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HIV testing among Asian Americans:

How do cultural and socio-psychological factors influence uptake?

By

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Doctor of Philosophy

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Abstract

HIV testing among Asian Americans: How do cultural and socio-psychological factors influence uptake?

By Minh Luu

HIV testing is the single entry-point to effective HIV diagnosis, prevention, and care continuum cascade. Asian Americans, while engaging in comparable levels of HIV risk behaviors compared to other ethnic groups, seem to have less likely chance of getting HIV tested. Existing literature has pointed to a host of underlying cultural and socio-psychological factors associated with HIV testing behaviors, including the intention of testing. However, no prior research has been conducted to better understand the interrelationships of these factors among Asian American men, the group of heightened risk for HIV infection. This dissertation research program aims to fill this gap in the literature by leveraging a mixed methods approach primarily guided by the theory of planned behavior (TPB) to examine factors related to HIV testing intention among a group of Asian American men.

The research program included three research studies. In the first study, I examined psychometrics of the homonegativity scale – a salient construct that was hypothesized to associate with HIV testing intention among Asian Americans. I used data from a cross sectional survey study among a group of general Asian Americans for this study. As this scale had not been validated in this population group, the finding was important to guide my Study 2 that included homonegativity as a main factor hypothetically associated with HIV testing intention. In the second study, I investigated the collective influence of the TPB constructs and other cultural and socio-psychological factors, including homonegativity, on HIV testing intention using path analysis techniques. For this study, I analyzed a nationally collected dataset via the internet from a group of Asian American men. In the last study, I analyzed qualitative focus group discussion data collected from a group of Asian American men who have sex with men (MSM) to further support important findings from Study 2, especially to gain deeper insights of the relationship between those factors and HIV testing intention among Asian American MSM – our population of interest for future research.

In **Study 1**, we found that the homonegativity scale was reliable and valid among the study samples. Results showed the scale had a four-factor structure. Acculturation, gender role beliefs, and length in immigration were significantly associated with homonegativity. Findings from **Study 2** suggested that social norms, attitude about HIV testing, and perceived HIV risk had both ***direct*** and ***indirect*** effects on HIV testing intention, with homonegativity as the mediating factor. Among them, social norms had the strongest total effects on HIV testing intention. **Study 3**'s results proved that homonegativity posed a barrier to HIV testing practices among Asian American MSM, while suggesting that there were bold differences in social norms about HIV testing between the general Asian American community and Asian American MSM groups.

The findings advanced our knowledge in HIV research among the Asian American population. My studies validated the psychometrics of the homonegativity scale as well as enriched existing literature with novel findings related to the factors associated with HIV testing intention among a group of Asian American men - an understudied population in the U.S.

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Summary and Specific Aims

HIV testing is the single entry-point to effective HIV diagnosis, prevention and care continuum cascade (CDC, 2019e). Asian Americans, while engaging in comparable levels of HIV risk behaviors compared to other ethnic groups, seem to have less likely chance of getting HIV tested (Sen, Nguyen, Kim, & Aguilar, 2017). It was estimated that of the approximately 17,600 Asian Americans who were living with HIV in the U.S. at the end of 2018; up to 20% were not aware of their status - a higher percentage than for any other racial group (CDC, 2018a). In continued efforts to understand mechanisms affecting HIV testing behavior of Asian Americans, existing literature has pointed to a host of underlying sociocultural, behavioral, and psychological factors unique to this population that warrant further attention; for example, how acculturation and immigration background relate to the stigma and discrimination associated with sexuality and HIV (Chwee Lye Chng, Frank Y Wong, Royce J Park, Mark C Edberg, & David S Lai, 2003a; Salud, Marshak, Natto, & Montgomery, 2014). During 2000 and 2019, Asian Americans were the fastest growing ethnic group in the U.S. with its population nearly doubled from 11.9 million to 23.2 million (81% increase) (Pew Research Center, 2021). While previous research has suggested immigration history, cultural practices, and other social changes due to displacement may be influential to people's views towards homosexuality and affect individuals' sexual health (Chng et al., 2003a; Luu & Bartsch, 2011), limited health-related research has been conducted to provide holistic explanations of these relationships in Asian Americans.

This mixed-method dissertation research employed the Theory of Planned Behavior (TPB), supplemented with other empirically derived constructs associated with HIV testing to **validate a measurement instrument** salient to HIV research among **Asian Americans**, and

assessed relationships of relevant cultural and socio-psychological factors and HIV testing intention among **Asian American men**.

To achieve these objectives, this research study included **three** research aims: **1)** validating a key construct of interest: homonegativity (or prejudice towards homosexuality) by assessing psychometrics of the Modern Homonegativity scale, its structure, as well as factors associated with this construct among **Asian Americans** ; **2)** testing a conceptual model grounded in TPB, supplemented with empirically derived constructs, and their associations with HIV testing intention in **Asian American men** using path analytical methods; and **3)** Based upon findings from Aim 2, a refined conceptual model was developed and used to understand how the retained factors influence HIV testing among an **Asian American population of men who have sex with men (MSM)**.

The research study produced novel learning of the performance of a salient psychological factor, *homonegativity*, in the population of Asian Americans. It also generated insights of how this factor interacts with other cultural and socio-psychological factors to influence HIV testing intention among Asian American men – an understudied population in the U.S.. The dissertation research program helps advance behavioral health research in this minority population group and will eventually inform future culturally and socially relevant intervention programs focused on promoting HIV testing behaviors among Asian American MSM.

CHAPTER 1: Introduction

Introduction and Literature Review

Today, there are an estimated 1.2 million people living with HIV in the United States (CDC, 2022). The number of annual diagnosis has decreased 8% from 2016 to 2019, with 30,635 newly diagnosed cases in 2020 (CDC, 2021). It is estimated that one out of seven people living with HIV are unaware of their infection status (HHS, 2022). The latest plan for ending the HIV epidemic in the U.S. has identified HIV testing, as a key pillar to effective HIV prevention, and the single gateway to early and continued HIV care (Fauci, Redfield, Sigounas, Weahkee, & Giroir, 2019).

The HIV epidemic in the U.S. has disproportionately affected different population subgroups by age, ethnicity, or behaviors. While it has placed the greatest burden on African Americans (incidence rate at 42.1 per 100,000 in 2019), and men who have sex with men (MSM) (accounted for 71% of all new HIV infections in 2020) (CDC, 2021; HHS, 2022), addressing unmet needs for HIV testing in other understudied groups, such as Asian American individuals, is important, particularly in light of the aggressive goal outlined by the federal government's initiative of "reducing new infections in the United States by 75% in five years and by 90% by 2030" (Fauci et al., 2019; HHS, 2019). Among Asian Americans, while HIV incidence rates have decreased during 2010 – 2016 (6.2 to 5.1 per 100,000) (CDC, 2019d), numbers of HIV diagnoses each year have gone up remarkably (increased by 36% during 2010 – 2016), largely attributed to newly diagnosed cases among Asian American MSM (nine out of ten Asian American men who had a HIV diagnosis were gay or bisexual men) (CDC, 2019a).

Asian American population and access to health care. The U.S. Asian American population doubled in size from 11.9 million in 2000 to 23.2 million in 2019 (US Census Bureau, 2023). It

is projected that Asian Americans will surpass Hispanic to become the largest immigrant group in the U.S. by 2055 (Pew Research Center, 2021). Certain Asian subgroups have seen dramatic increases in population size between 2011-2017, ranging from a 8.2% increase for Asian Koreans to 27.6% for Asian Indians (US Census Bureau, 2017). Individuals identifying as Chinese and Filipino descent are also among the largest Asian American population groups (US Census Bureau, 2017). Our understanding of Asian American health has been largely informed by aggregated data from the national health interview survey (CDC/National Center for Health Statistics, 2020). The Asian American population, in general, ranks first in health status with 39% of the population reporting their health as "excellent", compared to 37.5% and 33.5% for Whites and African Americans, respectively (CDC/National Center for Health Statistics, 2018). However, evidence related to health care practices shows significant health disparities between Asian Americans and Whites pertaining to access and utilization of health care (Kaiser Family Foundation, 2019b), as well as significant differences between Asian American population subgroups (W. Kim & Keefe, 2010; Palaniappan et al., 2010). For instance, access to health care may be limited for Vietnamese Americans primarily due to language barriers or lack of health insurance coverage (W. Kim & Keefe, 2010), while for Chinese Americans, the most common barrier pertains to traditional beliefs about the superiority of spiritual therapy and mistrust in Western medicine (Ma, 2000). Generally, underutilization of health care services is a common issue for the population of Asian American (Sue, Cheng, Saad, & Chu, 2012). Specifically, Asian Americans born outside of the U.S. have significantly lower level of access to routine care (OR = 0.52), sick care access (OR = 0.67), and health insurance coverage (OR = 0.29) compared to those born in the U.S. (Ye, Mack, Fry-Johnson, & Parker, 2012). Compared to Whites, Asian Americans have lower levels of intention for help-seeking when in elevated distress or having

mental health conditions (J. E. Kim & Zane, 2016). In recent years, the proportion of Asian women diagnosed with breast cancer at younger than 50 years was higher (32.8%) compared to Whites (23.6%) (Stapleton, Oseni, Bababekov, Hung, & Chang, 2018). In addition, for colorectal cancer screening (CRCS), Asian men have decreased odds of being up to date for CRCS compared to Whites (OR = 0.66) (Homayoon, Shahidi, & Cheung, 2013). In summary, Asian Americans engage in significantly lower rates of breast, cervical, Hepatitis B, and colorectal cancer screening compared to non-Hispanic Whites (Klabunde et al., 2012; M. Vu et al., 2022; M. Vu et al., 2021).

Asian immigrants in the U.S. There were an estimated 44 million immigrants (foreign-born individuals) of all origins living in the U.S. in 2017, accounting for 13.6% of the nation's population (Pew Research Center, 2017a). Immigrants and their minor children are projected to represent about 36% of the population by 2065 (Pew Research Center, 2015). As of 2019, there were 14.1 million immigrants from Asia living in the U.S., representing a 29-fold increase from 1960 (Immigration Policy Institute, 2021), nearly four times as fast as the total U.S. population (CDC, 2019a).

HIV testing among Asian Americans. There has been a sharp increase in HIV diagnosis among Asian Americans. From 2010 to 2016, the number of Asian Americans receiving an HIV diagnosis increased by 36%, mainly contributed by an increase in HIV testing among Asian MSM and bisexual men (CDC, 2019a). Asian Americans accounted for about 2% of HIV diagnoses in 2020 in the U.S., with its 7.2% contribution of the U.S. population (CDC, 2023a; US Census Bureau, 2023). Compared to the African American population, the numbers were 40.3% and 13.4%, respectively (CDC, 2023a; US Census Bureau, 2023). In 2019, HIV prevalence in the Asian American population was 82.3 per 100,000 (HHS, 2022). HIV incidence

rates among this population during 2010 and 2016 went from 6.2 to 5.1 per 100,000 – showing a slight decrease. Although the incidence rates are lower compared to other populations (CDC, 2019b), the sharp increase in diagnosed cases (CDC, 2019c), especially among Asian American MSM (47% increase during 2010-2016) (CDC, 2019a) makes prevention efforts for this group critical in order to keep future HIV/AIDS cases low. To date, very little is known about the extent to which immigration patterns, socioeconomic backgrounds, specific health behaviors, and cultural practices are associated with HIV testing behavior among the Asian American population.

Factors associated with HIV testing among Asian Americans and Asian American MSM. In general, factors associated with HIV testing have been documented to include knowledge about HIV, HIV risk perception, and pro-testing attitudes (Evangeli et al., 2018). Specific to MSM, a recent systematic review suggested that age, college education, drug use, and self-identification as being homosexual or gay are associated with HIV testing behavior (Noble, Jones, Bowles, DiNenno, & Tregear, 2017). Studies examining factors associated with HIV testing in Asian Americans and Asian American MSM have been extremely limited and are now dated (Chng et al., 2003a; K. H. Choi, Yep, & Kumekawa, 1998; Nemoto et al., 1998), with very little theoretical and empirical evidence among Asian Americans (J. J. Lee & Zhou, 2019). In one of the few studies on HIV testing conducted in this population, Huang et al. (2008) found that, for Asian Americans, key predictors of HIV testing included sexually transmitted infections (STI) testing history, HIV knowledge, and HIV-related sexual risks (Z. J. Huang, F. Y. Wong, J. M. De Leon, & R. J. Park, 2008). Recently, Lee and colleagues (2019) found that cultural factors, such as acculturation, community norms, and other psychological factors, such as stigma and discrimination, constructs of the theory of planned behavior (TPB) (attitudes, subjective norms,

and perceived behavioral control) were also directly associated with HIV testing intention (J. J. Lee & Zhou, 2019).

Specific to Asian American MSM, Chng et al. (2003) examined the roles of immigration history and acculturation in relation to HIV-related behaviors, including responses to HIV prevention interventions (Chng et al., 2003a). In addition to these empirically derived factors, constructs from the theory of planned behavior (TPB) have been found to be widely employed in HIV-related research, such as adolescent sexual health, condom use, and antiretroviral therapy adherence. A number of studies have pointed to the TPB constructs, i.e. attitude about HIV testing, subjective norm about HIV testing, perceived behavioral control about HIV testing and intention of HIV testing as strong predictors of HIV testing behavior in select populations of Africans (Olabode Ayodele, 2017; Mirkuzie, 2011a).

In summary, Asian Americans, with the fastest growth in population size, of multidimensional socio-cultural backgrounds underlying HIV-related behaviors, and having been rather understudied, warrant further research to further prevention efforts and inform future HIV program planning.

The ***long-term objective*** of this dissertation was to advance scientific knowledge about key factors influencing HIV testing in Asian American MSM. ***The short-term objective*****s** were to advance a measure salient to HIV research in Asian Americans, and identify underlying factors associated with the HIV testing behavior of Asian American men and Asian American MSM in the U.S..

The primary aims of this sequential mixed-method study (quantitative study using survey method followed by qualitative study using focus group discussion method) were as follows:

Aim 1: Performed a psychometric evaluation of the key construct of interest: homonegativity (or prejudice towards homosexuality) by assessing psychometrics of a homonegativity measure among **Asian Americans**; based on the reliability and validity of the scale, assessed theoretical and empirical factors associated with homonegativity in this population;

Aim 2: Tested a conceptual model grounded in TPB, supplemented with empirically derived constructs, and their association with HIV testing behavior in **Asian American men** using path analytical methods;

Aim 3: Based upon findings from Aim 2, a refined conceptual model was developed and used to qualitatively understand how the retained factors influence HIV testing among the **Asian American MSM** population.

Given the paucity of research instruments specifically validated for Asian Americans, as well as the scarcity of evidence around cultural and socio-psychological factors related to HIV testing in this population, findings from these research aims will help inform programs that mitigate barriers to HIV testing among Asian American men, specifically Asian American MSM.

Global HIV and public health

HIV definition and risk factors

The Human Immunodeficiency Virus (HIV) attacks human's immune system and gradually makes people's defense system weaker (WHO, 2019). If not treated, those infected with HIV then become immune-deficient. With suboptimal immunological functions, HIV infected people are highly susceptible to a whole host of infections, cancers, and other diseases. There are three clinical stages of HIV infection (acute infection, clinical latency, and AIDS), with the most advanced stage, called Acquired Immunodeficiency Syndrome (AIDS). An HIV

infected individual, without treatment, may develop AIDS within 2 to 15 years, depending on the person's clinical conditions. The most common definition of AIDS is based on the level of CD4 cell counts, the presence of some types of cancers, opportunistic infections, or other clinical manifestations (CDC, 2014, 2019f). HIV infected individuals may experience different symptoms depending on their stage of infection. The acute infection stage seems to be most infectious (acute infection), though it may not present any symptom – some people may show symptoms of flu (CDC, 2019g). Because few or no symptoms may be seen during this stage, HIV infected people may not be aware of their infection status.

Hence, regular and early HIV screening is crucial to prevent spreading of HIV, and to link those who have acquired HIV to treatment as early as possible. Behaviors and conditions that put individuals at greater risk of contracting HIV include: having unprotected anal or vaginal sex, having another sexually acquired infection such as syphilis, herpes, chlamydia, gonorrhea, and bacterial vaginosis, or sharing contaminated needles, syringes and other injecting equipment and drug solutions when injecting drugs, and selected medical procedures such as transplantation, blood transfusion, and others (CDC, 2018b; WHO, 2019).

HIV impacts

Since 1981, HIV has been one of the most concerning public health issues (Kaiser Family Foundation, 2019a). Globally, the disease has claimed more than 35 million lives to date. In 2017 alone, 940,000 people died from HIV-related causes (Dingake & Bethuel, 2018), of which the U.S. contributed 16,350 cases (CDC, 2019h) There were approximately 36.9 million people living with HIV at the end of 2017 with 1.8 million people becoming newly infected in 2017 (CDC, 2018b). In 2017, 21.7 million people living with HIV were receiving antiretroviral therapy (ART) (WHO, 2019). For U.S. alone, by the end of 2016, there were an estimated 1.1

million people having HIV (CDC, 2019h). There is no cure for HIV infection. However, effective antiretroviral (ARV) drugs can suppress the virus to reduce transmission risks. Adherence to ARV therapy and taking pre-exposure prophylaxis (PrEP) would help HIV infected people and those at higher risk enjoy healthier and longer lives.

Economically, HIV/AIDS also has tremendous impacts on global development. A recent study analyzing the long-term cost and impact of the global HIV/AIDS epidemic revealed that, between 2000 and 2015, a total of $562.6 billion was spent on overall care, treatment, and prevention. The annual cost peaked in 2013 with $49.7 billion in spending of the healthcare system towards HIV care and treatment programs (Dieleman et al., 2018).

In HIV epidemiology, researchers often use the term 'key populations' to refer to those who are at increased risk of HIV, regardless of epidemic stages or behavioral risk contexts. Key populations for HIV include: MSM, people who inject drugs, people in prisons and other closed settings, sex workers and their clients, and transgender people, who together account for the most cases of HIV infections (Population Council, 2019).

HIV and stigma towards HIV in Asia

Asia and the Pacific have been hit hard by the epidemic, only second to Africa in HIV prevalence among adults (Kaiser Family Foundation, 2019a; UNAIDS, 2019). At the end of 2018, there were 5.9 million Asian individuals living with HIV, including 310,000 newly infected adults and children in the same year (UNAIDS, 2019). The epidemic, however, is disproportionately distributed across the region, with more than 99% of all people living HIV residing in five countries: India, Indonesia, Myanmar, Nepal, and Thailand. India has the largest share of the epidemic, being the home to about 2.1 million (36%) of all HIV cases in the region (Pendse, Gupta, Yu, & Sarkar, 2016).

Asian cultures in general, while appraising values of harmony and conflict avoidance, may present certain unique challenges to people living with HIV, especially in regards to HIV status disclosure (Yoshioka & Schustack, 2001). Besides, Asian societies are less tolerant of practices linked to HIV risks, such as having sexual relationships with people of same sex, resulting in stigma and discrimination around HIV. This social pressure could inherently affect individuals' consideration to getting HIV tested - being afraid of rejection, discrimination or stigma in the event of HIV diagnosis (D. Chin & Kroesen, 1999). Asian and the Pacific nations have historically observed pervasive stigma surrounding HIV/AIDS since its inception in the early 1980's (Population Council, 1999). With steady increases in the number of immigrants from Asia to the U.S. during 2000 and 2015 (72% growth from 11.9 million to 20.4 million) (Immigration Policy Institute, 2021; Pew Research Center, 2017b), it is critical that novel research focusing on factors influencing HIV testing behaviors in Asian Americans and their children should be conducted in order to better inform HIV prevention efforts and understand the specific needs of this population.

HIV in the U.S. and HIV research among Asian Americans

There were approximately 1.2 million Americans living with HIV at the end of 2019, and about one out of eight people living with HIV (PLWH) did not know they had it (CDC, 2021). In 2019, the prevalence rate was 332 per 100,000 population (equivalent to 0.3%) (CDC, 2021). Despite recent data showing that annual new HIV infections (incidence) declined 8% between 2015 and 2019 (currently 12.6 per 100,000), a substantial burden remains, with nearly 40,000 individuals newly diagnosed each year (CDC, 2021). Despite the fact that surveillance data has shown gradual increases in diagnosed HIV cases in Asian Americans over the past two decades (CDC, 2019h; J. Chin, Leung, Sheth, & Rodriguez, 2007), Asian Americans are still the

population group with the largest number of undiagnosed HIV infections – approximately at 20% (CDC, 2018a). The number of HIV/AIDS cases reported between 2004 and 2007 increased at a much higher percentage for Asian Americans (44.3%) than for any other group (African Americans increased 11.6%, Hispanic 21.0%, White 15.9%) (J. Chin et al., 2007; Z. J. Huang et al., 2008). From 2010 to 2016, the trend continued with 36% increase in HIV diagnoses in this population (CDC, 2018a). Despite these accelerations, limited research has been conducted among this population.

To date, research on HIV testing among Asian Americans has been mostly concentrated around the period of 2000 – 2010, primarily focusing on four research areas: *HIV knowledge & beliefs, factors influencing HIV knowledge, HIV risk behaviors,* and *HIV-related stigma* (Sen et al., 2017). Further, Bhattacharya (2004) found that acculturation and gender norms were contributors to HIV knowledge and beliefs through communication and cultural beliefs about sexual intercourse (Bhattacharya, 2004). Other researchers also pointed to cultural taboos against discussing private or sexual matters as the primary driver of HIV stigma in this population (D. Chin & Kroesen, 1999; Vlassoff & Ali, 2011). A later study by DiStephano (2012) about HIV risks among young adults in Southern California suggested that cultural norms around sexuality played a role in shaping Asian Americans' view on HIV risks; they considered heterosexuality was equivalent to monogamy, and thus believed that only gay men were at risk of HIV (DiStefano et al., 2012). The findings suggested that these beliefs could eventually impact their HIV testing behavior. In the most recent and relevant study, Lee et al. (2019) found that acculturation, community norms, and other psychological factors, such as the construct of the TPB (attitudes, subjective norms, and perceived behavioral control) were the salient factors associated with HIV testing intention (J. J. Lee & Zhou, 2019).

Specific to Asian American MSM, social discrimination seemed to have significant impact on their HIV risks and HIV testing behavior. Wilson and Yoshikawa (2004) argued that by responding to social discrimination with self-attribution or self-blaming, Asian American MSM could inadvertently isolate themselves from others, thereby placing them at greater risks of HIV, and distancing them from HIV support services, including HIV testing (Wilson & Yoshikawa, 2004; Yoshikawa, Alan-David Wilson, Chae, & Cheng, 2004). A study by Nemoto et al. (2003) used qualitative methods to assess cultural and socio-psychological factors related to HIV risks among the Asian American MSM population. They revealed that stigma stemming from homophobia (or homonegativity) increased risk behaviors and decreased HIV testing rates (Nemoto et al., 1998). In a broader context, Chng et al. (2003) proposed a model for understanding sexual health among Asian American MSM, which further emphasized the need to examine acculturation and immigration experiences in research of HIV in this population, as they pointed out "*none of the eight studies investigated how sociocultural factors influenced, regulated, or shaped HIV-related risk behaviors … among the targeted Asian and Pacific Islanders (AAPI) MSM* " [p. 4] (Chng et al., 2003a). The model (Figure 1 on the right below) includes three main impact domains: Home country patterns, Migration experience, and U.S. experience, which center around sexual identity orientation, substance use/abuse and sexual HIV behavior patterns. Within this model, acculturation would interlink all three domains, while immigration would be most relevant to the domain of migration experience (Chwee Lye Chng, Frank Y. Wong, Royce J. Park, Mark C. Edberg, & David S. Lai, 2003b). Unfortunately, this model has yet to offer deeper insights into the direction or magnitude of relationships among its constructs.

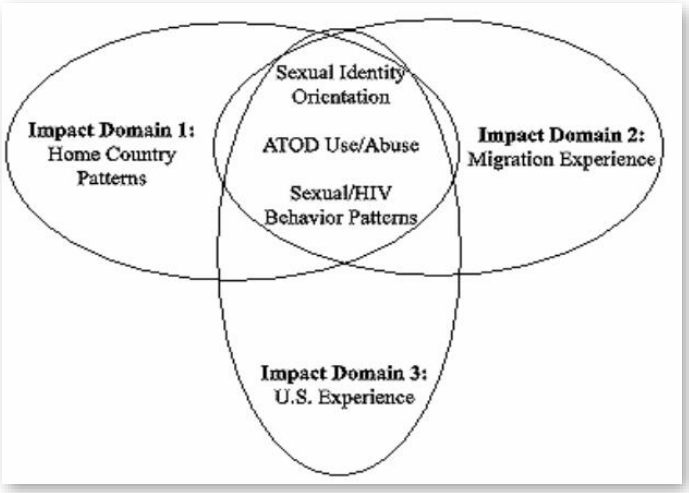


Figure 1: A model for understanding sexual health among Asian American MSM in the United States

All together, these select studies about HIV risk and HIV testing in heterosexual Asian Americans and Asian American MSM indicated that some research has been conducted in this population in the past; however, there have not been any studies holistically examining relationships of cultural and socio-psychological factors of HIV testing among Asian Americans, and Asian American MSM, especially in the late 10 years. The dearth of research about Asian health and HIV testing impedes the implementation of targeted prevention programs and behavioral interventions for this population (AETC, 2023). Thus, this dissertation aimed to specifically assess the relationships of theoretically and empirically derived factors influencing HIV testing in these population groups.

Factors associated with HIV among Asian Americans

In the context of research among Asian Americans in the U.S., studies have pointed to the roles of *immigration history*, *acculturation*, *social norms*, and *gender related norms* as important drivers of HIV stigma and discrimination, *homonegativity*, and subsequently HIV testing behavior (Chng et al., 2003a; Hahm, Lee, Rough, & Strathdee, 2012; J. J. Lee & Zhou, 2019;

Luu & Bartsch, 2011; Salud et al., 2014). In addition, other psychological factors such as *attitudes*, *subjective norms*, *perceived behavioral control* about HIV testing, and *perceived HIV risk* have been widely documented as directly associated with HIV testing among general MSM (Rob Stephenson, Darcy White, Lynae Darbes, Colleen Hoff, & Patrick Sullivan, 2015) and Asian American MSM (Kyung-Hee C. et al., 1998; J. J. Lee & Zhou, 2019; Nemoto et al., 1998).

Each of these factors will be reviewed in more detail below.

Homonegativity. Homonegativity is commonly operationalized as negative prejudice towards homosexuality. This construct is made up of variables measuring people's reactions to certain activities or social rights that gay men should or should not hold (Melanie A Morrison & Morrison, 2003); for example, questions may include "*gay men still need to protest for equal rights*" or "*gay men have become far too confrontational in their demand for equal rights*". Since there have been no studies found related to homonegativity among Asian Americans in the U.S., more research on homonegativity from Asian countries were presented for relevant background. As of 2019, there have been both advancement and regression regarding Lesbian, Gay, Bisexual, and Transgender (LGBT) rights globally and in the U.S. (Humanity in Action USA, 2020,). Yet, compared to countries in Asia, LGBT communities are still more socially accepted in the U.S. (Ross M., 2018). Generally, Asian cultures are less tolerant of homosexuality than other ethnic groups (Human Rights Campaign, 2019). On the surface, there have been unprecedented movements towards overall sexual equality in Asia. Taiwan for the first time expressed its support of same-sex marriages, and a few local governments in Japan recognized homosexual partnerships in 2017. While it has been a good sign of progression, these policies will likely not be sustained without continued advocacy from leading international organizations (USAIDS, 2019). There remains a significant gap between Asia and the Western world in terms of civil

rights for the LGBT community (Grace J., 2018). Among Asian countries, South Korea is recognized for its rampant homonegativity as over half the population is strongly opposed to accepting homosexuality (Human Rights Watch, 2017). China, the Asian country with highest population density, has also voiced its major opposition to homosexuality (Grace J., 2018). Malaysia, Indonesia, and Pakistan express even more homophobic tendencies, with two thirds of their population expressing intolerance to LQBT communities (Grace J., 2018). Through a few rare studies in Asian Americans, acculturation has been identified as an influencing factor on homonegativity. Fuks et al. (2018) suggested many Asian LGBT immigrants viewed a Western orientation as a coping response to heterosexism and cissexism in their culture of origin, even before their immigration experience (Fuks, Smith, Pelaez, Stefano, & Brown, 2018). Another study among Vietnamese American men in the U.S. supported that Vietnamese Americans with higher levels of acculturation have more positive attitudes towards homosexuality (Luu & Bartsch, 2011).

DiStephano (2012) conducted a study around cultural norms and HIV risks in a group of young adults in Southern California and suggested that culturally-rooted sexual norms influence Asian Americans' purview of their HIV risks; they considered heterosexuality as equivalent to monogamy, thus believed that only gay men were at risk of HIV (DiStefano et al., 2012). This belief could impact their HIV testing behavior. To my knowledge, there has not been any study examining homonegativity among broader groups of Asian Americans, however, the relationship, even indirectly, between homophobia or homonegativity and HIV testing has been documented in the MSM population (Ross M., 2018; C Wei et al., 2016). A systematic review study by Wei et al. (2011) summarized that experiences with discrimination by their own ethnic communities seem to have significant impact on both self-esteem, and is a strong factor

influencing HIV risk behaviors among MSM in Asia (Van Griensven & Van Wijngaarden, 2010). For instance, the first survey of gay men from different ethnic groups in the U.K. found that British MSM of South Asian origin "*are living in two worlds: they are living in 21st century Britain and, culturally, in India. They also face the potential for marginalization and discrimination both within their ethnic community and within the gay community"* (p.80) (Hickson et al., 2008). In addition, homonegativity and fear of discovery by family members may lead some Asian MSM to engage in unsafe sexual behaviors and avoidance from HIV testing (Van Griensven & Van Wijngaarden, 2010). Drawing upon these findings, I examined how homonegativity influences HIV testing behavior among Asian American men in the U.S. as part of this study.

Immigration History. Migration involves a process of displacing people, geographically and culturally, as "*an individual moves from a familiar world to an unknown, confusing, distressing, but sometime rewarding life in a new country*" (p.6) (Chng et al., 2003a). In the era of globalization, international migration could have important implications for sexuality and risk for HIV (Zhou, Coleman, Huang, Sinding, & Wei, 2017). However, it is important to acknowledge that being an immigrant, of itself, is not a risk factor for HIV (Portal, 2019). It is the experience and living circumstances resulting from the migration process that place individuals in vulnerable situations impacting their physical and mental well-being (Sabatier R., 1996). In this study, I hypothesize that the longer the immigration history since arrival, the more assimilated the individual would be, thus the less homo-negative the individual would be, and subsequently the higher the likelihood of getting HIV tested, due to the increased exposure to western values and sexual norms in the U.S.. This assumption is made based upon the perspective that the challenge of providing HIV/AIDS prevention services to Asian Americans is

unique because it involves the complexity of the immigration process, oftentimes required for refugee immigrants (W. Kim & Keefe, 2010). The problem could be further exacerbated as in many Asian American immigrant groups, the issues of intimate relations and sexual behavior are considered secret and taboo. Such cultures have a tendency to avoid public discussions of sexual matters (Sabatier R., 1996), which would ultimately hinder HIV prevention efforts.

Because of historical and political differences, Asian Americans in the U.S. present highly diverse immigration backgrounds. For example, Chinese are the population of longest immigration history, Filipino had the largest migration movement during 1970's, and Vietnamese are the latest arrivers in the U.S. (Takaki, 1989). The differential migration experiences among various Asian American groups may act as stressors that could contribute to adverse attitudes and unsafe practices related to the risk of HIV. In a study conducted by Chng and Geliga (2000), of those MSM in the sample who were born overseas, the majority was Asian American (61%), followed by Latino (29%) (Chng et al., 2003a) – suggesting a possibly large population of Asian MSM living in the U.S.. For men born overseas, the longer they have lived in the U.S., the less likely they are to engage in unprotected anal intercourse with other men, which was attributed to increased access to condoms and less stigma (Kramer et al., 2016). Another important study suggested that high acculturation levels and exposure to mainstream MSM communities are factors associated with consistent use of condoms among MSM, i.e. time spent in the U.S. is positively correlated with acculturation and exposure levels to mainstream cultures (Marin, Gomez, & Tschann, 1993). As suggested by these findings, a great number of immigrant Asian American MSM may not have access to HIV prevention messages until they are exposed to the mainstream MSM communities. It's also important to note that, immigration processes often influence family context, including shifting of residential locations, disrupting

relationships, as well as impacting the assimilation of new ideas and values (Xia, Do, & Xia, 2013). Hence, I included an assessment of individual immigration history, i.e., length of time living in the U.S., in this study, in order to further understanding of how immigration history can play a role in people's view towards homosexuality.

Acculturation to the American culture. Acculturation, in this study, is defined as the process of changing from a minority culture to the majority culture, and these changes would derive from their interactions with the new host countries, societies or people who don't share the same cultures (Schwartz, Unger, Zamboanga, & Szapocznik, 2010; Milkie Vu, Escoffery, Srivanjarean, Do, & Berg, 2019). The construct of acculturation has been conceptually studied as a unidimensional process (Gordon, 1964), or an intersect of two dimensions (receiving culture acquisition and heritage culture retention) with four categories: assimilation, separation, integration, and marginalization (Berry & Padilla, 1980). Acculturation has been found to have both positive and negative effects on behaviors that place individuals at higher risk for HIV/AIDS or distance people from HIV testing (Chng et al., 2003a). Common cultural perceptions within Asian communities include the assumptions that HIV and other STIs are irrelevant to them and that such infections are greater in other communities and populations such as among Whites and those with certain behavioral or demographic attributes (Chae & Yoshikawa, 2008). These cultural perceptions, when held by individual Asian MSM, for instance, were also linked with having unprotected anal sex (K. Choi, Han, Hudes, & Kegeles, 2002). Specifically, in a mixed methods study, lower ethnic cultural competence – a set of culturally specific skills that enable individuals to have effective interactions with others in their cultural community – was linked to reporting unsafe sex (Matteson DR., 1997). Given that the meaning of acculturation is a complex phenomenon, it is not surprising that studies in this

domain have presented mixed findings. One quantitative study reported lower acculturation was linked with unprotected anal sexual intercourses (Ratti, Bakeman, & Peterson, 2000), while another documented no relationship between acculturation and such practices (Chae & Yoshikawa, 2008; Ratti et al., 2000). To my knowledge, there have not been any studies directly examining acculturation with homonegativity together with HIV testing in Asian Americans in the United States. Hence, this study was hoped to explore this important social determinant of health.

Gender related norms in Asian cultures. Gender-related norms for health behavior play an important role in the spread of HIV through sexual contacts, especially in Asian cultures (Chow, 1998). Four qualitative studies reported that men who follow more traditional gender related norms and sexual norms in Asian cultures, such as subordination in relationship, intimacy and sex practices, were more inclined to report having unprotected anal intercourse relative to their counterparts not supporting such norms (K. Choi et al., 2002; Kanuha, 2000; Nemoto et al., 1998; F. Wong, Chng, Ross, & Mayer, 1998), although these findings have yet been replicated in a quantitative study (Shapiro & Vives, 1999).

For Asian American men, the influence of strong cultural gender stereotypes, for example masculine norms and Asian cultural values to heterosexuality (Iwamoto, Derek, & Kaya, 2009), may be linked to certain indirect risks for HIV infection, such as stigma and discrimination (UNAIDS, 2015), which may be caused by prevalent prejudice towards homosexuality or homonegativity. A large study in China by Chi et al. (2016) suggested that the ambiguity towards homosexual relationships among Asian MSM has caused certain challenges to the management of many public health programs, including HIV (Chi & Hawk, 2016). Often time, these are consequences of overwhelming societal discrimination, family backlash, and a lack of

legal protection (Sim, 2014). Traditional Chinese and other China-influenced cultures rooted in Confucian philosophies, such as Vietnamese, emphasize the continuation of family generations, respect for one's parents, elders, and ancestors (Baker, 2015), and the patriarchal family structure (D. Hsu & Waters, 2001). Additionally, in the context of the government's policies around family planning, such as Chinese and Vietnamese one-to-two child policies (Sim, 2014), families and proximal social surroundings exert intense pressure on MSM to marry women and have children in order to keep their family lines, and protect their families' reputations (Liu J. & Choi K., 2006). Further, prevailing prejudice and discrimination towards gay and lesbian individuals in China have been linked to high levels of mental and behavioral problems related to health practices, such as depression and substance abuse (Feng, Wu, & Detels, 2010; Liu J. & Choi K., 2006), - factors that negatively affect HIV testing uptake (C Wei et al., 2016). These commonly shared contexts among Asian cultures suggest an important contemporary public health challenge (Chi & Hawk, 2016). As no previous studies specifically examined similar constructs among Asian Americans had been found, I used findings from the research in Asia as a proxy to gain better perspectives of how gender related norms can be associated with homonegativity in the population of Asian American men as part of this study.

Social norms about HIV testing. The influence of social norms supporting HIV testing has been studied in different ethnic groups. A study by Sean et al. (2010) in African Americans found that the prevalent community norms about HIV testing helped reduce stigma and positively influenced uptake of HIV testing. In Asian cultures, it is perceived that social norms are largely influenced and shaped by social roles (F. Wong et al., 1998). Individuals with higher social standing influence the shared interpretations and behaviors of others in their sociocultural circles (Chou, 2001; Lai D. S., 1998). In societies of higher homogeneity, the relationships

among social roles often result in great agreement in the way people perceive and react to situations (F. Wong et al., 1998).

Given its relevance to the Asian cultures in Asian countries, and to a certain degree, among Asian Americans (Chou, 2001), it is critical that we examine how social norms relate to HIV testing behavior in this population. I am specifically interested in understanding the norms of HIV testing by investigating if Asian Americans think most people they know have been tested for HIV, and that if more positive social norm towards HIV testing would inherently influence higher HIV testing. Hence, part of this study explored the relationship between social norms about HIV testing and homonegativity, and subsequently, HIV testing intention among Asian American men.

Psychological factors influencing HIV testing. Generally, a number of important studies have shown that constructs from the Theory of Planned Behavior (TPB) are predictive of HIV testing (Booth, Harris, Goyder, & Norman, 2012; Hogben, Janet, Lawrence, Hennessy, & Eldridge, 2003). A study among women in two southern states in the U.S. employed the TPB to examine the links among beliefs, attitudes, perceived behavioral control, subjective norms, and behavioral intentions of STIs testing behavior (Hogben et al., 2003). The findings suggested that higher belief in the benefits of STIs testing were associated with favorable *attitudes towards testing*. More positive attitudes about testing were related to positive behavioral intentions to take the test, and also mediated some belief-intention associations. Perceived behavioral control and subjective norms were also associated with intentions and actual STIs testing behavior. The study concluded that the TPB provided an useful structure for measuring the predicates of risk behaviors and for testing the efficacy of risk reduction interventions (Hogben et al., 2003). In a more specific context, Booth et al. (2012) used the TPB to investigate salient beliefs about HIV

testing among young people living in relatively deprived areas. Likewise, findings from this study support the positive relationship between behavioral beliefs – an underlying construct of attitudes, perceived behavioral control and HIV testing as the behavioral outcome (Booth et al., 2012).

Further, a recent study by Ayodele (2017) found that a model containing TPB constructs explained 35% of the variance in HIV testing, with attitudes and perceived behavioral control making significant and unique contributions to intention, and subsequently actual HIV testing behaviors in a population of Nigerian young people. More importantly, the study highlighted the importance of perceived behavioral control and attitudes towards HIV infection in the prediction of HIV testing intentions among young people who have not previously tested for HIV (Ayodele, 2017). Another study by Mirkuzie et al. (2011) supported the same conclusion that the TPB constructs of attitudes, perceived behavioral control, and subjective norms explained a substantial amount of variance in HIV testing behavior among a sample of Ethiopian population (Mirkuzie, 2011b).

Among young American MSM, TPB has also been found useful in examining predictors of HIV testing, especially when taking into consideration other factors, such as exposure to HIV information, self-rated HIV knowledge, and use of information to make HIV-testing decisions (Chrysta C Meadowbrooke, Tiffany C Veinot, Jimena Loveluck, Andrew Hickok, & José A Bauermeister, 2014). It was concluded that the TPB's constructs with the added direct effects of other information-related factors explained more than twice as much variance as just TPB alone (Chrysta C Meadowbrooke et al., 2014; Salud et al., 2014). However, across existing literature on HIV testing, there was a gap in the application of the TPB in assessing HIV testing among Asian Americans. In the absence of similar studies using the TPB to specifically assess HIV

testing behavior among Asian Americans, this evidence the successful application of the TPB to HIV testing research would have great implications, and was ideally suited for this study as Asian Americans are among the groups with the lowest uptake of HIV testing (CDC, 2019h).

