages of change. *Journal of Consulting and Clinical Psychology*, *59*(2), 295-304.
- Dilley, J. A., Spigner, C., Boysun, M. J., Dent, C. W., & Pizacani, B. A. (2008). Does tobacco

- industry marketing excessively impact lesbian, gay and bisexual communities? *Tobacco Control*, 17(6), 385-390.
- Doolan, D. M., & Froelicher, E. S. (2006). Efficacy of smoking cessation intervention among special populations: review of the literature from 2000 to 2005. *Nursing Research*, 55(4 Suppl), S29-37.
- Fagerstrom, K. O., Kunze, M., Schoberberger, R., Breslau, N., Hughes, J. R., Hurt, R. D., Zatonski, W. (1996). Nicotine dependence versus smoking prevalence: comparisons among countries and categories of smokers. *Tobacco Control*, 5(1), 52-56.
- Fiore, M. C. (2000). US public health service clinical practice guideline: treating tobacco use and dependence. *Respiratory Care*, 45(10), 1200-1262.
- Greenwood, G. L., Paul, J. P., Pollack, L. M., Binson, D., Catania, J. A., Chang, J., et al., (2005). Tobacco use and cessation among a household-based sample of US urban men who have sex with men. *American Journal of Public Health*, 95(1), 145-151.
- Grov, C., Ventuneac, A., Rendina, H. J., Jimenez, R. H., & Parsons, J. T. (2012). Perceived importance of five different health issues for gay and bisexual men: Implications for new directions in health education and prevention. *American Journal of Men's Health*, 7(4), 274-284.
- Gruskin, E. P., Greenwood, G. L., Matevia, M., Pollack, L. M., & Bye, L. L. (2007). Disparities in smoking between the lesbian, gay, and bisexual population and the general population in California. *Journal Information*, 97(8).
- Harding, R., Bensley, J., & Corrigan, N. (2004). Targeting smoking cessation to high prevalence communities: outcomes from a pilot intervention for gay men. *BMC Public Health*, 4, 1-5.
- Hashimoto, Y., Futamura, A., Nakarai, H., & Nakahara, K. (2001). Effects of the frequency of alcohol intake on risk factors for coronary heart disease. *European Journal of Epidemiology*, 17(4), 307-312.
- Heatherton, T. F., Kozlowski, L. T., Frecker, R. C., & Fagerstrom, K. O. (1991). The Fagerström test for nicotine dependence: a revision of the Fagerstrom Tolerance Questionnaire. *British Journal of Addiction*, 86(9), 1119-1127.
- Holloway, I. W., Traube, D. E., Rice, E., Schrage, S. M., Palinkas, L. A., Richardson, J., et al., (2012). Community and individual factors associated with cigarette smoking among young men who have sex with men. *Journal of Research on Adolescence*, 22(2), 199-205.
- Hughes, J. R. (1996). The future of smoking cessation therapy in the United States. *Addiction*, 91(12), 1797-1802.
- Hughes, J. R. (2001). Distinguishing nicotine dependence from smoking: why it matters to tobacco control and psychiatry. *Archives of General Psychiatry*, 58(9), 817-818.
- Irvin, J. E., & Brandon, T. H. (2000). The increasing recalcitrance of smokers in clinical trials. *Nicotine & Tobacco Research*, 2(1), 79-84.
- Irvin, J. E., Hendricks, P. S., & Brandon, T. H. (2003). The increasing recalcitrance of smokers in clinical trials II: Pharmacotherapy trials. *Nicotine & Tobacco Research*, 5(1), 27-35.
- Lee, C.W., Kahende, J. (2007). Factors associated with successful smoking cessation in the United States, 2000. Retrieved from <http://www.pubmedcentral.nih.gov/articlerender.fcgi?artid=1931453>
- Lee, J. G. L., Griffin G. K., & Melvin, C. L. (2009). Tobacco use among sexual minorities in the USA, 1987 to May 2007: a systematic review. *Tobacco Control*, 18(4), 275-282.

