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## Heterosexual Self-Presentation and Other Individual- and Community-Based Correlates of HIV testing among Latino Men Who Have Sex With Men

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### Abstract

From 2010 to 2014, HIV diagnoses among Latino men who have sex with other men (LMSM) have increased by 14%, while diagnoses declined by 11% among white, non-Latino MSM. This health disparity is in part due to exposure to other LMSM with undiagnosed HIV infections. To

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effectively engage LMSM who are unaware of their serostatus, profiles of men differing in theorized determinants of HIV testing must be considered. In this retrospective study, we examined data from 546 LMSM to investigate whether hypothesized individual- (traditional masculine gender role conformity; sexual identity development status; alcohol and illicit drug use; sexual risk behaviors; perceived HIV susceptibility; and HIV stigma) and community-based (HIV prevention programming, access to health care, social support, neighborhood collective efficacy) factors were associated with differences in HIV testing. Latent profile analysis was used to identify profiles of men, and subsequent analyses examined whether profiles exhibited differential proportions of HIV testing. Four latent profiles were observed. One profile (50.3% tested) differed markedly from all other profiles (5.1 to 11% tested) in HIV testing. Characteristics of participants in this unique profile included reporting lower levels of heterosexual self-presentation, sexual identity uncertainty (and high levels of sexual identity commitment), condom use, HIV stigma, education, and perceived HIV susceptibility than all other profiles. Findings could improve HIV testing rates among LMSM by specifying ways in which public health advertisements/campaigns and community-based testing outreach efforts could be tailored to men most at-risk for transmitting HIV due to unknown serostatus.

### Keywords

men who have sex with men; HIV testing; Latinx

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The Latina/o/x (hereafter Latinx) population accounts for about one quarter of all new diagnoses of HIV in the United States (US), despite representing about 18% of the US population [Centers for Disease Control and Prevention (CDC), 2017]. About 70% of new HIV diagnoses among Latinx occur among gay, bisexual, and other Latino men who have sex with men (LMSM). From 2010 to 2014, diagnoses among LMSM increased 14% while diagnoses declined 11% among white, non-Latino men who have sex with men (MSM) and remained stable among African American MSM (CDC, 2017a). The disproportionate number of new HIV infections among LMSM is suggested in part due to exposure to men with undiagnosed HIV infection (Joseph et al., 2014). Many LMSM who are HIV positive are unaware of their status, which is problematic as a lack of awareness of one's HIV serostatus increases the likelihood of transmitting HIV to others (Lechuga, Owczarzak, & Petroll, 2013).

After receiving an HIV diagnosis, most HIV positive persons begin the continuum of treatment as well as disclose their serostatus to potential sexual partners (Arnold, Rice, Flannery, & Rotheram-Borus, 2008). Indeed, knowledge of HIV serostatus substantively reduces condomless sexual activity among HIV positive men (Marks, Crepaz, Senterfitt, & Janssen, 2005). Thus, a way of reducing the disparity in HIV diagnoses among LMSM compared to the general population is to increase HIV testing rates among LMSM, raise awareness of HIV serostatus, and potentially reduce sexual risk behaviors. To achieve this goal, psychologists and other health professionals have been called on to identify individual- and community-based barriers to HIV testing among LMSM (Lucas & Armbruster, 2013).

The CDC recommends that sexually active MSM be tested for HIV every three to six months (CDC, 2015). Recent public health efforts to prevent HIV infection in the general population promote the *seek, test, and treat* (STNT) approach (Hayden, 2010; Lechuga et al., 2013). The STNT approach posits that increasing the number of persons who are aware of their HIV positive status and treating them with antiretroviral drugs will curtail the number of new HIV infections (Granich, Gilks, Dye, De Cock, & Williams, 2009). A limitation of this approach is that it assumes persons at-risk for contracting HIV (a) are equally motivated to get tested and (b) can equally access testing when they desire. These assumptions are particularly problematic in the case of LMSM because of recognized barriers to testing (e.g., fear of stigma, fear of rejection by family, fear of testing positive, lacking access to health care, low perceived susceptibility) (Joseph et al., 2014). Thus, LMSM are less likely to be tested and less likely to be aware of their HIV status than non-Latino White MSM (CDC, 2017a). As a consequence, LMSM are more likely to be diagnosed at a later stage of the infection (Hanna, Pfeiffer, Torian, & Sackoff, 2008) and experience worse health outcomes after diagnosis, including faster disease progression and increased infectivity, compared to non-Latino White MSM (Hall et al., 2007). In the present study, we attempt to identify concomitant barriers to and facilitators of testing for LMSM to inform prevention efforts and more effectively engage LMSM in recommended testing practices.

Descriptive, cross-sectional research has found a number of potential determinants of HIV testing among MSM. To date, theorized primary predictors of HIV testing of MSM can be grouped into two domains: individual- (e.g., traditional masculine gender role conformity; sexual identity development status; alcohol and illicit drug use; sexual risk behaviors; perceived susceptibility, and HIV stigma) and community-based (e.g., available HIV prevention programming, access to health care, social support; neighborhood collective efficacy). Many individual-based predictors of HIV testing among MSM were derived from social cognitive theories, such as the theory of planned behavior (TPB; Ajzen, 1991). TPB states that constructs like one's attitudes toward testing, subjective norms about testing, and perceived behavioral control predict whether an individual has intentions to test and subsequently engages in testing. The community-based predictors are generally drawn from Bronfenbrenner's (1979) and others' work on the social ecology of human behavior and social determinants of health (Marmot & Wilkinson, 2006; Oster et al., 2013). The present study attempts to integrate theorized individual- and community-based predictors to understand the potential overlap of these domains via a person-centered design. The person-centered design involves a latent profile statistical analysis that identifies meaningful profiles of participants based on hypothesized individual and community-based predictors of HIV testing. Latent profile analysis (LPA) is a useful analytic technique in HIV prevention research because it allows for the identification and description of meaningful profiles of participants. A particular strength of LPA is that these profiles can be linked to health behaviors and intervention (Collins & Lanza, 2010). The design involves examining the derived profiles of participants with the target behavior (i.e., HIV testing). Our aim is to derive a more complete and accurate picture of LMSM who engage in HIV testing, and those who do not. A traditional variable-centered design (e.g., regression) would only allow us to detect variables that each independently associate with HIV testing. In contrast, LPA allows us to identify groups or profiles of men who are similar to one another based on

concomitant individual and community-based determinants of HIV testing. It also allows for comparisons among profiles on hypothesized characteristics as well as in relation to a target health behavior, in this case HIV testing within the past year.

## Potential Individual-based Determinants of HIV testing

Our conceptualization of individual-based influences on HIV testing for LMSM is based on previously-identified correlates of testing among general MSM samples (e.g., see Parent, Torrey, & Michaels, 2012; Joseph et al., 2014; Spadafino et al., 2016) and consists of five overarching variables (summarized below) emphasized in extant literature. These variables are noteworthy because they are potentially amenable to intervention: (a) traditional masculine gender role conformity, (b) sexual identity development status, (c) health risk behaviors, (d) perceived susceptibility, and (e) stigma toward persons living with HIV.