Perceived HIV Risk. Examining the relationship between HIV risk behaviors, risk perception, and HIV testing among populations at high risk for HIV transmission, including young MSM, has been a major focus among recent research literature worldwide (Clifton et al., 2016). A study by Clifton et al. (2016) analyzed a probability sample survey of the British general population and found that higher perceived risk of HIV was associated with sexual risk behaviors and with HIV testing. However, the majority of those rating themselves as "greatly" or "quite a lot" at risk of HIV (3.4% of men, 2.5% of women) had not tested in the past year (Clifton et al., 2016). The study suggested that strategies to further improve uptake of HIV testing are needed, particularly those aiming at changing individual's risk perception (Clifton et al., 2016). In another study examining this relationship specific to the high-risk population of MSM, Stephenson and colleagues (2015), echoed the findings of the previous study by Clifton et al. when they pointed to the need for dyadic interventions to tackle the underestimation of potential risk associated with low HIV testing among partnered MSM. In particular, they found that men with a main partner were more likely to report that they perceive zero personal risk of HIV infection (single MSM 24%, partnered MSM 48%). Partnered men also reported lower rates of HIV testing in the last 6 months than did single men (32% and 73%, respectively). In conclusion, the researchers suggested that couple's HIV testing and counseling (CHTC) affords male couples the opportunity to learn their HIV status together and discuss the realities of their agreement and relationship and should be considered a priority intervention for male couples in the U.S. (Rob Stephenson et al., 2015).

These findings hold true regarding the relationship of perceived risk for HIV and self-reported sexual risk among Asian young adults. A study in Laos among young Laotian people found that two thirds of the respondents reported their first sexual intercourse before age 15, and two thirds of the sexually experienced young males reported two or more sexual partners during their adolescent life (mean 3.1, SD 3.65). However, 57.6% assessed themselves to have no risk for HIV. These individuals, though having elevated sexual risk, may have poor knowledge on HIV, leading to low perception of HIV risk and low HIV testing uptake (Sychareun, Thomsen, Chaleunvong, & Faxelid, 2013). In the U.S., a study using Wave 3 of the National Longitudinal Study of Adolescent Health (2001-2002) found that among sexual minority young adult respondents who had an HIV diagnosis, females who reported only homogenous sexual relationships were more likely to believe they were at very low risk for HIV than were females reporting only heterogeneous sexual relationship (odd ratio 17.2). Bisexual females had significantly higher odds of HIV than heterosexual females (1.4), and females attracted to both sexes had significantly higher odds of HIV than females attracted only to male (1.8). However, none of these sexual minority status indicators predicted differential risks of HIV for males (Kaestle & Waller, 2011). In summary, the literature has mainly documented the relationships of sexual risks and risk perception with HIV testing among non-Asians, and Asians living in Asia, however, very little known is known among Asian Americans. Hence, this study examined sexual risks and risk perception in relation to HIV testing among Asian American men to help further knowledge in this area.

Limitations in the existing literature

As described in the previous sections, the existing literature has gaps in epidemiological knowledge, as well as the application of theoretical frameworks in studies around cultural and socio-psychological factors related to HIV testing in Asian Americans.

First, while greater evidence around HIV risk factors has been made available, there have been very few studies devoted to the examination of HIV testing behavior in the population of Asian Americans (Barth, Cook, Downs, Switzer, & Fischhoff, 2002; Mulholland & Van Wersch, 2007). Although the population increase has led to more research concerning Asian Americans' health in general, knowledge about the factors associated with HIV testing behavior among this group remains sparse (Sen et al., 2017).

Second, many behavioral theories examining factors of HIV risks have been conducted, however, to my knowledge, none of them considered the holistic approach of combining both TPB's and other empirically derived constructs. In the study by Ham et al. (2007), it was suggested that an extended framework may be much needed to broaden holistic perspectives of factors related to testing barriers and facilitators among Asian young adults, it did not have the resources to do so; and instead used the National Longitudinal Study of Adolescent Health, Wave 3 to primarily explore some social demographic predictors of HIV as a whole (Hahm, Lee, Ozonoff, & Amodeo, 2007). Another effort made by Boudewyns et al. (2011) took the same approach of emphasizing the importance of socio-psychological factors underlying HIV testing, yet also it was limited to individual behavioral factors (Boudewyns & Paquin, 2011). To the best knowledge of the PI, none of the studies identified offered a thorough example drawing upon the hybrid theoretical and empirical approach in studying this issue in Asian Americans.

Lastly, there have not been any studies examining the complex issue of HIV testing in the population of Asian American MSM living in the area of Southern U.S.. As this metropolitan area is booming with projected domestic and overseas immigration influx in the decade to come (World Population Review, 2019), a better understanding of the specific health issue – uptake of HIV testing - in this population becomes increasingly important.

Theoretical Framework and Conceptual Model

The most effective public health programs are those that are based on understanding of health behaviors and the contexts of these behaviors. Behavior change intervention studies based on theoretical frameworks have been found in peer-reviewed literatures to be more effective than those lacking a theoretical framework (Ammerman, Lindquist, Lohr, & Hersey, 2002; Legler J, 2002; Noar SM, 2007). A theory suggests a logical structure and framework of understanding events, behaviors, situations or contexts (Glanz & Rimer, 1997). Theories and models of behavior change help researchers comprehend the rationale of individuals' behaviors, especially behaviors related to health (Glanz & Rimer, 1997; Glanz, Rimer, & Viswanath, 2008; WHO., 2016), inform researchers of best strategies for intervention designs (Glanz et al., 2008), guide intervention evaluation efforts (Glasgow & Emmons, 2007), determine intervention timeframes (Glasgow & Linnan, 2008; Grol RP, 2007), and provide information needed for designing future effective programs (Safari M, 2012).

Conceptual Model

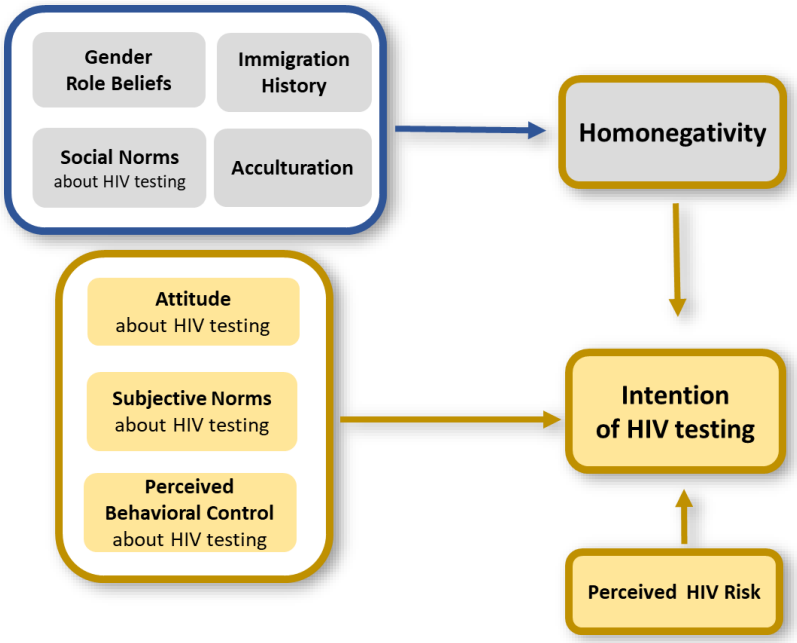
The Theory of Reason Action (TRA) (Glanz et al., 2008) and its successor, the TPB (Glanz & Rimer, 1997) portrait a causal path way of commonly presented human behaviors. The TPB has been successfully applied to a wide range of social and health behaviors and has been supported by numerous empirical studies and meta-analyses (Fishbein, 2010). This theory posits

that the most proximal predictor of a behavior is the intention to perform or engage in it. Intentions are understood to capture the motivational factors that influence a behavior, including attitudes, subjective norms, and perceived behavioral control; they are indications of a person's readiness to perform a behavior (Glanz & Rimer, 1997). Boudewyns et al. (2011) examined several psychological determinants of STIs testing among college students in the U.S. Southern region. He and his team drew on the theory of reasoned action, or planned behavior framework to gain insight into the cognitive processes underlying testing intentions with a broader aim of demonstrating how behavioral theory can be applied in formative research to generate recommendations for developing communication interventions (Boudewyns & Paquin, 2011). The overall findings of this study suggest that *attitudes towards getting tested for HIV* were the strongest determinants of intentions for the studied youth population. Both the theoretical framework and the findings are highly relevant to the research that is being pursued by the PI in this dissertation research. Though no studies have been found in the existing literature in regard to the use of TPB to predict HIV testing behavior among Asian Americans, a recent study by Ayodele (2017) has tested the theory among a group of Africans. Findings highlighted and supported the importance of perceived behavioral control, attitudes about HIV testing and perceived risk of HIV infection as predictors of HIV testing intention among those who have not previously had a HIV test (Olabode Ayodele, 2017).

Drawing upon the constructs of the TPB (Fishbein, 2010; McLeroy KR. et al., 1988), and from empirical evidence pointing to other constructs salient to HIV testing behavior in Asian Americans, the conceptual model for this study is presented in the Figure 2 below.

Figure 2. Conceptual model guiding the study of factors influencing HIV testing intention among Asian American Men

*(**Blue** denotes constructs of Aim 1, **Yellow** denotes constructs of Aim 2)*



This figure primarily served the assessment of empirically informed *factors related to homonegativity* (Aim 1) among Asian Americans. For Aim 2, it helped guide the path model where *theory-based and empirically derived constructs hypothesized to have direct and indirect relationships with HIV testing among Asian American men* were examined in addition to homonegativity in Aim 1. Overall, the whole model was used to frame the qualitative study of Aim 3, which focuses on deepening our understanding of *factors influencing HIV testing among Asian American MSM*.

The potential relationship between homonegativity and HIV testing has not been widely studied, especially for the population of Asian Americans (Chng et al., 2003a; Huang et al., 2012). However, a study around social network and other correlates of HIV testing among Chinese male sex workers and other MSM by Huang et al. (2012) suggests critical consideration

of homonegativity in HIV studies for MSM in Asia (Huang et al., 2012). The association between sexual risks and HIV testing has been also studied extensively among other non-Asian American ethnic groups (CDC, 2018b; K. Choi et al., 1999; Hahm et al., 2007).

Of most relevance, a study by Chng et al. (2003) presenting an extended model for understanding sexual health among Asian American MSM in the U.S. suggests that there is a close relationship between MSM sexual behaviors with the cultural and social dynamics in their home countries, such as homosexuality-related shame or stigma, sexual attitudes, sexual behavior, and drug use. Also, it points out that these cultural norms are modified by the migration/immigration experience. It, too, discusses how these norms, beliefs, and practices are continually influenced by the process of acculturation as these men try to adjust to life in the U.S. (Chng et al., 2003a). The study and its observations around immigration, acculturation, sexual networks and risk behaviors related to HIV among MSM have indeed laid the foundation for the idea of exploring a part of that same relationship patterns in the Asian American population, as well as extending the model to include HIV testing behavior within the scope of this dissertation research.

Aim 1: Performed a psychometric evaluation of a key construct of interest: homonegativity (or prejudice towards homosexuality) by assessing psychometrics of a homonegativity measure among **Asian Americans**; based on the reliability and validity of this scale, assessed theoretical and empirically derived factors associated with homonegativity in this population group;

Aim 2: Tested a conceptual model grounded in TPB, supplemented with empirically derived constructs, and their association with HIV testing behavior in **Asian American men** using path analytical methods;

Aim 3: Based upon findings from Aim 2, a refined conceptual model was developed and used to qualitatively understand how the retained factors influence HIV testing among the population of **Asian American MSM.**

Significance of the study

This study was innovative, as it was the first to leverage a conceptual model grounded in behavioral theory supplemented with additional salient factors from the empirical literature relevant to HIV testing in Asian Americans, using an explanatory sequential mixed-method design (J. Creswell & Poth, 2017; Ivankova N V., 2006) to examine how these factors relate to HIV testing behaviors of Asian Americans.

In 2014, the White House for the first time announced "The Ten Reasons to Address HIV/AIDS in Asian American and Pacific Islander Communities" on its official webpage to signify the importance of fighting the rise of HIV in this population (The White House, 2014). In 2017, HIV prevalence in the Asian American population was 108.8 (CDC, 2019a). HIV incidence rates among this population during 2010 and 2016 went from 6.3 to 5.8 – showing a sign of slight decrease (CDC, 2019a). According to the CDC, as of December 2015, there were a total of 15,800 Asian Americans living with HIV/AIDS (CDC, 2019a). Compared to the number reported in 2005 (4,356), this represented 72% increase - *the largest percentage increase for any racial/ethnic group* (CDC, 2018a). Despite that, of the total estimated Asians living with HIV/AIDS, only 80% had received a diagnosis, a lower percentage than for any other race/ethnicity (CDC, 2018a). Of concern, most of the HIV diagnoses among Asians happened at a very late stage when patients start seeking medical care for multiple AIDS-related symptoms (Zhihuan Jennifer Huang, Frank Y Wong, Jordana M De Leon, & Royce J Park, 2008). Even among those who are aware of their infection status, over 50% receive no ART or receive only

inadequate treatment, which places them at higher risk for morbidity and mortality, making the treatment more complicated and costly (Singer & Thames, 2016).

Findings from the National Behavioral Risk Factor Surveillance System indicated that the proportions of Asians and Pacific Islanders aged 18 and older reporting HIV risk behaviors in the past 12 months were similar to the proportions among other racial groups (Zaidi et al., 2005). However, it was reported that Asians and Pacific Islanders were significantly less likely to have been tested for HIV (CDC, 2018a; Zaidi et al., 2005). Although the population increase has led to more research concerning Asians and Pacific Islanders, knowledge about factors associated with HIV testing among Asian Americans remains scarce (Buchacz et al., 2004). Limitations in the existing literature suggests the importance of recognizing Asian Americans as a group of priority for studies around HIV testing practices.

This study advances our understanding of how sociocultural, behavioral and psychological factors are related to HIV testing behavior in Asian Americans – one of the fastest growing ethnic groups in the U.S.. Employing a combination of both quantitative and qualitative methodologies is a promising approach to investigate the relationship between theoretical and empirically derived factors and individual health (Diez-Roux, 2000). Mixed-methods research can help by providing a more thorough understanding of a relationship (Salazar, Crosby, & DiClemente, 2015). This study addressed specific gaps in the literature by:

1. Validating a psychological construct salient to public health research: homonegativity in **Asian Americans**. Given this construct had been validated among other populations, such as Brazilians, this work helped advance science in psychometric research in Asian Americans as a whole.

2. Testing a conceptual framework for understanding how sociocultural, psychological and behavioral factors influence uptake of HIV testing in a population of **Asian American men**; and,
3. Developing and testing a conceptual framework to gain knowledge about factors influencing HIV testing in **Asian American MSM**.

Our findings that homonegativity and sexual behaviors are indicators of HIV testing intention in the Asian American men population will inform future interventions and programs to address proximal attitudinal and behavioral norms in a culturally relevant context.

Chapter 1 References

AETC. (2023). *Asian American People and HIV*. Retrieved from https://www.neaetc.org/files/attachment/attachment/6055/EP%20-%20Asian%20Americans%20and%20HIV%20(2021-06).pdf:

Ammerman, A., Lindquist, C., Lohr, K., & Hersey, J. (2002). The efficacy of behavioral interventions to modify dietary fat and fruit and vegetable intake: a review of the evidence. *Prev Med, 35*(1), 25-41.

Ayodele, O. (2017). The theory of planned behavior as a predictor of HIV testing intention. *American Journal of Health Behavior, 41*(2), 147-151. doi:10.5993/AJHB.41.2.5.

Baker, H. D. (2015). *Chinese Family & Kinship*: Macmillan International Higher Education.

Barth, K. R., Cook, R. L., Downs, J. S., Switzer, G. E., & Fischhoff, B. (2002). Social stigma and negative consequences: factors that influence college students' decisions to seek testing for sexually transmitted infections. *Journal of American College Health, 50*(4), 153-159.

Berry, J. W., & Padilla, A. M. (1980). Acculturation: Theory, models and some new findings. *Acculturation as varieties of adaption, 9*, 25.

Bhattacharya, G. (2004). Health care seeking for HIV/AIDS among South Asians in the United States. *Health & Social Work, 29*(2), 106-115.

Booth, A., Harris, P., Goyder, E., & Norman, P. (2012). Beliefs about chlamydia testing amongst young people living in relatively deprived areas. *Journal oof Public Health, 35*(2). doi:DOI: 10.1093/pubmed/fds082

Boudewyns, V., & Paquin, R. S. (2011). Intentions and beliefs about getting tested for STDs: Implications for communication interventions. *Health Communication, 26*(8), 701-711.

Buchacz, K., Patel, P., Taylor, M., Kerndt, P. R., Byers, R. H., Holmberg, S. D., & Klausner, J. D. (2004). Syphilis increases HIV viral load and decreases CD4 cell counts in HIV-infected patients with new syphilis infections. *AIDS, 18*(15), 2075-2079.

CDC. (2014). Revised Surveillance Case Definition for HIV Infection - United States, 2014. *Accessed online at: https://www.cdc.gov/mmwr/preview/mmwrhtml/rr6303a1.htm?s_cid=rr6303a1_e*.

CDC. (2018a). Estimated HIV Incidence and Prevalence in the United States, 2010–2015. *HIV Surveillance Report, 23*(1), Accessed online at https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-supplemental-report-vol-23-21.pdf.

CDC. (2018b). Health Disparities in HIV/AIDS, Viral Hepatitis, STDs, and TB. *CDC webpage at https://www.cdc.gov/nchhstp/healthdisparities/asians.html*.

CDC. (2019a). HIV and Asians. *Official webpage at https://www.cdc.gov/hiv/group/racialethnic/asians/index.html*.

CDC. (2019b). HIV Incidence: Estimated Annual Infections in the U.S., 2010 - 2016. *Official webpage at https://www.cdc.gov/nchhstp/newsroom/2019/HIV-incidence.html*.

CDC. (2019c). HIV Surveillance Report *Official webpage at https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-supplemental-report-vol-24-1.pdf, 24*(1), Table 1, page 17-21.

CDC. (2019d). HIV Surveillance Report *Official webpage at https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-supplemental-report-vol-24-1.pdf, 24*(1), Table 2, page 24.

CDC. (2019e). HIV Testing Basics. *Official webpage: https://www.cdc.gov/hiv/basics/testing.html*.

CDC. (2019f). HIV/AIDS: HIV Risk and Prevention using Pre-Exposure Prophylaxis (PrEP). *https://www.cdc.gov/hiv/risk/prep/index.html accessed 3.28.19*.

CDC. (2019g). Patient Information Sheet - Acute HIV Infection (Information about Acute HIV Infection and PrEP). *Accessed online at https://www.cdc.gov/hiv/pdf/prep_gl_patient_factsheet_acute_hiv_infection_english.pdf*.

CDC. (2019h). Statistics Overview, HIV Surveillance Report. *Official webpage at https://www.cdc.gov/hiv/statistics/overview/index.html*.

CDC. (2021). *HIV Surveillance Report: Diagnoses of HIV Infection in the United States and Dependent Areas, 2019.* https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=51

CDC. (2022). Diagnoses of HIV Infection in the United States and dependent areas, 2020. *33*.

CDC. (2023). *Impact on Racial and Ethnic Minorities*.

CDC/National Center for Health Statistics. (2018). National Health Interview Survey. *Official webpage at https://ftp.cdc.gov/pub/Health_Statistics/NCHS/NHIS/SHS/2018_SHS_Table_P-1.pdf*.

CDC/National Center for Health Statistics. (2020). National Health Interview Survey. *Accessed online at https://www.cdc.gov/nchs/nhis/index.htm*.

Chae, D. H., & Yoshikawa, H. (2008). Perceived group devaluation, depression, and HIV-risk behavior among Asian gay men. *Health Psychology, 27*, 140–148. doi:10.1037/0278-6133.27.2.140

Chi, X., & Hawk, S. (2016). Attitudes toward Same-Sex Attraction and Behavior among Chinese University Students: Tendencies, Correlates, and Gender Differences. *Front. Psychol.* doi:https://doi.org/10.3389/fpsyg.2016.01592

Chin, D., & Kroesen, K. W. (1999). Disclosure of HIV infection among Asian/Pacific Islander American women: Cultural stigma and support. *Cultural Diversity and Ethnic Minority Psychology*, *5*(3), 222.

Chin, J., Leung, M., Sheth, L., & Rodriguez, T. (2007). Let's not ignore a growing HIV problem for Asians and Pacific Islanders in the US. *Journal of Urban Health*, *84*(5), 642-647.

Chng, C. L., Wong, F. Y., Park, R. J., Edberg, M. C., & Lai, D. S. (2003a). A model for understanding sexual health among Asian American/Pacific Islander men who have sex with men (MSM) in the United States. *AIDS Education and Prevention*, *15*(1 Supplement), 21-38.

Chng, C. L., Wong, F. Y., Park, R. J., Edberg, M. C., & Lai, D. S. (2003b). A model for understanding sexual health among Asian American/Pacific Islander men who have sex

with men (MSM) in the United States. *AIDS Educ Prev, 15*, 21-38. doi:https://doi.org/10.1521/aeap.15.1.5.21.23611

Choi, K., Han, C., Hudes, E., & Kegeles, S. (2002). Unprotected sex and associated risk factors among young Asian and Pacific Islander men who have sex with men. *AIDS Education and Prevention, 14*, 472–481. doi:10.1521/aeap.14.8.472.24114

Choi, K., Kumekawa, E., Dang, Q., Kegeles, S., Hays, R., & Stall, R. (1999). Risk and protective factors affecting sexual behavior among young Asian and Pacific Islander men who have sex with men: implications for HIV prevention. *Journal of Sex Education and Therapy, 24*(1-2), 47–55.

Choi, K. H., Yep, G. A., & Kumekawa, E. (1998). HIV prevention among Asian and Pacific Islander American men who have sex with men: a critical review of theoretical models and directions for future research. *AIDS Education and Prevention*.

Chou, W. (2001). Homosexuality and the cultural politics of Tongzhi in Chinese society. *Journal ofHomosexuality, 40*, 27-46.

Chow, E. N. L. (1998). The development of feminist consciousness among Asian American women. *Asian American Women and Gender, 3*, 2.

Clifton, S., Nardon, A., Field, N., Mercer, C., Tanton, C., Macdowall, W., . . . Sonnenberg, P. (2016). HIV testing, risk perception, and behaviour in the British population. *AIDS, 30*(6), 943-952. doi:10.1097/QAD.0000000000001006

Creswell, J., & Poth, C. (2017). Qualitative Inquiry and Research Design: Choosing Among Five Approaches. *Sage Publications*.

Dieleman, J. L., Haakenstad, A., Micah, A., Moses, M., Abbafati, C., Acharya, P., . . . Alam, K. (2018). Spending on health and HIV/AIDS: domestic health spending and development assistance in 188 countries, 1995–2015. *The lancet, 391*(10132), 1799-1829.

Diez-Roux, A. V. (2000). Multilevel analysis in public health research. *Annual review of public health, 21*(1), 171-192.

Dingake, O., & Bethuel, K. (2018). The state of human rights in relation to key populations, HIV and sexual and reproductive health. *Reproductive Health Matters, 26*(52), 46-50.

DiStefano, A. S., Hui, B., Barrera-Ng, A., Quitugua, L. F., Peters, R., Dimaculangan, J., . . . Tanjasiri, S. P. (2012). Contextualization of HIV and HPV risk and prevention among Pacific Islander young adults in Southern California. *Social Science & Medicine, 75*(4), 699-708.

Evangeli, M., Ferris, K., Kenney, N. M., Baker, L. L. E., Jones, B., & Wroe, A. L. (2018). A systematic review of psychological correlates of HIV testing intention. *AIDS Care, 30*(1), 18-26. doi:10.1080/09540121.2017.1344351

Fauci, A. S., Redfield, R. R., Sigounas, G., Weahkee, M. D., & Giroir, B. P. (2019). Ending the HIV epidemic: a plan for the United States. *Jama, 321*(9), 844-845.

Feng, Y., Wu, Z., & Detels, R. (2010). Evolution of men who have sex with men community and experienced stigma among men who have sex with men in Chengdu, China. *Acquir. Immune Defic. Syndr. , 53*(S98–S103.). doi: 10.1097/QAI.0b013e3181c7df71

Fishbein, M. A. (2010). Predicting and changing behavior: The reasoned action approach. *New York: Psychology Press.*

Fuks, N., Smith, N., Pelaez, S., Stefano, J., & Brown, T. (2018). Acculturation Experiences Among Lesbian, Gay, Bisexual, and Transgender Immigrants in Canada. *The Counseling Psychologist, 46*(3), 296-323. doi:https://doi.org/10.1177/0011000018768538

Glanz, K., & Rimer, B. (1997). Theory at a glance: A guide for health promotion practice: US Dept. of Health and Human Services, Public Health Service, National Institutes of Health, National Cancer Institute.

Glanz, K., Rimer, B., & Viswanath, K. (2008). Health behavior and health education: theory, research, and practice: . *John Wiley & Sons*.

Glasgow, R., & Emmons, K. (2007). How can we increase translation of research into practice? Types of evidence needed. *Annu Rev Public Health, 28*, 413-433.

Glasgow, R., & Linnan, L. (2008). Evaluation of theory-based interventions. *Health behavior and health education: theory, research, and practice 4th ed San Francisco, CA: Jossey-Bass.*, 487-508.

Gordon, M. M. (1964). *Assimilation in American life: The role of race, religion, and national origins*: Oxford University Press on Demand.

Grace J. (2018). Why Homophobia Is More Common Among Asian Populations? *https://studybreaks.com/news-politics/homophobia/ accessed 3.20.19.*

Grol RP, B. M., Hulscher ME, Eccles MP, Wensing M, Milbank Q.,. (2007). Planning and studying improvement in patient care: the use of theoretical perspectives., *85*(1), 93-138.

Hahm, H., Lee, J., Ozonoff, A., & Amodeo, M. (2007). Predictors of STDs Among Asian and Pacific Islander Young Adults. *Perspectives on Sexual and Reproductive Health, 39*(4), 231-239.

Hahm, H., Lee, J., Rough, K., & Strathdee, S. (2012). Gender Power Control, Sexual Experiences, Safer Sex Practices, and Potential HIV Risk Behaviors Among Young Asian-American Women. *AIDS and Behavior, 16*(1), 179-188. doi:10.1007/s10461-011-9885-2

HHS. (2019). 'Ending the HIV Epidemic: A Plan for America'? *Accessed online at https://www.hiv.gov/federal-response/ending-the-hiv-epidemic/overview*.

HHS. (2022). HIV Basics, U.S. Statistics, Fast Facts. *Official webpage at https://www.hiv.gov/hiv-basics/overview/data-and-trends/statistics*.

Hickson, F., Reid, D., Weatherburn, P., Stephens, M., Nutland, W., & Boakye, P. (2008). HIV, sexual risk, and ethinicity among men in England who have sex with men. *Sexually Transmitted Infections, 80*(6), 443-450. doi:10.1136/sti.2004.010520

Hogben, M., Janet, S., Lawrence, T., Hennessy, M., & Eldridge, G. (2003). Using The Theory Of Planned Behavior To Understand The STD Risk Behaviors Of Incarcerated Women. *Sage Publications*. doi:https://doi.org/10.1177/0093854802251003

Homayoon, B., Shahidi, N. C., & Cheung, W. Y. (2013). Impact of Asian ethnicity on colorectal cancer screening: a population-based analysis. *American journal of clinical oncology, 36*(2), 167-173.

Hsu, D., & Waters, J. (2001). Filial piety and sexual prejudice in Chinese culture. *Attitude measures, 11 Paper Presented at the Annual Conference of the American Psychological Association, San Francisco, CA.*

Huang, Z. J., He, N., Nehl, E. J., Zheng, T., Smith, B. D., Zhang, J., . . . Wong, F. Y. (2012). Social network and other correlates of HIV testing: findings from male sex workers and

other MSM in Shanghai, China. *AIDS Behavior, 16*(4), 858-871. doi:doi: 10.1007/s10461-011-0119-4.

Huang, Z. J., Wong, F. Y., De Leon, J. M., & Park, R. J. (2008). Self-reported HIV testing behaviors among a sample of Southeast Asians in an urban setting in the United States. *AIDS Education and Prevention, 20*(1), 65.

Huang, Z. J., Wong, F. Y., De Leon, J. M., & Park, R. J. (2008). Self-reported HIV testing behaviors among a sample of southeast Asians in an urban setting in the United States. *AIDS Educ Prev, 20*(1), 65-77. doi:10.1521/aeap.2008.20.1.65

Human Rights Campaign. (2019). Family and Coming out Issues for Asian Pacific Americans. *https://www.hrc.org/resources/family-and-coming-out-issues-for-asian-pacific-americans accessed 4.1.19.*

Human Rights Watch. (2017). South Korea Events of 2017. *Accessed online at https://www.hrw.org/world-report/2018/country-chapters/south-korea*.

Humanity in Action USA. (2020,). Human Rights Diplomacy Amidst "World War LGBT": Re-examining Western Promotion of LGBT Rights in Light of the “Traditional Values” Discourse. *Accessed online at https://www.humanityinaction.org/knowledge_detail/human-rights-diplomacy-amidst-world-war-lgbt-re-examining-western-promotion-of-lgbt-rights-in-light-of-the-traditional-values-discourse/*.

Immigration Policy Institute. (2021). Asian Immigrants in the United States. *Official webpage https://www.migrationpolicy.org/article/asian-immigrants-united-states*.

Ivankova N V., C. J., Stick SL., . (2006). Using Mixed-Methods Sequential Explanatory Design: From Theory to Practice. *Field methods*. doi:doi:10.1177/1525822X05282260

Iwamoto, Derek, K., & Kaya, A. (2009). Asian American men and Asianized attribution: Intersections of masculinity, race, and sexuality. *Asian American Psychology: Current Perspectives*, 211-232.

Kaestle, C., & Waller, M. (2011). Bacterial STDs and Perceived Risk Among Sexual Minority Young Adults. *Perspec Sex Reprod Health*, *43*(3), 158-163. doi:10.1363/4315811

Kaiser Family Foundation. (2019a). The Global HIV/AIDS Epidemic. *Official webpage https://www.kff.org/global-health-policy/fact-sheet/the-global-hivaids-epidemic/*.

Kaiser Family Foundation. (2019b). Key Facts on Health and Health Care by Race and Ethnicity (Section 2: Health Access and Utilization). *Official webpage at https://www.kff.org/report-section/key-facts-on-health-and-health-care-by-race-and-ethnicity-section-2-health-access-and-utilization/*.

Kanuha, V. (2000). The impact of sexuality and race/ethnicity on HIV/AIDS risk among Asian and Pacific Island American (A/PIA) gay and bisexual men in Hawaii. *AIDS Education and Prevention*, *12*, 505–518.

Kim, J. E., & Zane, N. (2016). Help-seeking intentions among Asian American and White American students in psychological distress: Application of the health belief model. *Cultural Diversity and Ethnic Minority Psychology*, *22*(3), 311.

Kim, W., & Keefe, R. H. (2010). Barriers to healthcare among Asian Americans. *Social Work in Public Health*, *25*(3-4), 286-295.

Klabunde, C. N., Brown, M., Ballard-Barbash, R., White, M. C., Thompson, T., Plescia, M., & King, S. C. (2012). Cancer Screening-United States, 2010 (Reprinted from MMWR, vol 61, pg 41-45, 2012). *JAMA-JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION*, *307*(12), 1248-1250.

Kramer, S., Schmidt, A., Berg, R., Furegato, M., Hospers, H., Folch, C., & Marcus, U. (2016). Factors associated with unprotected anal sex with multiple non-steady partners in the past 12 months: results from the European Men-Who-Have-Sex-With-Men Internet Survey (EMIS 2010). *BMC Public Health, 16,* 47. doi:10.1186/s12889-016-2691-z

Kyung-Hee C. et al. (1998). HIV prevention among Asian and Pacific Islander American men who have sex with men: A critical review of theoretical models and directions for future research. *AIDS Educ Prev, 10*(3), 19-30.

Lai D. S. (1998). Self-esteem and unsafe sex in Chinese-American and Japanese-American gay men. *Unpublished doctoral dissertation, California School of Professional Psychology, Alameda.*

Lee, J. J., & Zhou, Y. (2019). Facilitators and barriers to HIV testing among Asians in the United States: a systematic review. *AIDS Care, 31*(2), 141-152. doi:10.1080/09540121.2018.1533231

Legler J, M. H., Coyne C, Breen N, Chollette V, Rimer BK,. (2002). The effectiveness of interventions to promote mammography among women with historically lower rates of screening. *Cancer Epidemiol Biomarkers Prev, 11*(1), 59–71.

Liu J. & Choi K. (2006). Experiences of social discrimination among men who have sex with men in Shanghai. China. *AIDS Behav., 10*(25–33). doi:10.1007/s10461-006-9123-5

Luu, T. D., & Bartsch, R. A. (2011). Relationship Between Acculturation and Attitudes Toward Gay Men and Lesbians in the Vietnamese American Community. *Journal of Applied Social Psychology, 41*(11), 2621-2633. doi:https://doi.org/10.1111/j.1559-1816.2011.00840.x

Ma, G. (2000). Barriers to the use of health services by Chinese Americans. *Journal of Allied Health, 29*(2), 64-70.

Marin, B., Gomez, C., & Tschann, J. (1993). Condom use among men with secondary female sexual partners. *Public Health Reports,, 108*, 742-750.

Matteson DR. (1997). Bisexual and homosexual behavior and HIV risk among Chinese-, Filipino-, and Korean-American men. *Journal of Sex Research, 34*, 93–104. doi:10.1080/00224499709551870

McLeroy KR. et al. (1988). An ecological perspective on health program programs. *Review, 15*(4), 351-377.

Meadowbrooke, C. C., Veinot, T. C., Loveluck, J., Hickok, A., & Bauermeister, J. A. (2014). Information behavior and HIV testing intentions among young men at risk for HIV/AIDS. *Journal of the Association for Information Science and Technology, 65*(3), 609-620.

Mirkuzie, A. H. (2011a). Applying the theory of planned behavior to explain HIV testing in antenatal settings in Addis Ababa - a cohort study. *BMC Health Serv Res, 11*, 196. doi:https://doi.org/10.1186/1472-6963-11-196

Mirkuzie, A. H. (2011b). Applying the theory of planned behaviour to explain HIV testing in antenatal settings in Addis Ababa - a cohort study. *BMC Health Serv Res, 11*, 196. doi:10.1186/1472-6963-11-196

Morrison, M. A., & Morrison, T. G. (2003). Development and validation of a scale measuring modern prejudice toward gay men and lesbian women. *Journal of Homosexuality, 43*(2), 15-37.

Mulholland, E., & Van Wersch, A. (2007). Stigma, sexually transmitted infections and attendance at the GUM Clinic: an exploratory study with implications for the theory of planned behaviour. *Journal of Health Psychology, 12*(1), 17-31.

Nemoto, T., Wong, F., Ching, A., Chng, C. L., Bouey, P., Henrickson, M., & Sember, R. (1998). HIV seroprevalence, risk behaviors, and cognitive factors among Asian and Pacific Islander American men who have sex with men: a summary and critique of empirical studies and methodological issues. *AIDS education and prevention: official publication of the International Society for AIDS Education, 10*(3 Suppl), 31-47.

Noar SM, B. C., Harris MS,. (2007). Does tailoring matter? Meta-analytic review of tailored print health behavior change interventions. *Psychol Bull, 133*(4), 673-693.

Noble, M., Jones, A. M., Bowles, K., DiNenno, E. A., & Tregear, S. J. (2017). HIV testing among internet-using MSM in the United States: systematic review. *AIDS and Behavior, 21*(2), 561-575.

Palaniappan, L., Araneta, M., Assimes, T., Barrett-Connor, E., Carnethon, M., & Criqui, M. (2010). Call to action: cardiovascular disease in Asian Americans: a science advisory from the American Heart Association. . *Circulation, 122*(12), 1242-1252. doi:10.1161/CIR.0b013e3181f22af4

Pendse, R., Gupta, S., Yu, D., & Sarkar, S. (2016). HIV/AIDS in the South-East Asia region: progress and challenges. *Journal of virus eradication, 2*(Suppl 4), 1.

Pew Research Center. (2015). Modern Immigration Wave Brings 59 Million to U.S., Driving Population Growth and Change Through 2065: Views of Immigration's Impact on U.S. Society Mixed. *Official webpage*

https://www.pewresearch.org/hispanic/2015/09/28/modern-immigration-wave-brings-59-million-to-u-s-driving-population-growth-and-change-through-2065/.

Pew Research Center. (2017a). Facts on U.S. Immigrants: *Statistical portrait of the foreign-born population in the United States*. *Official webpage* *https://www.pewresearch.org/hispanic/2019/06/03/facts-on-u-s-immigrants/*.

Pew Research Center. (2017b). Key facts about Asian Americans, a diverse and growing population. *Official webpage: https://www.pewresearch.org/fact-tank/2017/09/08/key-facts-about-asian-americans/*.

Pew Research Center. (2021). *Key facts about Asian Americans, a diverse and growing population*. Retrieved from https://www.pewresearch.org/short-reads/2021/04/29/key-facts-about-asian-americans/:

Population Council. (1999). Literature Review: Challenging HIV-Related Stigma and Discrimination in Southeast Asia: Past Successes and Future Priorities. *Accessed online at https://pdfs.semanticscholar.org/b285/8e02447799321164c61eadeace54b02c7235.pdf*.

Population Council. (2019). Key Populations at Risk for HIV. *Accessed online at https://www.popcouncil.org/research/key-populations-at-risk-for-hiv*.

Portal, M. D. (2019). Migration and Health. *Accessed online at https://migrationdataportal.org/themes/migration-and-health*.

Ratti, R., Bakeman, R., & Peterson, J. (2000). Correlates of high-risk sexual behavior among Canadian men of South Asian and European origin who have sex with men. *AIDS Care, 12*, 193–202. doi:10.1080/09540120050001878

Ross M. (2018). Homophobia among Asian Americans and HIV testing. *Expert opinion via personal conversation Dated Jul 12, 2018*.

Sabatier R. (1996). Migrants and AIDS: Themes of vulnerability and resistance. In M.Haour-Knipe, & R. Rector (Eds). Crossing borders: Migration, ethnicity and AIDS. *London: Taylor & Francis*, 86-101.

Safari M, S.-Z. D., Ghofranipour F, Heydarnia A, Pakpur A.,. (2012). Theories, models and methods of health education and health promotion. 2 ed. Tehran: Asaresobhan.

Salazar, L. F., Crosby, R. A., & DiClemente, R. J. (2015). *Research methods in health promotion*: John Wiley & Sons.

Salud, M. C., Marshak, H. H., Natto, Z. S., & Montgomery, S. (2014). Exploring HIV-testing intentions in young Asian/Pacific Islander (API) women as it relates to acculturation, theory of gender and power (TGP), and the AIDS risk reduction model (ARRM). *AIDS Care, 26*(5), 642-647. doi:10.1080/09540121.2013.841836

Schwartz, S. J., Unger, J. B., Zamboanga, B. L., & Szapocznik, J. (2010). Rethinking the concept of acculturation: implications for theory and research. *American Psychologist, 65*(4), 237.

Sen, S., Nguyen, H. D., Kim, S. Y., & Aguilar, J. (2017). HIV knowledge, risk behavior, stigma, and their impact on HIV testing among Asian American and Pacific Islanders: a review of literature. *Social Work in Public Health, 32*(1), 11-29.

Shapiro, J., & Vives, G. (1999). Demographic and attitudinal variables related to high-risk behaviors in Asian males who have sex with other men. *AIDS Patient Care and STDs, 13*, 667–675. doi:10.1089/apc.1999.13.667

Sim, M. (2014). A Review of Homosexuality in China: Urban Attitudes toward Homosexuality In Light Of Channges age in the One-Child Policy. *http://works.bepress.com/melissa_sim/1/*.