- Leibel, K., Lee, J. G., Goldstein, A. O., & Ranney, L. M. (2011). Barring intervention? Lesbian and gay bars as an underutilized venue for tobacco interventions. *Nicotine & Tobacco Research, 13*(7), 507-511.
- Levy, D. T., Hyland, A., Higbee, C., Remer, L., & Compton, C. (2007). The role of public policies in reducing smoking prevalence in California: Results from the California Tobacco Policy Simulation Model. *Health Policy, 82*(2), 167-185.
- Luker, K. A., Chalmers, K. I., Caress, A.-L., & Salmon, M. P. (2007). Smoking cessation interventions in chronic obstructive pulmonary disease and the role of the family: a systematic literature review. *Journal of Advanced Nursing, 59*(6), 559-568.
- Maher, J. E., Boysun, M. J., Rohde, K., Stark, M. J., Pizacani, B. A., Dilley, J., et al., (2005). Are Latinos really less likely to be smokers? Lessons from Oregon. *Nicotine & Tobacco Research, 7*(2), 283-287.
- Matthews, A. K., Cho, Y. I., Hughes, T., Wilsnack, S. C., Johnson, T., & Martin, K. (2013). The relationships of sexual identity, hazardous drinking, and drinking expectancies with risky sexual behaviors in a community sample of lesbian and bisexual women. *Journal of the American Psychiatric Nurses Association, 19*(5), 259-270.
- McCabe, S. E., Boyd, C., Hughes, T. L., & d'Arcy, H. (2003). Sexual identity and substance use among undergraduate students. *Substance Abuse, 24*(2), 77-91.
- McKirnan, D. J., Tolou-Shams, M., Turner, L., Dyslin, K., & Hope, B. (2006). Elevated risk for tobacco use among men who have sex with men is mediated by demographic and psychosocial variables. *Substance Use & Misuse, 41*(8), 1197-1208.
- Miller, K. (2005). *Communications theories: perspectives, processes, and contexts*. New York: McGraw-Hill.
- Offen, N., Smith, E. A., & Malone, R. E. (2008). Is tobacco a gay issue? Interviews with leaders of the lesbian, gay, bisexual and transgender community. *Culture, Health, & Sexuality, 10*(2), 143-157.
- Prochaska, J. O., & Velicer, W. F. (1997). The transtheoretical model of health behavior change. *American Journal of Health Promotion, 12*(1), 38-48.
- Rice, V. H., Templin, T., Fox, D. H., Jarosz, P., Mullin, M., Seiggreen, M., & Lepczyk, M. (1996). Social context variables as predictors of smoking cessation. *Tobacco Control, 5*(4), 280-285.
- Rohsenow, D. J., Martin, R. A., Monti, P. M., Colby, S. M., Day, A. M., Abrams, D. B., et al., (2014). Motivational interviewing versus brief advice for cigarette smokers in residential alcohol treatment. *Journal of substance abuse treatment, 46*(3), 346-355.
- Santor, D. A., & Coyne, J. C. (1997). Shortening the CES-D to improve its ability to detect cases of depression. *Psychological Assessment, 9*(3), 233-243.
- Siegel D, Faigeles. B. (1996). Smoking and socioeconomic status in a population-based inner city sample of African-Americans, Latinos and whites. *Journal of Cardiovascular Risk, 3*(3), 295-300.
- Smith, E. A., Offen, N., & Malone, R. E. (2005). What makes an ad a cigarette ad? Commercial tobacco imagery in the lesbian, gay, and bisexual press. *Journal of Epidemiology & Community Health, 59*(12), 1086-1091.
- Smith, E. A., Offen, N., & Malone, R. E. (2006). Pictures worth a thousand words: noncommercial tobacco content in the lesbian, gay, and bisexual press. *Journal of Health Communication, 11*(7), 635-649.
- Smith, E. A., Thomson, K., Offen, N., & Malone, R. E. (2008). "If you know you exist, it's just

- marketing poison": meanings of tobacco industry targeting in the lesbian, gay, bisexual, and transgender community. *American Journal of Public Health*, 98(6), 996-1003.
- Song, A. V., & Glantz, S. A. (2008). Pushing secondhand smoke and the tobacco industry outside the social norm to reduce adolescent smoking. *The Journal of Adolescent Health*, 43(4), 315-317.
- Stevens, P., Carlson, L. M., & Hinman, J. M. (2004). An analysis of tobacco industry marketing to lesbian, gay, bisexual, and transgender (LGBT) populations: strategies for mainstream tobacco control and prevention. *Health Promotion Practice*, 5(3 Suppl), 129S-134S.
- Tang, H., Greenwood, G. L., Cowling, D. W., Lloyd, J. C., Roeseler, A. G., & Bal, D. G. (2004). Cigarette smoking among lesbians, gays, and bisexuals: How serious a problem? *Cancer Causes & Control*, 15(8), 797-803.
- Taylor, H., & Leitman, R. (2001). Lesbians and gays more likely to smoke than other adults - even though they know the risks and try to stop (Vol. 1): Harris Interactive.
- United States Department of Health and Human Services. (2000). *Reducing Tobacco Use: A Report of the Surgeon General*. Atlanta, GA: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, National Center for Chronic Disease Prevention and Health Promotion, Office on Smoking and Health.