### Traditional masculine gender role conformity

Traditional masculine gender conformity (i.e., the degree to which one conforms to prescribed social expectations for attitudes and behavior based on one's biological sex) has not previously been examined among LMSM samples but has been linked with HIV testing in a general MSM population (Parent et al., 2012). Traditional masculine gender role conformity has also been linked with other health risk behaviors among men (e.g., alcohol and drug use, risky sex, missing medical appointments; O'Neil, 2008; Vogel, Heimerdinger-Edwards, Hammer, & Hubbard, 2011). Because past research supports examining links between masculine gender norms and prosocial health behaviors, we examine the role of traditional masculine gender role conformity—specifically the overlapping constructs of heterosexual self-presentation and machismo—on HIV testing practices among LMSM.

**Heterosexual self-presentation**—HIV testing is theorized to be an occasion in which traditional masculine gender conformity norms are activated in MSM (Parent et al., 2012). Heterosexual self-presentation (i.e., the desire to be perceived by others as heterosexual) has been identified as one of the traditional masculine gender role norms that is negatively linked with HIV testing (Parent et al., 2012). That is, obtaining an HIV test may be viewed as identifying as gay because of associations between HIV/AIDS and the gay community. Thus, we hypothesize that heterosexual self-presentation will inversely relate with HIV testing in the present study. Moreover, LMSM may be especially reluctant to engage in HIV testing because of the traditional cultural value *machismo*—described below—among other social and cultural dynamics that encourage Latinx men to (a) project a masculinity that is not noticeably gay or effeminate and (b) keep their sexual identity private (Sánchez, Blas-Lopez, Martínez-Patiño, & Vilain, 2016; Zellner et al., 2009).

**Machismo**—Machismo is comprised of traditional gender role in Latinx society that has been characterized, in part, by health risk behaviors such as violence, hyper-masculinity, aggressiveness, sexualized behavior, substance use, and HIV risk behaviors (Dolezal, Carballo-Diéguez, Nieves-Rosa, & Díaz, 2000). In accordance with machismo, risky sexual behaviors are often enacted to prove manhood and reinforce masculinity. These behaviors may include having multiple sexual partners (Levy et al., 2005) and engaging in condomless

sex (Estrada, Rigali-Oiler, Arciniega, & Tracey, 2011; Jarama, Kennamer, Poppen, Hendricks, & Bradford, 2005). Moreover, machismo beliefs have been positively linked with homophobia (Estrada et al., 2011; Ortiz-Torres, Serrano-Garcia, & Torres-Burgos, 2000). The strong, *macho man* image that rejects and oppresses homosexuality in Latino communities (Mirandé, 1997) may lead to unhealthy sexual identity censorship and hindered sexual identity development among LMSM. Therefore, we expect that LMSM reporting higher machismo beliefs in the present study will be less likely to obtain HIV testing. Our hypothesis is based on literature suggesting (a) heightened traditional masculine gender role conformity (e.g., machismo) is linked with less help-seeking among men in general (e.g., Vogel et al., 2011), and (b) LMSM whom endorse higher levels of machismo are more likely to hold higher levels of internalized homophobic or heterosexist beliefs (Estrada et al., 2011; Ortiz-Torres, Serrano-Garcia, & Torres-Burgos, 2000). Therefore, LMSM with higher levels of machismo are hypothesized to avoid HIV testing because obtaining a test would enact their internalized heterosexism and concomitant psychological distress (Szymanski & Carr, 2008).

**Caballerismo**—Machismo has been postulated as a multidimensional cultural value (Arciniega, Anderson, Tovar-Blank, & Tracey, 2008; Estrada et al., 2011; Mirandé, Pitones, & Diaz, 2011; Torres, Solberg, & Carlstrom, 2002). Thus, it is important to note the theorized positive, protective aspects of machismo as well. For instance, machismo has been related to a sense of assertiveness, responsibility, sincerity, and emotional responsiveness (Mirandé et al., 2011; Torres et al., 2002). Positive machismo has been referred to as *caballerismo* and is characterized by social responsibility, emotional connectedness, nurturance, positive ethnic identity, life satisfaction, and healthy coping skills (Arciniega, Anderson, Tovar-Blank, & Tracey, 2008; Ojeda & Piña-Watson, 2014). Ojeda and Piña-Watson (2014) reported that caballerismo positively related with self-esteem among a sample of male, adult Mexican day laborers. Moreover, they found that caballerismo may serve as a buffer against the potential deleterious effect of machismo on one's self-esteem. Hence, in the present study LMSM reporting more caballerismo are hypothesized to engage in testing due to a theorized greater likelihood to be oriented toward health, responsibility to loved ones, and prosocial behaviors.

### Sexual identity development status

LMSM who label their sexual orientation as gay in comparison to bisexual or heterosexual are more likely to test for HIV (Joseph et al., 2014). However, sexual identity development has been suggested to involve more nuanced individual and social processes by which persons acknowledge and define their sexual orientation, their modes of sexual expression, and the characteristics of their sexual partners. Existing conceptualizations (e.g., Cass, 1979; Fassinger & Miller, 1996; Worthington, Navarro, Savoy, & Hampton, 2008; Worthington, Savoy, Dillon, & Vernaglia, 2002) described models of sexual identity development that move beyond labeling one's sexual orientation to incorporate what has been learned from years of theory and research concerning sexuality, sexual identity development, and attitudes toward sexual minority individuals. Based on sexual identity development theory, LMSM who are committed to their identity as a sexual minority are hypothesized to hold less internalized heterosexism (Szymanski & Carr, 2008) and more positive attitudes toward

sexual minorities based on preliminary studies with general populations (Worthington & Reynolds, 2009). Based on aforementioned literature concerning heterosexual self-presentation and sexual identity development theory, we hypothesize that LMSM who indicate more commitment to their sexual identity will test more than their counterparts whom express an uncertain sexual identity status.

### Health risk behaviors

HIV risk and substance use are theorized to often co-occur in accordance with syndemic theory (Halkitis, Wolitski, & Millett, 2013; Martinez et al., 2016). What is less clear is the link between HIV testing and engaging in health risk behaviors such as problematic substance use and condomless sex. A recent meta-analysis of testing among Internet-recruited MSM found that drug use was linked with being less likely to have been tested (Noble, Jones, Bowles, DiNunno, & Tregear, 2017). Because more research is needed to understand the influence of both problematic alcohol use and illicit drug use on HIV testing within the context of other individual and community determinants, we examine whether and how substance use rates may be linked with HIV testing among LMSM in particular.

Like with substance use, the association between HIV testing and condomless sex requires further study among LMSM. Testing has been found to be positively related to engagement in risky sexual practices in general MSM samples (Kellerman et al., 2002; Mimiaga et al., 2009; Sumartojo et al., 2008; Wall, Khosropour, & Sullivan et al., 2010). Among LMSM participants, consistent condom use also positively associated with HIV testing, suggesting that the protective behaviors may co-occur among LMSM (Gilbert & Rhodes, 2013). However, a meta-analysis of Internet-recruited MSM suggested inconsistent associations between testing and condom use (Noble et al., 2017). To elucidate this discrepancy, we explore whether condom use and HIV testing are co-occurring health promotion behaviors among LMSM in the present study.