Singer, E. J., & Thames, A. D. (2016). Neurobehavioral manifestations of human immunodeficiency Virus/AIDS: diagnosis and treatment. *Neurologic clinics, 34*(1), 33-53.

Stapleton, S. M., Oseni, T. O., Bababekov, Y. J., Hung, Y.-C., & Chang, D. C. (2018). Race/ethnicity and age distribution of breast cancer diagnosis in the United States. *JAMA surgery, 153*(6), 594-595.

Stephenson, R., White, D., Darbes, L., Hoff, C., & Sullivan, P. (2015). HIV testing behaviors and perceptions of risk of HIV infection among MSM with main partners. *AIDS and Behavior, 19*(3), 553-560.

Sue, S., Cheng, J. K. Y., Saad, C. S., & Chu, J. P. (2012). Asian American mental health: A call to action. *American Psychologist, 67*(7), 532.

Sychareun, V., Thomsen, S., Chaleunvong, K., & Faxelid, E. (2013). Risk perceptions of STIs/HIV and sexual risk behaviours among sexually experienced adolescents in the Northern part of Lao PDR. *BMC Public Health, 13*, 1126. doi:10.1186/1471-2458-13-1126

Takaki, R. (1989). Strangers from a different shore: A history ofAsian Americans. *Boston: Little, Brown.*

The White House. (2014). Ten Reasons to Address HIV/AIDS in Asian American and Pacific Islander Communities. *Accessed online at https://obamawhitehouse.archives.gov/blog/2014/05/19/ten-reasons-address-hivaids-asian-american-and-pacific-islander-communities*.

UNAIDS. (2015). Rights, Roles and Responsibilities of Men in Fast-trackinng the end of AIDS. *Accessed online at http://menengage.org/wp-content/uploads/2016/08/UNAIDS-Discussion-Paper-on-Men-and-HIV-for-HLM-Decembe-2015.pdf*.

UNAIDS. (2019). Core Epidemiology Slides: AIDSinfo (slide #6). *Official webpage at https://www.unaids.org/en/resources/documents/2019/core-epidemiology-slides*.

US Census Bureau. (2017). Asian alone or in any combination by selected groups. *2017 American Community Survey 1-Year Estimates. Official webpage: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk*.

US Census Bureau. (2023). *Asian American, Native Hawaiian and Pacific Islander Heritage Month: May 2023*. https://www.census.gov/newsroom/facts-for-features/2023/asian-american-pacific-islander.html

USAIDS. (2019). Being LGBT in Asia. *Accessed online at https://www.usaid.gov/asia-regional/being-lgbt-asia*.

Van Griensven, F., & Van Wijngaarden, J. (2010). A review of the epidemiology of HIV infection and prevention responses among MSM in Asia. *AIDS 24*(Suppl 3), s30-s40.

Vlassoff, C., & Ali, F. (2011). HIV-related stigma among South Asians in Toronto. *Ethnicity & health, 16*(1), 25-42.

Vu, M., Bednarczyk, R. A., Escoffery, C., Ta, D., Huynh, V. N., & Berg, C. J. (2022). U.S. Vietnamese parents' HPV vaccine decision-making for their adolescents: an exploration of practice-, provider-, and patient-level influences. *J Behav Med, 45*(2), 197-210. doi:10.1007/s10865-021-00265-3

Vu, M., Escoffery, C., Srivanjarean, Y., Do, E., & Berg, C. J. (2019). Acculturation and Exposure to Secondhand Smoke in the Home Among Vietnamese Immigrants in Metropolitan Atlanta. *Journal of immigrant and minority health*, 1-8.

Vu, M., Huynh, V. N., Berg, C. J., Allen, C. G., Nguyen, P. H., Tran, N. A., . . . Escoffery, C. (2021). Hepatitis B Testing Among Vietnamese in Metropolitan Atlanta: The Role of Healthcare-Related and Acculturation-Related Factors. *J Community Health, 46*(4), 767-776. doi:10.1007/s10900-020-00947-0

Wei, C., Cheung, D., Yan, H., Li, J., Shi, L., & Raymond, H. (2016). The Impact of Homophobia and HIV Stigma on HIV Testing Uptake among Chinese Men Who Have Sex with Men: A Mediation Analysis. *Journal Acquiried Immune Deficiency Syndrom, 71*(1), 87-93. doi:10.1097/QAI.0000000000000815

WHO. (2019). HIV/AIDS Key Facts. *https://www.who.int/news-room/fact-sheets/detail/hiv-aids accessed 3.28.19.*

WHO. (2016). Sexually transmitted infections (STIs): World Health Organization. *Available from: http://www.who.int/mediacentre/factsheets/fs110/en/. Cited 2 /15/2019*

Wilson, P. A., & Yoshikawa, H. (2004). Experiences of and responses to social discrimination among Asian and Pacific Islander gay men: Their relationship to HIV risk. *AIDS Education and Prevention, 16*(1: Special issue), 68-83.

Wong, F., Chng, C., Ross, M., & Mayer, K. (1998). Sexualities as social roles among Asian and Pacific Islander gay, bisexual, lesbian, and transgender individuals: Implications for community-based education and prevention. *Journal of Gay and Lesbian Medical Association, 2*, 157-166.

World Population Review. (2019). Asian Population 2019. *Official webpage at* *http://worldpopulationreview.com/states/asian-population/*.

Xia, Y., Do, K., & Xia, X. (2013). The Adjustment of Asian American Families to the U.S. Context: The Ecology of Strengths and Stress. *Digital Commons at University of Nebraska - Lincoln, Access online at* *https://digitalcommons.unl.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1082&context=famconfacpub*.

Ye, J., Mack, D., Fry-Johnson, Y., & Parker, K. (2012). Health care access and utilization among US-born and foreign-born Asian Americans. *Journal of immigrant and minority health, 14*(5), 731-737.

Yoshikawa, H., Alan-David Wilson, P., Chae, D. H., & Cheng, J.-F. (2004). Do family and friendship networks protect against the influence of discrimination on mental health and HIV risk among Asian and Pacific Islander gay men? *AIDS Education and Prevention, 16*(1: Special issue), 84-100.

Yoshioka, M. R., & Schustack, A. (2001). Disclosure of HIV status: cultural issues of Asian patients. *AIDS Patient Care and STDs, 15*(2), 77-82.

Zaidi, I. F., Crepaz, N., Song, R., Wan, C. K., Lin, L. S., Hu, D. J., & Sy, F. S. (2005). Epidemiology of HIV/AIDS among asians and pacific islanders in the United States. *AIDS Education & Prevention, 17*(5), 405-417.

Zhou, Y., Coleman, W., Huang, Y., Sinding, C., & Wei, W. (2017). Exploring the intersections of transnationalism, sexuality and HIV risk. *Culture, Health and Sexuality, 19*(6), 645-652. doi:https://doi.org/10.1080/13691058.2017.1300327

CHAPTER 2:

Psychometric Properties of the Modern Homonegativity Scale among a sample of Asian Americans

Abstract

Homonegativity refers to prejudice towards same sex relationships. We examined the psychometric properties of the 12-item Modern Homonegativity scale (internal consistency reliability, construct validity), exploratory factor analysis, and factors associated with homonegativity. The study used survey data from 198 Asian Americans in 2019 (mean age = 34, SD = 14). The scale demonstrated good reliability (ordinal alpha = 0.93) and satisfactory model fits for a 4-factor construct (RMSEA = 0.19, CFI = 0.97, TLI = 0.9, SRMR = 0.07). The construct validity showed that greater homonegativity associates with lower levels of acculturation, social norms about HIV testing, and less years in immigration. Overall, the Modern Homonegativity scale was found to be a reliable and valid measure to assess prejudice towards Asian American gay men. Future efforts to validate the scale among Asian Americans should consider investigating these properties among a more diverse sample with regards to geographies and sub-cultures.

Keywords: Asian Americans, exploratory factor analysis (EFA), psychometric properties, homonegativity and homophobia

Introduction

Homonegativity is an important yet understudied psychological construct in social science research. It is defined as any negative perceptions, prejudicial attitude, or discriminatory behavior directed toward same sex behaviors (Fiorentino et al., 2021; Todd G. Morrison, McLeod, Morrison, Anderson, & O'Connor, 1997). It is conceptually rooted in the connotation of homophobia that implies unfavorable cognitive impressions, expressions, such as fear, negative thoughts and beliefs, toward same sex relationships (Lottes & Grollman, 2010; Renzetti & Edleson, 2008; Ventriglio, Castaldelli-Maia, Torales, De Berardis, & Bhugra, 2021).

Research about opposition to homosexuals or negative attitudes toward same sex relationships has documented the use of different terms, such as homophobia, heterosexism, homonegativity, heteronormativity, and sexual prejudice. In the past few decades, studies have focused on investigating and understanding the most used concepts: homophobia and homonegativity. Distinctions of these two terms and their use are difficult to separate as there has been no general consensus about the nature and the number of dimensions to exclusively split the two (Lottes & Grollman, 2010). A study by Negy & Eisenman (2005) attempted to explore differences between these two concepts and suggested that "they likely overlap so much that it is difficult to separate them", while acknowledging the likelihood of their distinction in construct conceptualization but not in the operationalization (Negy & Eisenman, 2005).

Research has pointed to important relationships between homonegativity and psychological strain. It has been found that homonegativity is positively correlated with minority stress among gay men (Flood, McLaughlin, & Prentice, 2013), posttraumatic stress disorder symptoms among heterosexual and homosexual men (Robinson & Rubin, 2016), psychological distress among heterosexual college students (Romero, 2011) across male and female gender

groups (Romero, Morera, & Wiebe, 2015), and leads to distrust towards the health care system among populations of color (Hsueh, Layland, Kipke, & Bray, 2021). Furthermore, research has shown that homonegativity could have implications for the overall psychological wellbeing of gay men (Morandini, Blaszczynski, Ross, Costa, & Dar-Nimrod, 2015). Homonegativity, when internalized, has been found to negatively associated with access to HIV testing among lesbian, gay and bisexual persons (Rigmor C. Berg, Munthe-Kaas, & Ross, 2016). Among Asian American communities, homonegativity has gained increasing attention in health research and its impact on mental health considering the pervasive prejudice towards homosexuality in this population group (Ju, 2022; Szymanski & Gupta, 2009).

Foundational research around the measurement of homonegativity has existed for over 40 years when Hudson et al. (1980) developed the Index of Attitudes Toward Homosexuals (IAH, formerly known as the Index of Homophobia) (Hudson & Ricketts, 1980). Herek et al. (1988) then assessed prejudice based on religious and moral objections, or commonly referred to as a traditional measure of antigay prejudice, called the Attitudes Toward Lesbians and Gay Men Scale–Revised (ATLG-R) (Gregory M Herek, 1988). Morrison and colleagues (2002) revived the concept and introduced a "modern" form to measure homonegativity towards gay men - Modern Homonegativity Scale-Gay (MHS-G). The authors developed their scale to include contemporary concerns such as one's view on the ways gay people express the importance of their sexual orientation (M. A. Morrison & Morrison, 2002). Since the social construction of attitudes and norms can change over time, a new approach to the measurement of these constructs, such as MHS-G, appeared to be appropriate. Results of numerous studies since have suggested that the MHS-G is a reliable and valid scale to measure antigay prejudice and has been

widely used in the fields of psychology and health (Gavlas, 2018; Grey, Robinson, Coleman, & Bockting, 2013; Romero et al., 2015).

Many Asian American older adults, including the population of first-generation Asian immigrants in the United States, embody cultural beliefs that often consider homosexuality unacceptable (Shiu et al., 2016; Szymanski & Gupta, 2009). In a recent study, it was found that immigration generation (foreign born or U.S. born immigrants), intergeneration acculturation (acculturation differences incurred between generations over time among immigrants and their families), and religion associate with the views of Asian Americans towards homosexuality and their degree of homonegativity (Ju, 2022). Considering the association between homonegativity and well-being and mental health of minority groups, including Asian Americans, and the lack of a validated homonegativity scale for this population, a valid measure of homonegativity among Asian Americans would be instrumental for future health research (Rigmor C. Berg et al., 2016; Flood et al., 2013; Hsueh et al., 2021; Ju, 2022; Morandini et al., 2015; Robinson & Rubin, 2016; Romero, 2011).

This study focuses on validating the MHS-G, a 12-item self-reported scale that assesses prejudice towards gay men, including affective behaviors, feelings, and attitudes among general population (M. A. Morrison & Morrison, 2002). With this scale, the authors laid the groundwork for conceptualizing an updated form of homonegativity, understanding its construct structure, as well as validated the unidimensional composition of the MHS-G scale. Morrison and Morrison (2002) had initially proposed the examination of a version which was comprised of 50 items derived from their formative work among U.S. college students (M. A. Morrison & Morrison, 2002). Later, they conducted four separate studies to validate and examine the psychometric properties of a shortened version of the original 50 item scale (Melanie A Morrison & Morrison,

2013). The first study suggested that the length of this 50-item scale was considered prohibitive to its widespread use in social science research, hence, the authors shortened the scale to 25 items using the criteria described by Benson & Vincent (1980) (Benson & Vincent, 1980; Melanie A Morrison & Morrison, 2013). Following that, a principal component analysis was performed to further reduce the scale items, and to study the scale component structure and its factor loadings. Results from this study indicated a 13-item, one-component solution scale could be used (Melanie A Morrison & Morrison, 2013). In the final study, assessments of dimensionality using maximum likelihood factor analyses triggered the removal of an additional item that showed trivial values. Results from the study led to the adoption of the current 12-item Modern Homonegativity Scale (MHS) scale with its parallel forms; MHS-G for gay men and MHS-L for lesbians. The MHS-G operationalizes prejudice as negative attitudes towards male homosexuality. This scale consists of variables measuring people's reactions to certain behaviors of gay men or their rights in the society. Examples of MHS items include "*Gay men should stop shoving their lifestyle down other people's throats*", "*Gay men have become far too confrontational in their demand for equal rights*", "*gay men still need to protest for equal rights*" and "*gay men have become far too confrontational in their demand for equal rights*" (Melanie A Morrison & Morrison, 2013).

Studies on the psychometric properties of this scale have been conducted in different populations and geographical areas. Studies have consistently determined that MHS is a reliable scale to measure prejudice towards gayness, yet have offered varied findings regarding its factor structure and construct validity. For instance, a study by Romero et al. (2015) found that the MHS showed invariance in factor structure (one-factor solution) and factor loadings when validated among a mixed sample of male and female heterosexuals and homosexuals (Romero,

2011). In contrast, a study by Gavlas (2018) among a sample from the general population in 14 Southern U.S. states revealed a two-factor solution MHS (*8-item factor one refers to 'abusive antigay behavior' and 4-item factor two referring to 'gay rights'*) (Gavlas, 2018). Outside of the U.S., the MHS has been found to hold similar psychometric properties as in its original validation studies. A study in Ireland among heterosexual university students suggested that the MHS retained its unidimensionality and was positively correlated with racism, patriotism, nationalism, religious fundamentalism, social dominance, and perceived political conservatism (Todd G Morrison, Kenny, & Harrington, 2005). In Poland, Gorska et al. (2017) found that the general MHS (generic language towards same sex people) demonstrated a 2-factor solution when tested in a sample of heterosexual university male and female students. Also, when the scale was further adapted to indicate homonegativity towards gay and lesbians separately, the properties remained unchanged (Górska, Bilewicz, Winiewski, & Waszkiewicz, 2017). When studied among a sample of Canadian and American university students, the scale retained its full invariances (Melanie A Morrison, Morrison, & Franklin, 2009). Overall, the scale has been found to be more advantageous than two other commonly used homonegativity measures (Rye & Meaney, 2010), namely the Index of Homophobia (Ricketts & Hudson, 1980) and Attitudes Towards Lesbians and Gay Men (Herek & McLemore, 1998).

Homonegativity plays a strong role in health and HIV research, especially considering its impact and relationships towards health behaviors of certain sexual minority groups, such as homosexuals and racial and ethnic minority populations (i.e., Hispanic, Black, and Asian) living in the U.S. (Goldenberg, Stephenson, & Bauermeister, 2018; Ju, 2022; Mizuno et al., 2012; Shoptaw et al., 2009). Though the MSH-G scale has been validated in other ethnic groups (Romero et al., 2015; Michael W Ross et al., 2013; Shoptaw et al., 2009), it has not been

validated among Asian Americans and Asian immigrants in the U.S., a population where cultural norms of disapproval towards homosexuality may potentially yield differences in the scale's performance (Ju, 2022).

The purpose of this study is to examine the MHS-G's reliability, construct validity, construct structure (exploratory factor analysis), and factors associated with homonegativity among the population of Asian Americans and expand our understanding of its potential use in immigrant Asians.

Methods

We conducted an online, cross-sectional survey study from October to December 2018 with an initial group of 245 participants self-identifying as Asian American adults living in the state of Georgia. Among them, 227 consented to participate in the study. However, there were 29 consented entries that were left blank for the remainder of the survey, giving us 198 complete responses for the outcome variable - homonegativity. Response rates ranged from 145 (64%) to 191 (84%) for sociodemographic variables, 198 (87%) for the study variable (homonegativity) and 193 (85%) for all other covariates. We partnered with the Center for Pan Asian Community Services (CPACS) for recruitment. The study was promoted at an onsite health fair event hosted by CPACS in Atlanta, GA as well as via their email list. Community members who attended the CPACS' event were introduced to the study by trained research assistants who were present at exhibition booths. Participant eligibilities included: 1) self-identified as Asian American; 2) 18 years old and above; and 3) have lived in the U.S. for at least 6 months. Participants were advised that their participation in the study would help promote the health of Asian Americans and did not receive any monetary compensation. Potential participants were provided with a paper-based consent form and provided oral consent before participating in the survey. We were

able to collect 98 completed surveys from this one-day event. In addition to this event-based recruitment, via CPACS' email list, we sent the online version of the survey to other community members who were either affiliated with CPACS or were affiliated with the organization's community network. This method yielded an additional 147 survey entries, of which 100 provided consent and completed the survey.

For the online version of the survey, participants were provided with a link leading them to the survey's webpage, hosted by Qualtrics, a data management software for online surveys. At the landing page, they read information about the study and consented. Both paper-based and online surveys took approximately 20 minutes to complete. The paper-based survey was available in five languages: English, Vietnamese, Chinese, Korean, and Nepali. Foreign versions of the original survey questionnaire in English were initially developed and back translated by certified translators at CPACS, and later tested for face validity and interpretability by a group of volunteers at CPACS. The translation and back translation procedures had been detailed in the study protocol that was reviewed and approved by the Emory University's IRB Committee prior to the study. Translators volunteered their time and did not receive incentives. To avoid duplicate online responses, we allowed one response per IP address. The online survey, however, was available in English only.

Study Measures

Homonegativity Scale

The main construct of this study is the Modern Homonegativity scale (M. A. Morrison & Morrison, 2002), which comprises 12 items referring to various opinions toward gay men, for example, '*Gay men should stop shoving their lifestyle down other people's throats*' or *'Gay men still need to protest for equal rights*' (see Appendix for the full set of scale items). Responses to

each statement were on a Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Three of the 12 items were reverse coded in data analysis. Response to all items were summed (scores ranging from 12 to 60), with higher scores reflecting holding greater homonegativity.

Factors associated with Homonegativity

In this study, we also included scales or items to measure acculturation, gender role beliefs, social norm about HIV testing, length of time living in the U.S., and age as hypothesized factors associated with homonegativity.

For acculturation, we leveraged the Abbreviated Multidimensional Acculturation Scale (AMAS) which has 20 items, covering five domains of cultural identify (2 sub-domains: American and the culture of origin), social connection, political awareness, and historical influence with each domain containing four statements. The scale showed good internal consistency reliability (Cronbach's alpha = 0.9) (Zea MC. et al., 2003). Responses to each statement were on a Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Response to all items from all five domains were summed (scores ranging from 20 to 100), with higher scores reflecting higher acculturation.

The Short Gender Role Beliefs Scale purported the differentiation of gender role ideology and gender stereotypes (Brown & Gladstone, 2012). This is a 10-item scale which covers statements referring to '*prescriptive beliefs about gender roles*' as well as '*descriptive beliefs about gender characteristics and differences*'. The scale's internal consistency showed a high level of reliability (Cronbach's alpha = 0.83) (Brown & Gladstone, 2012). Responses to each statement were on a Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Responses to all items were summed (scores ranging from 10 to 50), with higher scores reflecting holding greater belief in gender differences and the dominance of male gender.

Social norm about HIV testing was measured via a single question '*Most people you know have been tested for HIV*'. Response to the statement were on a Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The higher the score, the greater the norm towards HIV testing.

Length in immigration, which was measured via a single question, "*If you were born outside of the United States, how long have you been living in the United States*?", and age were measured in self-reported discrete numbers ranging from 0 to 99 reflecting the years.

Statistical Analysis

We used SAS 9.4, SAS Enterprise 8.3, and Mplus 8.3 analytic software packages for all analyses. We organized our analytical strategies into different phases. First, all social demographic and other participant characteristics were summarized using descriptive analysis. Using the guidelines for data screening by Tabachnick et al. (2007), we performed initial descriptive analyses and inspected univariate statistics for accuracy of input, and to identify possible out of range values, or univariate outliers for all variables (Tabachnick, Fidell, & Ullman, 2007).

We employed two strategies for psychometric evaluation. First, we assessed the reliability (internal consistency) of the MHS-G scale. Given certain limitations of Cronbach's alpha in estimating correlations involving ordinal items – typically presented in the form of a Likert scale - we used polychoric correlations (Gadermann, Guhn, & Zumbo, 2012). Second, we performed polychoric correlation analysis between homonegativity and selected measures that were hypothesized to correlate with homonegativity (acculturation, gender role beliefs, social norm about HIV testing, and immigration length) to explore construct validity of the homonegativity scale. We hypothesized that lower levels of acculturation, social norm about

HIV testing, stronger beliefs of male dominance, and less years in immigration would correlate with higher level of homonegativity.

Next, using exploratory factor analysis approach (EFA), we examined whether a new factor structure existed within this study sample with Eigenvalues. A general criterium for retaining a factor in the solution was an Eigenvalue greater than one. Eigenvalue in the scree plot produced from the EFA analysis showed a flattened curve ending at a certain point (horizontal axis) and corresponding to approximately a certain point (vertical axis) with the crossover between the two axes indicating the number of factor(s) a model should be retained using the data in scope.

We then assessed the measurement invariances and performed estimation analyses and model fit selection procedures, as outlined by Hancock et al. (Hancock, Mueller, & Stapleton, 2019). Specifically, we 1) specified the model by indicating relationships of the latent/unobserved factor (homonegativity) and the 12 measured or observed variables; 2) estimated the parameters, which were expressed as covariance estimates of the 12 specified measured variables; 3) utilized diagonally weighted least squares (WLSMV), a technique commonly recommended for use with ordinal data (Li, 2016), estimated the unknown model's parameters (errors); 4) assessed the model's fit by examining a set of fit indices as suggested by experts in the field (Cangur & Ercan, 2015); and 5) assessed model fit indices (at least 3) to determine if the model had a good fit to the observed data. We started with exploring the model with one-factor solution as it had been originally validated by the author of the scale (M. A. Morrison & Morrison, 2002). Because initial results showed unsatisfactory fit indices, we reexamined the model specifications strategies, considering the scale's properties based upon existing literature throughout. Following this approach, we opted to modify our model to allow

for more than a one factor solution using Eigenvalues with value of 1 being the threshold for evaluation of possible number of factor solutions. Fit modification indices were used in guiding our effort to improve model fits and to select our final model.

Finally, we performed a theory-informed multivariable linear regression to examine relationships between the hypothesized associating factors (acculturation, gender role beliefs, social norm about HIV testing, length in immigration, and age) and homonegativity. To do this, we initially conducted various simple linear regressions to examine bivariate relationships of each of the factors and homonegativity. Variables with statistically significant standardized coefficient estimates from bivariate analyses were entered into the final multivariable linear regression model. The alpha level was set at 0.05 for all analyses.

Results

Sample Characteristics

Among the final study sample (N=198), more than two thirds were female (73.5%) with a mean overall age of 34 years (SD=14), and 90% from East and Southeast Asian regions. Nearly 83% of respondents were heterosexual, and 13.1% were homosexual, bisexual, or asexual. One fourth of the sample had received at least some high school education (24.6%), with similar proportions for those with some college training, bachelor's degree holders, or post graduate trainees (23.5%, 22.4%, and 22.9%, respectively). Almost half of the participants were married (47.2%), and 43.7% had a full-time job. One fifth of the sample had an average household income that ranged from $20,000 to $29,999 annually. The homonegativity measure's score had a mean of 30.1 with a range of 12 to 60 (Table 1).

We observed some missing in the data out of the 227 consented participants. However, there were 29 consented entries that were left blank for the remainder of the survey, giving us

198 complete responses for the target variable - homonegativity. Response rates ranged from 145 (64%) to 191 (84%) for sociodemographic variables, 198 (87%) for the study variable (homonegativity) and 193 (85%) for all other covariates. We performed missingness assessment on important covariates that we had intended to include in our bivariate and multivariable analyses, evaluated the missingness patterns, and found the missing was at random (Dong & Peng, 2013). Given the 5 (2.5%) responses missing across covariates salient to major analyses, we decided to pursue listwise deletion analyses for this study.

Psychometric Evaluation of the MHS

Internal Consistency

This is one of our two psychometric evaluation strategies. Overall, the MHS-G demonstrated good internal consistency using polychoric correlation analysis for paired correlations (Table 2), and strong overall correlation (ordinal alpha = 0.93) with the threshold of 0.7 and above being good levels (Taber, 2018) . Except for the relationships between items 2 and 3, all other individual items included in this scale were significantly correlated with each other, as shown in the table. When examining correlations of different items within each sub-domain, we observed similar results (Table 2b, Appendix 2). Combined results suggested that the overall MHS-G scale has good internal consistency as well as its sub-scales.

Construct Validity

As our second psychometric evaluation strategy, we performed polychoric correlation analysis to examine our hypothesis that homonegativity would be significantly correlated with acculturation, gender role beliefs, social norm about HIV testing, and length in immigration. Results suggested that the MHS was negatively correlated with acculturation ($r=-0.48$, $p<0.05$), implying that people with higher degree of acculturation would have less negative prejudice

toward gay men. The scale was found to be positively correlated with gender role beliefs, and this could be understood that people with stronger beliefs about male dominance would express stronger homonegativity ($r = 0.54$, $p < 0.05$). Our findings suggested that among a sample of Asian American population, the MHS-G was negatively correlated with both social norm about HIV testing and length in immigration ($r = -0.19$ and -0.29, respectively, $p < 0.05$), suggesting that seeing more people get tested for HIV and/or having longer time living in the U.S. would associate with lower level of homonegativity towards gay men. When examining the correlations of these factors and the four MHS-G sub-domains, we found very similar results, indicating almost the same strength of relationships in similar directions, except for the correlations between the sub-domains with length in immigration (variance in coefficients and insignificant p-values). All together this offered preliminary evidence for the scale's construct validity, as seen in Table 3.

Factor Analysis

We conducted an EFA to determine whether a new factor structure existed within this study sample. A general criterium for retaining a factor in the solution was an Eigenvalue greater than one; Eigenvalue in the scree plot produced from the EFA analysis showed a flattened curve ending at point 4 (horizontal axis) and corresponding to approximately point 1.5 (vertical axis), indicating that a 4-factor model should be retained for this model.

The EFA analysis suggested the 4-factor solution model presented good fit indices (Chi square p-value <0.01, RMSEA = 0.19, CFI = 0.97, TLI = 0.90, SRMR = 0.07). The model fit indices had most of estimates within the range of recommended parameters (Table 4). Standard thresholds to determine good model fit were referenced from recommended guidelines (Cangur

& Ercan, 2015), proposing that Chi-square p-value measuring absolute model fit should be > 0.5, RMSEA < 0.08, CFI/TLI > 0.9, and SRMR < 0.07.

Factor loadings were all above 0.66, except for Item 1. Items 10 and 11 had factor loadings greater than 1 and were reported since the model had no negative residual variances. In examining the factor loading matrix, we found no patterns indicating potential cross loading. Item 1 could be removed due to the low factor loading (β= 0.17) compared to other items in the same sub-construct, implying no to little value to the entire model. Results from the CFA final model suggested that the MHS-G, when tested among a sample of Asian Americans, has a 4-factor solution with 11 items (three factors with 3 items and one factor with 2 items).

Combined results suggested that the MHS-G, when tested in this population, has four sub-domains but these domains are highly correlated so they can function as a unified scale. In reviewing each sub-domain and its items, we proposed to label the first 3-item domain as "*Individual-related Homonegativity*" because they referred to the ways individual gay men express themselves, the second 4-item domain as "*Social-related Homonegativity*" since they stressed aspects of social movements related to gay men, the third 2-item domain as "*Admiration*" since they implied one's admiration for openly gay men, and the final 2-item domain to be called "*Policy*" as they pertain to social regulations towards tax spending and equal rights related to gay men.

Factors associated with the MHS scale

Based on results of the bivariate analysis where all proposed covariates (acculturation, gender role beliefs, social norm about HIV testing, length in immigration, age) were found to be significantly associated with homonegativity (βs = -.48, 0.54, -0.19, -0.29, and 0.41, respectively,

p<0.001), multiple linear regression was used to examine associations between these covariates and the overall MHS-G.

The model accounted for 53% of the total variance in explaining homonegativity with acculturation, gender norms, social norms about HIV testing, length in immigration, and age as covariates (R^2 = .53, p<0.001) (Table 5). Results suggested that gender role beliefs, length in immigration and age were significantly associated with homonegativity when controlling for all other variables included in the model (βs = .48, -.27, .26, respectively). Acculturation and social norm about HIV testing were not significantly associated with homonegativity.

Discussion

In this study sample of Asian Americans, the MHS-G showed good overall internal consistency, which aligned with findings from the study of the original scale (M. A. Morrison & Morrison, 2002) as well as among other populations in the U.S. and internationally (Gavlas, 2018; Lima, Tenório, Romário, Melo, & Andrade, 2019; Todd G Morrison et al., 2005; Romero, 2011). Regarding the validity of the scale, the results of our study suggest that MHS-G, originally developed and validated in other populations, is a psychometrically strong measure of negative attitude towards homosexuality in the population of Asian Americans. Key findings from our study indicate that the MHS-G scale, when operationalized among Asian Americans, has a four-factor structure, as opposed to the unidimensionality of the scale when validated in non-Asian American populations, and is a valid construct.

Even though our study did not support the single factor structure originally noted by Morrison and colleagues (M. A. Morrison & Morrison, 2002), the four-factor model demonstrates a good fit to the data. In this study, we found that two of the factors have only two items. Ideally, we would like sub-domains to have three items at the minimum, unless the items

are highly correlated with each other and are weakly correlated to other variables (Tabachnick et al., 2007). Those in this study satisfied the criteria and were therefore retained in all analyses.

Existing literature in the field of psychometric validation has pointed to several considerations when a psychometric measures' properties are found to vary in studies of different populations, bearing diverse cultural and social beliefs and practices. For example, several studies have found that they could not reproduce the same factorial structure as the original scale when adapted to populations of different cultures and ethnicities (Lima et al., 2019; Miyazaki, Bodenhorn, Zalaquett, & Ng, 2008; Schulz, Kroencke, Ewers, Schulz, & Younossi, 2008). The variance in the model factors of the MHS-G, therefore, warrants further investigations among Asian Americans. Given significant cultural and behavioral heterogeneity in the diverse Asian American population included in this study, future studies may benefit from focusing on a single ethnic group or a region of Asia of rather homogenous ethnicity, for example segmenting South Asian (Indian and Pakistan), or East Asian (Korean, Japanese), or Southeast Asian (Vietnam, Laos, The Philippines, Burma, etc.) rather than examining the largely mixed Asian American population.

With respect to construct validity, the homonegativity scale was significantly correlated with acculturation, gender role beliefs, social norm about HV testing, and length in immigration as initially hypothesized. These findings are supported by previous studies examining relationships between acculturation and risk enhancer of self-esteem in the context of internalized homonegativity among Latinx migrants to the U.S. (Anhalt, Toomey, & Shramko, 2020), and acculturation and homonegativity among Asian American MSM (Chng et al., 2003b), and gender role beliefs and homonegativity among a population of college-aged Americans (Miller & Lewallen, 2015). In multivariable models, gender role beliefs, length in immigration

and age were found to be associated with homonegativity among Asian Americans. This finding is supported by a study by Chng et al. (2003) where they proposed a model for understanding factors influencing sexual risks among Asian American MSM, which suggested that immigration history and gender norms are possible drivers of homonegativity (Chng et al., 2003b). Combined findings from our bivariate and multivariate analyses contribute to and advance the limited research focused on the sexual health of Asian Americans, as well as point to the need for future studies.

My study has several strengths. It is the first study examining psychometrics of the MHS-G scale and having a study population comprising diverse ethnicities of Asian communities living in the U.S., and the inclusion of both exploratory and construct validity analyses in the study. While this study provides useful insights on the use of a homonegativity measure in an understudied population, Asian Americans, it has some limitations. First, the sample was not representative of the entire Asian American population due to the study's convenience sampling approach (Saunders, Lewis, & Thornhill, 2012). Second, the nature of self-reported data collected in the study might have introduced recall bias (Rosenman, Tennekoon, & Hill, 2011). In addition, the study population comprised of participants largely from the East and Southeast Asian regions bearing strong differences in cultures, social norms, and beliefs could cause variations in the interpretation of the questionnaires, thus impacting the generalizability of our findings. Last, our study sample is rather small (less than 200 participants), possibly impacting testability of significance and limiting generalizability.

Conclusion

The study suggests a four-factor model of the MHS-G with good model fit that can be used to measure homonegativity in the population of Asian Americans (Boateng, Neilands,

Frongillo, Melgar-Quiñonez, & Young, 2018). Despite some limitations, the study advances our understanding pertaining to the psychometric performance of the MHS-G for measuring homonegativity in the Asian American community, one of the fastest growing populations in the U.S. Findings from this study contribute to future research programs in behavioral health and HIV prevention to promote the health of Americans in general as well as the well-being of the Asian American population.

Tables

Table 1. Characteristics of the study participants*

Variables	%	n*
Demographics		
Age (mean, SD) (n = 191)	34 (14)	
Sex (n = 185)		
Female	73.5	136
Male	26.5	49
Sexual Orientation (n=169)		
Heterosexual or straight	82.8	140
Homosexual, Bisexual, or Asexual	13.1	22
Don't know	4.1	7
Ethnic geography (n=169)		
East and Southeast Asian	85.8	145
Others	4.7	8
Did not respond	9.5	16
Education (n = 179)		
Grade 12 or below (including never attended school)	31.3	56
Some college or technical degree	23.4	42
Bachelor's degree	22.4	40
Any post graduate studies	22.9	41
Marital status (n = 180)		
Married/Cohabited/Living together as married	52.3	94
Separated/Divorced	3.3	6
Single/Never married	44.4	80
Employment (n = 181)		
Employed full time	43.7	79
Employed part time	26.5	48
Others (including unemployed)	29.8	54
Income (n = 145)		
0 to 29,999	44.8	65
30,000 to 74,999	41.4	60
75,000 or more	13.8	20
Outcome		
Homonegativity (mean, SD) (n = 198)**	30.1 (9.8)	

**n varies based upon missing responses*

***range: 12 - 60, the higher score indicating the higher level of homonegativity*

Table 2. Polychoric Correlation Coefficients Matrix of the Homonegativity scale (n = 198)

Observed variables	1	2	3	4	5	6	7	8	9	10	11	12
1. Many gay men use their sexual orientation so that they can obtain special privileges												
2. Gay men seem to focus on the ways in which they differ from heterosexuals and ignore the ways in which they are the same	0.56											
3. Gay men do not have all the rights they need *	0.41	**0.07										
4. The notion of universities providing students with undergraduate degrees in Gay and Lesbian Studies is ridiculous	0.53	0.52	0.23									
5. Celebrations such as "Gay Pride Day" are ridiculous because they assume that an individual's sexual orientation should constitute a source of pride	0.63	0.51	0.36	0.80								
6. Gay men still need to protest for equal right *	0.31	0.18	0.52	0.44	0.42							
7. Gay men should stop shoving their lifestyle down other people's throats	0.58	0.46	0.30	0.61	0.74	0.21						
8. If gay men want to be treated like everyone else, then they need to stop making such a fuss about their sexuality/culture	0.56	0.42	0.36	0.70	0.77	0.34	0.78					
9. Gay men who are "out of the closet" should be admired for their courage *	0.20	0.16	0.51	0.44	0.51	0.66	0.35	0.36				
10. Gay men should stop complaining about the way they are treated in society, and simply get on with their lives	0.49	0.38	0.33	0.62	0.72	0.40	0.72	0.80	0.45			
11. In today's tough economic times, American's tax dollars shouldn't be used to support gay men's organizations	0.49	0.35	0.37	0.65	0.75	0.41	0.75	0.77	0.52	0.79		
12. Gay men have become far too confrontational in their demand for equal rights	0.52	0.50	0.26	0.70	0.72	0.42	0.75	0.80	0.46	0.85	0.78	

**Indicates reversed coded items; **Indicates non-significance at 0.05*

Table 3. Polychoric correlations between the MHS-G and selected measures (n = 193)

Measure	**Total Homonegativity Scale**	**Subdomain 1** *(Individual-related Homonegativity)*	**Subdomain 2** *(Social-related Homonegativity)*	**Subdomain 3** *(Admiration)*	**Subdomain 4** *(Policy)*
	Correlation Coefficients				
Acculturation	-0.48*	-0.36*	-0.46*	-0.41*	-0.41*
Gender Norm Beliefs	0.54*	0.49*	0.52*	0.46*	0.55*
Social Norm about HIV testing	-0.19*	-0.16*	-0.28*	-0.26*	-0.23*
Immigration Length (in years)	-0.29*	-0.13	-0.09	-0.05	-0.06

**Indicates significance at 0.05*

Table 4. Results of the Exploratory Factor Analysis: Factor loadings and model fit indices (n=198)

Measures' items	Factor loadings (4-factor)			
	Factor 1	Factor 2	Factor 3	Factor 4
1. Many gay men use their sexual orientation so that they can obtain special privileges *(proposed to be removed due to low factor loading)*	0.174			
2. Gay men seem to focus on the ways in which they differ from heterosexuals and ignore the ways in which they are the same	1.002			
3. Gay men do not have all the rights they need *	0.797			
4. The notion of universities providing students with undergraduate degrees in Gay and Lesbian Studies is ridiculous	0.902			
5. Celebrations such as "Gay Pride Day" are ridiculous because they assume that an individual's sexual orientation should constitute a source of pride		0.741		
6. Gay men still need to protest for equal right *		0.826		
7. Gay men should stop shoving their lifestyle down other people's throats		0.949		
8. If gay men want to be treated like everyone else, then they need to stop making such a fuss about their sexuality/culture		0.885		
9. Gay men who are "out of the closet" should be admired for their courage *			1.027	
10. Gay men should stop complaining about the way they are treated in society, and simply get on with their lives			0.924	
11. In today's tough economic times, American's tax dollars shouldn't be used to support gay men's organizations				0.857
12. Gay men have become far too confrontational in their demand for equal rights				0.965
Model fit indices				
Chi square p-value		<0.01		
RMSEA		0.19		
CFI/TLI		0.97/0.90		
SRMR		0.07		

**Indicates reversed coded items*

Table 5. Multivariable linear regression analysis of factors associated with Homonegativity (n = 193)

Predictor variables	Parameter estimates	Standard Error	95% CI		p-values	r2	p-value
(Intercept)	27.27	5.94	15.16	39.38	<.0001	0.53	<0.001
Acculturation	-0.21	0.11	-0.44	0.02	0.07		
Gender Role Beliefs	0.48	0.10	0.29	0.68	<.0001		
Social Norm about HIV Testing	-0.75	0.48	-1.69	0.19	0.12		
Length in Immigration	-0.27	0.08	-0.43	-0.11	<.0001		
Age	0.26	0.06	0.14	0.38	<.0001		

Note: Intercept and parameter estimates are standardized

Appendix 2.A: Descriptions of the Modern Homonegativity Scale for Gay Men (MHS-G)

a. The measures include 12 statements rendering various opinions about gay men
b. Among the 12-items, there are 3 items that need to be reversed-coded
c. Sum of scores from the 12 items will reflect respective levels of homonegativity – the higher the more homonegative.