### Perceived susceptibility and stigma

Studies involving mostly general MSM samples and fewer LMSM samples indicate that beliefs about HIV (e.g., stigma, fear of testing positive, perceived susceptibility) are strongly linked with testing (e.g., Gilbert & Rhodes, 2013; Joseph et al., 2014; Oster et al., 2013; Solorio, Forehand, & Simoni, 2013). Compared with White MSM, LMSM tend to report more fear of testing positive as their major reason for not getting tested (Joseph et al., 2014; MacKellar et al., 2011). Similarly, HIV/AIDS-related stigma, which is defined as prejudice, discrediting, and discrimination toward people who are perceived as having HIV/AIDS in addition to others with whom they are associated (Herek & Capitano, 1992), has been measured as higher among Latino men who had never been tested for HIV (Darrow, Montanea, & Gladwin, 2009). Hence, in the present study, two individual-based attitudinal factors (perceived susceptibility and HIV stigma) are hypothesized to differentially influence testing in the context of other determinants: LMSM who received an HIV test are expected to indicate lower perceived susceptibility and lower levels of HIV stigma in the present study.



## Potential Community Determinants to Testing

As previously alluded to, theories of the social ecology of human development (e.g., Bronfenbrenner, 1979) and current research on the social ecology of human behavior and social determinants of health (Marmot & Wilkinson, 2006; Oster et al., 2013) describe the interconnections among various community-based sources of influence on health behaviors. Several contextual correlates are suggested to be linked to individual's HIV testing among general MSM and LMSM samples such as experience of HIV prevention campaigns or interventions, access to health care, and social support. More specifically, having access to (and visiting) a health care provider was linked to more testing among a general sample of MSM (Lo, Turabelidze, Lin, & Friedberg, 2012). In particular for LMSM, having access to and visiting a health care provider (as well as disclosing same-sex behavior to provider) was correlated with recent testing (Joseph et al., 2014). Testing also was linked positively with more experience of HIV prevention efforts, knowing a comfortable place for testing, and more social support among a large national sample of young MSM with 77% of the sample being men of color (Sumartojo et al., 2008). Similarly, social supports were positively associated with motivation to get tested in a sample of young MSM of color (Leonard, Ragan, Gwadz, & Aregbesola, 2014). Thus, the present study includes experience of HIV prevention, access to health care, and social support as potential community-based determinants of testing to concurrently consider along with aforementioned individual-based influences.

We also study the potential distal, community-based determinant of perceived neighborhood collective efficacy. Collective efficacy consists of two theorized domains: informal social control (i.e., the ability of one's neighborhood to maintain community organization and obtain resources when needed) and social cohesion (i.e., the degree to which neighbors know, help, and trust each other; Sampson, Raudenbush, & Earls, 1997). Living in neighborhoods with low levels of collective efficacy, overlapping problems of poor physical infrastructure, low social-community organizational networks, and inadequate health care resources for HIV prevention contributes to increased levels of HIV (Latkin, German, Vlahov, & Galea, 2013). In fact, geographic areas with high poverty, high unemployment, and low neighborhood educational attainment are associated with higher HIV rates (Lopez-De Fede, Stewart, Hardin, Mayfield-Smith, & Sudduth, 2011). Conversely, neighborhoods with high perceived social cohesion have been associated with lower reported HIV risk behaviors (Latkin et al., 2013). Hence, community-based interventions for HIV prevention have begun to promote collective efficacy (Carlson, Brennan, & Earls, 2012). Therefore, collective efficacy is conceptualized as a potential community-based facilitator of HIV testing among LMSM in the present study.

## Intersecting Individual and Community Determinants of HIV Testing

Individual- and community-based domains of determinants of HIV testing have been treated mostly as separate in the extant research literature—with an emphasis on individual based factors. However, numerous studies of health risk behaviors suggest that individual and community processes may combine to influence health behaviors among Latinx samples (Prado et al., 2009). Although individual and community influences may be intertwined, it is

quite plausible that LMSM could experience high levels of detrimental community determinants but also high levels of individual facilitators of HIV testing, or vice versa (Prado et al., 2009). Such dynamics have not been explored in the existing literature on HIV testing among LMSM.

## The Present Study

The first aim of the present study was to identify profiles of participants based on the aforementioned theorized individual- and community-based determinants of HIV testing while accounting for demographic covariates posited to influence testing [e.g., age (Gilbert & Rhodes, 2013), socioeconomic status (i.e., income and education; Gilbert & Rhodes, 2013; Joseph et al., 2014), cultural identity and race group membership (Diaz, 1998; Organista, 2012), and relationship status (Sumartojo et al., 2008)].

The second aim of the present study was to determine whether obtaining an HIV test differed across the determined profiles. We expected that four profiles would emerge, and their rates of HIV testing would differ. Profile 1 will be those LMSM who have detrimental individual level and detrimental community-based determinants. Participants in Profile 1 are expected to yield the lowest rates of HIV testing in comparison to other profiles. Profile 2 will be those LMSM who have detrimental individual-based determinants but facilitative community-based determinants. Profile 3 will be those LMSM who have facilitative individual-based and detrimental community-based determinants. No differences in HIV testing are expected between Profiles 2 and 3. Profile 4 will be those LMSM who report both facilitative individual- and community-based determinants, and they are expected to indicate significantly greater levels of HIV testing than all other profiles.

## Method

### Participants

Inclusion criteria for the present study consisted of (a) identifying as a Latino man, (b) endorsing sex (oral or anal) with at least one male-identified person during the 12 months prior to assessment, (c) being HIV negative or of unknown HIV status, and (d) being aged 18 years or older. The sample consisted of 546 adult LMSM ( $M_{age} = 30.84$  years,  $SD = 6.17$ ) who identified as the following Latinx ethnicities: Mexican (48.0%), Cuban (21.0%), Colombian (10.1%), Puerto Rican (7.1%), Dominican (3.7%), Argentinian (2.7%), and Bolivian (1.3%). Nine other ethnicities (Venezuelan, Chilean, Ecuadorian, El Salvadorian, Guatemalan, Nicaraguan, Paraguayan, Peruvian, and Uruguayan) each represented less than 1% of the sample. Approximately 24% ( $n = 132$ ) of the sample self-identified as *Black, Hispanic/Latino*. The median reported education level was a Bachelor's degree. The median yearly income was \$75,000 to \$99,999. The median descriptor of participants sexual orientation was 4 = *Mostly Homosexual* on The Kinsey Scale ranging from 1 = *Exclusively Heterosexual* to 5 = *Exclusively Homosexual*. In terms of relationship status, 29.7% were married, 20.5% were cohabitating with a partner, and the remaining 50.2% were single, separated, or widowed. Approximately 97% were US citizens by birth or naturalization, while 3.3% were documented immigrants. The 46 Latino immigrants indicated living in the US for an average of 18.2 years ( $SD = 9.58$ ). Among all persons that consented to



participate in the study, the percentage of participants that (a) met eligibility criteria and (b) provided valid (i.e., checked via logic checks and validity check items) responses and (c) analyzable data (i.e., completed at least 80% of item level data on each study variable) was 23.11% (546/2362).

## Procedure

The institutional review board of a public university in New York approved the study. Targeted Internet-based recruitment venues were used such as email listservs and forums on social media sites (e.g., Facebook groups) designed to invite traffic from LMSM and community-based agencies serving LMSM in upstate New York and New York City and four urban centers where HIV prevalence among Latino males is highest in the US: Miami, Los Angeles, Chicago, and Houston (Wejnert et al., 2016). Other recruitment methods included announcing the study via community centers, health care organizations, and bars/nightclubs that attract Latinx and sexual minority populations. Approximately 97% of participants indicated learning about the study via an Internet-based platform, while the remaining 3% learned about the study from a community agency.

Eligible individuals who wished to access the survey were directed to a website that immediately linked to an informed consent page in both English and Spanish. Consenting participants were then directed to study measures. Measures were presented in Spanish and English. Participants who submitted a valid survey received an incentive in the form of a \$15 Amazon.com e-gift certificate, that was sent to the e-mail address voluntarily provided by the participant. Upon completion of the survey, participants were asked to forward the survey to eligible peers. The debriefing statement included a link to a website maintained by the Centers for Disease Control and Prevention (<https://gettested.cdc.gov/Reasons/>) that allows users to search for local HIV testing venues using their zip code.

## Measures

### Individual-based determinants

**Heterosexual self-presentation:** Heterosexual self-presentation was measured using the Heterosexual Self-Presentation subscale of the Conformity to Masculine Norms Inventory-46 (Parent & Moradi, 2009). This 6-item subscale assesses the importance a man places on being perceived by others as heterosexual (e.g., “*I try to avoid being thought of as gay or bisexual*”) using a 4-point Likert-type scale from 0 (*Strongly disagree*) to 3 (*Strongly agree*). The subscale yielded strong reliability coefficients across past samples (e.g., Parent & Moradi, 2009; Parent, Moradi, Rummell, & Tokar, 2011; Parent et al. 2012). Parent and Moradi (2011) demonstrated evidence of convergent and discriminant validity of the Heterosexual Self-Presentation subscale by describing its empirical distinctiveness from personality variables and self-esteem in a past study sample. The Cronbach’s alpha estimate obtained from current sample was .77.

**Machismo and caballerismo:** The Machismo and Caballerismo Scale (Arciniega et al., 2008) assessed traditional Latino masculine gender role beliefs. This 20-item scale measures both theorized risk (machismo) and protective (caballerismo) aspects of traditional Latino male gender norms. The two subscales of this measure, Traditional Machismo and

Caballerismo, each ask participants to rate the extent to which they agree with statements reflecting these respective constructs on a 7-point scale (1 = *Very strongly disagree* to 7 = *Very strongly agree*). Both subscales yielded appropriate internal consistency estimates in a past sample of Latino men in the US (Arciniega et al., 2008). Evidence of construct validity via confirmatory factor analysis as well as discriminant and convergent validity of both subscales were found in the same sample (Arciniega et al., 2008). Cronbach's alpha for the current study sample was .90 for Traditional Machismo and .88 for Caballerismo.

**Sexual identity development status:** The Uncertainty and Commitment subscales of the Measure of Sexual Identity (Worthington et al., 2008) were administered to measure conceptually distinct statuses of participants' sexual identity development. The six items of the commitment subscale (e.g., "*I have a firm sense of what my sexual needs are*") measured participants' certainty in their sexual identity whereas the three items of the uncertainty subscale (e.g., "*My sexual orientation is not clear to me*") assessed participants' lack of commitment to a sexual identity (Worthington et al., 2008). Both subscales use a 6-point Likert-type scale from 1 (*Very uncharacteristic of me*) to 6 (*Very characteristic of me*). Worthington et al. (2008) reported evidence for the convergent validity of both subscales in a diverse sample of adults via findings of relations with sexual conservatism, sexual self-monitoring, sexual assertiveness, awareness of sexual appeal, age, gender, and sexual orientation identity. Appropriate test-retest reliability and internal consistency estimates also were reported for the subscales in other adult samples (Worthington et al., 2008; Worthington & Reynolds, 2009). Cronbach's alphas for the current study sample were .74 for commitment and .62 for uncertainty.

**Alcohol and illicit drug use:** The Alcohol Use Disorders Identification Test (AUDIT; Babor, Higgins-Biddle, Saunders, & Monteiro, 2001) measured participants' alcohol use within the past 12 months. This 10-item screening questionnaire assesses alcohol use frequency, quantity, dependence, and associated problems. Scores on the AUDIT range from 0 to 40, with greater scores indicating higher risk of problematic alcohol use (Babor et al., 2001). Past studies have reported evidence of internal consistency of the AUDIT as a total score as well as test-retest reliability in numerous samples (see Babor et al., 2001). Evidence of various forms of validity for the AUDIT total score in past samples also has been described (see Babor et al., 2001). Cronbach's alpha for the current study was .92.

The Drug Use Frequency measure (DUF; O'Farrell, Fals-Stewart, & Murphy, 2003) assessed the frequency of illicit drug use and non-prescribed use of prescription drugs among the participants during the past 12 months. Participants were asked to indicate whether they used (a) sedatives, hypnotics, or tranquilizers; (b) cannabis; (c) stimulants; (d) heroin; (e) cocaine; (f) phencyclidine; and/or (g) hallucinogens during the 12 months prior to assessment on a scale from 0 ("*Never*") to 7 ("*Everyday*"). Estimates of concurrent validity for each drug type frequency score have been reported (i.e., relations between DUF scores a TLFB measure and knowledgeable collateral informants; O'Farrell et al., 2003). In the present study, a total number of drug types used score was calculated by summing responses across drug types. Cronbach's alpha for the total score calculated in the present study sample was .96.

**Sex risk behavior:** Items from the Risk Behavior Assessment (RBA; National Institute on Drug Abuse, 1993) assessed frequency of condom use for the 12 months prior to assessment. Participants reported condom use during vaginal, anal, and oral sex on a 5-point Likert-type scale from 1 (*Never*) to 5 (*Always*). Acceptable test-retest reliability and internal consistency estimates were reported for the RBA in an adult, drug using samples (see Needle et al., 1995). Moreover, evidence of concurrent validity has been indicated in an adult, drug using samples (Dowling-Guyer et al., 1994). In the present study, scores across sex acts were averaged to a mean frequency of condom use score. Cronbach's alpha for the current study sample was .93.

**Perceived HIV susceptibility:** To assess perceived HIV susceptibility, we used a single item developed in past research (Joseph et al., 2014): "In general, how worried are you about getting HIV?" rated on a 4-point Likert-style response scale (1 = *Not at all* to 4 = *A great deal*).

**HIV stigma:** The Negative Feelings Towards Persons with AIDS scale from a past survey (Herek & Capitano, 1992) was used to assess HIV/AIDS stigma in present study. Three items asked participants to rate their emotions (anger, fear, and disgust) toward people with AIDS on a Likert-type scale of 1 (*Very angry/afraid/disgusted*) to 4 (*Not at all angry/afraid/disgusted*). In the present study, scores across the three items were averaged for a mean total score. Although this scale yielded a low internal consistency score of .60 in past study sample of adults (Herek & Capitano, 1992), Cronbach's alpha for the current study sample was .81.