Modern Homonegativity Scale – Gay Men
(MHS-G; Morrison & Morrison, 2002)

1. Many gay men use their sexual orientation so that they can obtain special privileges.

2. Gay men seem to focus on the ways in which they differ from heterosexuals and ignore the ways in which they are the same.

3. Gay men do not have all the rights they need. *

4. The notion of universities providing students with undergraduate degrees in Gay and Lesbian Studies is ridiculous.

5. Celebrations such as "Gay Pride Day" are ridiculous because they assume that an individual's sexual orientation should constitute a source of pride.

6. Gay men still need to protest for equal rights. *

7. Gay men should stop shoving their lifestyle down other people's throats.

8. If gay men want to be treated like everyone else, then they need to stop making such a fuss about their sexuality/culture.

9. Gay men who are "out of the closet" should be admired for their courage. *

10. Gay men should stop complaining about the way they are treated in society, and simply get on with their lives.

11. In today's tough economic times, Canadians' tax dollars shouldn't be used to support gay men's organizations.

12. Gay men have become far too confrontational in their demand for equal rights.

Note: * represents items to be reverse scored. A 5-point Likert-type scale has typically been used with the MHS (1=strongly disagree; 2=disagree; 3=don't know; 4=agree; 5=strongly agree)

Appendix 2.B: Polychoric Correlation Coefficients Matrix of the MHS-G Sub-Scales

Table 2b. Polychoric Correlation Coeffients Matrix of the MHS-G sub-scales (n = 198)

Observed Variables	2	3	4	6	7	8	10	12
2. Gay men seem to focus on the ways in which they differ from heterosexuals and ignore the ways in which they are the same		0.07	0.52*					
3. Gay men do not have all the rights they need *			0.23*					
4. The notion of universities providing students with undergraduate degrees in Gay and Lesbian Studies is ridiculous								
5. Celebrations such as "Gay Pride Day" are ridiculous because they assume that an individual's sexual orientation should constitute a source of pride				0.42*	0.74*	0.77*		
6. Gay men still need to protest for equal right *					0.21*	0.34*		
7. Gay men should stop shoving their lifestyle down other people's throats						0.78*		
8. If gay men want to be treated like everyone else, then they need to stop making such a fuss about their sexuality/culture								
9. Gay men who are "out of the closet" should be admired for their courage *							0.45*	
10. Gay men should stop complaining about the way they are treated in society, and simply get on with their lives								
11. In today's tough economic times, American's tax dollars shouldn't be used to support gay men's organizations								0.78*
12. Gay men have become far too confrontational in their demand for equal rights								

** Indicates significance at 0.05*

Chapter 2 References

Anhalt, K., Toomey, R. B., & Shramko, M. (2020). Latinx sexual minority youth adjustment in the context of discrimination and internalized homonegativity: The moderating role of cultural orientation processes. *Journal of Latinx Psychology*, *8*(1), 41-57. https://doi.org/10.1037/lat0000134

Benson, P. L., & Vincent, S. (1980). Development and Validation of the Sexist Attitudes Toward Women Scale (SATWS). *Psychology of women quarterly*, *5*(2), 276-291. https://doi.org/10.1111/j.1471-6402.1980.tb00962.x

Berg, R. C., Munthe-Kaas, H. M., & Ross, M. W. (2016). Internalized Homonegativity: A Systematic Mapping Review of Empirical Research. *Journal of Homosexuality*, *63*(4), 541-558. https://doi.org/10.1080/00918369.2015.1083788

Boateng, G. O., Neilands, T. B., Frongillo, E. A., Melgar-Quiñonez, H. R., & Young, S. L. (2018). Best Practices for Developing and Validating Scales for Health, Social, and Behavioral Research: A Primer. *Frontiers in public health*, *6*, 149-149. https://doi.org/10.3389/fpubh.2018.00149

Brown, M. J., & Gladstone, N. (2012). Development of a short version of the gender role beliefs scale. *International Journal of Psychology and Behavioral Sciences*, *2*(5), 154-158.

Cangur, S., & Ercan, I. (2015). Comparison of model fit indices used in structural equation modeling under multivariate normality. *Journal of Modern Applied Statistical Methods*, *14*(1), 14.

Chng, C. L., Wong, F. Y., Park, R. J., Edberg, M. C., & Lai, D. S. (2003). A model for understanding sexual health among Asian American/Pacific Islander men who have sex

with men (MSM) in the United States. *AIDS Educ Prev*, *15*, 21-38. https://doi.org/https://doi.org/10.1521/aeap.15.1.5.21.23611

Dong, Y., & Peng, C. Y. (2013). Principled missing data methods for researchers. *Springerplus*, *2*(1), 222. https://doi.org/10.1186/2193-1801-2-222

Fiorentino, M., Eubanks, A., Coulaud, P. J., Couderc, C., Keita, B. D., Anoma, C., Dah, E., Mensah, E., Maradan, G., Bourrelly, M., Riegel, L., Rojas-Castro, D., Yaya, I., Spire, B., Laurent, C., & Sagaon-Teyssier, L. (2021). Homonegativity, sexual violence and condom use with women in men who have sex with men and women in West Africa. *AIDS*, *35*(4), 681-687. https://doi.org/10.1097/qad.0000000000002782

Flood, J., McLaughlin, C., & Prentice, G. (2013). Minority Stress, Homonegativity, Alcohol Use and Mental Health Among College Gay Males. *Journal of Gay & Lesbian Mental Health*, *17*(4), 367-386. https://doi.org/10.1080/19359705.2013.800006

Gadermann, A. M., Guhn, M., & Zumbo, B. D. (2012). Estimating ordinal reliability for Likert-type and ordinal item response data: A conceptual, empirical, and practical guide. *Practical Assessment, Research, and Evaluation*, *17*(1), 3.

Gavlas, J. T. (2018). *Psychometric Properties of the Modern Homonegativity Scale in the Southern United States* Walden University].

Goldenberg, T., Stephenson, R., & Bauermeister, J. (2018). Community stigma, internalized homonegativity, enacted stigma, and HIV testing among young men who have sex with men. *Journal of Community Psychology*, *46*(4), 515-528. https://doi.org/https://doi.org/10.1002/jcop.21957

Górska, P., Bilewicz, M., Winiewski, M., & Waszkiewicz, A. (2017). On old-fashioned versus modern homonegativity distinction: Evidence from Poland. *Journal of Homosexuality*, *64*(2), 256-272.

Grey, J. A., Robinson, B. B., Coleman, E., & Bockting, W. O. (2013). A systematic review of instruments that measure attitudes toward homosexual men. *J Sex Res*, *50*(3-4), 329-352. https://doi.org/10.1080/00224499.2012.746279

Hancock, G., Mueller, R., & Stapleton, L. (2019). The Reviewer's Guide to Quantitative Methods in the Social Sciences. *Texbook.*

Herek, G. M. (1988). Heterosexuals' attitudes toward lesbians and gay men: Correlates and gender differences. *Journal of Sex Research*, *25*(4), 451-477.

Herek, G. M., & McLemore, K. A. (1998). Attitudes toward lesbians and gay men scale. *Handbook of sexuality-related measures*, 392-394.

Hsueh, L., Layland, E. K., Kipke, M. D., & Bray, B. C. (2021). Linking racism and homonegativity to healthcare system distrust among young men of color who have sex with men: Evidence from the Healthy Young Men's (HYM) study. *Social Science & Medicine*, *284*, 114219. https://doi.org/https://doi.org/10.1016/j.socscimed.2021.114219

Hudson, W. W., & Ricketts, W. A. (1980). A strategy for the measurement of homophobia. *Journal of Homosexuality*, *5*(4), 357-372.

Ju, D. H. (2022). Factors shaping Asian Americans' attitudes toward homosexuality. *Ethnic and Racial Studies*, *45*(5), 851-874. https://doi.org/10.1080/01419870.2021.1884732

Li, C.-H. (2016). Confirmatory factor analysis with ordinal data: Comparing robust maximum likelihood and diagonally weighted least squares. *Behavior research methods*, *48*(3), 936-949.

Lima, K. d. S., Tenório, J. M. V., Romário, F., Melo, L. M. F. d., & Andrade, J. M. d. (2019). Evidence of Validity of a Modern Homonegativity Measure against Gays and Lesbians. *Psico-USF*, *24*, 673-684.

Lottes, I. L., & Grollman, E. A. (2010). Conceptualization and assessment of homonegativity. *International Journal of Sexual Health*, *22*(4), 219-233. https://doi.org/10.1080/19317611.2010.489358

Miller, B., & Lewallen, J. (2015). The Effects of Portrayals of Gay Men on Homonegativity and the Attribution of Gender-Based Descriptors. *Communication Studies*, *66*(3), 358-377. https://doi.org/10.1080/10510974.2015.1018446

Miyazaki, Y., Bodenhorn, N., Zalaquett, C., & Ng, K.-M. (2008). Factorial structure of Brief COPE for international students attending US colleges. *College Student Journal*, *42*(3).

Mizuno, Y., Borkowf, C., Millett, G. A., Bingham, T., Ayala, G., & Stueve, A. (2012). Homophobia and Racism Experienced by Latino Men Who Have Sex with Men in the United States: Correlates of Exposure and Associations with HIV Risk Behaviors. *AIDS and Behavior*, *16*(3), 724-735. https://doi.org/10.1007/s10461-011-9967-1

Morandini, J. S., Blaszczynski, A., Ross, M. W., Costa, D. S., & Dar-Nimrod, I. (2015). Essentialist beliefs, sexual identity uncertainty, internalized homonegativity and psychological wellbeing in gay men. *Journal of counseling psychology*, *62*(3), 413.

Morrison, M. A., & Morrison, T. G. (2002). Development and validation of a scale measuring modern prejudice toward gay men and lesbian women. *J Homosex*, *43*(2), 15-37. https://doi.org/10.1300/j082v43n02_02

Morrison, M. A., & Morrison, T. G. (2013). Modern Homonegativity Scale. In *Handbook of sexuality-related measures* (pp. 414-426). Routledge.

Morrison, M. A., Morrison, T. G., & Franklin, R. (2009). Modern and old-fashioned homonegativity among samples of Canadian and American university students. *Journal of Cross-Cultural Psychology*, *40*(4), 523-542.

Morrison, T. G., Kenny, P., & Harrington, A. (2005). Modern prejudice toward gay men and lesbian women: Assessing the viability of a measure of modern homonegative attitudes within an Irish context. *Genetic, Social, and General Psychology Monographs*, *131*(3), 219-250.

Morrison, T. G., McLeod, L. D., Morrison, M. A., Anderson, D., & O'Connor, W. E. (1997). Gender stereotyping, homonegativity, and misconceptions about sexually coercive behavior among adolescents. *Youth & Society*, *28*, 351-382. https://doi.org/10.1177/0044118X97028003004

Negy, C., & Eisenman, R. (2005). A comparison of African American and white college students' affective and attitudinal reactions to lesbian, gay, and bisexual individuals: An exploratory study. *The Journal of Sex Research*, *42*(4), 291-298. https://doi.org/10.1080/00224490509552284

Renzetti, C. M., & Edleson, J. L. (2008). *Encyclopedia of interpersonal violence*. Sage Publications.

Ricketts, W. A., & Hudson, W. W. (1980). Index of homophobia (Index of attitudes toward homosexuals). *Handbook of sexuality-related measures*, 367-368.

Robinson, J. L., & Rubin, L. J. (2016). Homonegative Microaggressions and Posttraumatic Stress Symptoms. *Journal of Gay & Lesbian Mental Health*, *20*(1), 57-69. https://doi.org/10.1080/19359705.2015.1066729

Romero, D. H. (2011). *Assessing the measurement invariance of the modern homonegativity scale*. The University of Texas at El Paso.

Romero, D. H., Morera, O. F., & Wiebe, J. S. (2015). Assessing the gender invariance of the Modern Homonegativity Scale. *Journal of Homosexuality*, *62*(11), 1539-1559.

Rosenman, R., Tennekoon, V., & Hill, L. G. (2011). Measuring bias in self-reported data. *International journal of behavioural & healthcare research*, *2*(4), 320.

Ross, M. W., Berg, R. C., Schmidt, A. J., Hospers, H. J., Breveglieri, M., Furegato, M., & Weatherburn, P. (2013). Internalised homonegativity predicts HIV-associated risk behavior in European men who have sex with men in a 38-country cross-sectional study: some public health implications of homophobia. *BMJ Open*, *3*(2), e001928. https://doi.org/10.1136/bmjopen-2012-001928

Rye, B., & Meaney, G. J. (2010). Measuring homonegativity: A psychometric analysis. *Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement*, *42*(3), 158.

Saunders, M., Lewis, P., & Thornhill, A. (2012). Research methodology—Convenience sampling. In.

Schulz, K.-H., Kroencke, S., Ewers, H., Schulz, H., & Younossi, Z. M. (2008). The factorial structure of the Chronic Liver Disease Questionnaire (CLDQ). *Quality of Life Research*, *17*(4), 575-584. https://doi.org/10.1007/s11136-008-9332-7

Shiu, C., Voisin, D., Chen, W., Lo, Y., Hardestry, M., & Nguyen, H. (2016). A Synthesis of 20 Years of Research on Sexual Risk Taking Among Asian/Pacific Islander Men Who Have Sex With Men in Western Countries. *Am J Mens Health*, *10*(3), 170-180. https://doi.org/10.1177/1557988314561489

Shoptaw, S., Weiss, R. E., Munjas, B., Hucks-Ortiz, C., Young, S. D., Larkins, S., Victorianne, G. D., & Gorbach, P. M. (2009). Homonegativity, Substance Use, Sexual Risk Behaviors, and HIV Status in Poor and Ethnic Men Who Have Sex with Men in Los Angeles. *Journal of Urban Health*, *86*(1), 77-92. https://doi.org/10.1007/s11524-009-9372-5

Szymanski, D. M., & Gupta, A. (2009). Examining the Relationships Between Multiple Oppressions and Asian American Sexual Minority Persons' Psychological Distress. *Journal of Gay & Lesbian Social Services*, *21*(2-3), 267-281. https://doi.org/10.1080/10538720902772212

Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). *Using multivariate statistics* (Vol. 5). Pearson Boston, MA.

Taber, K. S. (2018). The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education. *Research in Science Education*, *48*(6), 1273-1296. https://doi.org/10.1007/s11165-016-9602-2

Ventriglio, A., Castaldelli-Maia, J. M., Torales, J., De Berardis, D., & Bhugra, D. (2021). Homophobia and mental health: a scourge of modern era. *Epidemiol Psychiatr Sci*, *30*, e52. https://doi.org/10.1017/s2045796021000391

Zea MC. et al. (2003). The Abbreviated Multidimensional Acculturation Scale: Empirical validation with two Latino/Latina samples. *Cultural Diversity and Ethnic Minority Psychology*, *9*(2), 107-126. https://doi.org/10.1037/1099-9809.9.2.107

CHAPTER 3:

Factors associated with intention of HIV testing among Asian American Men: A Path Analysis

Abstract

Research has pointed to myriad cultural and socio-psychological factors associated with HIV testing, such as acculturation, social norms about HIV testing, masculinity, homonegativity, and constructs from the Theory of Planned Behavior. However, the interrelationships of these factors on the intentions of HIV testing among the population of Asian American men remains unknown. A dataset of 425 Asian American men in the U.S., collected online with convenience sampling method during 2020-2021, was analyzed to test a conceptual framework that aimed to fill this gap. Results from a path model with two endogenous variables (homonegativity and HIV testing intention) indicated that perceived social norms about HIV testing, attitude about HIV testing, and perceived HIV risk had *direct* and *indirect* relationships with the intentions of HIV testing in the study population. However, social norms about HIV testing and perceived HIV risk showed stronger direct effects (standardized estimates = 0.37 and 0.34, respectively, p-value < 0.001). Additionally, we found that the relationships of these factors with HIV testing intention were also mediated by homonegativity. Findings from this study advance our understanding of pathways of associations between a host of cultural and socio-psychological factors with HIV testing intention among an understudied population – Asian American men. Our results will help inform the development of future intervention programs to increase HIV testing in this population.

Keywords Asian American men, path analysis, endogenous variable, exogenous variables, homonegativity.

Background

Currently numbering at 24 million, the Asian American population is projected to be the largest immigrant group in the U.S. by 2055 (Pew Research Center, 2021; US Census Bureau, 2023). During the period of 2010 - 2016, the number of Asian Americans, the fastest growing population in the U.S., receiving an HIV diagnosis increased by 42%, mainly due to an increase in HIV testing among Asian men who have sex with men (MSM) and bisexual men (CDC, 2019a).

Despite the sharp rise, Asian Americans are less likely to be tested for HIV (Sen et al., 2017). It was estimated that of the approximately 16,600 Asian Americans who were living with HIV in the U.S. at the end of 2016 (CDC, 2018a). Among them, up to 20% were not aware of their status, a higher percentage than for any other racial group (CDC, 2018c). To address the history of low - HIV testing in this population, it is important to better understand the mechanisms affecting HIV testing behaviors among Asian Americans, particularly Asian American men who account for the majority of recent HIV diagnoses among this population. This knowledge will help inform interventions that promote HIV testing uptake and linkages to timely preventive services. In the context of research on HIV testing practices among Asian Americans in the U.S., research has pointed to the roles of *acculturation*, *social norms about HIV testing*, and *masculine beliefs* as important drivers of HIV stigma and discrimination, *homonegativity*, and subsequently *intention* of HIV testing (Chng et al., 2003a; Hahm et al., 2012; Luu & Bartsch, 2011; Salud et al., 2014). In addition, other theoretically-informed psychological factors such as *attitude about HIV testing*, *subjective norms about HIV testing*, *perceived behavioral control about HIV testing*, and *perceived HIV risk* have also been widely documented as directly associated with intention of HIV testing among MSM (R. Stephenson, D.

White, L. Darbes, C. Hoff, & P. Sullivan, 2015) and Asian American MSM (Kyung-Hee C. et al., 1998; Nemoto et al., 1998).

Acculturation to the American culture and Homonegativity

Acculturation, in this study, is defined as the process of changing from a minority culture to the majority culture, and these changes derive from their interactions with the new host countries, societies or people who do not share the same cultures (Schwartz et al., 2010; Milkie Vu et al., 2019). Acculturation has been found to have both positive and negative effects on behaviors that place individuals at higher risk for HIV or distance people from HIV testing (Chng et al., 2003a). Commonly held cultural perceptions within Asian communities include the assumptions that HIV and other sexually transmitted infections (STIs) are irrelevant to them and that such infections are greater in other communities and populations such as among Whites and those with certain behavioral or demographic attributes (Chae & Yoshikawa, 2008).

Literature has also documented underlying relationships between acculturation and homonegativity. In the limited studies among Asian Americans, acculturation has been identified as a related factor- that could either have negative or positive influence on homonegativity. Fuks et al. (2018) suggested many Asian Lesbian, Gay, Bisexual, and Transgender (LGBT) immigrants viewed a Western orientation as a coping response to heterosexism and cissexism in their culture of origin, even before their immigration experience (Fuks et al., 2018). Another study among Vietnamese American men in the U.S. supported that Vietnamese Americans with higher levels of acculturation have more positive attitudes towards homosexuality (Luu & Bartsch, 2011).

Limited research in Asian Americans points to acculturation as an influencing factor on homonegativity (Fuks et al., 2018; Luu & Bartsch, 2011). As part of this study, we will examine this relationship among Asian American men.

Homonegativity and HIV Testing Intention

Homonegativity is commonly operationalized as negative attitudes towards homosexuality. This measure consists of statements measuring people's reactions to certain activities or social rights that gay men should or should not hold (M. A. Morrison & Morrison, 2002). Research points to negative prejudice towards homosexuality as common barriers to HIV-related testing, however, their impacts among Asian Americans are poorly understood (Rigmor C Berg, Ross, Weatherburn, & Schmidt, 2013; Michael W. Ross, Rosser, & Neumaier, 2008; Sen et al., 2017).

To our knowledge, no study has examined homonegativity's relationship to HIV testing among Asian Americans in general, however, the relationship, even indirectly, between homonegativity and HIV testing has been documented in the general MSM population (Michael W. Ross et al., 2008; C. Wei et al., 2016). Understanding the relationship between homonegativity and HIV testing intention will inform future efforts that aim to promote positive views towards homosexuality among Asian American men. This study, hence, examined how homonegativity influences HIV testing intention among a group of Asian American men.

Social norms about HIV testing and Homonegativity and HIV testing intention

People tend to perform a certain behavior when they *believe* or *see* others like them do that; the extent of those perceptions are called 'social norms' (Cialdini & Goldstein, 2004). Having the perceptions, these individuals would be more likely to follow the examples (Cialdini & Goldstein, 2004; Sean D. Young & Goldstein, 2021). The influence of social norms

supporting HIV testing has been studied in different ethnic groups. A study by Young et al. (2010) among African adults found that perceived supportive societal testing norms were associated with a history of HIV testing, especially among repeated testers (S. D. Young et al., 2010). Additionally, this study pointed to the link between social norms about HIV and the stigma associated with people living with HIV among Africans. Young and colleagues (2010) found that supportive norms about HIV testing were associated with decreased prejudice towards individuals having HIV (S. D. Young et al., 2010).

In the context of Asian Americans, many of whom hold intolerant views towards same-sex relationships, HIV infection would be deemed strongly connected with homosexuality (Tang & Chen, 2018). Based on these connected findings, our study further hypothesized that negative attitudes towards homosexuality may play a role in the relationship between social norms and HIV testing intention. However, there has been no effort examining this potential linkage in the population of Asian Americans. To fill the gap, this study examined how social norms associate with homonegativity and HIV testing intention among a group of Asian American men.

Masculinity and Homonegativity

The norms of masculinity are culturally grounded and societal expectations for men's roles, behaviors, and relationships (Iwamoto et al., 2009; Sileo & Kershaw, 2020). Masculine norm conformity for health behavior plays an important role in the spread of HIV through sexual contacts, especially in Asian cultures (Chow, 1998). Among the early efforts to investigate the role of masculinity on HIV-related sexual risks, four qualitative studies reported that Asian American gay and bisexual men who follow more traditional gender roles (male dominance) and sexual norms in Asian cultures, such as subordination in relationship, intimacy and sex practices, were more inclined to report having unprotected anal intercourse relative to their counterparts

not supporting such norms (K. Choi et al., 2002; Kanuha, 2000; Nemoto et al., 1998; F. Wong et al., 1998), although these findings have not been replicated in a quantitative study (Shapiro & Vives, 1999).

A recent literature review study by Fleming et al. (2016) offered more dimensional aspects of masculine norms that shape American men's sexual behaviors, including uncontrollable male sex drive, capacity of perform sexually, and power over others (Fleming, DiClemente, & Barrington, 2016).

For Asian American men, the influence of strong masculine norms and Asian cultural values towards heterosexuality (Iwamoto et al., 2009) may be linked to certain indirect risks for HIV infection, such as stigma and discrimination (UNAIDS, 2015); inherently, these phenomenon could be caused by prevalent prejudice towards homosexuality or homonegativity (Han, Proctor, & Choi, 2014). Informed by the literature, we studied the association between masculinity and homonegativity in a group of Asian American men.

Perceived HIV Risk and HIV Testing Intention

Investigating the relationship between HIV risk perception and HIV testing among populations at high risk for HIV transmission, including young MSM, has been a major focus among the field of HIV research worldwide (Clifton et al., 2016). Studies have suggested strong relationships between perceived HIV risk and intention for HIV testing or actual HIV testing behavior in the general population, and lower perceived risk has been negatively associated with HIV testing (Clifton et al., 2016). In a study examining this relationship in MSM, Stephenson and colleagues (2015) also found that lower risk perception was associated with low HIV testing among partnered MSM (R. Stephenson et al., 2015).

Specific to the population of Asian Americans, research has suggested that HIV risk perceptions are common facilitators of HIV testing (Cooper, Loue, & Lloyd, 2001; Murray & Oraka, 2014); however, this relationship has not been examined in combination with other cultural and socio-psychological factors that might help generate novel insights of their collective impact on HIV testing intention (J. J. Lee & Zhou, 2019). To fill this gap, our study examined the association between perceived HIV risk with HIV testing intention among Asian American men, a group at high risk of HIV infection among the general population of Asian Americans.

Construct of the Theory of Planned Behavior (TPB) and HIV testing intention

Generally, research has shown that constructs from the TPB (attitudes, subjective norms, and perceived behavioral control) are predictive of HIV testing (Booth et al., 2012; Hogben et al., 2003; C. C. Meadowbrooke, T. C. Veinot, J. Loveluck, A. Hickok, & J. A. Bauermeister, 2014). Informed by the theoretical framework, various studies about HIV testing intention have been conducted among Asians (Fauk et al., 2018; Gu, Lau, & Tsui, 2011), Africans (O. Ayodele, 2017; Pikard, 2009).

Findings from these studies suggested that more positive attitudes about testing, greater subjective norms, and strong perceived behavior control were associated with stronger HIV testing intention. In western society, Booth et al. (2012) used the TPB to investigate salient beliefs about STI testing among young people living in relatively deprived areas in the UK. Likewise, findings from this study support the positive relationship between behavioral belief (antecedent of attitudes), normative beliefs (antecedent of subjective norms), and control beliefs (antecedent of perceived behavioral control)and STI testing intention (Booth et al., 2012).

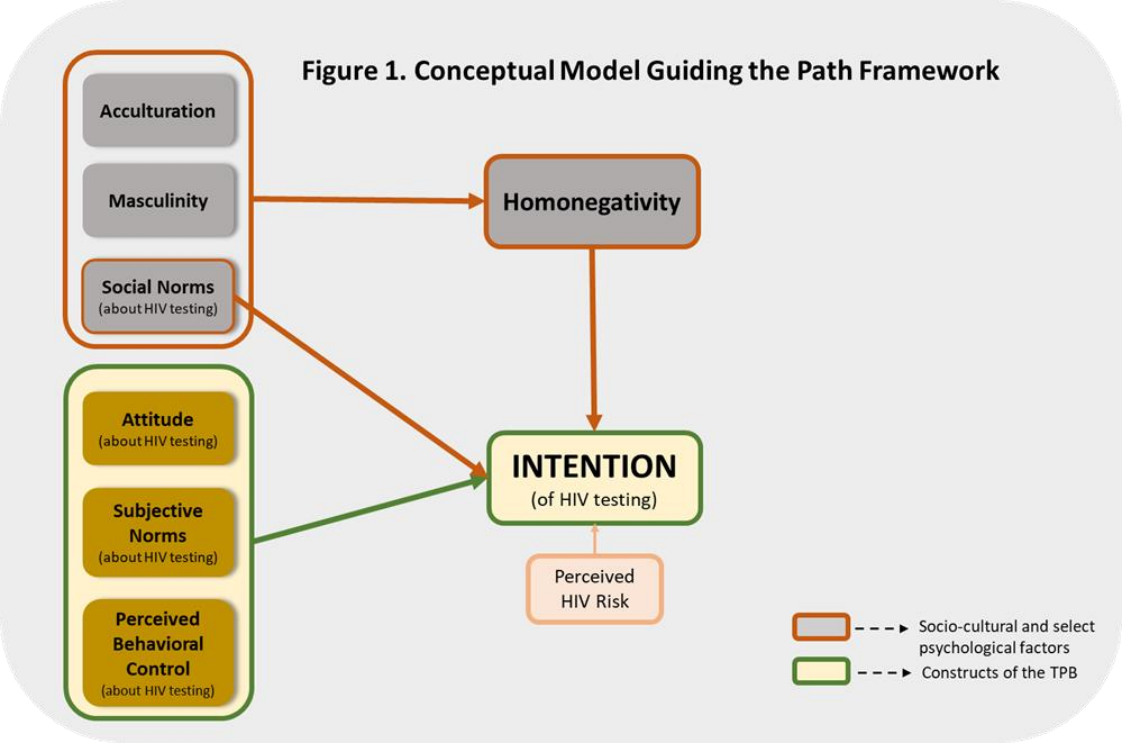
Among young U.S. MSM, the TPB has been found useful in examining predictors of HIV testing, especially when taking into consideration other factors, such as exposure to HIV information, self-rated HIV knowledge, and use of information to make HIV-testing decisions (C. C. Meadowbrooke et al., 2014). They found that the TPB's constructs with the added direct effects of other information-related factors explained 41.9% of the testing intention – much better than the TPB framework alone, at 18.1% (C. C. Meadowbrooke et al., 2014; Salud et al., 2014) or 32.8% (Montanaro & Bryan, 2014). However, across existing literature on HIV testing, there is a gap in the application of the TPB in assessing HIV testing among Asian Americans. In the absence of similar studies using the TPB to specifically assess HIV testing behavior among Asian Americans, this evidence of the successful application of the TPB to HIV testing research made it suited for use in our study. Furthermore, Meadowbrook and colleagues found it necessary to even expand on TPB's constructs to maximize its utility among U.S. MSM for HIV testing (C. C. Meadowbrooke et al., 2014). When coupled with the importance of understanding the holistic relationship of cultural and socio-psychological factors influencing *intentions* of HIV testing among the population of Asian Americans in particular (J. J. Lee & Zhou, 2019), it was critical for us to include other related cultural and socio-psychological factors to best identify the most salient factors impacting HIV testing intentions among Asian American men.

Taken together, we examined the relationship between the TPB constructs and acculturation, masculinity, social norms about HIV testing, homonegativity, and perceived HIV risk with HIV testing intention among Asian American men. Specifically, we employed path analysis methods to examine *direct* and *indirect* pathways among those factors and HIV testing intention. This research is a necessary first step to inform intervention programs promoting HIV testing uptake among this population.

Conceptual Model

Drawing upon the constructs of the TPB (Fishbein, 2010; McLeroy KR. et al., 1988), and from empirical evidence pointing to other constructs salient to HIV testing behavior in **Asian American men**, the conceptual model proposed for this study is presented in the Figure 1 below.

Figure 1. Conceptual model guiding the study of factors influencing Intention for HIV testing among Asian American Men



Methods

Data Collection

Participants in this study were 425 Asian American adult men living in the U.S.. Participant eligibility included: age 18 or above, self-identified as Asian American men, residents of the U.S. for a minimum of 6 months and be able to read in English.

Participants were recruited via Facebook social media using the platform's filtering functions for eligibility screening, e.g., location, gender, interests, etc. Facebook identified potential participants and invited them to the survey's landing page based on user's registered personal profiles. The online surveys were administered in English only. This channel of recruitment has proven to be useful for health science research (Gray, Annabell, & Kennedy, 2010; Kapp, Peters, & Oliver, 2013; Thornton et al., 2016). Eligible participants were compensated with a $10 Amazon gift card for their time (approximately 15 minutes in total) upon completion of the survey.

In addition to screening questions, we used Captcha (version 2.0) as well as open ended questions throughout the survey to prevent bots scamming and ensure only real interested individuals were recruited. The study protocol was approved by the Institutional Review Board at Emory University prior to data collection.

Measures

There are 10 variables employed in our hypothesized path model, including ***two endogenous*** and ***seven exogenous*** variables. Scales or measures that have been validated among Asian Americans will be explained accordingly.

Endogenous variables

Homonegativity: The study used the Modern Homonegativity scale (M. A. Morrison & Morrison, 2002), which comprises 16 items referring to various opinions towards gay men. For example, questions may be '*Gay men should stop shoving their lifestyle down other people's throats*' or *'Gay men still need to protest for equal rights*'. The scale showed good internal consistency reliability (Cronbach's alpha = 0.91). Responses to each statement were on a Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). Three of the 12 items were reverse coded. Sum of

all scores reflect levels of homonegativity, with higher scores reflecting holding greater homonegativity. This scale has been validated in a study by this research team and the work is being under review for publication. Results of the study suggested that this scale is appropriate for use in Asian Americans.

Intention for HIV testing (outcome variable): The study used a 3-item measure (Pikard, 2009) with 5-point Likert scale (1 = strongly disagree and 5 = strongly agree) to examine intention of HIV testing. Examples are: "In the next 12 months, I *expect* to have an HIV test" or "In the next 12 months, I *want* to have an HIV test". Sum of all scores reflect levels of intention of HIV testing, with higher scores reflecting holding greater intention. This measure has been used among the African youth population to examine HIV testing intention (Pikard, 2009). Data from this study showed that this measure had good internal consistency (Cronbach's alpha .75).

Exogenous variables

Acculturation: We leveraged the Abbreviated Multidimensional Acculturation Scale (AMAS) (Zea, Asner-Self, Birman, & Buki, 2003) which has 30 items, covering six domains of cultural identity (general social connection with American culture and the culture of origin, language, food, political awareness, and historical influence with each domain containing five statements. There were 16 items which were reverse coded. The scale showed good internal consistency reliability (Cronbach's alpha = 0.9). Responses to each statement were on a Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The sum of all scores reflects levels of acculturation, the higher the more acculturated to the American culture. This scale was developed to be adapted to any culture, including Asian Americans (Zea et al., 2003), and has been validated in a sub-group of Asian Americans (Japanese Americans) (Miyoshi, Asner-Self, Yanyan, & Koran, 2017).

Masculine Beliefs: The Masculinity in Chronic Disease Inventory (MCD-I) measures how socially constructed masculinities and gender ideals are shaped (Occhipinti et al., 2019). In previous research the five-factor scale has exhibited good reliabilities with alphas ranging from 0.68 to 0.93 (Occhipinti et al., 2019). We used a 30-item question which covers statements like "*Being physically able to have sex is important to me" or "I like to be in control*" or *"I like to win"*. Responses to each statement were on a Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The sum of all scores reflects levels of masculinity, the higher the greater masculine beliefs. This scale has been validated for use in Asian Americans (K. Hsu & Iwamoto, 2014).

Social norms about HIV testing: Social Norm about HIV testing was measured via a 5-item scale that includes statements such as '*Most people you know have been tested for HIV*', '*Some of my immediate family members have been tested for HIV*', '*Most of my gay friends have been tested for HIV'*, '*Most of my straight friends have been tested for HIV*', and '*My sexual partner(s) has/have been tested for HIV'*. Responses to the statement were on a Likert scale, ranging from 1 (strongly disagree) to 5 (strongly agree). This measure was developed in reference to a study by Stephenson and colleagues (R. Stephenson et al., 2015) and an unpublished work by the study team among a group of Asian Americans. The total score was the sum of scores from individual items. The higher the total score the greater the norm towards HIV testing. This measure has been used in Asian Americans (unpublished work by the research team).

Perceived HIV Risk: We asked participants two questions: "*In the next 12 months, based on your current sexual and other risky behaviors, what do you think your chance of becoming infected with HIV*?" and "*How much do you worry that you could get HIV*?" in the survey. The question has 5-point Likert response options, ranging from 1 (very low) to 5 (very high). These questions were

developed in reference to previous studies by Choi and colleagues (K. Choi, Wong, & Sy, 2005), an unpublished work by the study team in a group of Asian Americans, and Sales and colleagues (Sales & Sheth, 2019). The higher the total score the greater the perceived HIV risk. This measure has been used in Asian Americans (K. Choi et al., 2005).

Attitude about HIV testing: A 5-item measure (Kakoko, Astrøm, Lugoe, & Lie, 2006) with 5-point Likert scale (1 = strongly disagree and 5 = strongly agree) was used. An example of the questions includes "*Getting tested for HIV helps people feel better*". The total score is the sum of the individual scores for each item with higher score indicating greater holding of positive attitude towards HIV testing. Data from this study showed that the two sub-scales of this measure (behavioral belief and behavioral outcome) had good internal consistencies (Cronbach's alphas .73 and 0.74, respectively).

Subjective Norms about HIV testing: A 5-item measure (Kakoko et al., 2006) with 5-point Likert scale (1 = strongly disagree and 5 = strongly agree) was used. An example of the questions includes "*Most people who are important to me think I should have an HIV test*", or "*Most people who are important to me think it would be a good idea for me to have an HIV test*". The total score is the sum of the individual scores for each item with higher score indicating greater holding of perceived norms towards HIV testing. Data from this study showed that the two sub-scales of this measure (normative belief and motivation to comply) had good internal consistencies (Cronbach's alphas .81 and 0.79, respectively).

Perceived Behavioral Control about HIV testing: A 4-item measure (Kakoko et al., 2006) with 5-point Likert scale (1 = strongly disagree and 5 = strongly agree) was used. An example of the questions includes "*I am confident that I can get an HIV test*", or "*It's easy for me to get an HIV test*". The total score is the sum of the individual scores for each item with higher score

indicating greater holding of perceived behavioral control towards HIV testing. Data from this study showed that the two sub-scales of this measure (control belief and perceived power) had good internal consistencies (Cronbach's alphas .77 and 0.79, respectively).

Analysis

The SAS Enterprise 8.3 and Mplus 8.3 software packages were used for our analyses. We applied several inspection schemes that have been recommended for online research to detect potential responses by web bots, including the inclusion of open-ended questions in the survey, monitoring response time length, or assessing responses that were next to each other and entirely similar (Simone, 2019).

There were 501 participants who provided consent but three of them did not complete any questions after consenting. We removed five incomplete surveys (participants completed one or several questions at the beginning of the survey, mainly demographics). Additionally, sixty-two complete surveys were excluded because their timestamps did not pass our data integrity criterium (total survey completion time less than half of the median [13.8] at 6.9 minutes) (Ballard, Cardwell, & Young, 2019) . We detected another six surveys as "cluster" responses, i.e., all responses were clustered and were entirely the same, thus removed them from the analysis. Our final study sample included 425 participants. We calculated scales for key variables and used descriptive statistics to analyze demographic characteristics of the participants. Cronbach's alphas for each of the scales, wherever available, were previously noted in the methods section.

Several exploratory analyses were performed to identify variables that would be most appropriate for the path modeling procedure. First, bivariate relationships between predictor variables and intention for HIV testing (study outcome) were examined with polychoric

correlations to assess the direction and magnitude of association between each pair of variables. Next, predictors with significant correlations (at alpha .05) with the corresponding outcome variable were then introduced into multi-variables regression models to examine their relationships with either or both of the two outcome variables (homonegativity and HIV testing intention), as specified in the initial hypothesized path model. The significant standardized coefficient estimates (at alpha .05) from these two models were included in the initial path model. Last, path analysis was employed to identify directions and strengths of the predictors and the outcome variables resulted from the previous multi-variables regression models using Mplus (version 8.3).

Modification indices, in combination with established theoretical foundations, informed the re-specifications of the initial path model to the revised path models, and subsequently the selection of the final path model. Specifically, model fit indices (Chi-square, RMSEA, CFI, TLI, and SRMR) of the path models were evaluated and used to inform our selection of the final model. The diagonally weighted least squares (WLSMV) estimation was used to accommodate the ordinal data type of several variables.

Results

Study sample and examination of the variables

Descriptions of participants' demographics are presented in Table 1. Among the 425 study participants, the average age was 31.8 (SD = 6.9, median = 32). A majority of the participants (78.8%) were born in the U.S., and 63.5% had attained bachelor's degrees or any post-graduate training. Regarding sexual identity, 71.1% identified as being heterosexual, while 25.9% answered that they were homosexual or bisexual. More than two thirds (73.9%) of the respondents reported that they had been tested for HIV (lifetime history), while the proportions

of HIV testing among heterosexual and homosexual or bisexual participants were 75.5% and 82.7%, respectively.

Results of the bivariate analysis are presented in the correlation matrix in Table 2. The two main dependent (endogenous) variables in the hypothesized path model (Figure 2), namely homonegativity and HIV testing intention, were significantly correlated with all respective independent variables at the alpha level of 0.05. Specifically, acculturation, masculinity, and social norms were significantly correlated with homonegativity (βs = -0.29, 0.3, and 0.21, respectively, p-values < 0.001). Homonegativity, attitude, subjective norms, perceived behavioral control, and perceived HIV risk were significantly correlated with HIV testing intentions (βs = 0.35, 0.16, 0.45, 0.17, and 0.54, respectively). Subjective norms and perceived HIV risk were strongly correlated with HIV testing intentions and showed the strongest associations (βs = 0.45 and 0.54, respectively).

Multivariable modeling analyses for the two sub-models regressing on homonegativity and HIV testing intention showed that acculturation, social norms, and masculinity were significantly associated with homonegativity (βs = -0.29 [95% CI: -0.38 to -0.2], 0.65 (95% CI: 0.45 to 0.85], and 0.06 [95% CI: 0.01 to 0.1]). Similarly, attitude, subjective norms, perceived behavioral control, social norms, homonegativity, and perceived HIV risk were significantly associated with HIV testing intention at the alpha level of 0.05. Results of the two multivariable models are presented in Table 3.