### **Community-based determinants**

**Experiences with HIV prevention:** Four items assessed whether respondents had encountered, within the past 12 months, HIV prevention information concerning the importance of (a) condom use, (b) testing for HIV, (c) testing for STIs, and (d) the benefits of being faithful to one's partner (CDC AIDS Community Demonstration Projects Research Group, 1999; Sumartojo et al., 2008). Each of the four items had a yes/no response; "yes" responses were summed to yield a count variable of the total number of experiences with HIV prevention.

**Access to health care resources:** A 6-item Access to Health Care measure derived from the HIV Cost and Services Utilization Study (Cunningham et al., 1999; Kinsler et al., 2009) assessed health care affordability, availability, convenience, and specialist accessibility. Participants were asked to rate items assessing their perceived access to medical care (e.g., "*It is easy for me to get medical care in an emergency*") on a Likert-type scale from 0 (*Strongly disagree*) to 4 (*Strongly agree*), with higher scores indicating greater perceived access to medical care. The measure demonstrated evidence of reliability and validity in past studies of clinical samples (Cunningham et al. 1999; Kinsler et al., 2009). Cronbach's alpha for the current study was .77.

**Social support:** Tangible Support and Belonging Support subscales of the Interpersonal Support Evaluation List (Cohen, Mermelstein, Kamarck, & Hoberman, 1985) measured

social support. This 12-item measure asked participants to rate the perceived availability of various types of social support on a 4-point Likert-type scale from 0 (*Definitely false*) to 3 (*Definitely true*), with greater scores indicating greater perceived social support. Evidence of total score reliability and validity have been indicated in large, population-based Latinx sample (Merz et al., 2014). Cronbach's alpha for the total score in the current study sample was .75.

**Perceived neighborhood collective efficacy:** Neighborhood collective efficacy was measured using the 10-item Collective Efficacy Scale (Sampson et al., 1997), which assesses perceived social cohesion among participants' neighbors. Items include "*People in this neighborhood can be trusted*" and "*People around here are willing to help their neighbors.*" All items are coded with a 5-point Likert-type scale ranging from 1 (*Very Unlikely*) to 5 (*Very Likely*). Higher scores indicate more perceived neighborhood collective efficacy. Adequate inter-rater reliability and validity estimates have been reported in a large, diverse community-based past sample (Sampson et al, 1997). Evidence of reliability in the present study sample was adequate ( $\alpha = .76$ ).

**Demographic Covariates**—Participants reported demographic information including age, marital status (0 = *Unmarried/partnered*, 1 = *Married/partnered*), education, annual income, and Latinx ethnicity. We also measured participants' level of ethnic identity with the Multigroup Ethnic Identity Measure (MEIM; Phinney, 1992), which assessed participant's level of commitment to their Latino ethnic identity using 12 items. Participant rate their feelings regarding their self-identified ethnic group on a 5-point Likert-type scale (1 = *Strongly agree*, 5 = *Strongly disagree*). Total scores were utilized, with higher scores indicating greater ethnic identity commitment. The 12-item total MEIM score has yielded evidence of reliability and validity in past research samples of young adolescents (Roberts et al., 1999), and a similar version (i.e., 14-items) has demonstrated evidence of reliability and validity in past samples of US born, adolescents (Phinney, Cantu, & Kurtz, 1997). Cronbach's alpha for the current study's sample was .95.

**HIV testing**—We measured HIV testing using a single item asking whether participants had been tested for HIV during the 12 months prior to assessment (0 = *Not tested*, 1 = *Tested*). We also asked participants to list the name, city, and state of the testing service to encourage honest reporting.

### Analytic Plan

Latent profile analysis was conducted using Mplus 8 (Muthén & Muthén, 2017) to examine whether different conceptually meaningful profiles of Latino men emerged based on levels of hypothesized individual- and community-based correlates of HIV testing. We then tested whether the resulting profiles had differential rates of HIV testing during the 12 months prior to assessment. Latent profile analysis involves grouping participants based on their similarities on a single or multiple dimensions and generating groups that maximize similarity within the group and minimize similarity between groups. This technique fits the purpose of this study, which was to determine distinct configurations (i.e., profiles) of potential individual and community determinants of HIV testing and to examine whether

profiles differed in their HIV screening participation. Latent profile analysis also allows for the estimation of measurement error.

Three major analytic steps were conducted. First, latent profiles were specified based on measures of individual- and community-based potential determinants of HIV testing. This involved determining how many profiles were appropriate through an iterative process in which fit for models with fewer profiles was compared to fit for models with more profiles using the Vuong–Lo–Mendell–Rubin test (VLMR; Lo, Mendell, & Rubin, 2001). The VLMR test compares the fit of two nested models that differ by one profile. When the  $p$  value for the VLMR test is significant, the complex model fits significantly better than the simpler, more parsimonious model. A nonsignificant  $p$  value indicates that the model fit is not significantly different, and therefore the more parsimonious model is desired. Akaike information criterion (AIC), Bayesian information criterion (BIC), and entropy also were reviewed to determine appropriate number of latent profiles. Lower AIC and BIC values are more favorable, and entropy values near 1.00 indicate better classification of participants into profiles (Collins & Lanza, 2010). Resulting profiles also had to consist of a large enough subsample to allow for comparison between profiles. In the second step, analysis of variance and chi-square difference tests were conducted to compare the classes on the individual and community potential determinants of testing. Significant results were explored by Bonferroni pairwise comparisons to determine which pairs of profiles were significantly different from each other on the individual- and community-based determinants of testing. The third and final step was to examine differences in HIV testing rates by profile via analysis of variance with Bonferroni pairwise comparisons.

## Results

### Latent Profile Analysis

Hypothesized individual- and community-based determinants of testing generated four profiles of participants. Models with one, two, three, four, and five profiles were compared. Model fit comparisons are shown in Table 1. The model with four profiles was retained. As shown in Table 2, both individual- and community-based determinants of testing significantly differed by profile.

The first (Profile 1) consisted of 146 (26.7%) participants that reported discrepant levels of the following individual- and community-based determinants in comparison to all other profiles: (a) lowest endorsement of caballerismo, (b) lowest commitment to cultural identity, (c) lowest illicit drug use, and (d) lowest access to health care. The second (Profile 2) consisted of 153 participants (28%) reporting the (a) lowest levels of heterosexual self-presentation, (b) lowest sexual identity uncertainty (and highest levels of sexual identity commitment), (c) least condom use, (d) lowest HIV stigma, (e) least education, and (f) lowest perceived HIV susceptibility. The third (Profile 3) consisted of 144 participants (26.4%). This profile had the largest number of men who identified as Black. Profile 3 participants also reported discrepant levels of the following characteristics in comparison to two of the three other profiles: relatively high (a) problematic alcohol use, (b) illicit drug use, (c) machismo, (d) income, (e) sexual identity uncertainty; and relatively low (f) perceived HIV susceptibility, (g) collective efficacy, and (h) prevention messaging. The

fourth (Profile 4) consisted of 99 participants (18.1%) reporting the highest (a) sexual identity uncertainty, (b) problematic alcohol use, (c) heterosexual self-presentation, (d) caballerismo and machismo, (e) condom use, (f) HIV stigma, (g) education, and (h) income in comparison to all other profiles. Profile 4 had the least number of men who identified as Black. Men in Profile 4 also indicated the most (a) perceived HIV susceptibility, (b) access to health care, (c) tended to identify as heterosexual, and (d) were more likely to be married than all other profiles.

### Predictors of HIV testing

Approximately 20% ( $n = 108$ ) of the sample engaged in HIV testing during the 12 months prior to assessment. Significant associations were found between profile membership and HIV testing 12 months prior to assessment. Profile 2 participants reported significantly greater HIV testing rates (50.3% tested) than Profile 1 participants (11% tested),  $\chi^2(1) = 54.03$ ,  $p < .001$ ,  $\phi = .425$ ; as well as Profile 3 participants (6.9% tested),  $\chi^2(1) = 67.41$ ,  $p < .001$ ,  $\phi = .476$ ; and Profile 4 participants (5.1% tested),  $\chi^2(1) = 56.13$ ,  $p < .001$ ,  $\phi = .472$ .

### Discussion

Latinos represented 23% of new infections in the U.S. in 2013 despite comprising only 16% of the population, and 81% these infections were specifically among MSM (CDC, 2013). If current HIV diagnoses rates persist, one in four Latino MSM in the US will be diagnosed with HIV during their lifetime (CDC, 2016). Our study was designed to distinguish typologies of LMSM based on individual- and community-based risk and protective factors and to compare rates of HIV testing across profiles. Identifying LMSM by profiles may assist preventionists in better reaching communities with low HIV testing rates with effective prevention messaging and testing recommendations.

Two noteworthy findings emerged from our study. First, the proportion of men testing annually in our sample (19.8%) was (a) lower compared to the rate of 58% obtained in a recent meta-analysis study of HIV testing among Internet-using MSM in the US (Noble et al., 2017) and (b) also lower than the rate of annual testing from a national probability sample of MSM (42%; Kwan, Rose, Brooks, Marks, & Sionean, 2016). These differences reflect the continued problem of lower engagement of LMSM in recommended HIV testing in comparison to the general MSM population. Second, this study is, to our knowledge, the first to use a person-centered rather than variable-centered approach when examining potential factors that associate with HIV testing among LMSM. The variable-centered approach is limited in that it only identifies the correlates of testing. By using a person-centered approach, this study identified profiles of LMSM who share similar levels of multiple, distinctive individual- (masculinity norms, health behaviors, cultural variables, demographics) and community-based (social support, exposure to HIV prevention messaging, neighborhood cohesion) characteristics linked with HIV testing. One of the four profiles, (Profile 2; the 50.3% testing rate profile) revealed several distinct individual and community-based characteristics. Profile 2 also was found to substantially differ from all other profiles in testing during the year prior to assessment. The characteristics of men



categorized in Profile 2 (50.3% testing rate profile) help elucidate the qualities of LMSM most likely to get tested. We also identified three additional profiles based on individual and community-based determinants of HIV testing. However, while men in Profiles 1 (11% testing rate profile), 3 (6.9% testing rate profile), and 4 (5.1% testing rate profile) were distinct on some individual- and community-based factors, the men that compromised Profiles 1, 3, and 4 did not significantly differ in HIV testing from one another.

In terms of noteworthy characteristics of the highest testing profile, men in Profile 2 (50.3% testing rate profile) reported the lowest levels of desiring to be perceived by others as heterosexual in comparison to all other Profiles. This result reflects findings from a past study of masculinity among Latino gay men (Sánchez et al., 2016) and a seminal study of masculinity and HIV testing among a predominantly White, European-American (83%) MSM sample indicating that MSM likely avoid HIV testing to the extent that they endorse the masculine norm of heterosexual self-presentation (Parent et al., 2012). Parent et al. (2012) concluded that MSM may equate HIV testing with coming out as gay or bisexual. This notion was supported in the present study's Internet-recruited LMSM sample. Moreover, men in Profile 2 (50.3% testing rate profile) reported lower levels of machismo in comparison to most other Profiles. The intersection of lower levels of both machismo and heterosexual self-presentation among Profile 2 (50.3% testing rate profile) men seems intuitive because, like the desire be perceived as heterosexual, traditional machismo may promote avoidance of disclosing one's same-sex behavior or sexual minority identity. A fear of disclosing one's sexual behavior or sexual identity appears to be one factor disproportionately preventing Latino men from seeking testing (CDC, 2017). This fear in accordance with the notion that obtaining an HIV test is an enactment of the social construction of sexual identity (see Parent et al., 2012). That is, some LMSM may avoid HIV testing to the extent that it is important for them to project a heterosexual identity *as well as* act in accordance with their machismo beliefs.

Men in Profile 2 (50.3% testing rate profile) also indicated relatively higher levels of commitment toward their Latinx cultural identity than most other profiles. It is interesting to note that men in Profile 2 (50.3% testing rate profile) endorsed a high commitment to a Latinx cultural identity while reporting relatively low levels of machismo. The combination of relatively low levels of machismo and high commitment to one's Latinx cultural identity illustrates how some LMSM may retain commitment to their Latinx identity while rejecting hypermasculine, traditional machismo traits such as dominance and aggressiveness (Arcineiga et al., 2008). This intersectional dynamic has been described in past studies that have challenged the stereotype of the Latinx man as solely hyper masculine, dominant, and aggressive (Arciniega et al., 2008; Estrada et al., 2011; Mirandé, 1997; Torres et al., 2002). Most importantly, the intersection of high commitment to one's Latinx identity while refusing traditional machismo, informs future HIV prevention programming. For instance, it echoes calls by LMSM for less stereotypical messaging in testing campaign, while being more inclusive of the heterogeneity of MSM in Latinx community (Drumhiller et al., 2018).

As for sexual identity development status, Profile 2 (50.3% testing rate profile) men expressed the most certainty about their sexual identity (and lowest levels of uncertainty) in comparison to all other profiles. Internet-using MSM from general populations who

categorically self-label as “gay” or “homosexual” have been found to be more likely to test than those who self-label as “straight,” “heterosexual,” or “bisexual” (see Noble et al., 2017). However, no study to date has explored how more nuanced sexual identity development theory (e.g., Dillon, Moradi, & Worthington, 2011; McCarn & Fassinger, 1996; Riggle, Whitman, Olson, Rostosky, & Strong, 2008) is linked with testing. The relatively high levels of sexual identity commitment status of men in Profile 2 (50.3% testing rate profile) suggests that these men may have experienced greater exploration and commitment to their identified sexual needs, values, preferences for sexual partner characteristics, modes of sexual expression, and greater amount of overall self-understanding and knowledge about their sexual identity. This heightened sense of self-understanding is hypothesized by sexual identity development theorists to lead to greater levels of clarity about one’s sexuality and greater acceptance of one’s sexual identity (see Dillon, Moradi, & Worthington, 2011). Finally, persons endorsing greater sexual identity commitment also are thought to be more affirmative toward sexual minorities and aware of concepts like privilege and oppression of minority group members (Dillon et al., 2011), which was somewhat reflected in the finding that Profile 2 (50.3% testing rate profile) men expressed the least amount of stigma about persons living with HIV/AIDS in comparison to other profiles.