Final path model

Considering the results from the multivariable models, all constructs exhibiting statistically significant relationships with the endogenous variables were introduced into the initial path model. As all variables were significantly associated with the corresponding outcome

variables (at alpha .05), none of them were excluded. Model fit indices of the base model (initial hypothesized path model) indicated that the model did not fit well with the data (Table 4). Two subsequent model modifications were made using a theory-informed and data-informed hybrid approach. We reviewed model modification indices to select which modifying action would be most theoretically appropriate. Specifically, we added *two* additional path specifications, including the paths from *attitudes about HIV testing to homonegativity*, and *perceived HIV risk to homonegativity*. Research among Asian Americans has pointed to the relationships between HIV and homonegativity in the context that HIV would be deemed strongly connected with homosexuality and that it is a "gay's disease" (Chng et al., 2003a; Tang & Chen, 2018). Regarding the connection between perceived HIV risk and homonegativity, it has been found that men of all sexual orientations would feel under pressure to engage in risky behaviors to promote their desired masculinity norms, and possibly avoid being perceived as gay or effeminate (Jeffries & Johnson, 2015).

We reached the final model with satisfactory model fit indices (chi square test of model fit [df] = 11.95[4], chi-square p-value = 0.02, RMSEA = 0.07, CFI = 0.98, TLI = 0.93, and SRMR = 0.03) after making these literature-informed (Chng et al., 2003a; Jeffries & Johnson, 2015; Tang & Chen, 2018) and data-informed modifications.

Results of the final path model with standardized regression coefficients are presented in Table 5. They included standardized estimates of the total, indirect, and direct effects of exogenous variables and the corresponding endogenous variable. All standardized estimates were significant at the alpha level of 0.05 with the sub-models' r-square estimates of 0.35 and 0.46 ($p<0.001$) regressing on homonegativity and HIV testing intention, respectively. Our key results showed that social norms about HIV testing, attitude about HIV testing, and perceived

HIV risk had both *direct* and *indirect* effects on intentions of HIV testing in the study population, with homonegativity as the mediating variable. For the indirect effects via homonegativity, greater social norms about HIV testing ($\beta = 0.22$, $p<0.01$), negative attitudes about HIV testing ($\beta = -0.35$, $p<0.01$), and stronger HIV risk perception ($\beta = 0.24$, $p<0.01$) were associated with holding higher level of homonegativity. For the direct effects, social norms about HIV testing and perceived HIV risk showed stronger effects on HIV testing intention (βs= 0.37 and 0.34, respectively, p-values < 0.001); and these two factors also had the largest total effects on HIV testing intention (βs = 0.40 and 0.37, respectively). Overall, the sub-models with homonegativity and HIV testing intention account for 35% and 46% of the variances, respectively (p-values < 0.001). Results from the final path diagram with standardized estimates of effect magnitudes and direction of relationships for each path were shown in Figure 3.

Supplemental Table 1 (Appendix 1) provides details about the variables that were introduced into the path model analysis. It describes the composition, measuring scale, range with minimum and maximum value, average value, as well as the standard deviation for each construct.

Discussion

Being the fastest growing population in the U.S. (US Census Bureau, 2023), with approximately 24 million residents in the U.S., Asian Americans is the population group with highest rate of undiagnosed HIV (22%) than any other racial and ethnic group in the U.S. (CDC, 2017). Furthermore, Asian American MSM are more likely than other racial groups to experience delayed HIV diagnosis due to multiple cultural and socio-psychological factors (Chng et al., 2003a; Sen et al., 2017). Coupled with the dearth of evidence regarding HIV testing practices within this population group, it is important to expand our understanding of factors

impacting HIV testing intention among Asian Americans, especially Asian American men as they have higher risk of HIV infection relative to women.

This study attempted to fill gaps in knowledge regarding salient factors associated with HIV testing intention in this understudied population. Key findings from our path analysis aligned with the existing literature. Highlighted results from this study suggested that social norms about HIV testing, attitude about HIV testing, and perceived HIV risk are significant factors that are directly and indirectly associated with HIV testing intention and these relationships were mediated by homonegativity. Additionally, we observed that several path directions were reversed to the initial hypothesized conceptual model. Specifically, results suggested that positive social norms about HIV testing were associated with elevated homonegativity, negative attitudes about HIV testing were associated with strong HIV testing intention, and weak perceptions of behavioral control was associated with strong HIV testing intention.

First, regarding the positive relationships between social norms about HIV testing and homonegativity and HIV testing intention, prior research has shown that among a population of African men, perceiving that HIV testing was normative is linked to history of HIV testing, i.e. positive social norms were associated with greater HIV testing uptake (Perkins et al., 2018). Further, a study among Chinese MSM indicated that social norms about HIV testing was significantly positively associated with HIV testing (P. Zhao et al., 2018). In reference to the relationship between social norms about HIV testing and homonegativity, a study among U.S. MSM has suggested that increased social stigma or perceptions of community prejudice were associated with lower odds of never testing (Goldenberg et al., 2018). Results from this study aligned with previous research suggesting homonegativity could act as a mediating factor

between social norms about HIV testing intention, as hypothesized in our research question. Together, it is found that these constructs are salient factors for understanding HIV testing intentions among Asian American men.

Similarly, the current study found that perceived HIV risk was directly and indirectly associated with *HIV* testing intention with homonegativity as the mediating variable. While the relationship of perceived HIV risk and HIV testing intention has been well established among general population (Evangeli et al., 2018), and among the MSM population in the U.S. (R. Stephenson et al., 2015), as well as globally (O. Ayodele, 2017; Marcus, Gassowski, & Drewes, 2016; Musumari et al., 2020), to our knowledge, no previous efforts have been made to study the relationship between perceived risk of HIV and homonegativity. Gaps in the existing literature, along with emerging insights from the current study, emphasize the importance of continued efforts to better understanding how homonegativity may play a role in the relationship between perceived HIV risk and HIV testing intention in other populations.

Our study findings also suggested that homonegativity served as a mediator in the relationships of attitude about HIV testing and HIV testing intention. To our knowledge, no prior efforts have been found that employed a path analysis to examine the mediating role of homonegativity on the association between attitudes and HIV testing intention. However, previous studies using multivariable regression indicates that attitude and homonegativity are both related to HIV testing intention among the general population (Evangeli et al., 2018), among MSM in the U.S. and globally (Goldenberg et al., 2018; M. W. Ross, Kajubi, Mandel, McFarland, & Raymond, 2013; Michael W. Ross et al., 2008), and among Asian MSM (H. Lee et al., 2022; Paine et al., 2021; C. Wei et al., 2016). Specifically, the bidirectional relationships between attitude and HIV testing intention as well as homonegativity and HIV testing practices

have been studied (Rigmor C Berg et al., 2013; Evangeli et al., 2018; Michael W Ross et al., 2013; Sen et al., 2017). It was found that holding greater homonegativity was a barrier to HIV testing (Michael W Ross et al., 2013). Existing literature also suggests that holding a more favorable attitude about HIV testing was related to stronger intention to test for HIV among a population of young MSM with unknown HIV infection status in the U.S. (C. C. Meadowbrooke et al., 2014) However, it also showed that the standardized direct effect of attitudes on HIV testing intention in an expanded model was much smaller (β=0.18) than that in the TPB model alone (β=0.34) (C. C. Meadowbrooke et al., 2014).This finding had important implications to our finding that attitudes had a small effect on HIV testing intention using a path model. Counter to the positive relationship observed in prior studies (O. Ayodele, 2017; C. C. Meadowbrooke et al., 2014; Mirkuzie, 2011b), our finding revealed a negative relationship between attitude and HIV testing, which could be observed for a couple of reasons. First, it might have been resulted from the analysis of data collected from a sample with high rates of HIV testing experience; thus, attitude might not hold a great level of weight in their intention to seek a HIV test with an observed small coefficient (β = -11, p = 0.01). Second, a path model, with simultaneous multivariate modeling techniques, could impact the structure and the magnitude of interactions among variables due to the mediation effects (Loehlin, 1988).

Further research should examine this finding, possibly through a qualitative study, to garner deeper contexts around the relationship between attitude about HIV testing and homonegativity in Asian American men.

Our results show some other variables having reverse directions in relationship to our initial hypotheses. Specifically, greater homonegativity was associated with greater intention of HIV testing, and stronger perceived behavioral control was associated with less intention of HIV

testing. As discussed earlier, this could happen due to the mediation effects resulting from a cyclic pathways analysis. The fact that the full multivariate analysis of a path model, unlike bivariate regressions, considers multiple simultaneous pathway regressions, could inherently impact the direction and magnitude of the individual bi-directional interactions (Klem, 1995, 2000; C. C. Meadowbrooke et al., 2014).

In summary, our analysis identified some key pathways influencing HIV testing intention. Specifically, it found that social norms (the more positive social norms, the stronger HIV intention), attitudes (the more positive attitudes, the less intention for HIV testing) , and perceived HIV risk (the greater perceptions of HIV risk, the stronger HIV testing intention) had both direct and indirect relationships with HIV testing intention with homonegativity as the mediating variable (the more positive attitudes, the weaker homonegativity; the more positive social norms, the more homonegativity; the stronger perceptions of HIV risk, the more homonegativity). As the current literature has mainly attempted to identify paired bi-directional relationships of these constructs, findings from this study emphasize that research on factors impacting HIV testing intention may require stronger focus on the identification of mediating variables that may help produce greater insights about the nature of these associations, both in the direction and the structure of relationships.

Future research may also consider disaggregating these results by studying a subset of the Asian American men population who never tested for HIV, especially when employing the TPB. A study by Ayodele (2017) has suggested that among young Nigerian adults who have never tested for HIV, this theoretical framework serves as a significant predictor of HIV testing intention (O. Ayodele, 2017). Given our findings in some areas, including the negative relationships between attitudes and perceived behavioral control for HIV testing and intention of

HIV testing – which are in contrary to the TPB dispositions – expanded research would help dissect these findings in deeper contexts.

Findings from this study will help guide future intervention programs promoting HIV testing among the population of Asian American men. For example, it is suggested that interventions aiming to holistically address psychological factors related to HIV testing should place greater focus on mitigating negative prejudice towards homosexuality together with other related factors (social norms, perceived HIV risk and the TPB constructs). In addition, as social norms about HIV testing and perceived HIV risk were identified as the factors strongly associated with HIV testing intention in this study, future HIV prevention efforts should consider these aspects to promote HIV testing uptake in the population of Asian American men.

Our study is one of the first efforts examining the interrelationships of salient factors associated with HIV testing intention using path modeling techniques to serve Asian American men – an understudied population. Considering this was an exploratory effort to develop a first path model to understand factors influencing intention of HIV testing among Asian American men, we considered an appropriate shift from a theory-based to data-based model re-specification approach (e.g., final path model identified *homonegativity as a mediator* in the relationship between attitude about HIV testing and HIV testing intention, as well as perceived HIV risk and HIV testing intention) to gain important emerging insights into this historically understudied population. Strengths of the study included having a study sample collected from individuals across the U.S. with rigorous data quality assurance protocols. However, it embodied some limitations. We used self-reported data collected via an online platform and the survey was in English only. This limits participation to only those who have access to internet and can read in English. This might have also led to potential sampling biases resulting in some possible

differences of the sample characteristics in relation to the general Asian American men. A rather modest study sample that did not allow for sub-group analyses to further explore explanations for some of our findings was another limitation in our study. For example, only 110 (25.9%) were reported as homosexuals, which may not accommodate a significance test in this sub-group. Future studies may consider a more inclusive recruitment approach, such as combining web-based and mail surveys, to ensure better representation of Asian American men (McCabe, Diez, Boyd, Nelson, & Weitzman, 2006) and facilitate stratified analyses, if needed.

Conclusion

Findings from our study provided valuable insights that expand our understandings of salient factors associated with HIV testing intention among Asian American men. Key results suggested that an expanded model that includes the TPB and other cultural and socio-psychological factors could be used to effectively examine HIV testing intention. The study also produced novel learnings about the mediating effects of the homonegativity construct between social norms about HIV testing, attitude about HIV testing, and perceived HIV risk with HIV testing intention. Results from this study will inform future research to promote HIV testing behaviors among the population of Asian American men who are of heightened risk for HIV infection.

Tables and Figures

Table 1. Characteristics of the study samples (N=425)

Variables	n, or mean (SD)	%
Demographics and HIV testing history		
Age (mean, SD)	31.8 (6.9)	
Birthplace		
U.S.	335	78.8
Outside of US	90	21.2
Education		
High school (or GED) and below	35	8.3
Some college, associate degree, or technical training	120	28.2
Bachelor's degree	225	52.9
Any Post-graduate training	45	10.6
Marital Status		
Married/cohabited/living together	307	72.2
Separated/divorced	11	2.6
Single/never married	107	25.2
Employment		
Full time	348	81.9
Part time (including full-time student)	65	15.3
Other (home maker, retired, etc.)	12	2.8
Income		
$27,000 or less	19	4.5
$27,001 - $49,999	71	16.6
$50,000 - $74,999	136	32.0
$75,000 and more	186	43.8
Don't know	13	3.1
Sexual Identity		
Heterosexual	302	71.1
Homosexual or bisexual	110	25.9
Other (asexual, queer, etc.)	13	3.0
HIV testing history (ever had a HIV test)		
Overall		
Yes	314	73.9
No	98	23.1
Unsure	13	3.0
Heterosexual		
Yes	228	75.5
No or Unsure	74	24.5
Homosexual or Bisexual		
Yes	91	82.7
No or Unsure	19	17.3
Dependent variable		
Intention of HIV testing* (mean, SD)	9.8 (2.9)	

** Ranging from 3-15 with higher average indicates stronger intention of HIV testing*

Table 2. Correlation matrix of all variables proposed for the path model (N=425)

Variable	Acculturation	Social Norm	Gender Role	Homonegativity*	Attitude	Subjective Norm	Perceived Behavioral Control	Perceived Risk	HIV Testing Intention *
Acculturation	1.00	.04 *.41*	-.16 *<.001*	**-.29** *<.001*	-.09 *.07*	.05 *.34*	.05 *.30*	-.08 *.12*	-.01 *.76*
Social Norms	.04 *0.41*	1.00	.21 *<.001*	**.30** *<.001*	.18 *0.00*	.49 *<.001*	.18 *<.001*	.38 *<.001*	**.59** *<.001*
Masculinity	-.16 *<.001*	.21 *<.001*	1.00	**.21** *<.001*	.53 *<.001*	.39 *<.001*	.14 *<.001*	.05 *0.31*	.17 *<0.001*
Homonegativity	-.29 *<.001*	.30 *<.001*	.21 *<.001*	1.00	-.15 *<.001*	.13 *0.01*	.16 *<.001*	.39 *<.0001*	**.35** *<.001*
Attitude	-.09 *0.07*	.18 *<.001*	.53 *<.001*	-.15 *<.001*	1.00	.46 *<.001*	.15 *<.001*	-.09 *0.08*	**.16** *<.001*
Subjective Norms	.05 *0.34*	.49 *<.001*	.39 *<.001*	.13 *0.01*	.46 *<.001*	1.00	.27 *<.001*	.23 *<.001*	**.45** *<.001*
Perceived Behavioral Control	.05 *0.30*	.18 *<.001*	.14 *<.001*	.16 *<.001*	.15 *<.001*	.27 *<.001*	1.00	.31 *<.0001*	**.17** *<.001*
Perceived HIV Risk	-.08 *0.12*	.38 *<.001*	.05 *0.31*	.39 *<.001*	-.09 *0.08*	.23 *<.001*	.31 *<.001*	1.00	**.54** *<.001*
HIV Testing Intention	-.01 *0.76*	.59 *<.001*	.17 *<.001*	.35 *<.001*	.16 *<.001*	.45 *<.001*	.17 *<.001*	.54 *<.001*	**1.00**

**Endogenous variables in the proposed path model*

Table 3. Models regressing on two endogenous variables: Homonegativity and HIV Testing Intention (n=425)

Variable	Standardized Estimate *(p-value)*	R-square *(p-value)*
Model 1 (*dependent variable:* ***Homonegativity)***		.19 *(<0.001)*
Acculturation	-.29 *(<0.001)*	
Social Norms about HIV testing	.65 *(<0.001)*	
Gender Role/Masculinity	.06 *(0.02)*	
Model 2 (*dependent variable:* ***HIV Testing Intention)***		.51 *(<0.001)*
Attitude about HIV testing	.04 *(0.03)*	
Subjective Norms about HIV testing	.09 *(<0.001)*	
Perceived Behavioral Control about HIV testing	-.03 *(0.02)*	
Homonegativity	.05 *(<0.001)*	
Social Norms about HIV testing	.25 *(<0.001)*	
Perceived HIV Risk	.65 *(<0.001)*	

Figure 1. Conceptual Model Guiding the Path Framework

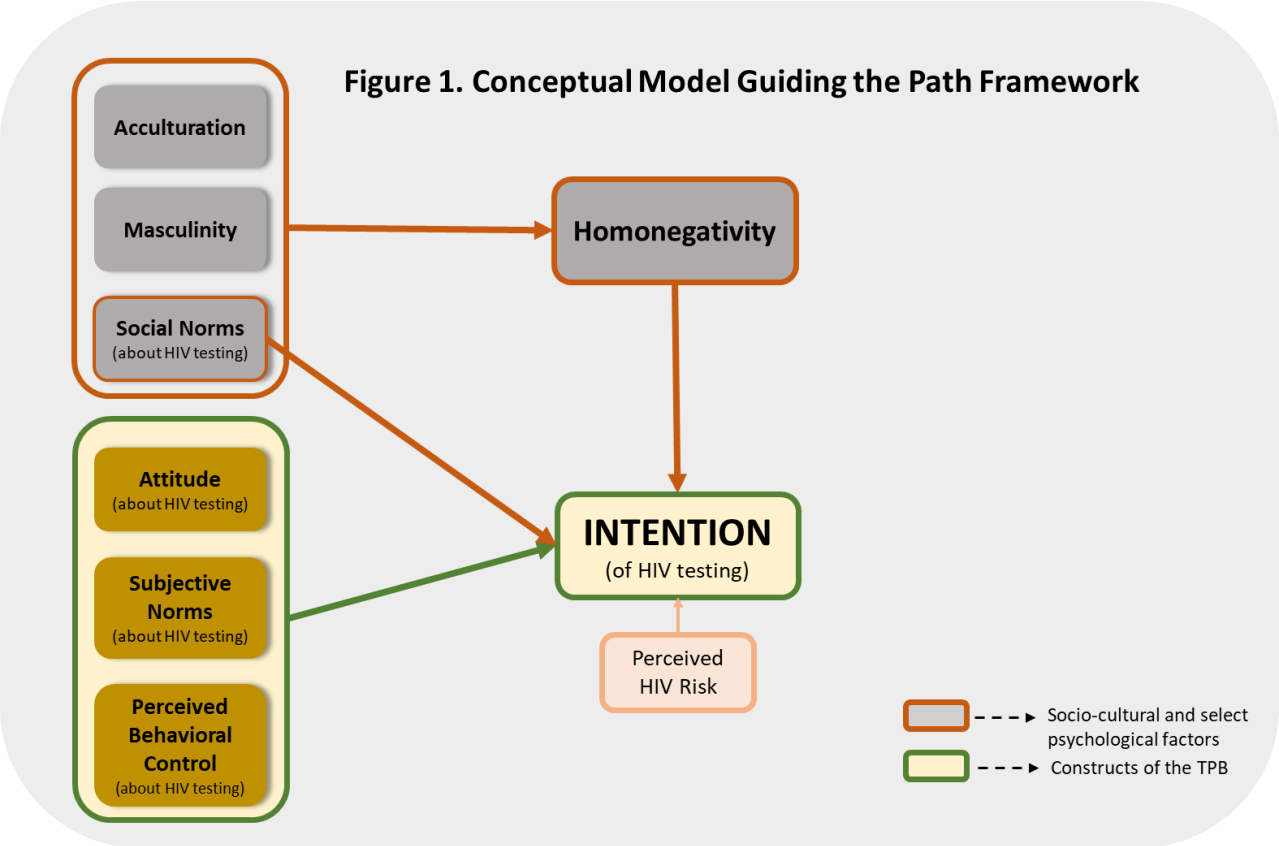


Figure 2. Initial Hypothesized Path Model

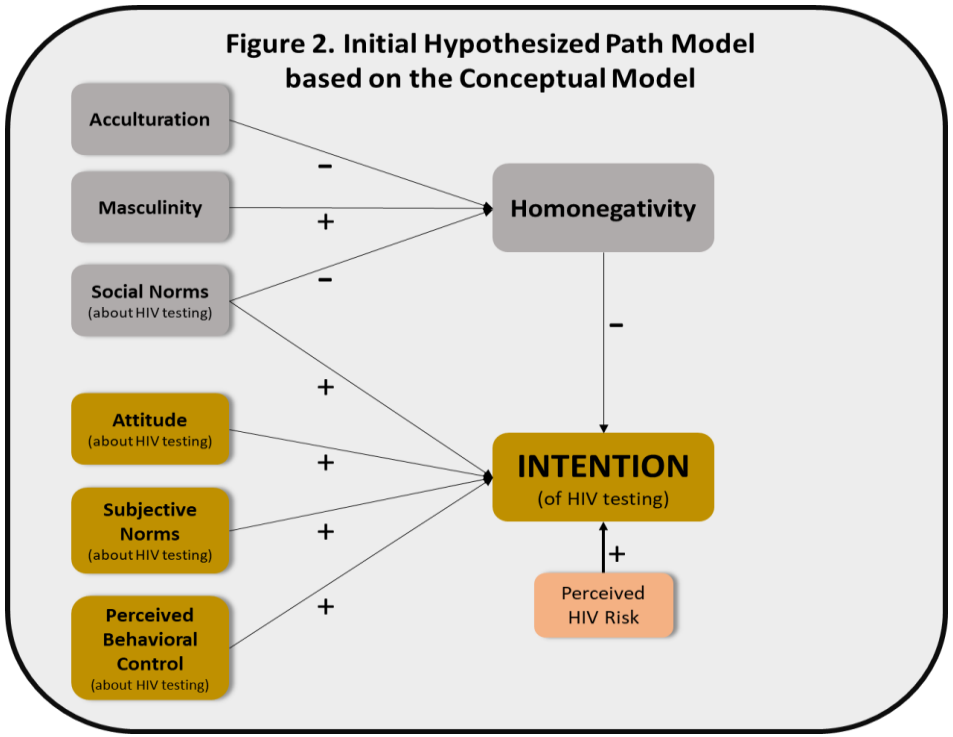


Figure 3. Final Path Model Standardized Results

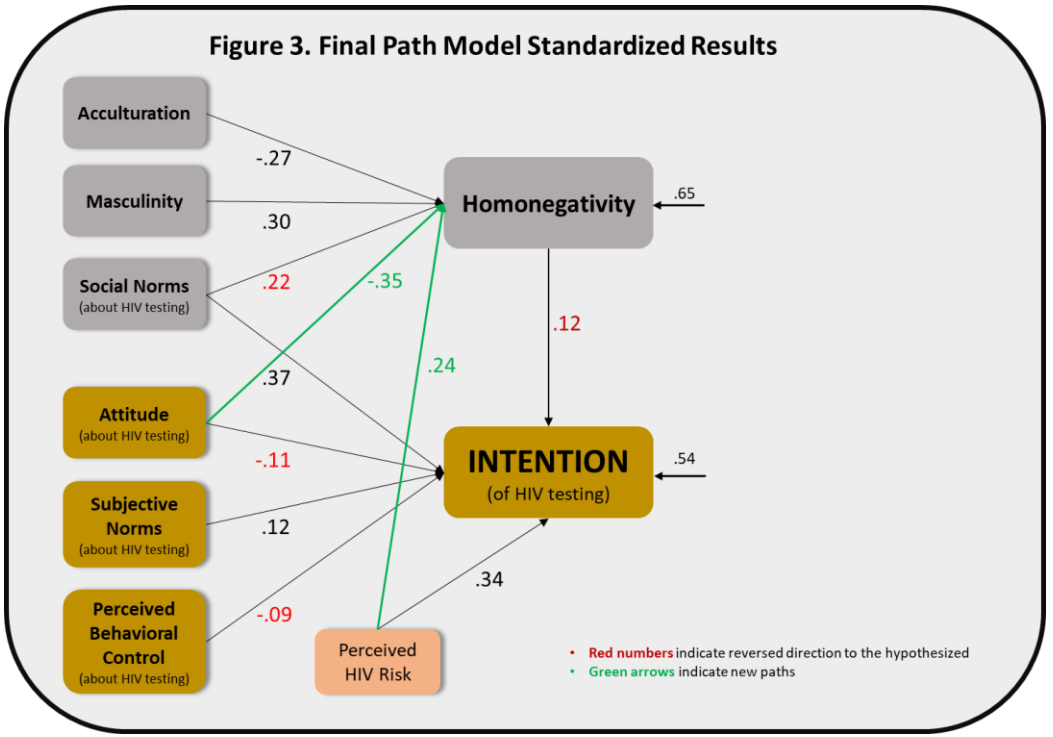


Table 4. Path Model Selection and Standardized Results (N= 425)

MODEL SELECTION	Model Fit Indexes*					Modifications
	Chi-square p-value	RMSEA	CFI	TLI	SRMR	
Base Model based on initial path framework	<.001	.24	.63	.21	.11	N/A
Modified Model #1 based on the base model	<.001	.13	.92	.75	.06	New path added from *Attitude* to *Homonegativity*
Modified Model #2 **(Final Model)** based on the Modified Model 1	.02	.07	**.98****	**.93****	**.03****	New path added from *Perceived HIV Risk* to *Homonegativity*
R-SQUARE	**Standardized Estimate (p-value)**					
Sub-model 1 *Endogenous variable as Homonegativity)*	.35 (<.001)					
Sub-model 2 *(Endogenous variable as HIV Testing Intention)*	.46 (<.001)					

** Recommended model fit index reference: Chi-square p-value > 0.05, RMSEA < 0.06, CFI > 0.9, TLI > 0.95, SRMR < 0.05*

*** Metrics satisfied the recommended thresholds and collectively showing good fit of the model with the data*

Table 5. Final Path Model Standardized Results (N=425)

Path	Standardized Estimate	S.E.	P-value
Total effect: Acculturation → HIV Testing Intention	**-.03**		
Indirect 1 (Acculturation → Homonegativity)	-.27	.04	*<.001*
Indirect 2 (Homonegativity → HIV Testing Intention)	.12	.04	*<.001*
Total effect: Masculinity → HIV Testing Intention	**.04**		
Indirect 1 (Gender Role/Masculinity → Homonegativity)	.30	.05	*<.001*
Indirect 2 (Homonegativity → HIV Testing Intention)	.12	.04	*<.001*
Total effect: Social Norms → HIV Testing Intention	**.40**		
Indirect 1 (Social Norms → Homonegativity)	.22	.04	*<.001*
Indirect 2 (Homonegativity → HIV Testing Intention)	.12	.04	*<.001*
Direct (Social Norms → HIV Testing Intention)	0.37	.04	*<.001*
Total effect: Attitude → HIV Testing Intention	**-.15**		
Indirect 1 (Attitude → Homonegativity)	-.35	.05	*<.001*
Indirect 2 (Homonegativity → HIV Testing Intention)	.12	.04	*<.001*
Direct (Attitude → HIV Testing Intention)	-.11	.04	*.01*
Total direct effect: Subjective Norm → HIV Testing Intention	**.12**	.05	*.01*
Total direct effect: Perceived Behavioral Control → HIV Testing Intention	**-.09**	.04	*.02*
Total effect from Perceived HIV Risk → HIV Testing Intention	**.37**		
Indirect 1 (Perceived HIV Risk → Homonegativity)	.24	.04	*<.001*
Indirect 2 (Homonegativity → HIV Testing Intention)	.12	.04	*<.001*
Direct (Perceived HIV Risk → HIV Testing Intention)	.34	.04	*<.001*

Total effect: Homonegativity → HIV Testing Intention	**.12**	.04	*.002*
Model R-square			
Homonegativity	.35	.04	*<.001*
HIV Testing Intention	.46	.04	*<.001*

Appendix 3: Description of endogenous and exogenous variables

Appendix 1. Description of endogenous and exogenous variables entering the model (N=425)

Variables	R-square* *(p-value)*	n	Description	Range	Min	Max	Average	SD
Endogenous								
Homonegativity	0.19 *(<0.001)*	425	16 items (Likert 1-5)	16 to 80	18	65	45.0	9.1
Intention of HIV Testing	0.43 *(<0.001)*	425	3 items (Likert 1-5)	3 to 15	3	15	9.8	2.9
Exogenous								
Acculturation *(To Homonegativity)*		425	30 items (Likert 1-5)	30 to 150	48	117	75.5	9.0
Social Norms *(To Homonegativity)*		425	5 items (Likert 1-5)	5 to 25	5	25	16.7	4.0
Masculinity *(To Homonegativity)*		425	30 items (Likert 1-5)	30 to 150	30	150	108.7	17.4
Attitude *(To Intention)*		425	10 items (Likert 1-5)	10 to 50	22	50	37.0	6.4
Subjective Norms *(To Intention)*		425	16 items (Likert 1-5)	16 to 80	16	80	55.6	9.7
Perceived Behavioral Control *(To Intention)*		425	12 items (Likert 1-5)	12 to 60	12	60	38.6	8.7
Perceived HIV Risk *(To Intention)*		425	2 items (Likert 1-5)	2 to 10	2	10	5.5	2.0

Chapter 3 References

Abamecha, F., Godesso, A., & Girma, E. (2013). Intention to voluntary HIV counseling and testing (VCT) among health professionals in Jimma zone, Ethiopia: the theory of planned behavior (TPB) perspective. *BMC Public Health, 13*(1), 140. doi:10.1186/1471-2458-13-140

Adih, W. K., Campsmith, M., Williams, C. L., Hardnett, F. P., & Hughes, D. (2011). Epidemiology of HIV among Asians and Pacific Islanders in the United States, 2001-2008. *J Int Assoc Physicians AIDS Care (Chic), 10*(3), 150-159. doi:10.1177/1545109711399805

Adong, J., Fatch, R., Emenyonu, N. I., Cheng, D. M., Muyindike, W. R., Ngabirano, C., . . . Hahn, J. A. (2019). Social Desirability Bias Impacts Self-Reported Alcohol Use Among Persons With HIV in Uganda. *Alcohol Clin Exp Res, 43*(12), 2591-2598. doi:10.1111/acer.14218

AETC. (2023). *Asian American People and HIV*. Retrieved from https://www.neaetc.org/files/attachment/attachment/6055/EP%20-%20Asian%20Americans%20and%20HIV%20(2021-06).pdf:

Ajzen, I. (2013). The theory of planned behavioral questionnaire. Measurement Instrument Database for the social science. In.

Ammerman, A., Lindquist, C., Lohr, K., & Hersey, J. (2002). The efficacy of behavioral interventions to modify dietary fat and fruit and vegetable intake: a review of the evidence. *Prev Med, 35*(1), 25-41.

Anhalt, K., Toomey, R. B., & Shramko, M. (2020). Latinx sexual minority youth adjustment in the context of discrimination and internalized homonegativity: The moderating role of

cultural orientation processes. *Journal of Latinx Psychology, 8*(1), 41-57. doi:10.1037/lat0000134

Ayodele, O. (2017). The theory of planned behavior as a predictor of HIV testing intention. *American Journal of Health Behavior, 41*(2), 147-151. doi:10.5993/AJHB.41.2.5.

Ayodele, O. (2017). The Theory of Planned Behavior as a Predictor of HIV Testing Intention. *Am J Health Behav, 41*(2), 147-151. doi:10.5993/ajhb.41.2.5

Baker, H. D. (2015). *Chinese Family & Kinship*: Macmillan International Higher Education.

Ballard, A. M., Cardwell, T., & Young, A. M. (2019). Fraud detection protocol for web-based research among men who have sex with men: development and descriptive evaluation. *JMIR Public Health and Surveillance, 5*(1), e12344.

Balsamo, M., Innamorati, M., & Lamis, D. A. (2007). CLINICAL PSYCHOMETRICS: OLD ISSUES AND NEW PERSPECTIVES.

Balsamo, M., Innamorati, M., & Lamis, D. A. (2019). Clinical psychometrics: Old issues and new perspectives. In (Vol. 10, pp. 947): Frontiers Media SA.

Barth, K. R., Cook, R. L., Downs, J. S., Switzer, G. E., & Fischhoff, B. (2002). Social stigma and negative consequences: factors that influence college students' decisions to seek testing for sexually transmitted infections. *Journal of American College Health, 50*(4), 153-159.

Benson, P. L., & Vincent, S. (1980). Development and Validation of the Sexist Attitudes Toward Women Scale (SATWS). *Psychology of women quarterly, 5*(2), 276-291. doi:10.1111/j.1471-6402.1980.tb00962.x

Berg, R. C., Munthe-Kaas, H. M., & Ross, M. W. (2016). Internalized Homonegativity: A Systematic Mapping Review of Empirical Research. *Journal of Homosexuality, 63*(4), 541-558. doi:10.1080/00918369.2015.1083788

Berg, R. C., Ross, M. W., Weatherburn, P., & Schmidt, A. J. (2013). Structural and environmental factors are associated with internalised homonegativity in men who have sex with men: Findings from the European MSM Internet Survey (EMIS) in 38 countries. *Social Science & Medicine, 78*, 61-69.

Berry, J. W., & Padilla, A. M. (1980). Acculturation: Theory, models and some new findings. *Acculturation as varieties of adaption, 9*, 25.

Beyrer, C., Sullivan, P., Sanchez, J., Baral, S. D., Collins, C., Wirtz, A. L., . . . Mayer, K. (2013). The increase in global HIV epidemics in MSM. *AIDS, 27*(17), 2665-2678. doi:10.1097/01.aids.0000432449.30239.fe

Bhattacharya, G. (2004). Health care seeking for HIV/AIDS among South Asians in the United States. *Health & Social Work, 29*(2), 106-115.

Bicchieri, C., Ryan Muldoon, Alessandro Sontuoso. (2018). Social Norms. *The Stanford Encyclopedia of Philosophy Winter 2018 Edition*. doi:https://plato.stanford.edu/entries/social-norms/

Boateng, G. O., Neilands, T. B., Frongillo, E. A., Melgar-Quiñonez, H. R., & Young, S. L. (2018). Best Practices for Developing and Validating Scales for Health, Social, and Behavioral Research: A Primer. *Frontiers in public health, 6*, 149-149. doi:10.3389/fpubh.2018.00149

Booth, A., Harris, P., Goyder, E., & Norman, P. (2012). Beliefs about chlamydia testing amongst young people living in relatively deprived areas. *Journal oof Public Health, 35*(2). doi:DOI: 10.1093/pubmed/fds082

Borsboom, D., Mellenbergh, G. J., & van Heerden, J. (2004). The concept of validity. *Psychol Rev, 111*(4), 1061-1071. doi:10.1037/0033-295x.111.4.1061

Boudewyns, V., & Paquin, R. S. (2011). Intentions and beliefs about getting tested for STDs: Implications for communication interventions. *Health Communication, 26*(8), 701-711.

Brown, M. J., & Gladstone, N. (2012). Development of a short version of the gender role beliefs scale. *International Journal of Psychology and Behavioral Sciences, 2*(5), 154-158.

Buchacz, K., Patel, P., Taylor, M., Kerndt, P. R., Byers, R. H., Holmberg, S. D., & Klausner, J. D. (2004). Syphilis increases HIV viral load and decreases CD4 cell counts in HIV-infected patients with new syphilis infections. *AIDS, 18*(15), 2075-2079.

Buetow, S. (2010). Thematic analysis and its reconceptualization as 'saliency analysis'. *Journal of health services research & policy, 15*(2), 123-125.

Burk, J., Park, M., & Saewyc, E. M. (2018). A Media-Based School Intervention to Reduce Sexual Orientation Prejudice and Its Relationship to Discrimination, Bullying, and the Mental Health of Lesbian, Gay, and Bisexual Adolescents in Western Canada: A Population-Based Evaluation. *Int J Environ Res Public Health, 15*(11). doi:10.3390/ijerph15112447

Cangur, S., & Ercan, I. (2015). Comparison of model fit indices used in structural equation modeling under multivariate normality. *Journal of Modern Applied Statistical Methods, 14*(1), 14.

Carteret, M. (2011). Cultural Values of Asian Patients and Families.

CDC. (2014). Revised Surveillance Case Definition for HIV Infection - United States, 2014. *Accessed online at: https://www.cdc.gov/mmwr/preview/mmwrhtml/rr6303a1.htm?s_cid=rr6303a1_e*.

CDC. (2017). *HIV among Asians*. May 2017

CDC. (2018a). Estimated HIV Incidence and Prevalence in the United States, 2010–2015. *HIV Surveillance Report*, *23*(1), Accessed online at https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-supplemental-report-vol-23-21.pdf.

CDC. (2018b). Health Disparities in HIV/AIDS, Viral Hepatitis, STDs, and TB. *CDC webpage at https://www.cdc.gov/nchhstp/healthdisparities/asians.html*.

CDC. (2018c). HIV Surveillance Supplemental Report. *Official webpage: https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-supplemental-report-vol-23-1.pdf*.

CDC. (2018d). HIV Testing Guidelines. *Accessed online at https://www.cdc.gov/hiv/guidelines/testing.html*.

CDC. (2019a). HIV and Asians. *Official webpage at https://www.cdc.gov/hiv/group/racialethnic/asians/index.html*.

CDC. (2019b). HIV Incidence: Estimated Annual Infections in the U.S., 2010 - 2016. *Official webpage at https://www.cdc.gov/nchhstp/newsroom/2019/HIV-incidence.html*.

CDC. (2019c). HIV Surveillance Report *Official webpage at https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-supplemental-report-vol-24-1.pdf*, *24*(1), Table 2, page 24.

CDC. (2019d). HIV Surveillance Report *Official webpage at* *https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-supplemental-report-vol-24-1.pdf*, *24*(1), Table 1, page 17-21.

CDC. (2019e). HIV Testing Basics. *Official webpage:* *https://www.cdc.gov/hiv/basics/testing.html*.

CDC. (2019f). HIV/AIDS: HIV Risk and Prevention using Pre-Exposure Prophylaxis (PrEP). *https://www.cdc.gov/hiv/risk/prep/index.html accessed 3.28.19*.

CDC. (2019g). Patient Information Sheet - Acute HIV Infection (Information about Acute HIV Infection and PrEP). *Accessed online at* *https://www.cdc.gov/hiv/pdf/prep_gl_patient_factsheet_acute_hiv_infection_english.pdf*.

CDC. (2019h). Statistics Overview, HIV Surveillance Report. *Official webpage at* *https://www.cdc.gov/hiv/statistics/overview/index.html*.

CDC. (2021). *HIV Surveillance Report: Diagnoses of HIV Infection in the United States and Dependent Areas, 2019.* https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=51

CDC. (2022). Diagnoses of HIV Infection in the United States and dependent areas, 2020. *33*.

CDC. (2023a). *Impact on Racial and Ethnic Minorities*.

CDC (Producer). (2023b, 1/24/23). Screening in Clinical Settings. Retrieved from https://www.cdc.gov/hiv/clinicians/screening/clinical-settings.html#:~:text=CDC%20recommends%20that%20clinicians%20screen,increased%20risk%20for%20HIV%20Infection.

CDC/National Center for Health Statistics. (2018). National Health Interview Survey. *Official webpage at https://ftp.cdc.gov/pub/Health_Statistics/NCHS/NHIS/SHS/2018_SHS_Table_P-1.pdf*.

CDC/National Center for Health Statistics. (2020). National Health Interview Survey. *Accessed online at https://www.cdc.gov/nchs/nhis/index.htm*.

Chae, D. H., & Yoshikawa, H. (2008). Perceived group devaluation, depression, and HIV-risk behavior among Asian gay men. *Health Psychology, 27*, 140–148. doi:10.1037/0278-6133.27.2.140

Chi, X., & Hawk, S. (2016). Attitudes toward Same-Sex Attraction and Behavior among Chinese University Students: Tendencies, Correlates, and Gender Differences. *Front. Psychol.* doi:https://doi.org/10.3389/fpsyg.2016.01592

Chin, D., & Kroesen, K. W. (1999). Disclosure of HIV infection among Asian/Pacific Islander American women: Cultural stigma and support. *Cultural Diversity and Ethnic Minority Psychology, 5*(3), 222.