As found in past studies (Noble et al., 2017), using comparatively lower levels of alcohol/drug use and being older in age also appeared to be individual-based facilitators of testing among Profile 2 (50.3% testing rate profile) men in comparison to other profiles. Other studies of Internet-recruited MSM have similarly found substance use to be inversely linked with likelihood to obtain testing (e.g., Margolis, Joseph, Belcher, Hirshfield, & Chiasson, 2012; Rendina, Jimenez, Grov, Ventuneac, & Parsons, 2013). As for age, HIV surveillance data and other studies (e.g., Spadafino et al., 2016) indicate that young LMSM test less frequently as evidenced by higher rates of undiagnosed HIV infection compared to older LMSM (CDC, 2017b). Reasons for lower rates of testing among younger LMSM include lacking access to health services, particularly culturally competent services for Latinx sexual minority youth (Noble et al., 2017). Findings from the present study partially validated this notion because the youngest Profiles 1 (11% tested) and 3(6.9% tested) also reported the lowest access to health care and low exposure to HIV prevention messaging, respectively.

Profile 2 (50.3% testing rate profile) participants endorsed the highest levels of some hypothesized community-based facilitators of HIV testing, such as social support. Higher levels of social support may be a benefit for LMSM who are open about their sexual identity and same-sex relationships, such as men in this high testing profile. These men also reported living in more resourceful and cohesive neighborhoods (i.e., collective efficacy)—a distal predictor of HIV prevention in past studies (Carlson et al., 2012; Latkin et al., 2013). Future studies need to elucidate whether (a) some LMSM either live in a less homonegative context than their peers, which facilitates their sexual identity development, and/or (b) some LMSM have resiliently developed a satisfactory social support system despite societal homonegativity (Mahajan et al., 2008; Quinn & Dickson-Gomez, 2016). Peer social support may facilitate HIV testing among LMSM, and campaigns have been called for to encourage LMSM to seek out trusted friends and family and invite them to accompany them to the HIV testing site to help reduce stress when receiving results (Solorio et al., 2013).

In terms of other community-based factors, men in Profile 2 (50.3% testing rate profile) also described experiencing more HIV prevention messaging than all other profiles. This finding informs preventionists of characteristics of the LMSM profile that are receiving prevention messaging more than most other LMSM. In addition, it sheds light on the efficacy of prevention messaging; given that Profile 2 (50.3% testing rate profile) men received the most messaging and stated that they tested the most. Conversely, we also know which men are receiving less messaging, which has implications for who to target more in the future.

Surprisingly, men in Profile 2 (50.3% testing rate profile) were distinct in being the least educated of all three profiles and reporting a lower income than two of the three profiles. A study of a general population of MSM recruited online also suggested an inverse link between testing for HIV and education (Margolis et al., 2012); however, another study of Latino gay and bisexual men recruited online found no association between education and testing (Schnarrs et al., 2012). The finding concerning more testing among men reporting lower incomes informs inconclusive links in the general MSM population studies (Noble et al., 2017). Assumptions that social and economic barriers, including poverty and lack of access to healthcare (CDC, 2017a), may prevent testing among LMSM may not apply to all levels of socioeconomic status (SES). Future research needs to explore more specific SES indicators (e.g., employment, health insurance) and the relations with HIV testing among LMSM. Furthermore, studies are needed to assess (a) whether HIV testing outreach is reaching LMSM of lower and higher SES, and (b) how men from different SES levels respond to prevention programming and obtain testing (e.g., via at-home tests, established medical provider, or free testing programs at local or mobile clinics).

It is also noteworthy that Profile 2 (50.3% testing rate profile) participants reported the least condom use, despite engaging in HIV testing the most. The finding concerning condomless sex was unexpected but matches past results yielded with Internet-recruited MSM samples (Rendina et al., 2013). Relatedly, men in Profile 2 (50.3% testing rate profile) expressed the least perceived HIV susceptibility despite less condom use than all other Profiles. The present study findings about perceived susceptibility support the literature suggesting that MSM with the least perceived susceptibility obtain testing at higher rates due to less fear of obtaining results (Joseph et al. 2014). Nevertheless, the contradiction between the group of men reporting the least condom use while also reporting the least perceived susceptibility highlights the need for future study of predictors of perceived susceptibility among LMSM (e.g., PrEP use, partner characteristics and communication).

Finally, our findings partially inform the literature on intersectionality theory (Crenshaw, 1989). LMSM experience multiple minority identity groups that may experience overlapping forms of oppression and marginalization. Researchers have been encouraged to consider multiple identities (e.g., racial, ethnic, and sexual identities) via intersectionality theory-based studies and how overlapping forms of oppression (e.g., racism and heterosexism) impact the health of members of multiple marginalized groups (Meyer, 2010; Santos & VanDaalen, 2016). The overarching findings of the current study inform the dual identity experience of LMSM in terms of correlates of HIV testing as well as the literature about characteristics of Black-identified LMSM. Profile 3 (6.9% testing rate profile) had the largest number of participants who identified as Black Latino (55% versus other Profiles

ranging from 1% to 22% Black-identified men). As previously indicated, men in Profile 3 (6.9% testing rate profile) also reported relatively high problematic alcohol use and illicit drug use. Profile 3 men also reported relatively high levels of machismo, income, and sexual identity uncertainty. Taken together, future intersectionality-based research is recommended to elucidate whether distinct levels of such characteristics (substance use, machismo, income, and sexual identity uncertainty) generalize to other Black-identified LMSM versus other populations of MSM. Similarly, additional research is needed to document reasons for—and interventions addressing—potentially distinct low perceived HIV susceptibility, low neighborhood collective efficacy, and non-visible prevention messaging among Black identified Latino MSM.

### Limitations

Some study limitations should be noted. Our use of Internet-based recruitment and convenience sampling introduces the potential for sampling bias. Past research on HIV testing has identified differences between MSM recruited through Internet and MSM recruited through community venues (Noble et al., 2017). Therefore, although the present study LMSM sample was recruited nationally, the present study does not generalize to groups of LMSM outside of the US, those who do not use or have access to the Internet/social media sites targeted in the present study, or other partnering community-based agencies. Although we rigorously validated participant data through identifying and filtering out suspicious cases (e.g., via validity check items, checks for duplicate submissions, checks for logically inconsistent responses, checks for appropriate time taken to complete survey), online surveying methods also are vulnerable to fraudulent responses, especially when offering participation incentives as in present study. Finally, the present study is retrospective and does not allow for causal inference about the variables assessed. Longitudinal analyses establishing temporal relations are needed to examine whether the hypothesized correlates are truly determinants of testing.

### Conclusions and Implications

Findings from the present study could potentially improve HIV testing rates among LMSM by specifying ways in which public health advertisements, campaigns, and community-based HIV testing outreach efforts could be tailored to men in the LMSM population not seeking testing. Psychologists and other health professionals are encouraged to creatively attempt to increase HIV testing among LMSM who do not possess the characteristics of Profile 2 (50.3% testing rate profile) participants. These include men such as the men in Profile 4 (only 5.1% testing rate) who desire to be perceived as heterosexual, endorse machismo beliefs, lack social supports, and who use relatively more alcohol than peers in Profile 2 (50.3% testing rate profile) Interventionists also are encouraged to promote HIV testing among younger LMSM given that the men in Profiles 1 (11% testing rate profile) and 3 (6.9% testing rate profile) were significantly younger than men in the highest testing profile: Profile 2 (50.3% testing rate profile).

Parent et al. (2012) recommended presenting HIV testing in a way that may be acceptable or attractive to men by emphasizing the importance of sexual health for sexually active men and for men who are interested in maintaining their overall physical health. HIV testing

outreach that does not rely on gay identification also has been identified as effective (Joseph et al., 2014) and may be more suitable for some Latinx men (Sánchez et al., 2016). This notion is supported by men in Profile 4 (5.1% testing rate) who reported high heterosexual self-presentation and low testing rates. Furthermore, more efforts are needed to produce sexual identity affirming interventions for LMSM who are experiencing higher sexual identity uncertainty such as men in Profile 4 (only 5.1% testing rate). Notably, sexual identity uncertainty and high heterosexual self-presentation co-occurred in men in Profile 4 (only 5.1% testing rate); thus, these men may be best reached via Internet-based interventions (Mustanski, Lyons, & Garcia, 2011); such as interventions encouraging testing (e.g., Rhodes et al., 2016) or promoting aspects of healthy sexual identity development (e.g., Lin & Israel, 2012) in the context of overall health. Finally, more longitudinal studies and interventions are needed to inform the next generation of HIV testing campaigns of novel facilitators of HIV testing and help reduce the disparity of HIV affecting LMSM.

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**Table 1**

Model Fit Indices for One- to Five Profile Solutions

Model	AIC	BIC	aBIC	VLMR $p$	Entropy
One-profile solution	35345.61	35526.32	35293.00	–	–
Two-profile solution	33157.45	33432.82	33229.66	0.00	0.963
Three-profile solution	32034.36	32404.39	32131.39	0.00	0.971
<b>Four-profile solution</b>	<b>31387.60</b>	<b>31852.28</b>	<b>31509.45</b>	<b>0.00</b>	<b>0.957</b>
Five-profile solution	31019.83	31579.17	31155.50	0.11	0.950

*Note.* The bolder profile indicates the best-fitting solution. AIC = Akaike Information Criterion; aBIC = adjusted Bayesian information criterion; BIC = Bayesian information criterion; aBIC – adjusted Bayesian information criterion; VLMR = Vuong-Lo-Mendell-Rubin test

**Table 2**

Means, Standard Deviations, and Proportions of Profiles on Study Variables

Variables	Profile 1	Profile 2	Profile 3	Profile 4	Between Profile Differences	F (3, 545) or $\chi^2(3, 545)$
<b>HIV Testing</b>	11 % Yes	50.3 % Yes	6.9% Yes	5.1% Yes	1,3,4 < 2	124.92**
<b>Individual-Based Determinants</b>						
Age	29.42 (5.11)	33.62 (7.82)	27.98 (4.33)	32.86 (4.31)	1,3 < 2,4	31.59**
Annual Income	6.02 (2.13)	5.95 (1.57)	7.07 (1.62)	8.16 (1.13)	1,2 < 3 1,2,3 < 4	44.80**
Caballerismo	4.70 (0.92)	5.50 (0.81)	5.41 (0.86)	6.07 (0.56)	1 < 2,3,4 1,2,3 < 4	58.82**
Collective Efficacy	3.30 (0.69)	3.95 (0.54)	3.35 (0.36)	3.88 (0.20)	1,3 < 2,4	64.48**
Condom Use	3.09 (1.11)	2.80 (1.10)	3.31 (0.81)	4.22 (0.76)	2 < 1,3 1,2,3 < 4	46.77**
Cultural Identity	3.35 (0.75)	2.05 (0.72)	2.72 (0.81)	1.94 (0.94)	2,4 < 3 2,3,4 < 1	92.43**
Education	4.53 (1.48)	3.95 (1.31)	4.74 (1.00)	5.74 (0.86)	1,3 < 4 2 < 1,3,4	43.58**
Heterosexual Self-Presentation	2.61 (0.57)	1.82 (0.57)	2.63 (0.37)	2.87 (0.22)	1,3 < 4 2 < 1,3,4	128.70**
HIV Stigma	2.27 (0.79)	2.96 (0.75)	2.35 (0.62)	1.96 (0.68)	1,3 < 2 4 < 1,2,3	45.71**
Illicit Drug Use	1.06 (0.94)	1.69 (1.59)	6.94 (0.62)	7.16 (0.67)	2 < 3,4 1 < 2,3,4	1274.32**
Kinsey Scale Sexual Orientation	3.94 (1.17)	4.20 (1.04)	3.99 (1.11)	1.90 (0.44)	4 < 1,2,3	120.31**
Machismo	4.20 (0.91)	4.05 (1.24)	5.20 (0.82)	6.16 (0.58)	2 < 3 1,2,3 < 4	126.86**
Perceived HIV susceptibility	2.89 (0.79)	2.18 (0.81)	2.63 (0.66)	3.42 (0.80)	2 < 3 2,3 < 1 1,2,3 < 4	45.71**
Problematic Alcohol Use	13.06 (7.02)	11.54 (7.36)	18.71 (6.16)	27.25 (4.79)	1,2 < 3 1,2,3 < 4	137.33**
Self-Identified Race	22% Black	14% Black	55% Black	1% Black	1,2 < 3 4 < 1,2,3	110.01**
Relationship Status	47% married/cohabitating	34% married/cohabitating	37% married/cohabitating	100% married/cohabitating	1,2,3 < 4	125.25**
Sexual Identity Commitment	3.73 (0.78)	5.13 (0.66)	3.57 (0.43)	3.70 (0.43)	1,3,4 < 2	209.48**
Sexual Identity Uncertainty	3.53 (0.94)	1.80 (0.64)	3.85 (0.61)	4.05 (0.48)	2 < 1,3	302.69**



Variables	Profile 1	Profile 2	Profile 3	Profile 4	Between Profile Differences	F (3, 545) or $\chi^2(3, 545)$
<b>Community-Based Determinants</b>						
Access to Health Care	3.75 (0.64)	3.99 (0.69)	4.01 (0.49)	3.22 (1.15)	1,2,3 < 4 2,3 < 4 1 < 2,3,4	32.09**
HIV Prevention Experience	4.63 (1.05)	6.26 (1.60)	4.19 (0.53)	4.25 (0.48)	1 < 2 3,4 < 1,2	120.22**
Social Support	2.68 (0.37)	3.35 (0.34)	2.64 (0.28)	2.55 (0.21)	1 < 2 3 < 2 4 < 1,2	191.95**

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p < .001