Chin, J., Leung, M., Sheth, L., & Rodriguez, T. (2007). Let's not ignore a growing HIV problem for Asians and Pacific Islanders in the US. *Journal of Urban Health, 84*(5), 642-647.

Chng, C. L., Wong, F. Y., Park, R. J., Edberg, M. C., & Lai, D. S. (2003a). A model for understanding sexual health among Asian American/Pacific Islander men who have sex with men (MSM) in the United States. *AIDS Education and Prevention, 15*(1 Supplement), 21-38.

Chng, C. L., Wong, F. Y., Park, R. J., Edberg, M. C., & Lai, D. S. (2003b). A model for understanding sexual health among Asian American/Pacific Islander men who have sex

with men (MSM) in the United States. *AIDS Educ Prev, 15*, 21-38. doi:https://doi.org/10.1521/aeap.15.1.5.21.23611

Choi, K., Han, C., Hudes, E., & Kegeles, S. (2002). Unprotected sex and associated risk factors among young Asian and Pacific Islander men who have sex with men. *AIDS Education and Prevention, 14*, 472–481. doi:10.1521/aeap.14.8.472.24114

Choi, K., Kumekawa, E., Dang, Q., Kegeles, S., Hays, R., & Stall, R. (1999). Risk and protective factors affecting sexual behavior among young Asian and Pacific Islander men who have sex with men: implications for HIV prevention. *Journal of Sex Education and Therapy, 24*(1-2), 47–55.

Choi, K., Wong, F., & Sy, F. (2005). HIV/AIDS among Asians and Pacific Islanders in the United States. *AIDS Education and Prevention, 17*, iii-v.

Choi, K. H., Yep, G. A., & Kumekawa, E. (1998). HIV prevention among Asian and Pacific Islander American men who have sex with men: a critical review of theoretical models and directions for future research. *AIDS Education and Prevention*.

Chou, W. (2001). Homosexuality and the cultural politics of Tongzhi in Chinese society. *Journal ofHomosexuality, 40*, 27-46.

Chow, E. N. L. (1998). The development of feminist consciousness among Asian American women. *Asian American Women and Gender, 3*, 2.

Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. *Annu. Rev. Psychol., 55*, 591-621.

Clifton, S., Nardon, A., Field, N., Mercer, C., Tanton, C., Macdowall, W., . . . Sonnenberg, P. (2016). HIV testing, risk perception, and behaviour in the British population. *AIDS, 30*(6), 943-952. doi:10.1097/QAD.0000000000001006

Cooper, M., Loue, S., & Lloyd, L. S. (2001). Perceived susceptibility to HIV infection among Asian and Pacific Islander women in San Diego. *Journal of Health care for the Poor and Underserved, 12*(2), 208-223.

Cotten-Huston, A. L., & Waite, B. M. (2000). Anti-homosexual attitudes in college students: predictors and classroom interventions. *J Homosex, 38*(3), 117-133. doi:10.1300/j082v38n03_07

CPACS. (2018). HIV testing among Asian Americans in Georgia, U.S. *Unpublished qualitative data from 3 focus group discussions among Asian Americans (Korean, Chinese, and Vietnamese)*.

Creswell, J., & Poth, C. (2017). Qualitative Inquiry and Research Design: Choosing Among Five Approaches. *Sage Publications*.

Creswell, J. W., & Miller, D. L. (2000). Determining Validity in Qualitative Inquiry. *Theory Into Practice, 39*(3), 124-130. doi:10.1207/s15430421tip3903_2

Deepak, A. C. (2005). Parenting and the Process of Migration: Possibilities Within South Asian Families. *Child Welfare, 84*(5), 585-606. Retrieved from http://www.jstor.org/stable/45398734

Dieleman, J. L., Haakenstad, A., Micah, A., Moses, M., Abbafati, C., Acharya, P., . . . Alam, K. (2018). Spending on health and HIV/AIDS: domestic health spending and development assistance in 188 countries, 1995–2015. *The lancet, 391*(10132), 1799-1829.

Diez-Roux, A. V. (2000). Multilevel analysis in public health research. *Annual review of public health, 21*(1), 171-192.

Dingake, O., & Bethuel, K. (2018). The state of human rights in relation to key populations, HIV and sexual and reproductive health. *Reproductive Health Matters, 26*(52), 46-50.

DiStefano, A. S., Hui, B., Barrera-Ng, A., Quitugua, L. F., Peters, R., Dimaculangan, J., . . . Tanjasiri, S. P. (2012). Contextualization of HIV and HPV risk and prevention among Pacific Islander young adults in Southern California. *Social Science & Medicine, 75*(4), 699-708.

Do, T. D., Hudes, E. S., Proctor, K., Han, C. S., & Choi, K. H. (2006). HIV testing trends and correlates among young Asian and Pacific Islander men who have sex with men in two U.S. cities. *AIDS Educ Prev, 18*(1), 44-55. doi:10.1521/aeap.2006.18.1.44

Dong, Y., & Peng, C. Y. (2013). Principled missing data methods for researchers. *Springerplus, 2*(1), 222. doi:10.1186/2193-1801-2-222

Estrada, D., & Rutter, P. (2006). Using the Multiple Lenses of Identity: Working With Ethnic and Sexual Minority College Students. *Journal of College Counseling, 9*(2), 158-166. doi:https://doi.org/10.1002/j.2161-1882.2006.tb00102.x

Evangeli, M., Ferris, K., Kenney, N. M., Baker, L. L. E., Jones, B., & Wroe, A. L. (2018). A systematic review of psychological correlates of HIV testing intention. *AIDS Care, 30*(1), 18-26. doi:10.1080/09540121.2017.1344351

Evangeli, M., Pady, K., & Wroe, A. L. (2016). Which Psychological Factors are Related to HIV Testing? A Quantitative Systematic Review of Global Studies. *AIDS Behav, 20*(4), 880-918. doi:10.1007/s10461-015-1246-0

Evans, C., Turner, K., Suggs, L., Occa, A., Juma, A., & Blake, H. (2016). Developing a mHealth intervention to promote uptake of HIV testing among African communities in the UK: a qualitative study. *BMC Public Health, 16*(1), 1-16.

Fauci, A. S., Redfield, R. R., Sigounas, G., Weahkee, M. D., & Giroir, B. P. (2019). Ending the HIV epidemic: a plan for the United States. *Jama, 321*(9), 844-845.

Fauk, N. K., Sukmawati, A. S., Wardojo, S. S. I., Teli, M., Bere, Y. K., & Mwanri, L. (2018). The intention of men who have sex with men to participate in voluntary counseling and HIV testing and access free condoms in Indonesia. *American Journal of Men's Health, 12*(5), 1175-1184.

Feng, Y., Wu, Z., & Detels, R. (2010). Evolution of men who have sex with men community and experienced stigma among men who have sex with men in Chengdu, China. *Acquir. Immune Defic. Syndr. , 53*(S98–S103.). doi: 10.1097/QAI.0b013e3181c7df71

Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development. *International Journal of Qualitative Methods, 5*(1), 80-92. doi:10.1177/160940690600500107

Figueroa, C., Johnson, C., Verster, A., & Baggaley, R. (2015). Attitudes and acceptability on HIV self-testing among key populations: a literature review. *AIDS and Behavior, 19*(11), 1949-1965.

Fiorentino, M., Eubanks, A., Coulaud, P. J., Couderc, C., Keita, B. D., Anoma, C., . . . Sagaon-Teyssier, L. (2021). Homonegativity, sexual violence and condom use with women in men who have sex with men and women in West Africa. *AIDS, 35*(4), 681-687. doi:10.1097/qad.0000000000002782

Fishbein, M. A. (2010). Predicting and changing behavior: The reasoned action approach. *New York: Psychology Press.*

Fleming, P. J., DiClemente, R. J., & Barrington, C. (2016). Masculinity and HIV: Dimensions of Masculine Norms that Contribute to Men's HIV-Related Sexual Behaviors. *AIDS and Behavior, 20*(4), 788-798. doi:10.1007/s10461-015-1264-y

Flood, J., McLaughlin, C., & Prentice, G. (2013). Minority Stress, Homonegativity, Alcohol Use and Mental Health Among College Gay Males. *Journal of Gay & Lesbian Mental Health, 17*(4), 367-386. doi:10.1080/19359705.2013.800006

Fuks, N., Smith, N., Pelaez, S., Stefano, J., & Brown, T. (2018). Acculturation Experiences Among Lesbian, Gay, Bisexual, and Transgender Immigrants in Canada. *The Counseling Psychologist, 46*(3), 296-323. doi:https://doi.org/10.1177/0011000018768538

Gadermann, A. M., Guhn, M., & Zumbo, B. D. (2012). Estimating ordinal reliability for Likert-type and ordinal item response data: A conceptual, empirical, and practical guide. *Practical Assessment, Research, and Evaluation*, *17*(1), 3.

Gavlas, J. T. (2018). *Psychometric Properties of the Modern Homonegativity Scale in the Southern United States.* Walden University,

Glanz, K., & Rimer, B. (1997). Theory at a glance: A guide for health promotion practice: US Dept. of Health and Human Services, Public Health Service, National Institutes of Health, National Cancer Institute.

Glanz, K., Rimer, B., & Viswanath, K. (2008). Health behavior and health education: theory, research, and practice: . *John Wiley & Sons*.

Glasgow, R., & Emmons, K. (2007). How can we increase translation of research into practice? Types of evidence needed. *Annu Rev Public Health, 28*, 413-433.

Glasgow, R., & Linnan, L. (2008). Evaluation of theory-based interventions. *Health behavior and health education: theory, research, and practice 4th ed San Francisco, CA: Jossey-Bass.*, 487-508.

Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *Qual. Rep., 8*, 597-606.

Goldenberg, T., Stephenson, R., & Bauermeister, J. (2018). Community stigma, internalized homonegativity, enacted stigma, and HIV testing among young men who have sex with men. *Journal of Community Psychology, 46*(4), 515-528. doi:https://doi.org/10.1002/jcop.21957

Gordon, M. M. (1964). *Assimilation in American life: The role of race, religion, and national origins*: Oxford University Press on Demand.

Górska, P., Bilewicz, M., Winiewski, M., & Waszkiewicz, A. (2017). On old-fashioned versus modern homonegativity distinction: Evidence from Poland. *Journal of Homosexuality, 64*(2), 256-272.

Grace J. (2018). Why Homophobia Is More Common Among Asian Populations? *https://studybreaks.com/news-politics/homophobia/ accessed 3.20.19.*

Gray, K., Annabell, L., & Kennedy, G. (2010). Medical students' use of Facebook to support learning: Insights from four case studies. *Medical teacher, 32*(12), 971-976.

Grey, J. A., Robinson, B. B., Coleman, E., & Bockting, W. O. (2013). A systematic review of instruments that measure attitudes toward homosexual men. *J Sex Res, 50*(3-4), 329-352. doi:10.1080/00224499.2012.746279

Grol RP, B. M., Hulscher ME, Eccles MP, Wensing M, Milbank Q.,. (2007). Planning and studying improvement in patient care: the use of theoretical perspectives., *85*(1), 93-138.

Grover, K. W., & Miller, C. T. (2014). Effects of mortality salience and perceived vulnerability on HIV testing intentions and behaviour. *Psychol Health, 29*(4), 475-490. doi:10.1080/08870446.2013.866672

Gu, J., Lau, J., & Tsui, H. (2011). Psychological factors in association with uptake of voluntary counselling and testing for HIV among men who have sex with men in Hong Kong. *Public health, 125*(5), 275-282.

Hahm, H., Lee, J., Ozonoff, A., & Amodeo, M. (2007). Predictors of STDs Among Asian and Pacific Islander Young Adults. *Perspectives on Sexual and Reproductive Health, 39*(4), 231-239. doi:https://doi.org/10.1363/3923107

Hahm, H., Lee, J., Rough, K., & Strathdee, S. (2012). Gender Power Control, Sexual Experiences, Safer Sex Practices, and Potential HIV Risk Behaviors Among Young Asian-American Women. *AIDS and Behavior, 16*(1), 179-188. doi:10.1007/s10461-011-9885-2

Han, C.-S., Proctor, K., & Choi, K.-H. (2014). We Pretend like Sexuality Doesn't Exist: Managing Homophobia in Gaysian America. *The Journal of Men's Studies, 22*(1), 53-63. doi:10.3149/jms.2201.53

Hancock, G., Mueller, R., & Stapleton, L. (2019). The Reviewer's Guide to Quantitative Methods in the Social Sciences. *Texbook.*

Hennink, M., Hutter, I., & Bailey, A. (2010). *Qualitative research methods*: Sage.

Herek, G. M. (1988). Heterosexuals' attitudes toward lesbians and gay men: Correlates and gender differences. *Journal of Sex Research, 25*(4), 451-477.

Herek, G. M. (1988). Heterosexuals' attitudes toward lesbians and gay men: Correlates and gender differences. *The Journal of Sex Research, 25*(4), 451-477. doi:10.1080/00224498809551476

Herek, G. M., & McLemore, K. A. (1998). Attitudes toward lesbians and gay men scale. *Handbook of sexuality-related measures*, 392-394.

HHS. (2019). 'Ending the HIV Epidemic: A Plan for America'? *Accessed online at https://www.hiv.gov/federal-response/ending-the-hiv-epidemic/overview*.

HHS. (2022). HIV Basics, U.S. Statistics, Fast Facts. *Official webpage at https://www.hiv.gov/hiv-basics/overview/data-and-trends/statistics*.

Hickson, F., Reid, D., Weatherburn, P., Stephens, M., Nutland, W., & Boakye, P. (2008). HIV, sexual risk, and ethinicity among men in England who have sex with men. *Sexually Transmitted Infections, 80*(6), 443-450. doi:10.1136/sti.2004.010520

Hogben, M., Janet, S., Lawrence, T., Hennessy, M., & Eldridge, G. (2003). Using The Theory Of Planned Behavior To Understand The STD Risk Behaviors Of Incarcerated Women. *Sage Publications*. doi:https://doi.org/10.1177/0093854802251003

Homayoon, B., Shahidi, N. C., & Cheung, W. Y. (2013). Impact of Asian ethnicity on colorectal cancer screening: a population-based analysis. *American journal of clinical oncology, 36*(2), 167-173.

Hsu, D., & Waters, J. (2001). Filial piety and sexual prejudice in Chinese culture. *Attitude measures, 11 Paper Presented at the Annual Conference of the American Psychological Association, San Francisco, CA.*

Hsu, K., & Iwamoto, D. K. (2014). Testing for Measurement Invariance in the Conformity to Masculine Norms-46 Across White and Asian American College Men: Development and Validity of the CMNI-29. *Psychol Men Masc, 15*(4), 397-406. doi:10.1037/a0034548

Hsueh, L., Layland, E. K., Kipke, M. D., & Bray, B. C. (2021). Linking racism and homonegativity to healthcare system distrust among young men of color who have sex with men: Evidence from the Healthy Young Men's (HYM) study. *Social Science & Medicine, 284*, 114219. doi:https://doi.org/10.1016/j.socscimed.2021.114219

Huang, Z. J., He, N., Nehl, E. J., Zheng, T., Smith, B. D., Zhang, J., . . . Wong, F. Y. (2012). Social network and other correlates of HIV testing: findings from male sex workers and other MSM in Shanghai, China. *AIDS Behavior, 16*(4), 858-871. doi:doi: 10.1007/s10461-011-0119-4.

Huang, Z. J., Wong, F. Y., De Leon, J. M., & Park, R. J. (2008). Self-reported HIV testing behaviors among a sample of Southeast Asians in an urban setting in the United States. *AIDS Education and Prevention, 20*(1), 65.

Huang, Z. J., Wong, F. Y., De Leon, J. M., & Park, R. J. (2008). Self-reported HIV testing behaviors among a sample of southeast Asians in an urban setting in the United States. *AIDS Educ Prev, 20*(1), 65-77. doi:10.1521/aeap.2008.20.1.65

Hudson, W. W., & Ricketts, W. A. (1980). A strategy for the measurement of homophobia. *Journal of Homosexuality, 5*(4), 357-372.

Human Rights Campaign. (2019). Family and Coming out Issues for Asian Pacific Americans. *https://www.hrc.org/resources/family-and-coming-out-issues-for-asian-pacific-americans accessed 4.1.19.*

Human Rights Watch. (2017). South Korea Events of 2017. *Accessed online at https://www.hrw.org/world-report/2018/country-chapters/south-korea*.

Humanity in Action USA. (2020,). Human Rights Diplomacy Amidst "World War LGBT": Re-examining Western Promotion of LGBT Rights in Light of the “Traditional Values” Discourse. *Accessed online at https://www.humanityinaction.org/knowledge_detail/human-rights-diplomacy-amidst-world-war-lgbt-re-examining-western-promotion-of-lgbt-rights-in-light-of-the-traditional-values-discourse/*.

Immigration Policy Institute. (2021). Asian Immigrants in the United States. *Official webpage* *https://www.migrationpolicy.org/article/asian-immigrants-united-states*.

Iott, B. E., Loveluck, J., Benton, A., Golson, L., Kahle, E., Lam, J., . . . Veinot, T. C. (2022). The impact of stigma on HIV testing decisions for gay, bisexual, queer and other men who have sex with men: a qualitative study. *BMC Public Health, 22*(1), 471. doi:10.1186/s12889-022-12761-5

Ivankova N V., C. J., Stick SL., . (2006). Using Mixed-Methods Sequential Explanatory Design: From Theory to Practice. *Field methods*. doi:doi:10.1177/1525822X05282260

Iwamoto, Derek, K., & Kaya, A. (2009). Asian American men and Asianized attribution: Intersections of masculinity, race, and sexuality. *Asian American Psychology: Current Perspectives*, 211-232.

Jeffries, W. L. t., & Johnson, O. D. (2015). Homonegative Attitudes and Risk Behaviors for HIV and Other Sexually Transmitted Infections Among Sexually Active Men in the United States. *Am J Public Health, 105*(12), 2466-2472. doi:10.2105/ajph.2015.302780

Ju, D. H. (2021). Factors shaping Asian Americans' attitudes toward homosexuality. *Ethnic and Racial Studies*, 1-24. doi:10.1080/01419870.2021.1884732

Ju, D. H. (2022). Factors shaping Asian Americans' attitudes toward homosexuality. *Ethnic and Racial Studies, 45*(5), 851-874. doi:10.1080/01419870.2021.1884732

Kaestle, C., & Waller, M. (2011). Bacterial STDs and Perceived Risk Among Sexual Minority Young Adults. *Perspec Sex Reprod Health, 43*(3), 158-163. doi:10.1363/4315811

Kaiser Family Foundation. (2019a). The Global HIV/AIDS Epidemic. *Official webpage* *https://www.kff.org/global-health-policy/fact-sheet/the-global-hivaids-epidemic/*.

Kaiser Family Foundation. (2019b). Key Facts on Health and Health Care by Race and Ethnicity (Section 2: Health Access and Utilization). *Official webpage at https://www.kff.org/report-section/key-facts-on-health-and-health-care-by-race-and-ethnicity-section-2-health-access-and-utilization/*.

Kakoko, D. C., Astrøm, A. N., Lugoe, W. L., & Lie, G. T. (2006). Predicting intended use of voluntary HIV counselling and testing services among Tanzanian teachers using the theory of planned behaviour. *Soc Sci Med*, *63*(4), 991-999. doi:10.1016/j.socscimed.2006.02.016

Kanuha, V. (2000). The impact of sexuality and race/ethnicity on HIV/AIDS risk among Asian and Pacific Island American (A/PIA) gay and bisexual men in Hawaii. *AIDS Education and Prevention, 12*, 505–518.

Kapp, J. M., Peters, C., & Oliver, D. P. (2013). Research recruitment using Facebook advertising: big potential, big challenges. *Journal of Cancer Education, 28*(1), 134-137.

Kim, J. E., & Zane, N. (2016). Help-seeking intentions among Asian American and White American students in psychological distress: Application of the health belief model. *Cultural Diversity and Ethnic Minority Psychology, 22*(3), 311.

Kim, W., & Keefe, R. H. (2010). Barriers to healthcare among Asian Americans. *Social Work in Public Health, 25*(3-4), 286-295.

Klabunde, C. N., Brown, M., Ballard-Barbash, R., White, M. C., Thompson, T., Plescia, M., & King, S. C. (2012). Cancer Screening-United States, 2010 (Reprinted from MMWR, vol 61, pg 41-45, 2012). *JAMA-JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 307*(12), 1248-1250.

Klem, L. (1995). Path analysis. p. 65-98.

Klem, L. (2000). Structural equation modeling. p. 227-259.

Kramer, S., Schmidt, A., Berg, R., Furegato, M., Hospers, H., Folch, C., & Marcus, U. (2016). Factors associated with unprotected anal sex with multiple non-steady partners in the past 12 months: results from the European Men-Who-Have-Sex-With-Men Internet Survey (EMIS 2010). *BMC Public Health, 16*, 47. doi:10.1186/s12889-016-2691-z

Kumar, E. M., & Poulakis, M. . (April 2013). Uncovering an Invisible Population: South Asian Gay Men. *Society for the Psychology of Sexual Orientation and Gender Diversity, Division 44 Newsletter.* doi: https://www.apadivisions.org/division-44/publications/newsletters/division/2013/04/south-asian-gay

Kyung-Hee C. et al. (1998). HIV prevention among Asian and Pacific Islander American men who have sex with men: A critical review of theoretical models and directions for future research. *AIDS Educ Prev, 10*(3), 19-30.

Lai D. S. (1998). Self-esteem and unsafe sex in Chinese-American and Japanese-American gay men. *Unpublished doctoral dissertation, California School of Professional Psychology, Alameda.*

Lee, H., Operario, D., Agénor, M., Yi, H., Choo, S., & Kim, S.-S. (2022). Internalized homophobia and HIV testing among Korean gay and bisexual men: a study in a high-income country with pervasive HIV/AIDS stigma. *AIDS Care*, 1-6. doi:10.1080/09540121.2022.2083056

Lee, J. J., & Zhou, Y. (2019). Facilitators and barriers to HIV testing among Asians in the United States: a systematic review. *AIDS Care, 31*(2), 141-152. doi:10.1080/09540121.2018.1533231

Legler J, M. H., Coyne C, Breen N, Chollette V, Rimer BK,. (2002). The effectiveness of interventions to promote mammography among women with historically lower rates of screening. *Cancer Epidemiol Biomarkers Prev, 11*(1), 59–71.

Li, C.-H. (2016). Confirmatory factor analysis with ordinal data: Comparing robust maximum likelihood and diagonally weighted least squares. *Behavior research methods, 48*(3), 936-949.

Lima, K. d. S., Tenório, J. M. V., Romário, F., Melo, L. M. F. d., & Andrade, J. M. d. (2019). Evidence of Validity of a Modern Homonegativity Measure against Gays and Lesbians. *Psico-USF, 24*, 673-684.

Liu J. & Choi K. (2006). Experiences of social discrimination among men who have sex with men in Shanghai. China. *AIDS Behav., 10*(25–33). doi:10.1007/s10461-006-9123-5

Loehlin, J. (1988). Latent Variable Models-an Introduction to Factor, Path, and Structural-Analysis-Loehlin, Jc. *Applied Psychological Measurement, 12*(2), 211-213.

Lorenc, T., Marrero-Guillamón, I., Llewellyn, A., Aggleton, P., Cooper, C., Lehmann, A., & Lindsay, C. (2011). HIV testing among men who have sex with men (MSM): systematic review of qualitative evidence. *Health Educ Res, 26*(5), 834-846. doi:10.1093/her/cyr064

Lottes, I. L., & Grollman, E. A. (2010). Conceptualization and assessment of homonegativity. *International Journal of Sexual Health, 22*(4), 219-233. doi:10.1080/19317611.2010.489358

Luu, T. D., & Bartsch, R. A. (2011). Relationship Between Acculturation and Attitudes Toward Gay Men and Lesbians in the Vietnamese American Community. *Journal of Applied Social Psychology, 41*(11), 2621-2633. doi:https://doi.org/10.1111/j.1559-1816.2011.00840.x

Ma, G. (2000). Barriers to the use of health services by Chinese Americans. *Journal of Allied Health, 29*(2), 64-70.

Marcus, U., Gassowski, M., & Drewes, J. (2016). HIV risk perception and testing behaviours among men having sex with men (MSM) reporting potential transmission risks in the previous 12 months from a large online sample of MSM living in Germany. *BMC Public Health, 16*(1), 1111. doi:10.1186/s12889-016-3759-5

Marin, B., Gomez, C., & Tschann, J. (1993). Condom use among men with secondary female sexual partners. *Public Health Reports,, 108*, 742-750.

Matteson DR. (1997). Bisexual and homosexual behavior and HIV risk among Chinese-, Filipino-, and Korean-American men. *Journal of Sex Research, 34*, 93–104. doi:10.1080/00224499709551870

Maxwell, J. A. (2012). *Qualitative research design: An interactive approach* (Vol. 41): Sage publications.

McCabe, S. E., Diez, A., Boyd, C. J., Nelson, T. F., & Weitzman, E. R. (2006). Comparing web and mail responses in a mixed mode survey in college alcohol use research. *Addictive behaviors, 31*(9), 1619-1627.

McLeroy KR. et al. (1988). An ecological perspective on health program programs. *Review, 15*(4), 351-377.

Meadowbrooke, C. C., Veinot, T. C., Loveluck, J., Hickok, A., & Bauermeister, J. A. (2014). Information Behavior and HIV Testing Intentions Among Young Men at Risk for HIV/AIDS. *J Assoc Inf Sci Technol, 65*(3), 609-620. doi:10.1002/asi.23001

Meadowbrooke, C. C., Veinot, T. C., Loveluck, J., Hickok, A., & Bauermeister, J. A. (2014). Information behavior and HIV testing intentions among young men at risk for

HIV/AIDS. *Journal of the Association for Information Science and Technology, 65*(3), 609-620.

Miller, B., & Lewallen, J. (2015). The Effects of Portrayals of Gay Men on Homonegativity and the Attribution of Gender-Based Descriptors. *Communication Studies, 66*(3), 358-377. doi:10.1080/10510974.2015.1018446

Mirkuzie, A. H. (2011a). Applying the theory of planned behavior to explain HIV testing in antenatal settings in Addis Ababa - a cohort study. *BMC Health Serv Res, 11*, 196. doi:https://doi.org/10.1186/1472-6963-11-196

Mirkuzie, A. H. (2011b). Applying the theory of planned behaviour to explain HIV testing in antenatal settings in Addis Ababa - a cohort study. *BMC Health Serv Res, 11*, 196. doi:10.1186/1472-6963-11-196

Miyazaki, Y., Bodenhorn, N., Zalaquett, C., & Ng, K.-M. (2008). Factorial structure of Brief COPE for international students attending US colleges. *College Student Journal, 42*(3).

Miyoshi, M., Asner-Self, K., Yanyan, S., & Koran, J. M. (2017). Psychometric Properties of the Abbreviated Multidimensional Acculturation Scale and the Multigroup Ethnic Identity Measure With Japanese Sojourners. *Assessment, 24*(1), 104-114. doi:10.1177/1073191115601208

Mizuno, Y., Borkowf, C., Millett, G. A., Bingham, T., Ayala, G., & Stueve, A. (2012). Homophobia and Racism Experienced by Latino Men Who Have Sex with Men in the United States: Correlates of Exposure and Associations with HIV Risk Behaviors. *AIDS and Behavior, 16*(3), 724-735. doi:10.1007/s10461-011-9967-1

Mohajan, H. K. (2017). Two criteria for good measurements in research: Validity and reliability. *Annals of Spiru Haret University. Economic Series, 17*(4), 59-82.

Montanaro, E. A., & Bryan, A. D. (2014). Comparing theory-based condom interventions: Health belief model versus theory of planned behavior. *Health Psychology, 33,* 1251-1260. doi:10.1037/a0033969

Morandini, J. S., Blaszczynski, A., Ross, M. W., Costa, D. S., & Dar-Nimrod, I. (2015). Essentialist beliefs, sexual identity uncertainty, internalized homonegativity and psychological wellbeing in gay men. *Journal of counseling psychology, 62*(3), 413.

Morrison, M. A., & Morrison, T. G. (2002). Development and validation of a scale measuring modern prejudice toward gay men and lesbian women. *J Homosex, 43*(2), 15-37. doi:10.1300/j082v43n02_02

Morrison, M. A., & Morrison, T. G. (2003). Development and validation of a scale measuring modern prejudice toward gay men and lesbian women. *Journal of Homosexuality, 43*(2), 15-37.

Morrison, M. A., & Morrison, T. G. (2013). Modern Homonegativity Scale. In *Handbook of sexuality-related measures* (pp. 414-426): Routledge.

Morrison, M. A., Morrison, T. G., & Franklin, R. (2009). Modern and old-fashioned homonegativity among samples of Canadian and American university students. *Journal of Cross-Cultural Psychology, 40*(4), 523-542.

Morrison, T. G., Kenny, P., & Harrington, A. (2005). Modern prejudice toward gay men and lesbian women: Assessing the viability of a measure of modern homonegative attitudes within an Irish context. *Genetic, Social, and General Psychology Monographs, 131*(3), 219-250.

Morrison, T. G., McLeod, L. D., Morrison, M. A., Anderson, D., & O'Connor, W. E. (1997). Gender stereotyping, homonegativity, and misconceptions about sexually coercive

behavior among adolescents. *Youth & Society, 28*, 351-382. doi:10.1177/0044118X97028003004

Mulholland, E., & Van Wersch, A. (2007). Stigma, sexually transmitted infections and attendance at the GUM Clinic: an exploratory study with implications for the theory of planned behaviour. *Journal of Health Psychology, 12*(1), 17-31.

Murray, K., & Oraka, E. (2014). Racial and ethnic disparities in future testing intentions for HIV: United States, 2007–2010: results from the National Health Interview Survey. *AIDS and Behavior, 18*, 1247-1255.

Musumari, P. M., Techasrivichien, T., Srithanaviboonchai, K., Tangmunkongvorakul, A., Ono-Kihara, M., & Kihara, M. (2020). Factors associated with HIV testing and intention to test for HIV among the general population of Nonthaburi Province, Thailand. *PLoS One, 15*(8), e0237393. doi:10.1371/journal.pone.0237393

Negy, C., & Eisenman, R. (2005). A comparison of African American and white college students' affective and attitudinal reactions to lesbian, gay, and bisexual individuals: An exploratory study. *The Journal of Sex Research, 42*(4), 291-298. doi:10.1080/00224490509552284

Nemoto, T., Wong, F., Ching, A., Chng, C. L., Bouey, P., Henrickson, M., & Sember, R. (1998). HIV seroprevalence, risk behaviors, and cognitive factors among Asian and Pacific Islander American men who have sex with men: a summary and critique of empirical studies and methodological issues. *AIDS education and prevention: official publication of the International Society for AIDS Education, 10*(3 Suppl), 31-47.

Nicholls, E. J., Samba, P., McCabe, L., Gafos, M., Philips, A. N., Trevelion, R., . . . Witzel, T. C. (2022). Experiences of and attitudes towards HIV testing for Asian, Black and Latin

American men who have sex with men (MSM) in the SELPHI (HIV Self-Testing Public Health Intervention) randomized controlled trial in England and Wales: implications for HIV self-testing. *BMC Public Health, 22*(1), 809. doi:10.1186/s12889-022-13189-7

Noar SM, B. C., Harris MS,. (2007). Does tailoring matter? Meta-analytic review of tailored print health behavior change interventions. *Psychol Bull, 133*(4), 673-693.

Noble, M., Jones, A. M., Bowles, K., DiNenno, E. A., & Tregear, S. J. (2017). HIV testing among internet-using MSM in the United States: systematic review. *AIDS and Behavior, 21*(2), 561-575.

O.Nyumba, T., Wilson, K., Derrick, C. J., & Mukherjee, N. (2018). The use of focus group discussion methodology: Insights from two decades of application in conservation. *Methods in Ecology and Evolution, 9*(1), 20-32. doi:https://doi.org/10.1111/2041-210X.12860

Occhipinti, S., Laurie, K., Hyde, M. K., Martin, S., Oliffe, J., Wittert, G., & Chambers, S. K. (2019). Measuring Masculinity in Men With Chronic Disease. *Am J Mens Health, 13*(4), 1557988319859706. doi:10.1177/1557988319859706

Onwuegbuzie, A. J., Dickinson, W. B., Leech, N. L., & Zoran, A. G. (2009). A Qualitative Framework for Collecting and Analyzing Data in Focus Group Research. *International Journal of Qualitative Methods, 8*(3), 1-21. doi:10.1177/160940690900800301

Oyarce-Vildósola, O., Rodríguez-Fernández, A., & Maury-Sintjago, E. (2022). Association between Homophobia and Sociodemographic Characteristics in Health Workers in Southern Chile. *Int J Environ Res Public Health, 19*(21). doi:10.3390/ijerph192113749

Padela, A. I., Vu, M., Muhammad, H., Marfani, F., Mallick, S., Peek, M., & Quinn, M. T. (2016). Religious beliefs and mammography intention: findings from a qualitative study

of a diverse group of American Muslim women. *Psychooncology, 25*(10), 1175-1182. doi:10.1002/pon.4216

Paine, E. A., Lee, Y. G., Vinogradov, V., Zhakupova, G., Hunt, T., Primbetova, S., . . . Wu, E. (2021). HIV Stigma, Homophobia, Sexual and Gender Minority Community Connectedness and HIV Testing Among Gay, Bisexual, and Other Men and Transgender People Who Have Sex with Men in Kazakhstan. *AIDS and Behavior, 25*(8), 2568-2577. doi:10.1007/s10461-021-03217-9

Palaniappan, L., Araneta, M., Assimes, T., Barrett-Connor, E., Carnethon, M., & Criqui, M. (2010). Call to action: cardiovascular disease in Asian Americans: a science advisory from the American Heart Association. . *Circulation, 122*(12), 1242-1252. doi:10.1161/CIR.0b013e3181f22af4

Pendse, R., Gupta, S., Yu, D., & Sarkar, S. (2016). HIV/AIDS in the South-East Asia region: progress and challenges. *Journal of virus eradication, 2*(Suppl 4), 1.

Perkins, J. M., Nyakato, V. N., Kakuhikire, B., Mbabazi, P. K., Perkins, H. W., Tsai, A. C., . . . Bangsberg, D. R. (2018). Actual Versus Perceived HIV Testing Norms, and Personal HIV Testing Uptake: A Cross-Sectional, Population-Based Study in Rural Uganda. *AIDS Behav, 22*(2), 616-628. doi:10.1007/s10461-017-1691-z

Pew Research Center. (2015). Modern Immigration Wave Brings 59 Million to U.S., Driving Population Growth and Change Through 2065: Views of Immigration's Impact on U.S. Society Mixed. *Official webpage* *https://www.pewresearch.org/hispanic/2015/09/28/modern-immigration-wave-brings-59-million-to-u-s-driving-population-growth-and-change-through-2065/*.

Pew Research Center. (2017a). Facts on U.S. Immigrants: *Statistical portrait of the foreign-born population in the United States*. *Official webpage* *https://www.pewresearch.org/hispanic/2019/06/03/facts-on-u-s-immigrants/*.

Pew Research Center. (2017b). Key facts about Asian Americans, a diverse and growing population. *Official webpage: https://www.pewresearch.org/fact-tank/2017/09/08/key-facts-about-asian-americans/*.

Pew Research Center. (2021). *Key facts about Asian Americans, a diverse and growing population*. Retrieved from https://www.pewresearch.org/short-reads/2021/04/29/key-facts-about-asian-americans/:

Pikard, J. L. (2009). *HIV voluntary counselling and testing among Kenyan male youth aged 13-15 years: the theory of planned behaviour applied.* Queen's University,

Population Council. (1999). Literature Review: Challenging HIV-Related Stigma and Discrimination in Southeast Asia: Past Successes and Future Priorities. *Accessed online at https://pdfs.semanticscholar.org/b285/8e02447799321164c61eadeace54b02c7235.pdf*.

Population Council. (2019). Key Populations at Risk for HIV. *Accessed online at https://www.popcouncil.org/research/key-populations-at-risk-for-hiv*.

Portal, M. D. (2019). Migration and Health. *Accessed online at https://migrationdataportal.org/themes/migration-and-health*.

Ratti, R., Bakeman, R., & Peterson, J. (2000). Correlates of high-risk sexual behavior among Canadian men of South Asian and European origin who have sex with men. *AIDS Care, 12*, 193–202. doi:10.1080/09540120050001878

Renzetti, C. M., & Edleson, J. L. (2008). *Encyclopedia of interpersonal violence*: Sage Publications.

Ricketts, W. A., & Hudson, W. W. (1980). Index of homophobia (Index of attitudes toward homosexuals). *Handbook of sexuality-related measures*, 367-368.

Robinson, J. L., & Rubin, L. J. (2016). Homonegative Microaggressions and Posttraumatic Stress Symptoms. *Journal of Gay & Lesbian Mental Health, 20*(1), 57-69. doi:10.1080/19359705.2015.1066729

Roder A. (2015). Immigrants' Attitudes toward Homosexuality: Socialization, Religion, and Acculturation in European Host Societies. *The International Migration Review, 49*(4), 1042-1070. Retrieved from http://www.jstor.org/stable/43948596

Romero, D. H. (2011). *Assessing the measurement invariance of the modern homonegativity scale*: The University of Texas at El Paso.

Romero, D. H., Morera, O. F., & Wiebe, J. S. (2015). Assessing the gender invariance of the Modern Homonegativity Scale. *Journal of Homosexuality, 62*(11), 1539-1559.

Rosenman, R., Tennekoon, V., & Hill, L. G. (2011). Measuring bias in self-reported data. *International journal of behavioural & healthcare research, 2*(4), 320.

Ross M. (2018). Homophobia among Asian Americans and HIV testing. *Expert opinion via personal conversation Dated Jul 12, 2018*.

Ross, M. W., Berg, R. C., Schmidt, A. J., Hospers, H. J., Breveglieri, M., Furegato, M., & Weatherburn, P. (2013). Internalised homonegativity predicts HIV-associated risk behavior in European men who have sex with men in a 38-country cross-sectional study: some public health implications of homophobia. *BMJ Open, 3*(2), e001928. doi:10.1136/bmjopen-2012-001928

Ross, M. W., Kajubi, P., Mandel, J. S., McFarland, W., & Raymond, H. F. (2013). Internalized homonegativity/homophobia is associated with HIV-risk behaviours among Ugandan gay

and bisexual men. *International journal of STD & AIDS, 24*(5), 409-413. doi:10.1177/0956462412472793

Ross, M. W., Rosser, B. R. S., & Neumaier, E. R. (2008). The Relationship of Internalized Homonegativity to Unsafe Sexual Behavior in HIV-Seropositive Men Who Have Sex With Men. *AIDS Education and Prevention, 20*(6), 547-557. doi:10.1521/aeap.2008.20.6.547

Rye, B., & Meaney, G. J. (2010). Measuring homonegativity: A psychometric analysis. *Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement, 42*(3), 158.

Sabatier R. (1996). Migrants and AIDS: Themes of vulnerability and resistance. In M.Haour-Knipe, & R. Rector (Eds). Crossing borders: Migration, ethnicity and AIDS. *London: Taylor & Francis*, 86-101.

Safari M, S.-Z. D., Ghofranipour F, Heydarnia A, Pakpur A.,. (2012). Theories, models and methods of health education and health promotion. 2 ed. Tehran: Asaresobhan.

Salazar, L. F., Crosby, R. A., & DiClemente, R. J. (2015). *Research methods in health promotion*: John Wiley & Sons.

Sales, J. M., & Sheth, A. N. (2019). Associations Among Perceived HIV Risk, Behavioral Risk and Interest in PrEP Among Black Women in the Southern US. *AIDS Behav, 23*(7), 1871-1876. doi:10.1007/s10461-018-2333-9

Salud, M. C., Marshak, H. H., Natto, Z. S., & Montgomery, S. (2014). Exploring HIV-testing intentions in young Asian/Pacific Islander (API) women as it relates to acculturation, theory of gender and power (TGP), and the AIDS risk reduction model (ARRM). *AIDS Care, 26*(5), 642-647. doi:10.1080/09540121.2013.841836

Saunders, M., Lewis, P., & Thornhill, A. (2012). Research methodology—Convenience sampling. In.

Schulz, K.-H., Kroencke, S., Ewers, H., Schulz, H., & Younossi, Z. M. (2008). The factorial structure of the Chronic Liver Disease Questionnaire (CLDQ). *Quality of Life Research, 17*(4), 575-584. doi:10.1007/s11136-008-9332-7

Schwartz, S. J., Unger, J. B., Zamboanga, B. L., & Szapocznik, J. (2010). Rethinking the concept of acculturation: implications for theory and research. *American Psychologist, 65*(4), 237.

Sen, S., Aguilar, J. P., & Petty, M. (2021). An ecological framework for understanding HIV- and AIDS-related stigma among Asian American and Pacific Islander men who have sex with men living in the USA. *Culture, Health & Sexuality, 23*(1), 85-97. doi:10.1080/13691058.2019.1690164

Sen, S., Nguyen, H. D., Kim, S. Y., & Aguilar, J. (2017). HIV knowledge, risk behavior, stigma, and their impact on HIV testing among Asian American and Pacific Islanders: a review of literature. *Social Work in Public Health, 32*(1), 11-29.

Shapiro, J., & Vives, G. (1999). Demographic and attitudinal variables related to high-risk behaviors in Asian males who have sex with other men. *AIDS Patient Care and STDs, 13*, 667–675. doi:10.1089/apc.1999.13.667

Shariff, A. (2009). Ethnic identity and parenting stress in South Asian families: Implications for culturally sensitive counselling. *Canadian Journal of Counselling and Psychotherapy, 43*(1).

Shiu, C., Voisin, D., Chen, W., Lo, Y., Hardestry, M., & Nguyen, H. (2016). A Synthesis of 20 Years of Research on Sexual Risk Taking Among Asian/Pacific Islander Men Who Have

Sex With Men in Western Countries. *Am J Mens Health, 10*(3), 170-180. doi:10.1177/1557988314561489

Shoptaw, S., Weiss, R. E., Munjas, B., Hucks-Ortiz, C., Young, S. D., Larkins, S., . . . Gorbach, P. M. (2009). Homonegativity, Substance Use, Sexual Risk Behaviors, and HIV Status in Poor and Ethnic Men Who Have Sex with Men in Los Angeles. *Journal of Urban Health, 86*(1), 77-92. doi:10.1007/s11524-009-9372-5

Sileo, K. M., & Kershaw, T. S. (2020). Dimensions of Masculine Norms, Depression, and Mental Health Service Utilization: Results From a Prospective Cohort Study Among Emerging Adult Men in the United States. *Am J Mens Health, 14*(1), 1557988320906980. doi:10.1177/1557988320906980

Sim, M. (2014). A Review of Homosexuality in China: Urban Attitudes toward Homosexuality In Light Of Channges age in the One-Child Policy. *http://works.bepress.com/melissa_sim/1/*.

Statnews. (2019). Simone, M. [Mobile application software]

Singer, E. J., & Thames, A. D. (2016). Neurobehavioral manifestations of human immunodeficiency Virus/AIDS: diagnosis and treatment. *Neurologic clinics, 34*(1), 33-53.

Solorio, R., Forehand, M., & Simoni, J. (2013). Attitudes towards and Beliefs about HIV Testing among Latino Immigrant MSM: A Comparison of Testers and Nontesters. *AIDS Res Treat, 2013*, 563537. doi:10.1155/2013/563537

Spielberg, F., Kurth, A., Gorbach, P. M., & Goldbaum, G. (2001). Moving from apprehension to action: HIV counseling and testing preferences in three at-risk populations. *AIDS Education and Prevention, 13*(6), 524-540.

Stapleton, S. M., Oseni, T. O., Bababekov, Y. J., Hung, Y.-C., & Chang, D. C. (2018). Race/ethnicity and age distribution of breast cancer diagnosis in the United States. *JAMA surgery, 153*(6), 594-595.

Stephenson, R., White, D., Darbes, L., Hoff, C., & Sullivan, P. (2015). HIV testing behaviors and perceptions of risk of HIV infection among MSM with main partners. *AIDS and Behavior, 19*(3), 553-560.

Stephenson, R., White, D., Darbes, L., Hoff, C., & Sullivan, P. (2015). HIV testing behaviors and perceptions of risk of HIV infection among MSM with main partners. *AIDS Behav, 19*(3), 553-560. doi:10.1007/s10461-014-0862-4

Stewart, D. W., & Shamdasani, P. N. (1990). Focus groups: Theory and practice. *Applied social research methods series, Thousand Oaks, CA: Sage Publications, Inc.*

Sue, S., Cheng, J. K. Y., Saad, C. S., & Chu, J. P. (2012). Asian American mental health: A call to action. *American Psychologist, 67*(7), 532.

Sychareun, V., Thomsen, S., Chaleunvong, K., & Faxelid, E. (2013). Risk perceptions of STIs/HIV and sexual risk behaviours among sexually experienced adolescents in the Northern part of Lao PDR. *BMC Public Health, 13*, 1126. doi:10.1186/1471-2458-13-1126

Szymanski, D. M., & Gupta, A. (2009). Examining the Relationships Between Multiple Oppressions and Asian American Sexual Minority Persons' Psychological Distress. *Journal of Gay & Lesbian Social Services, 21*(2-3), 267-281. doi:10.1080/10538720902772212

Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). *Using multivariate statistics* (Vol. 5): Pearson Boston, MA.

Taber, K. S. (2018). The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education. *Research in Science Education, 48*(6), 1273-1296. doi:10.1007/s11165-016-9602-2

Takaki, R. (1989). Strangers from a different shore: A history ofAsian Americans. *Boston: Little, Brown.*

Tang, K., & Chen, W. T. (2018). HIV and religion in HIV-infected Asians and their families: A qualitative study. *Appl Nurs Res, 44*, 18-24. doi:10.1016/j.apnr.2018.09.003

The White House. (2014). Ten Reasons to Address HIV/AIDS in Asian American and Pacific Islander Communities. *Accessed online at https://obamawhitehouse.archives.gov/blog/2014/05/19/ten-reasons-address-hivaids-asian-american-and-pacific-islander-communities*.

Thornton, L., Batterham, P. J., Fassnacht, D. B., Kay-Lambkin, F., Calear, A. L., & Hunt, S. (2016). Recruiting for health, medical or psychosocial research using Facebook: Systematic review. *Internet Interventions, 4*, 72-81.

Truijens, F. L., Cornelis, S., Desmet, M., De Smet, M. M., & Meganck, R. (2019). Validity Beyond Measurement: Why Psychometric Validity Is Insufficient for Valid Psychotherapy Research. *Front Psychol, 10*, 532. doi:10.3389/fpsyg.2019.00532

UNAIDS. (2015). Rights, Roles and Responsibilities of Men in Fast-trackinng the end of AIDS. *Accessed online at http://menengage.org/wp-content/uploads/2016/08/UNAIDS-Discussion-Paper-on-Men-and-HIV-for-HLM-Decembe-2015.pdf*.

UNAIDS. (2019). Core Epidemiology Slides: AIDSinfo (slide #6). *Official webpage at https://www.unaids.org/en/resources/documents/2019/core-epidemiology-slides*.

US Census Bureau. (2017). Asian alone or in any combination by selected groups. *2017 American Community Survey 1-Year Estimates. Official webpage: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk*.

US Census Bureau. (2023). *Asian American, Native Hawaiian and Pacific Islander Heritage Month: May 2023*. https://www.census.gov/newsroom/facts-for-features/2023/asian-american-pacific-islander.html

USAIDS. (2019). Being LGBT in Asia. *Accessed online at https://www.usaid.gov/asia-regional/being-lgbt-asia*.

Van der Bracht, K., & Van de Putte, B. (2014). Homonegativity among first and second generation migrants in Europe: the interplay of time trends, origin, destination and religion. *Soc Sci Res, 48*, 108-120. doi:10.1016/j.ssresearch.2014.05.011

Van Griensven, F., & Van Wijngaarden, J. (2010). A review of the epidemiology of HIV infection and prevention responses among MSM in Asia. *AIDS 24*(Suppl 3), s30-s40.

Veinot, T. C., Caldwell, E., Loveluck, J., Arnold, M. P., & Bauermeister, J. (2016). HIV Testing Behavior and Social Network Characteristics and Functions Among Young Men Who have Sex with Men (YMSM) in Metropolitan Detroit. *AIDS Behav, 20*(11), 2739-2761. doi:10.1007/s10461-016-1296-y

Ventriglio, A., Castaldelli-Maia, J. M., Torales, J., De Berardis, D., & Bhugra, D. (2021). Homophobia and mental health: a scourge of modern era. *Epidemiol Psychiatr Sci*, *30*, e52. doi:10.1017/s2045796021000391

Vlassoff, C., & Ali, F. (2011). HIV-related stigma among South Asians in Toronto. *Ethnicity & health, 16*(1), 25-42.

Vu, M., Bednarczyk, R. A., Escoffery, C., Ta, D., Huynh, V. N., & Berg, C. J. (2022). U.S. Vietnamese parents' HPV vaccine decision-making for their adolescents: an exploration of practice-, provider-, and patient-level influences. *J Behav Med, 45*(2), 197-210. doi:10.1007/s10865-021-00265-3

Vu, M., Escoffery, C., Srivanjarean, Y., Do, E., & Berg, C. J. (2019). Acculturation and Exposure to Secondhand Smoke in the Home Among Vietnamese Immigrants in Metropolitan Atlanta. *Journal of immigrant and minority health*, 1-8.

Vu, M., Huynh, V. N., Berg, C. J., Allen, C. G., Nguyen, P. H., Tran, N. A., . . . Escoffery, C. (2021). Hepatitis B Testing Among Vietnamese in Metropolitan Atlanta: The Role of Healthcare-Related and Acculturation-Related Factors. *J Community Health, 46*(4), 767-776. doi:10.1007/s10900-020-00947-0

Wei, C., Cheung, D., Yan, H., Li, J., Shi, L., & Raymond, H. (2016). The Impact of Homophobia and HIV Stigma on HIV Testing Uptake among Chinese Men Who Have Sex with Men: A Mediation Analysis. *Journal Acquiried Immune Deficiency Syndrom, 71*(1), 87-93. doi:10.1097/QAI.0000000000000815

Wei, C., Cheung, D. H., Yan, H., Li, J., Shi, L. E., & Raymond, H. F. (2016). The Impact of Homophobia and HIV Stigma on HIV Testing Uptake Among Chinese Men Who Have Sex With Men: a Mediation Analysis. *J Acquir Immune Defic Syndr, 71*(1), 87-93. doi:10.1097/qai.0000000000000815

WHO. (2016). Consolidated guidelines on HIV prevention, diagnosis, treatment and care for key populations, 2016 update. Retrieved from https://www.who.int/publications/i/item/9789241511124

WHO. (2019). HIV/AIDS Key Facts. *https://www.who.int/news-room/fact-sheets/detail/hiv-aids accessed 3.28.19.*

WHO. (2016). Sexually transmitted infections (STIs): World Health Organization. *Available from: http://www.who.int/mediacentre/factsheets/fs110/en/. Cited 2 /15/2019*

Wilson, P. A., & Yoshikawa, H. (2004). Experiences of and responses to social discrimination among Asian and Pacific Islander gay men: Their relationship to HIV risk. *AIDS Education and Prevention, 16*(1: Special issue), 68-83.

Wong, F., Chng, C., Ross, M., & Mayer, K. (1998). Sexualities as social roles among Asian and Pacific Islander gay, bisexual, lesbian, and transgender individuals: Implications for community-based education and prevention. *Journal of Gay and Lesbian Medical Association, 2*, 157-166.

Wong, F. Y., Nehl, E. J., Han, J. J., Huang, Z. J., Wu, Y., Young, D., & Ross, M. W. (2012). HIV testing and management: findings from a national sample of Asian/Pacific islander men who have sex with men. *Public Health Rep, 127*(2), 186-194. doi:10.1177/003335491212700207

Wong FY. et al. (2004). HIV testing and awareness of care-related services among a group of HIV-positibe Asian Americans and Pacific Islanders in the United States: findings from a supplemental HIV/AIDS surveillance project. *AIDS Education and Prevention, 16*(5), 440-447.

World Population Review. (2019). Asian Population 2019. *Official webpage at http://worldpopulationreview.com/states/asian-population/*.

Xia, Y., Do, K., & Xia, X. (2013). The Adjustment of Asian American Families to the U.S. Context: The Ecology of Strengths and Stress. *Digital Commons at University of*

Nebraska - Lincoln, Access online at https://digitalcommons.unl.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1082&context=famconfacpub.

Ye, J., Mack, D., Fry-Johnson, Y., & Parker, K. (2012). Health care access and utilization among US-born and foreign-born Asian Americans. *Journal of immigrant and minority health, 14*(5), 731-737.

Yeung, W.-J. J., Desai, S., & Jones, G. W. (2018). Families in southeast and South Asia. *Annual Review of Sociology, 44*, 469-495.

Yoshikawa, H., Alan-David Wilson, P., Chae, D. H., & Cheng, J.-F. (2004). Do family and friendship networks protect against the influence of discrimination on mental health and HIV risk among Asian and Pacific Islander gay men? *AIDS Education and Prevention, 16*(1: Special issue), 84-100.

Yoshikawa, H., Wilson, P. A., Hsueh, J., Rosman, E. A., Chin, J., & Kim, J. H. (2003). What Front-Line CBO Staff Can Tell Us About Culturally Anchored Theories of Behavior Change in HIV Prevention for Asian/Pacific Islanders. *American Journal of Community Psychology, 32*(1-2), 143-158.

Yoshioka, M. R., & Schustack, A. (2001). Disclosure of HIV status: cultural issues of Asian patients. *AIDS Patient Care and STDs, 15*(2), 77-82.

Young, S. D., & Goldstein, N. J. (2021). Applying social norms interventions to increase adherence to COVID-19 prevention and control guidelines. *Preventive Medicine, 145*, 106424. doi:https://doi.org/10.1016/j.ypmed.2021.106424

Young, S. D., Hlavka, Z., Modiba, P., Gray, G., Van Rooyen, H., Richter, L., . . . Coates, T. (2010). HIV-related stigma, social norms, and HIV testing in Soweto and Vulindlela,

South Africa: National Institutes of Mental Health Project Accept (HPTN 043). *J Acquir Immune Defic Syndr, 55*(5), 620-624. doi:10.1097/QAI.0b013e3181fc6429

Zaidi, I. F., Crepaz, N., Song, R., Wan, C. K., Lin, L. S., Hu, D. J., & Sy, F. S. (2005). Epidemiology of HIV/AIDS among asians and pacific islanders in the United States. *AIDS Education & Prevention, 17*(5), 405-417.

Zea, M. C., Asner-Self, K. K., Birman, D., & Buki, L. P. (2003). The Abbreviated Multidimentional Acculturation Scale: Empirical validation with two Latino/Latina samples. *Cultural Diversity and Ethnic Minority Psychology, 9*(2), 107.

Zea MC. et al. (2003). The Abbreviated Multidimensional Acculturation Scale: Empirical validation with two Latino/Latina samples. *Cultural Diversity and Ethnic Minority Psychology, 9*(2), 107-126. doi:10.1037/1099-9809.9.2.107

Zhao, P., Liu, L., Zhang, Y., Cheng, H., Cao, B., Liu, C., . . . Tang, W. (2018). The interaction between HIV testing social norms and self-efficacy on HIV testing among Chinese men who have sex with men: results from an online cross-sectional study. *BMC Infectious Diseases, 18*(1), 541. doi:10.1186/s12879-018-3454-5

Zhao, Y., Bromberg, D. J., Khoshnood, K., & Sheng, Y. (2020). Factors associated with regular HIV testing behavior of MSM in China: a cross-sectional survey informed by theory of triadic influence. *International journal of STD & AIDS, 31*(14), 1340-1351. doi:10.1177/0956462420953012

Zhou, Y., Coleman, W., Huang, Y., Sinding, C., & Wei, W. (2017). Exploring the intersections of transnationalism, sexuality and HIV risk. *Culture, Health and Sexuality, 19*(6), 645-652. doi:https://doi.org/10.1080/13691058.2017.1300327

CHAPTER 4:

Homonegativity as a barrier to HIV testing intention among Asian American MSM: A qualitative study

Abstract

Members of sexual minority groups often receive HIV diagnosis at later stages and are less likely to get tested. However, little is known about how HIV testing intention is shaped among Asian American men who have sex with men (MSM). This study explored socio-psychological factors that can influence the intention of HIV testing in this population. Using convenience sampling, we conducted three focus group discussions among Asian American MSM, regardless of their HIV testing history and HIV status. Data were analyzed employing a thematic analysis approach. We found divergent perspectives around factors influencing participants' HIV testing intention. Facilitators of HIV testing intention included high levels of approval of testing by sex partners and health care providers. Homonegativity (negative attitudes towards homosexuality) and concerns about confidentiality of testing services were discussed as barriers to HIV testing intention among this population group. Social norms about HIV testing among general Asian community were reported to be less positive relative to among gay men groups. These findings will inform targeted programs promoting positive social views towards HIV testing and mitigating prejudices towards homosexuality in Asian American community.

*Keywords***:** Asian American MSM, homonegativity, thematic analysis

Introduction

HIV testing has been widely acknowledged as an effective gateway linking HIV diagnosis to timely care and treatment for HIV, subsequently reducing the spread of HIV infection (CDC, 2018d). Globally, gay, bisexual, transgender men and other men who have sex with men (MSM) are of heightened risk for HIV infection (Beyrer et al., 2013; WHO, 2016). The CDC recommends MSM should be tested for HIV annually; however, MSM at increased risk of HIV infection should be tested more frequently (3 to 6 months) (CDC, 2023b). Asian American MSM, while generally found to be less aware of their HIV status due to a history of low HIV testing (Sen et al., 2017), are as likely as other racial or ethnic groups to engage in HIV-related risk behaviors (Adih, Campsmith, Williams, Hardnett, & Hughes, 2011; Wong FY. et al., 2004).

It is reported that Asian Americans had the highest rate of undiagnosed HIV (22%) than any other racial and ethnic group in the U.S. (CDC, 2017). Furthermore, Asian American MSM are more likely than other racial groups to experience delayed HIV or testing due to multiple socio-psychological factors such as social norms about HIV testing, homonegativity, attitude, subjective norms, perceived behavioral control about HIV testing, and perceived HIV risk (Chng et al., 2003a; Salud et al., 2014; Sen et al., 2017; R. Stephenson et al., 2015). However, knowledge about drivers of HIV testing intention among Asian Americans, especially Asian American MSM, has been very modest (J. J. Lee & Zhou, 2019).

The limited research investigating HIV testing practices among Asian Americans MSM in the U.S. suggest that communities with stronger approval of homosexuality do positively influence HIV testing uptake (Do, Hudes, Proctor, Han, & Choi, 2006). Other psychological factors such as *perceived HIV risk, attitudes, subjective norms,* and *perceived behavioral control about HIV testing* have been widely documented as directly associated with intention of HIV

testing among MSM overall (R. Stephenson et al., 2015) and Asian American MSM specifically (Kyung-Hee C. et al., 1998; Nemoto et al., 1998) . Nevertheless, there has been a lack of understanding about the collective influence of these socio-psychological factors on HIV testing intention among the population of Asian Americans MSM. To fill the gap, this study used qualitative methods, informed by constructs of the theory of planned behavior (TPB), to investigate how social norms about HIV testing, homonegativity, perceived HIV risk, attitudes, subjective norms, and perceived behavioral control about HIV testing relate to HIV testing intention in this population.

Social norms about HIV testing

Social norms are "the informal rules that govern behavior in groups or societies" [p.1] (Bicchieri, 2018). In Asian cultures, it is perceived that social norms are largely influenced and shaped by social roles (Carteret, 2011; Chng et al., 2003a). Individuals with higher social standing influence the shared interpretations and behaviors of others in their sociocultural circles (Chou, 2001). While research has suggested that social support and acceptance of homosexuality could be a facilitator to HIV testing among Asian American MSM (Do et al., 2006), no studies have examined the context of social norms about HIV testing and HIV testing intention in this population.

It is, therefore, important to develop a better understanding of how social norms about HIV testing shape HIV testing intention among the population of Asian American MSM.

Homonegativity

Homonegativity is commonly defined as negative attitudes toward homosexuality (Todd G Morrison et al., 2005), and has been found to be a barrier to HIV testing among MSM communities (Goldenberg et al., 2018). However, it is unknown how this psychological factor

may influence HIV testing intention among the Asian American MSM population. In behavioral research, the concept can be operationalized in two forms: external sources of homonegativity (prejudices from others towards someone's homosexuality) and internalized homonegativity (negative feelings toward oneself when recognizing their own non-heterosexual identities) (Rigmor C. Berg et al., 2016).

This study focuses on the external homonegativity to better understand the impact of societal prejudice towards homosexuality on HIV testing intention among Asian American MSM. This construct consists of variables measuring people's reactions to certain activities or social rights that gay men should or should not hold (Melanie A Morrison & Morrison, 2003). Current literature documents no study examining homonegativity among Asian American MSM; however, the relationship between homonegativity and HIV testing has been studied among general MSM community (Ross M., 2018; C Wei et al., 2016).

A better understanding of the context about how homonegativity relates to HIV testing intention among Asian American MSM would be crucial for future efforts aiming at mitigating social barriers to HIV testing in this high-risk group.

Perceived Risk of HIV

The way people think and feel about their risk of HIV infection can influence testing behavior (Evangeli et al., 2018). Research has indicated that a higher level of perceived HIV risk is associated with stronger HIV testing intention (Grover & Miller, 2014; Salud et al., 2014). Examining the relationships between perceived HIV risk and HIV testing among populations at high risk for HIV transmission, including young MSM, has been a major focus among research (Clifton et al., 2016). However, the literature has mainly documented the relationships of sexual

risks and risk perception with HIV testing among non-Asians, and Asians living in Asia (Lorenc et al., 2011) and very little is known among Asian Americans.

We aim to fill this gap by exploring how perceived HIV risk might play a role in shaping Asian American MSMs' HIV testing intentions.

Other psychological factors influencing HIV testing intention

The theory of planned behavior (TPB) has played an important role in guiding research on HIV testing (Evangeli et al., 2018). It offers theoretical underpinnings to investigate psychological factors driving HIV testing intentions (Abamecha, Godesso, & Girma, 2013). Research employing the TPB has suggested that positive testing attitudes, stronger beliefs in social pressure to test, and greater perceived behavioral control towards testing are associated with greater HIV testing intention in general population (Evangeli, Pady, & Wroe, 2016; Mirkuzie, 2011b).

Among young American MSM, the TPB has been found useful in examining predictors of HIV testing, especially when taking into consideration other factors, such as exposure to HIV information, self-rated HIV knowledge, and use of information to make HIV-testing decisions (C. C. Meadowbrooke et al., 2014). It was suggested that the TPB's constructs with the added direct effects of other information-related factors explained 41.9% of the testing intention – better than the TPB framework solely (18.1%) (C. C. Meadowbrooke et al., 2014). However, across existing literature on HIV testing, there is a gap in the application of the TPB in assessing HIV testing among Asian Americans. In the absence of similar studies using the TPB to specifically assess HIV testing behavior among Asian Americans, evidence of the utility of the TPB to HIV testing research has implications for advancing our knowledge about theory-informed determinants of HIV testing intention among Asian American MSM.

Altogether, this qualitative study seeks to deepen our insights of socio-psychological factors (social norms, homonegativity, perceived HIV risk, attitudes, subjective norms, and perceived behavioral control) relating to the HIV testing intentions of Asian American MSM. Findings will be used to inform future interventions that promote HIV testing in this racial and sexual minority group.

Methods

Participants and Data Collection

This study is a part of a larger mixed-methods research program focusing on understanding socio- psychological factors influencing HIV testing intentions among Asian American men. From September to December 2021, we conducted three online focus groups using a convenience sample of 18 Asian American MSM living all over the U.S. The eligibility for participants included: 1) self-identified Asian American MSM; 2) aged 18 years and older; and 3) being a resident in the U.S. for a minimum of 6 months. Participants were recruited from several channels: 1) participants from a previous quantitative component (first phase) of the research program; 2) a community organization serving Asian Americans with a focus on health, education, and legal services; and 3) a self-help group of Asian American gay men. The sample size of 18 participants, divided into 3 groups of 6 participants, was determined following recommendations for qualitative sample size needed to achieve code and meaning saturation (Hennink, Hutter, & Bailey, 2010; Maxwell, 2012; Onwuegbuzie, Dickinson, Leech, & Zoran, 2009).

Prior to each focus group discussion, participants were sent an email with information about potential meeting dates and times for their selection, as well as a consent form for them to review and confirm participation. Among 25 invited participants, 19 responded including 18 who

agreed to participate in the focus groups (72% response rate), one initially expressed interest but later withdrew due to personal reasons. Focus group discussions were organized by the first author, a Vietnamese female doctoral-level researcher with advanced training and experience in qualitative research, and a research assistant, serving as moderator, who has substantial knowledge and community connections with the population of Asian American MSM. The first author also served as assistant moderator, as needed, and note taker during the focus groups. All discussions were held in English and via the Zoom online meeting platform. Each discussion session lasted between 90 and 100 minutes and was audio-recorded. Participants received a $30 Amazon gift card to compensate for their time and study participation. The study protocol was approved by the Institutional Review Board at Emory University.

The focus group discussion guide was developed based on techniques recommended by Nyumba and colleagues that outlined key steps in qualitative research design using focus group discussion methods (O.Nyumba, Wilson, Derrick, & Mukherjee, 2018). First, we identified the main aim of the study being to explore how the proposed socio-psychological factors influence HIV testing intention among Asian American MSM. Based upon this aim, we prepared a list of primary questions and related prompts to be used as a guide in each focus group discussion session. The guide was developed drawing on existing literature about HIV testing intention among young adult men (O. Ayodele, 2017; C. C. Meadowbrooke et al., 2014) using the TPB (Ajzen, 2013). The guide began with general questions about knowledge of HIV testing.

Primarily informed by the TPB constructs and supplemented by key findings from the previous quantitative component of our team's research studies, we constructed specific questions that discussed how social norms about HIV testing, homonegativity, perceived HIV risk, attitudes, subjective norms, and perceived behavioral control about HIV testing might

influence HIV testing intention. One question at the end of the guide included probes to allow comments, ideas, and recommendations regarding strategies to promote HIV testing among Asian American MSM. Examples of questions and probes are listed in Appendix 1.

Before conducting the focus group discussions, we pilot-tested the guide with members of our research team (the moderator and one research collaborator from a community organization) who are Asian American MSM, have substantial knowledge and understanding of the study population as well as extensive experience in conducting focus group discussions. The guide was revised and finalized based on feedback and comments from the testers.

In addition to focus group discussion data, we also collected basic sociodemographic characteristics of the participants, including age, education, employment, and marital status after the completion of each focus group discussion session. The demographic survey was conducted via email after the focus groups. Response to the sociodemographic questions was optional. Recordings of the three focus group discussions were transcribed verbatim by a professional transcriber.

Data Analysis

We employed a mixed qualitative thematic analysis that utilized both deductive and inductive approaches (Fereday & Muir-Cochrane, 2006). First, our team of two coders (the first author and a doctoral-level research assistant specializing in behavioral science and qualitative research) developed an initial framework of codes and sub-codes from the focus group discussion guide. The team then read all three transcripts carefully and developed a codebook with code definitions, inclusion criteria, exclusion criteria and examples. Throughout the review, recurring explanatory statements were identified and classified into thematic units, including

negative or divergent comments to add rigor to the results of our qualitative analysis (Stewart, 1990).

With the TPB as the guiding framework and other related socio-psychological determinants of HIV testing intention, including social norms about HIV testing, homonegativity, and perceived HIV risk, we categorized emergent themes based on the key constructs. For example, quotes related to 'negativity' but not directly corresponding to homonegativity and HIV testing intention, we categorized as 'negativity-within MSM group', 'negativity-outside MSM group' or 'negativity-religion related'. We then used the codebook to independently code all three transcripts in parallel. During the coding process, we regularly discussed ideas, questions, or concerns as they arose. We resolved any discrepancies through theoretically informed deliberations that involved rereading of the transcripts, reviews of notes taken from all three focus group discussions, as well as our knowledge of HIV prevention among Asian American MSM.

During the analytic process, we leveraged several techniques to ensure validity in qualitative research, including analyst triangulation (two analysts to review findings), and negative case analysis (discussions of elements that would deem contradictory to normal cases) (J. W. Creswell & Miller, 2000; Golafshani, 2003). Descriptive analysis of demographic data was performed using Microsoft Excel Worksheet@.

Results

Sample characteristics

We conducted three focus group discussions with 18 participants; each session had 6 people. Only four participants responded to the online demographic survey. Due to the low response, we could not characterize the demographics of the sample.

Research findings

Across the three focus groups, there were no major differences in perspectives related to how the socio- psychological factors influenced HIV testing intention among the participants. Themes emerged from each of the six constructs with sample quotes are presented in Table 1. We identified 18 themes from the topics that were present at least in two out of three focus group discussions and discussed by at least two participants in each group (Buetow, 2010; Padela et al., 2016). Stronger themes, defined as common subjects mentioned in all three focus discussions, or themes of novel and strongly relevant insights, are highlighted below.

Social Norms about HIV testing and HIV testing intention

As part of this study, we explored perceptions of HIV testing behavior that Asian MSM felt represented the overall Asian community and within their groups of gay men.
When talked about what they knew of the HIV testing intentions of other Asian community members, participants shared different perspectives. For the broader community of Asian Americans, participants discussed negative perceptions HIV testing intentions. For example, one participant recalled: "*So other Asians, I feel most of them, they're so reluctant to go for the tests, because they feel that they will face some stigma. And then being pointed that they are [sic], for example, if they're positive, and so people laugh at them, and they will also isolate them.*". Another participant concurred: "*So I think most of them do not want to go for the tests because of being Asians. People maybe see it as that it is maybe [sic] embarrassing. Yeah, most of them are not comfortable*.".

Negative social norms about HIV testing also were mentioned as a potential barrier to Asian MSM as it comes to personal motivation to get a HIV test. One participant described: "*As for me, I think the testing behavior of those who are surrounding me, I have come to find out that*

these guys are a little bit shy and reluctant to go to testing as suggested, because I've never had maybe some in a group discussing about maybe testing for HIV and AIDS". Another participant recalled: "*And then being pointed that they are, for example, if they're positive, and so people laugh at them, and they will also isolate them."*

In contrast, within the community of MSM, participants felt positive social norms towards HIV testing from their peers and friends. One participant stated: "*There is a handful of very close friends of mine who has discussed this with me. For some reason they mention they're going to get tested or whatever*." This was further supported by another participant who recalled: "*I don't think there's any issues at all, with my immediate friends around this topic at all*."

Additionally, most of participants had experienced positive influence from their peers in relation to HIV testing. A stigma-free community, positive social norms, and peer influence were discussed as facilitators of getting someone tested. One participant asserted: "*I think everyone just knows that it's something you should do if you're having open relationships or promiscuous sex or whatnot with another partner. So, I don't think there's any issues or stigmatism, within my network of friends*." Another participant added: "*As humans, I think that knowing when somebody else is doing something would also encourage you or would motivate you to do something". Another participant voiced his own belief: "Well, so I think a lot of my friends, gay Asians or Caucasians or whatever, it doesn't matter. Yeah, I feel very confident getting it and if my peers are getting tested then why not*?".

Homonegativity and HIV Testing Intention

Homonegativity refers to prejudices or negative attitudes toward homosexual individuals (Melanie A Morrison & Morrison, 2013). We explored participants' experiences of homonegativity and how those experiences might influence their HIV testing intention.

The majority of participants across all focus groups shared their thoughts and experiences being stigmatized as Asian MSMs. One participant said: "*First of all, they usually think if you're gay, you will have AIDS and you will die. That's one. And number two, one of my best friend's moms actually think we are a disease and not who you are*". Another added: "*So she told my best friend like, 'Oh, I feel so bad that your friend is sick', and my friend was like, 'What are you talking about?' And then her mom was like, 'Because he is gay. He has an illness'* ".

The consequence of homonegativity on the first-time participants sought HIV testing services was reported as a novel thematic insight. Several comments were made in relation to their first-time testing, with their primary concern being the underlying risk of personal information leaking to their family. One exclaimed: "*It was very difficult decision the first time I went. When I was further from my family, it was easier*". Another participant said: "*Okay, I wanted to say that, for me at first, the stereotyping of me as an MSM--as an Asian MSM. It makes you not want to go. So as time went by, I have had the courage and it no longer affects*". This comment was supported by another participant who said: "*I remember P say that the stigmatization in school caused him to be scared about getting tested [at first]*".

Differences in the experience of homonegativity within Asian sub-cultures emerged as another strong topic of discussion. Homonegativity as the barrier to HIV testing, if any, appeared to come from family, especially those from South Asian cultures. One said: "*And I know that there are some family members of mine who are particularly sensitive to how others think and those are the people who I worry about, I suppose sometimes*". Another participant shared: "*So*

far, the negative connotation, in my experience has been from my more conservative family members who, again, they just perceive sexual promiscuity, or sexual activity to be done post-marriage". Unique cultural dynamics of South Asian communities were also discussed as an emerging theme when it came to the societal and family approval of homosexuality and homonegativity towards gay men. To elucidate the context, one participant from South Asia reported: "*I think about that, that there's an intersectionality with religion a lot in a lot of South Asian cultures that a lot of my East Asian friends don't experience when it comes to East Asian MSMs versus South Asian MSMs and there's often a very big difference*". Another participant shared additional views: "*But I think this is experienced a lot in other Asian cultures, which is like those, the aunties on the top of the buildings with binoculars*".

Additionally, participants voiced their concern about the relationship between homonegativity and immigration status and/or education. One participant said: "*Education is the problem with those who express homonegativity*". Another one added: "*Yeah, I'm kind of thinking about maybe building off of K's comment about maybe older generational Asian communities may view relationships and sex more conservatively than the younger generation and also Asian Americans versus Asian-Asian, where maybe, the view of somebody who's heterosexual would be to, once they're an adult, find a partner, have children settle down, and all that*".

Perceived HIV risk and HIV testing intention

The way people perceive their own risk of HIV acquisition impacts their testing intention (Evangeli et al., 2018). In this study, we found that risk perception was strongly reported to influence Asian MSM's intention of HIV testing, and this was primarily derived from the sexual

HIV risk behaviors, including high frequencies of sexual intercourse and having multiple sex partners and.

Regarding the perceived risk related to having multiple sex partners, one participant reflected: "*But for example, if I have had sex with multiple partners who I'm not aware of their status, then I definitely will be concerned and definitely I will want to know my health, or rather, my status because I do not know the status of these people*". A different participant said: "*So, I think, when I was seeing multiple partners, or promiscuous or whatever, I did get tested on a six-month basis when I have protected sex.*"

A heightened frequency of sexual activities was discussed as directly related to perceived HIV risk. Almost all participants stressed that, for them, the importance of getting tested depends on the frequency of sexual intercourses. One said: "*So to me, what can push me towards getting testing is if I have maybe many different partners and we have the sex for[sic] frequently*". Another participant contributed: "*Right, definitely multiple [partners], especially ones you don't know, and also even the safety-ness of the sex, either wearing in a condom or not, either scenario you want to get tested, but I think the frequency, the amount of time you go get tested, would change based upon how safe you are in your sexual activities*".

Constructs of the TPB

Attitudes towards HIV testing

Participants shared detailed accounts of their thoughts and beliefs towards HIV testing. While individual perspectives varied, they centered around the positive or negative aspects of HIV testing behavior, as well as the anticipated outcomes of testing.

Most participants expressed positive attitudes about HIV testing. However, different reasons emerged about why taking an HIV test was encouraging to them. Several participants indicated that knowing their HIV status would mitigate their uncertainty and subsequently help them navigate care services as appropriate. For example, one participant reflected: "*There are many benefits of getting tested for HIV. The first benefit is that the test is fast and easy. And the last benefit is that it can give you peace of mind*". Another participant added: "*I'd say yeah, like, just the health benefits is just too many health benefits to even considering not getting one, not only for yourself to make sure that on the chance that you do, gosh, you ever do receive HIV that it's important to, to find out immediately and then just take care as soon as possible to manage the viral load*".

Aligned with these positive sentiments about HIV testing, several other participants also mentioned that seeing HIV testing as a regular health seeking behavior would help normalize the topic in public. For example, one participant brought up: "*I think, yeah socially, it's a good benefit for more people to take it more often, you know, have people talk about it, because then the taboo becomes less and less, you know*". When expressing their behavioral beliefs or evaluation of behavioral outcomes about HIV testing, most participants agreed that HIV testing is important, convenient, and it would help people protect themselves and their sex partners, as well as providing the benefit of getting early to care if they need to. One participant emphasized that: "*And I think that's something that we've forgotten or not realized, that you having a positive test is not a death sentence like it used to be in the 80s*".

Concerns about confidentiality were reported as factors that hinder participants' intention to get tested. One participant wondered: "*How many people will know about what your sexual activities and yeah, like it just something you want to keep very close to the chest*. *I'd say the*

costs, again, it's like, then you've got to weigh the social costs.". The concern was furthered by another participant: "*Yeah, because I don't--with my primary care provider, I am not I'm open about it and I think partly because that primary care provider is connected with like, it's also a provider to my family members. And so, I cannot, I don't even want to think about that*".

Subjective norms about HIV testing

In this section, we explored participants' perception of the expectations from partners, friends, families, and other acquaintances towards their HIV testing intention (normative beliefs), as well as their motivation to respond to those expectations (motivation to comply). Overall, there was strong agreement among participants that HIV testing was a private matter and they considered sexual partners, primary health care providers, and peers being the most trusted individuals supporting their intention of HIV testing. One participant said: *"Don't know about the other Asian MSM but to me and my partner we took that responsibility to go getting tested after every six months.".* Speaking of expected approval on HIV testing intention and trust in someone regarding HIV testing intention, a participant described: "*I guess if I feel like I need to get testing, I would definitely consult with my partner. So that's one. Then the other person would be my physician because that's probably where I would go get testing.*". Another participant added: *"So when it comes to my peers, and me speaking to them, they are supportive."* Not surprisingly, the majority of participants did not think it would be appropriate to discuss HIV testing with their family. A participant revealed: "*I don't usually talk to my family about this stuff. Ironically, I'm very receptive to HIV testing, but most of them aren't.*" Another participant reported: "*Because I cannot afford like, I mean, I have one or two family members who know, but it's a very touchy subject and it's just even indulging the conversation on something that would relate to this is touchy. So, I've just kind of stopped it there.*"

Regarding motivation to comply, all participants agreed that having themselves tested for HIV would align with the expectation of their sexual partner, advice from their health care provider, and because they cared for their health. One participant mentioned: "*So I think I would just lean on people who are on the need-to-know basis, and that's basically my sexual partner, and the physician*." Another participant added: "*It's my health and it's just all for me. And just before I get the testing, if it's at a clinic, your physician will probably be the one to give you counseling advice before and also after you get the test.*"

None of the participants mentioned religious leaders or community leaders as their source of support or someone they would turn to for advice in the context of HIV testing.

Perceived behavioral control of HIV testing and HIV testing intention

The majority of participants indicated that they believed in their ability to get tested for HIV. In addition to factors highlighted as facilitators to HIV testing, such as availability, affordability, and accessibility to home testing, having a primary care physician was mentioned as an important support system that enables their HIV testing plan. One participant said: "*So you know, like, when in doubt, I just go and talk to my not even go and talk to him, I just send him a message through the portal, say, 'Hey, Doc, can you write me order for HIV test?' and he just probably will*".

Most participants agreed that getting an HIV test was easy and at no cost at many different locations. One participant described: "*I also know that at pride events, the festivals, there's always testing freely available--free--to anyone to come in and take the test and these tests are--you get results within five to 10 minutes now*". Another shared his experience about how easy it is for him to get tested: "*With being in an educational sort of an institution, they*

often have a very easy way to get it done and I recall, that's how I initially got my first one as well was through my university and their student health center". In addition, not having to worry about testing cost was mentioned as a positive driver of their actual HIV testing behavior. One said: "*So it's all covered, like everything is all taken care of*". Another participant expressed his positive view about HIV testing: "*So if you do test positive, there are people there who discussed and counsel you on how to deal with those positive results*".

Participants repeatedly mentioned the convenience and accessibility of HIV testing across different venues, including clinic, home-based testing, and others. One participant shared: "*Okay, I can say that HIV testing is very easy, since you only--there are some home test kits being sold in pharmacy and convenience store*". Another one added: "*And I know there's also nonprofit organizations such as here in Atlanta, we have AID Atlanta that provides these tests freely available to any person that would like to get tested*".

Discussion

This study is one of the first efforts to explore socio-psychological factors relating to HIV testing intention among Asian American MSM. Our findings are generally aligned with existing literature related to barriers and facilitators to HIV testing among the population of Asian Americans (Evangeli et al., 2016; Lorenc et al., 2011). The study also provides important insights into the cultural dynamics with regards to familial approval of homosexuality within South Asian communities.

Overall, participants expressed diverse views towards the role of social norms on their HV testing intention. First, our primary results indicated that Asian American MSM perceived ***positive social norms*** about HIV testing within the gay community, but that the social norms were less supportive in their families or broader Asian American community. These results

correspond with a study among Chinese MSM which found that perceived norms regarding HIV testing was strongly associated with regular HIV testing (Y. Zhao, Bromberg, Khoshnood, & Sheng, 2020). In the absence of similar evidence specific to the Asian American MSM population, this finding seems to support our observation that when individuals perceive the prevalent norms of HIV testing in their social circle, they would be more likely to engage in HIV testing behavior.

On the other hand, participants reported that HIV testing was less common among those outside of their gay community, including their families. This dynamic could be explained via the context of socio-cultural norms among Asian immigrants. In many U.S. Asian communities, Asian American MSM often experience family- and community-level stigmatizing beliefs due to their homosexuality, which is considered non-conforming to traditional values such as sexual activity as a means to maintain family lineage (Bhattacharya, 2004). Seeking a HIV test may be seen to be associated with shame on family or community because it represents a deviation from the Asian cultural norms that classify homosexuality as taboo (Chng et al., 2003a; Yoshikawa et al., 2003). These cultural characteristics may explain the differences in the way participants perceived HIV testing norms within their networks versus family and broader U.S. Asian communities in our study.

Homonegativity was reported to be a common barrier to HIV testing, especially for those testing for their first time in this study. Additionally, it was suggested that newly immigrated Asians and individuals with lower education would hold higher level of homonegativity towards Asian American MSM.

Research has suggested that perceptions of community stigma on homosexuality may have negative impacts on HIV testing intentions among American MSM (Iott et al., 2022;

Lorenc et al., 2011). In our study, we focused solely on community prejudice and its impact on HIV testing intention and our results is consistent with the existing literature. Our finding of elevated homonegativity among new immigrants is supported by Bracht et al. (2014) which suggested that new immigrants to a western country would have greater disapproval of homosexuality and that would decline over time (Van der Bracht & Van de Putte, 2014). This finding is further supported by a study by Röder et al. (2015) indicating that negative prejudices towards homosexuality is stronger among the first generation of immigrants compared to the second generation (Roder A, 2015). Regarding the finding that homonegativity appeared more recognizable among individuals with low education, Oyarce-Vildósola et al. (2022) found that people with education attainment of high school or higher would have lower level of homonegativity compared to those without high school education (Oyarce-Vildósola, Rodríguez-Fernández, & Maury-Sintjago, 2022). While no studies have addressed this phenomenon among Asian American immigrants, these studies help explain our initial observation that Asian American MSM perceive that new immigrants and individuals of low education attainment might hold stronger homonegativity towards Asian American MSM communities, as discussed in our focus groups.

Another finding indicated that ***HIV risk perception***, based upon actual risk behaviors such as frequency of sexual activities and unprotected sexual intercourse, drove participants decisions related to HIV tested. The positive relationship between perceived risk and HIV testing intention is supported by results of previous studies. In a systematic review by Lee and colleagues, it was found that risk perception is one of the barriers to whether to get tested for HIV among Asian Americans (J. J. Lee & Zhou, 2019). Among all Americans, Spielberg and colleagues found that individual-level factors such as HIV risk perceptions and HIV knowledge

were commonly reported as facilitators of HIV testing and that an acknowledged risk history was a key factor in many people's decision to seek an HIV test (Spielberg, Kurth, Gorbach, & Goldbaum, 2001).

Lastly, psychological factors including attitudes, subjective norms, and perceived behavioral control towards HIV testing were found to have impacts on the HIV testing intentions of Asian American MSM. There was a strong consensus that participants cared about their health and took responsibility for protecting themselves by knowing their HIV status. Nevertheless, some expressed concern about confidentiality. Sexual partners and physicians were the biggest influencers towards HIV testing behavior among Asian American MSM and they held strong personal beliefs that they could manage a HIV test when needed.

The diverse ***attitudinal beliefs*** towards HIV testing documented in this study among Asian American MSM are supported by existing literature. While MSM in general, and Asian MSM specifically generally were found to have a positive sense of responsibility to protect oneself or one's partner, concerns related to privacy and confidentiality, especially among those of minority backgrounds and/or experiences of migration, would be specific barriers to HIV testing (Evans et al., 2016; Figueroa, Johnson, Verster, & Baggaley, 2015; J. J. Lee & Zhou, 2019; Lorenc et al., 2011; Nicholls et al., 2022). Additionally, our findings highlight the social cost associated with HIV testing. This was described as the fear among Asian American MSM that their deviation from the conventional sex role standards of traditional Asian society would be disclosed if they get tested for HIV. Though the research team is not aware of previous studies that have examined this aspect among Asian American MSM, studies among general MSM have indicated that perceptions of stigma, from other gay men or the general public acts as barrier to HIV testing (Lorenc et al., 2011; Solorio, Forehand, & Simoni, 2013). As stigma towards

homosexuality in Asian societies has been widely recognized (CPACS, 2018; Ju, 2021; Vlassoff & Ali, 2011), this could help explain the finding related to the social cost of HIV testing in this study.

Related to ***subjective norms*** about HIV testing, we found strong agreement among participants that partners and physicians offer frontline support to their HIV testing intention and that most of them do not consider their family as a source of support. While a study by Lorenc et al. suggested that desire to protect oneself or one's partner may be a motive for HIV testing in MSM of other ethnicities (Lorenc et al., 2011), this observation appeared to support the finding from our study that Asian American MSM have a mutual desire to protect each other by supporting their partner's intention to seek HIV testing. Conversely, the lack of support from family to MSM when it comes to HIV testing has been observed in a study by Wong et al. (2012). As it is common that Asian American MSM keep their sexual orientation undisclosed to their family, the hesitancy to confide in their family with intention for HIV testing is understandable (F. Y. Wong et al., 2012). Additionally, our finding is supported by a study by Solorio and colleagues (2012), where they documented negative attitudes towards HIV testing by family members among Latino immigrant MSM and suggested this may hinder HIV testing intention within this population (Solorio et al., 2013).

Our study found important observations relating to the unique familial (e.g., multi-generation family living arrangements) (Yeung, Desai, & Jones, 2018) and cultural dynamics (e.g., family obligations and loyalty to the elders) (Shariff, 2009) towards homosexuality among those of South Asian heritages. Literature on this topic is limited (Kumar, April 2013); however, it is evident that South Asian gay men bear pressure from their parents concerning their homosexual identity (Deepak, 2005). Specifically, many South Asian parents consider

homosexuality unfit to their cultural norms (Estrada & Rutter, 2006). This interplay helps explain our finding that South Asian gay men would not turn to their family for sexual matters and HIV testing discussions.

Our study found strong ***perceived behavioral control towards*** HIV testing across all participants. The finding that perceived behavioral control positively influenced HIV testing intention aligns well with existing literature where TBP has been used as the underlying theoretical framework. Multiple studies have affirmed that when individuals found it easy to get HIV tested, they would be more likely to engage in HIV testing behavior (Hogben et al., 2003; C. C. Meadowbrooke et al., 2014; Mirkuzie, 2011b).

Altogether, findings from our study are supported by existing literature and offer important novel insights of the influence of socio-psychological factors on the HIV testing intentions of the population of Asian American MSM.

Limitations

Although this is one of the first studies to explore factors influencing HIV testing intention in the population of Asian American MSM, it does have limitations. First, the study was limited to participants who had access to the internet and the Zoom platform. This data collection method could have introduced selection bias because it limited participation to those who had access to the internet, thus hindering the generalizability of our findings. Second, social desirability bias may present a challenge in data quality. Topics discussed in the focus group discussions were personal and sensitive. Efforts by the research personnel to ensure research protocols, including assurance of privacy and confidentiality, were implemented. However, only four out of eighteen participants were willing to provide personal demographic information at the end of the focus group discussions. Last, the discussions were held fully in English, thus,

participants who were not fluent might have not been able to articulate their thoughts comfortably. Future studies should consider these limitations in the design and implementation to facilitate broader participation and better data collection.

New Contribution to the Literature

Findings from this study have important implications for developing interventions to promote HIV testing among the population of Asian American MSM. Understanding the influence of social and psychological factors on HIV testing intention among this minority group would help policy-making agencies, health service providers and community organizations better mobilize resources to address underlying barriers and promoting facilitators to HIV testing intention through initiatives that are culturally relevant and appropriate, especially for the first-time testers and the community of gay men originally from South Asia. Specifically, our largest themes echoed previous research indicating that homonegativity, an underlying barrier to HIV testing, is strongly present among heterosexual male population (Gregory M. Herek, 1988) and underscored the association between perceived HIV testing social norms and HIV testing (J. J. Lee & Zhou, 2019). These factors should be taken into consideration in designing future intervention programs.

As addressing sensitive topics such as homonegativity and HIV testing social norms may require a community-based approach through social networks (Veinot, Caldwell, Loveluck, Arnold, & Bauermeister, 2016), HIV program implementers could adopt strategies that have been suggested elsewhere, including the captivation of network homophily (e.g. targeting groups sharing similar social and demographic characteristics) (Veinot et al., 2016) or group interventions (e.g. classroom-based, computer-based, or community-based) for younger individuals, such as college students (Burk, Park, & Saewyc, 2018; Cotten-Huston & Waite,

2000). Taken together, our results could help public health efforts in increasing HIV testing and meeting other health needs of this racial and sexual minority group – Asian American MSM.

Tables

Table 1. Themes Matrix

Construct	Themes	Salience			Sample responses
		Group 1	Group 2	Group 3	
1. Social Norms about HIV testing	1.1 Underuse of HIV testing in the general Asian American population	X	X	X	*"So other Asians I feel most of them, they're so reluctant to go for the tests, because they feel that they will face some stigma. And they feel that they come from that minority group."* *"I don't see they really openly discuss this topic [HIV testing]."* *"Yeah, most of them are not comfortable [getting tested]."* *"I think most of them do not want to go for the tests because of being Asians."*
	1.2 HIV testing is common among Asian American MSM	X	X	X	*"I guess getting tested for me and getting continually tested would be a way for me to bolster my community."* *"I'm pretty sure that they [Asian American MSM] have had some done in the past and maybe the fact that, you know, one of them gets COVID tests pretty regularly tells me that he generally wants to know his status for anything risky that he might under undergo."* *"So aside from that, I think it's, at least within my community and social circle, it's, it's a positive action to get HIV testing."* *"There is a handful of very close friends of mine who have discussed this with me. For some reason they mention they're going to get tested or whatever."*
	1.3 Peer Influence promoting HIV testing	X	X	X	*"That's a very interesting comment B, because it does remind me that some people, some of my friends actually go get testing together and that has helped them."* *"Yeah, I feel very confident getting it and if my peers are getting tested then why not?"* *"I don't think there's any issues at all, with my immediate friends around this topic at all."*

					"Well, so I think a lot of my friends, gay Asians or Caucasians or whatever, it [getting HIV tested] doesn't matter."
	1.4 Negative social norms as potential barrier to HIV testing	X	X		"*As for me, I think the testing behavior of those who are surrounding me, I have come to find out that these guys are a little bit shy and reluctant to go to testing as suggested, because I've never had maybe some in a group discussing about maybe testing for HIV and AIDS*". *"And then being pointed that they are, for example, if they're positive, and so people laugh at them, and they will also isolate them."*
2. Homonegativity	2.1 Experiencing homonegativity is a barrier to HIV testing among Asian American MSM	X	X	X	*"Most of them really are scared but lack the confidence to get on get tested because of all the stereotypes in the community and the society today."* *"I don't know why, maybe it's fear, maybe it's a stigma. I don't know. I don't know. Because that's not something [HIV testing] we talk about it."* *"Not everyone gets an HIV test, and getting one is a sign [of being homosexual], especially if you're not out to a lot of people. It is very--that was one of my considerations."*
	2.2 Homonegativity places greater burden on HIV testing for the first-time testers		X	X	*"Kind of like double minority in which you are an Asian and then you're always a member of the marginalized community as well. So that might be a barrier in the first time or somewhat considered--I don't know."* *"But with those who really care about how people, how society looks at them, or how people think about them or so and so then that might be a problem and that might be a barrier [in the first time] right there."* "*It was very difficult decision the first time I went. When I was further from my family, it was easier*".
	2.3 Divergence in Asian sub-cultures	X	X		*"Now, I think that is an ultimately, that the degree of out-ness is where it intersects with a lot of things like, ethnicity, religion, and I think the diversity of the Asian American experience kind of gets to that in that, you know, that many people come from different religions and ethnic backgrounds."*

					"But I do know, it's a lot harder for other people, especially those who don't have as much familial support or those who just don't have as many resources and accessibility as us. So, I think about that, and I think it's a particularly a South Asian experience."
	2.4 Difference by other demographic characteristics (education, immigration status)	X	X		*"And with all that taboo, and the association, I thought that was kind of--I didn't, I wasn't mad, because I know that was lack of education."* *"So, I think they kind of tie being gay and AIDS hand in hand and there's a lot of conversation, but that is from first generation immigrant escaping war, right?"*
3. Perceived HIV Risk	3.1 Risks from having multiple partners	X	X	X	*"That people who have sex more frequently, those people who have multiple partners, those people maybe who are not loyal to their partners should be very much concerned, because their behavior may trigger them to get infected with the virus more than, let's say, guys who have maybe one partner, guys who more loyal to their partners."* *"It doesn't have to be unprotected but this engagement activity, sexual activity with other partners prior to the current one."* *"Especially if it's part of the most vulnerable period where they're, embracing their newfound freedom, getting time away from family, and parents or they are possibly more likely to engage in those behaviors [having multiple partners], especially with college parties."* *"And it's just a whole bunch of high, half-naked people dancing on each other."*
	3.2 Risks from a heightened frequency of sexual activities	X	X	X	*"The frequency of sex and also the number of partners. So those are factors."* *"I think to me, those who regularly have sex, the age bracket especially between 18 to 30, I will say that their sex activities are much active."* *"That people who have sex more frequently, … should be very much concerned"*
	3.3 Risks from unprotected sexual intercourses	X		X	*"Okay, to me is having, let's say, unprotected sex with more than one person."*

					"Definitely unprotected sex and sexual encounters where maybe you don't know the partners at all."
4. Attitude about HIV testing	4.1 Health benefits of HIV testing (mitigating uncertainty, navigating health care)	X	X	X	*"So, getting tested for HIV can give you a peace of mind."* *"Okay, my main point is that it is important to do HIV testing to free yourself from stress."* *"It is always better to take action than ignore your concern."* *"Yeah, that was a really good point. I'd say yeah, like, just the health benefits is just too many health benefits to even considering not getting one, not only for yourself to make sure that on the chance that you do, gosh, you ever do receive HIV that it's important to, to find out immediately and then just take care as soon as possible to manage the viral load."*
	4.2 Seeking HIV testing helps normalize the topic in public	X	X		*"I think, yeah socially, it's a good benefit for more people to take it more often, you know, have people talk about it, because then the taboo becomes less and less, you know."* *"And that's something we really want to sort of mention and be known to the public that testing is actually a good thing, even if it's positive, there are a lot of drugs out there that helps you survive much better."*
	4.3 Confidentiality as a concern relating to HIV testing		X	X	"*How many people will know about what your sexual activities and yeah, like it just something you want to keep very close to the chest. I'd say the costs, again, it's like, then you've got to weigh the social costs.*". "*Yeah, because I don't--with my primary care provider, I am not I'm open about it and I think partly because that primary care provider is connected with like, it's also a provider to my family members. And so, I cannot, I don't even want to think about that*". *"I think, I think building off of that, there was something that was mentioned, it's really important and what's making me reflect on what was the biggest challenge for me in accessibility was to keep distance from my family."*
5. Subjective Norms about HIV testing	5.1 Strong approval from/sharing with non-family	X	X	X	*"Don't know about the other Asian MSM but to me and my partner we took that responsibility to go getting tested after every six months."*

	(partners, peers, health care providers)				*"To me, I only share my sexual information [related to HIV testing] with my partner, since I'm not comfortable sharing all that with my other family members."* *"I guess if I feel like I need to get testing, I will definitely consult with my partner. So, that's obvious he would support me in this decision."* *"So, I think I would just lean on people who are on the need-to-know basis, and that's basically my sexual partner, and the physician."* *"I personally will be comfortable sharing with my close trusted friend who will not judge me in case of anything and my physician who will let me know the way forward and how to do everything after knowing my status. Yeah, since it's a private issue."*
	5.2 Lack of support from family	X		X	*"Some of the Asian American MSMs that I know, who are, like, completely cut off from their family have--it's like a non-issue."* *"There's a barrier when talking about HIV and AIDS to family and they are talking instead to a friend because chatting to your friend is much easier than your family."* *"Besides, that, there are some family members who I would not share with just the fact that the get a negative connotation with it or it's taboo."*
6. Perceived Behavioral Control about HIV testing	6.1 Affordability, availability, and accessibility of HIV testing	X	X	X	*"But I know that it's easily available for me, because it's covered through my health insurance."* *"In my case, I have cancer. The hospital I go for treatment. I can get free testing."* *"I also know that at pride events, the festivals, there's always testing freely available--free--to anyone to come in and take the test and these tests are--you get results within five to 10 minutes now."* *"There's a lot of organizations that does it for free and it's quite fast to know your results."* *"Okay for me, I think HIV testing has become quite easy nowadays because awareness, has*

					been done, and there are a lot of self test kits, dispersed available, thanks to the CDC and many other organizations."
	6.2 Home testing		X	X	*"And I have friends who would rather go to me, so that I can do the home test on them, than to go to a professional."* *"So outside of, you know, certain people relying on my result, to make them feel a little better I used to have a lot of home testing kits with me."*

Chapter 4 References

Abamecha, F., Godesso, A., & Girma, E. (2013). Intention to voluntary HIV counseling and testing (VCT) among health professionals in Jimma zone, Ethiopia: the theory of planned behavior (TPB) perspective. *BMC Public Health*, *13*(1), 140. https://doi.org/10.1186/1471-2458-13-140

Adih, W. K., Campsmith, M., Williams, C. L., Hardnett, F. P., & Hughes, D. (2011). Epidemiology of HIV among Asians and Pacific Islanders in the United States, 2001-2008. *J Int Assoc Physicians AIDS Care (Chic)*, *10*(3), 150-159. https://doi.org/10.1177/1545109711399805

Ajzen, I. (2013). The theory of planned behavioral questionnaire. Measurement Instrument Database for the social science. In.

Ayodele, O. (2017). The Theory of Planned Behavior as a Predictor of HIV Testing Intention. *Am J Health Behav*, *41*(2), 147-151. https://doi.org/10.5993/ajhb.41.2.5

Berg, R. C., Munthe-Kaas, H. M., & Ross, M. W. (2016). Internalized Homonegativity: A Systematic Mapping Review of Empirical Research. *Journal of Homosexuality*, *63*(4), 541-558. https://doi.org/10.1080/00918369.2015.1083788

Beyrer, C., Sullivan, P., Sanchez, J., Baral, S. D., Collins, C., Wirtz, A. L., Altman, D., Trapence, G., & Mayer, K. (2013). The increase in global HIV epidemics in MSM. *AIDS*, *27*(17), 2665-2678. https://doi.org/10.1097/01.aids.0000432449.30239.fe

Bhattacharya, G. (2004). Health care seeking for HIV/AIDS among South Asians in the United States. *Health & Social Work*, *29*(2), 106-115.

Bicchieri, C., Ryan Muldoon, Alessandro Sontuoso. (2018). Social Norms. *The Stanford Encyclopedia of Philosophy Winter 2018 Edition*. https://doi.org/https://plato.stanford.edu/entries/social-norms/

Buetow, S. (2010). Thematic analysis and its reconceptualization as 'saliency analysis'. *Journal of health services research & policy*, *15*(2), 123-125.

Burk, J., Park, M., & Saewyc, E. M. (2018). A Media-Based School Intervention to Reduce Sexual Orientation Prejudice and Its Relationship to Discrimination, Bullying, and the Mental Health of Lesbian, Gay, and Bisexual Adolescents in Western Canada: A Population-Based Evaluation. *Int J Environ Res Public Health*, *15*(11). https://doi.org/10.3390/ijerph15112447

Carteret, M. (2011). Cultural Values of Asian Patients and Families.

CDC. (2017). *HIV among Asians*. May 2017

CDC. (2018). HIV Testing Guidelines. *Accessed online at https://www.cdc.gov/hiv/guidelines/testing.html*.

CDC. (2023). *Screening in Clinical Settings*. https://www.cdc.gov/hiv/clinicians/screening/clinical-settings.html#:~:text=CDC%20recommends%20that%20clinicians%20screen,increased%20risk%20for%20HIV%20Infection.

Chng, C. L., Wong, F. Y., Park, R. J., Edberg, M. C., & Lai, D. S. (2003). A model for understanding sexual health among Asian American/Pacific Islander men who have sex with men (MSM) in the United States. *AIDS Education and Prevention*, *15*(1 Supplement), 21-38.

Chou, W. (2001). Homosexuality and the cultural politics of Tongzhi in Chinese society. *Journal ofHomosexuality*, *40*, 27-46.

Clifton, S., Nardon, A., Field, N., Mercer, C., Tanton, C., Macdowall, W., Johnson, A., & Sonnenberg, P. (2016). HIV testing, risk perception, and behaviour in the British population. *AIDS*, *30*(6), 943-952. https://doi.org/10.1097/QAD.0000000000001006

Cotten-Huston, A. L., & Waite, B. M. (2000). Anti-homosexual attitudes in college students: predictors and classroom interventions. *J Homosex*, *38*(3), 117-133. https://doi.org/10.1300/j082v38n03_07

CPACS. (2018). HIV testing among Asian Americans in Georgia, U.S. *Unpublished qualitative data from 3 focus group discussions among Asian Americans (Korean, Chinese, and Vietnamese)*.

Creswell, J. W., & Miller, D. L. (2000). Determining Validity in Qualitative Inquiry. *Theory Into Practice*, *39*(3), 124-130. https://doi.org/10.1207/s15430421tip3903_2

Deepak, A. C. (2005). Parenting and the Process of Migration: Possibilities Within South Asian Families. *Child Welfare*, *84*(5), 585-606. http://www.jstor.org/stable/45398734

Do, T. D., Hudes, E. S., Proctor, K., Han, C. S., & Choi, K. H. (2006). HIV testing trends and correlates among young Asian and Pacific Islander men who have sex with men in two U.S. cities. *AIDS Educ Prev*, *18*(1), 44-55. https://doi.org/10.1521/aeap.2006.18.1.44

Estrada, D., & Rutter, P. (2006). Using the Multiple Lenses of Identity: Working With Ethnic and Sexual Minority College Students. *Journal of College Counseling*, *9*(2), 158-166. https://doi.org/https://doi.org/10.1002/j.2161-1882.2006.tb00102.x

Evangeli, M., Ferris, K., Kenney, N. M., Baker, L. L. E., Jones, B., & Wroe, A. L. (2018). A systematic review of psychological correlates of HIV testing intention. *AIDS Care*, *30*(1), 18-26. https://doi.org/10.1080/09540121.2017.1344351

Evangeli, M., Pady, K., & Wroe, A. L. (2016). Which Psychological Factors are Related to HIV Testing? A Quantitative Systematic Review of Global Studies. *AIDS Behav*, *20*(4), 880-918. https://doi.org/10.1007/s10461-015-1246-0

Evans, C., Turner, K., Suggs, L., Occa, A., Juma, A., & Blake, H. (2016). Developing a mHealth intervention to promote uptake of HIV testing among African communities in the UK: a qualitative study. *BMC Public Health*, *16*(1), 1-16.

Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development. *International Journal of Qualitative Methods*, *5*(1), 80-92. https://doi.org/10.1177/160940690600500107

Figueroa, C., Johnson, C., Verster, A., & Baggaley, R. (2015). Attitudes and acceptability on HIV self-testing among key populations: a literature review. *AIDS and Behavior*, *19*(11), 1949-1965.

Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *Qual. Rep.*, *8*, 597-606.

Goldenberg, T., Stephenson, R., & Bauermeister, J. (2018). Community stigma, internalized homonegativity, enacted stigma, and HIV testing among young men who have sex with men. *Journal of Community Psychology*, *46*(4), 515-528. https://doi.org/https://doi.org/10.1002/jcop.21957

Grover, K. W., & Miller, C. T. (2014). Effects of mortality salience and perceived vulnerability on HIV testing intentions and behaviour. *Psychol Health*, *29*(4), 475-490. https://doi.org/10.1080/08870446.2013.866672

Hennink, M., Hutter, I., & Bailey, A. (2010). *Qualitative research methods*. Sage.

Herek, G. M. (1988). Heterosexuals' attitudes toward lesbians and gay men: Correlates and gender differences. *The Journal of Sex Research*, *25*(4), 451-477. https://doi.org/10.1080/00224498809551476

Hogben, M., Janet, S., Lawrence, T., Hennessy, M., & Eldridge, G. (2003). Using The Theory Of Planned Behavior To Understand The STD Risk Behaviors Of Incarcerated Women. *Sage Publications*. https://doi.org/https://doi.org/10.1177/0093854802251003

Iott, B. E., Loveluck, J., Benton, A., Golson, L., Kahle, E., Lam, J., Bauermeister, J. A., & Veinot, T. C. (2022). The impact of stigma on HIV testing decisions for gay, bisexual, queer and other men who have sex with men: a qualitative study. *BMC Public Health*, *22*(1), 471. https://doi.org/10.1186/s12889-022-12761-5

Ju, D. H. (2021). Factors shaping Asian Americans' attitudes toward homosexuality. *Ethnic and Racial Studies*, 1-24. https://doi.org/10.1080/01419870.2021.1884732

Kumar, E. M., & Poulakis, M. . (April 2013). Uncovering an Invisible Population: South Asian Gay Men. *Society for the Psychology of Sexual Orientation and Gender Diversity, Division 44 Newsletter*. https://doi.org/ https://www.apadivisions.org/division-44/publications/newsletters/division/2013/04/south-asian-gay

Kyung-Hee C. et al. (1998). HIV prevention among Asian and Pacific Islander American men who have sex with men: A critical review of theoretical models and directions for future research. *AIDS Educ Prev*, *10*(3), 19-30.

Lee, J. J., & Zhou, Y. (2019). Facilitators and barriers to HIV testing among Asians in the United States: a systematic review. *AIDS Care*, *31*(2), 141-152. https://doi.org/10.1080/09540121.2018.1533231

Lorenc, T., Marrero-Guillamón, I., Llewellyn, A., Aggleton, P., Cooper, C., Lehmann, A., & Lindsay, C. (2011). HIV testing among men who have sex with men (MSM): systematic review of qualitative evidence. *Health Educ Res*, *26*(5), 834-846. https://doi.org/10.1093/her/cyr064

Maxwell, J. A. (2012). *Qualitative research design: An interactive approach* (Vol. 41). Sage publications.

Meadowbrooke, C. C., Veinot, T. C., Loveluck, J., Hickok, A., & Bauermeister, J. A. (2014). Information Behavior and HIV Testing Intentions Among Young Men at Risk for HIV/AIDS. *J Assoc Inf Sci Technol*, *65*(3), 609-620. https://doi.org/10.1002/asi.23001

Mirkuzie, A. H. (2011). Applying the theory of planned behaviour to explain HIV testing in antenatal settings in Addis Ababa - a cohort study. *BMC Health Serv Res*, *11*, 196. https://doi.org/10.1186/1472-6963-11-196

Morrison, M. A., & Morrison, T. G. (2003). Development and validation of a scale measuring modern prejudice toward gay men and lesbian women. *Journal of Homosexuality*, *43*(2), 15-37.

Morrison, M. A., & Morrison, T. G. (2013). Modern Homonegativity Scale. In *Handbook of sexuality-related measures* (pp. 414-426). Routledge.

Morrison, T. G., Kenny, P., & Harrington, A. (2005). Modern prejudice toward gay men and lesbian women: Assessing the viability of a measure of modern homonegative attitudes

within an Irish context. *Genetic, Social, and General Psychology Monographs*, *131*(3), 219-250.

Nemoto, T., Wong, F., Ching, A., Chng, C. L., Bouey, P., Henrickson, M., & Sember, R. (1998). HIV seroprevalence, risk behaviors, and cognitive factors among Asian and Pacific Islander American men who have sex with men: a summary and critique of empirical studies and methodological issues. *AIDS education and prevention: official publication of the International Society for AIDS Education*, *10*(3 Suppl), 31-47.

Nicholls, E. J., Samba, P., McCabe, L., Gafos, M., Philips, A. N., Trevelion, R., Rodger, A. J., Burns, F. M., Weatherburn, P., & Witzel, T. C. (2022). Experiences of and attitudes towards HIV testing for Asian, Black and Latin American men who have sex with men (MSM) in the SELPHI (HIV Self-Testing Public Health Intervention) randomized controlled trial in England and Wales: implications for HIV self-testing. *BMC Public Health*, *22*(1), 809. https://doi.org/10.1186/s12889-022-13189-7

O.Nyumba, T., Wilson, K., Derrick, C. J., & Mukherjee, N. (2018). The use of focus group discussion methodology: Insights from two decades of application in conservation. *Methods in Ecology and Evolution*, *9*(1), 20-32. https://doi.org/https://doi.org/10.1111/2041-210X.12860

Onwuegbuzie, A. J., Dickinson, W. B., Leech, N. L., & Zoran, A. G. (2009). A Qualitative Framework for Collecting and Analyzing Data in Focus Group Research. *International Journal of Qualitative Methods*, *8*(3), 1-21. https://doi.org/10.1177/160940690900800301

Oyarce-Vildósola, O., Rodríguez-Fernández, A., & Maury-Sintjago, E. (2022). Association between Homophobia and Sociodemographic Characteristics in Health Workers in

Southern Chile. *Int J Environ Res Public Health*, *19*(21). https://doi.org/10.3390/ijerph192113749

Padela, A. I., Vu, M., Muhammad, H., Marfani, F., Mallick, S., Peek, M., & Quinn, M. T. (2016). Religious beliefs and mammography intention: findings from a qualitative study of a diverse group of American Muslim women. *Psychooncology*, *25*(10), 1175-1182. https://doi.org/10.1002/pon.4216

Roder A. (2015). Immigrants' Attitudes toward Homosexuality: Socialization, Religion, and Acculturation in European Host Societies. *The International Migration Review*, *49*(4), 1042-1070. http://www.jstor.org/stable/43948596

Ross M. (2018). Homophobia among Asian Americans and HIV testing. *Expert opinion via personal conversation Dated Jul 12, 2018*.

Salud, M. C., Marshak, H. H., Natto, Z. S., & Montgomery, S. (2014). Exploring HIV-testing intentions in young Asian/Pacific Islander (API) women as it relates to acculturation, theory of gender and power (TGP), and the AIDS risk reduction model (ARRM). *AIDS Care*, *26*(5), 642-647. https://doi.org/10.1080/09540121.2013.841836

Sen, S., Nguyen, H. D., Kim, S. Y., & Aguilar, J. (2017). HIV knowledge, risk behavior, stigma, and their impact on HIV testing among Asian American and Pacific Islanders: a review of literature. *Social Work in Public Health*, *32*(1), 11-29.

Shariff, A. (2009). Ethnic identity and parenting stress in South Asian families: Implications for culturally sensitive counselling. *Canadian Journal of Counselling and Psychotherapy*, *43*(1).

Solorio, R., Forehand, M., & Simoni, J. (2013). Attitudes towards and Beliefs about HIV Testing among Latino Immigrant MSM: A Comparison of Testers and Nontesters. *AIDS Res Treat*, *2013*, 563537. https://doi.org/10.1155/2013/563537

Spielberg, F., Kurth, A., Gorbach, P. M., & Goldbaum, G. (2001). Moving from apprehension to action: HIV counseling and testing preferences in three at-risk populations. *AIDS Education and Prevention*, *13*(6), 524-540.

Stephenson, R., White, D., Darbes, L., Hoff, C., & Sullivan, P. (2015). HIV testing behaviors and perceptions of risk of HIV infection among MSM with main partners. *AIDS Behav*, *19*(3), 553-560. https://doi.org/10.1007/s10461-014-0862-4

Stewart, D. W., & Shamdasani, P. N. (1990). Focus groups: Theory and practice. *Applied social research methods series, Thousand Oaks, CA: Sage Publications, Inc.*

Van der Bracht, K., & Van de Putte, B. (2014). Homonegativity among first and second generation migrants in Europe: the interplay of time trends, origin, destination and religion. *Soc Sci Res*, *48*, 108-120. https://doi.org/10.1016/j.ssresearch.2014.05.011

Veinot, T. C., Caldwell, E., Loveluck, J., Arnold, M. P., & Bauermeister, J. (2016). HIV Testing Behavior and Social Network Characteristics and Functions Among Young Men Who have Sex with Men (YMSM) in Metropolitan Detroit. *AIDS Behav*, *20*(11), 2739-2761. https://doi.org/10.1007/s10461-016-1296-y

Vlassoff, C., & Ali, F. (2011). HIV-related stigma among South Asians in Toronto. *Ethnicity & health*, *16*(1), 25-42.

Wei, C., Cheung, D., Yan, H., Li, J., Shi, L., & Raymond, H. (2016). The Impact of Homophobia and HIV Stigma on HIV Testing Uptake among Chinese Men Who Have Sex with Men:

A Mediation Analysis. *Journal Acquiried Immune Deficiency Syndrom*, *71*(1), 87-93. https://doi.org/10.1097/QAI.0000000000000815

WHO. (2016). *Consolidated guidelines on HIV prevention, diagnosis, treatment and care for key populations, 2016 update*. World Health Organization. https://www.who.int/publications/i/item/9789241511124

Wong, F. Y., Nehl, E. J., Han, J. J., Huang, Z. J., Wu, Y., Young, D., & Ross, M. W. (2012). HIV testing and management: findings from a national sample of Asian/Pacific islander men who have sex with men. *Public Health Rep*, *127*(2), 186-194. https://doi.org/10.1177/003335491212700207

Wong FY. et al. (2004). HIV testing and awareness of care-related services among a group of HIV-positibe Asian Americans and Pacific Islanders in the United States: findings from a supplemental HIV/AIDS surveillance project. *AIDS Education and Prevention*, *16*(5), 440-447.

Yeung, W.-J. J., Desai, S., & Jones, G. W. (2018). Families in southeast and South Asia. *Annual Review of Sociology*, *44*, 469-495.

Yoshikawa, H., Wilson, P. A., Hsueh, J., Rosman, E. A., Chin, J., & Kim, J. H. (2003). What Front-Line CBO Staff Can Tell Us About Culturally Anchored Theories of Behavior Change in HIV Prevention for Asian/Pacific Islanders. *American Journal of Community Psychology*, *32*(1-2), 143-158.

Zhao, Y., Bromberg, D. J., Khoshnood, K., & Sheng, Y. (2020). Factors associated with regular HIV testing behavior of MSM in China: a cross-sectional survey informed by theory of triadic influence. *International journal of STD & AIDS*, *31*(14), 1340-1351. https://doi.org/10.1177/0956462420953012

CHAPTER 5: Discussion

Asian Americans present the fastest growing population group in the U.S., presently numbering at 24 million (US Census Bureau, 2023). In 2019, general HIV infection rate of the Asian American population was 3.9 per 100,000 (CDC, 2021).. The population is projected to surpass Hispanic to become the largest immigrant group in the U.S by 2055, reaching approximately 46 million (Pew Research Center, 2021). The goal of this dissertation research is to mitigate impact of HIV on Asian American MSM, the population of heightened HIV risk, with a focus on promoting HIV testing. Within the scope of this dissertation research program, I conducted three separate studies to deepen our understanding about the cultural and socio-psychological factors related to HIV testing behaviors among Asian Americans and Asian American men.

The first study of this dissertation research was to assess the instrument properties of an important psycho-behavioral research measure, the Modern Homonegativity scale, that had not been validated in the population of Asian Americans. In **Study 1**, I performed a psychometric evaluation (i.e., reliability, construct validity) and an exploratory factor analysis of the Modern Homonegativity scale in the population of **Asian Americans**. I also examined the relationship of homonegativity with other relevant cultural and socio-psychological factors, including *acculturation, social norms, gender role beliefs, and immigration history (construct validity)*. Informed by Study 1, I used path analysis to examine salient factors impacting HIV testing intention in the group of higher risk for HIV infection relative to women – Asian American men. In **Study 2**, I investigated the interrelationships, via path modeling methods, of cultural and socio-psychological factors (*acculturation, social norms, masculinity, homonegativity, perceived HIV risk, and the constructs of the TPB*) with HIV testing intention in this population. To

achieve that, I conducted a national online survey among **Asian American men** and analyzed the quantitative data to generate insights.

To learn contextual insights about how the factors identified in Study 2 relate to HIV testing intention and inform future programs appropriate for the target group of intervention, Asian American MSM, I collected qualitative data via focus group discussions with Asian American MSM. This qualitative analysis would expand our understanding of the highlighted findings from the previous study. Specifically, in **Study 3**, I explored the contexts of how salient factors we found in Study 2 (*social norms, homonegativity, perceived HIV risk, and the constructs of the TPB*) relate to HIV testing intention among **Asian American MSM**.

Together, findings from this formative research will inform the development of culturally appropriate messages and interventions to improve HIV testing among Asian American men, with a focus on Asian American MSM. Specifically, an understanding about what factors are associated with HIV testing among Asian American men and how they are contextualized among Asian American MSM will facilitate the prioritization of intervention strategies focusing on the most salient factor(s) and/or population sub-group(s) in future HIV prevention programs targeting Asian American men.

Summary of Findings

Findings from **Study 1** indicated that the Modern Homonegativity scale demonstrated good reliability (ordinal alpha = 0.93) and satisfactory model fit indices for a 4-factor construct (RMSEA = 0.19, CFI = 0.97, TLI = 0.9, SRMR = 0.07). Analyses that examined construct validity showed that greater homonegativity is associated with lower levels of acculturation, social norms about HIV testing, and less years since immigration. Factors that were significantly associated with homonegativity included gender role beliefs ($\beta = 0.48$, p-value < 0.001) and

immigration history (years since immigration, in years) (β= -0.27, p-value < 0.001). Overall, the Modern Homonegativity scale was found to be a reliable and valid measure to assess prejudice towards gay men among Asian Americans.

With the use of the homonegativity scale, which was validated in Study 1, results from a path model in **Study 2** with two endogenous variables (homonegativity and HIV testing intention) indicated that social norms about HIV testing, attitudes about HIV testing, and perceived HIV risk had both *direct* and *indirect* relationships with the intention of HIV testing in the study sample of Asian American men. However, social norms about HIV testing and perceived HIV risk showed stronger direct effects (standardized estimates = 0.37 and 0.34, respectively, p-value < 0.001). Additionally, we found that the relationships of these factors with HIV testing intention were mediated by homonegativity. Overall, the sub-models with two endogenous variables (homonegativity and HIV testing intention) account for 35% and 46% of the variances, respectively (p-values < 0.001). Findings of this study furthered our understanding of the pathways of association between a group of cultural and socio-psychological factors (*acculturation, social norms about HIV testing, masculine beliefs, perceived HIV risk, attitude, subjective norms, and perceived behavioral control about HIV testing*) with HIV testing intention among an understudied population – Asian American men.

In **Study 3**, we found divergent perspectives around factors influencing Asian American MSMs' HIV testing intention. Promoters of HIV testing intention included high levels of approval by sex partners and health care providers towards HIV testing. Homonegativity (negative attitudes towards homosexuality) was found to be a barrier to HIV testing intention among this population group. Overall, participants expressed diverse views towards the role of social norms on their HV testing intention. Our key results indicated that Asian American MSM

perceived *positive social norms* about HIV testing within the gay community, but that the social norms were less supportive among their families or broader Asian American community. On the other hand, participants reported that HIV testing behavior was less common among those outside of their gay community, including their families. *Homonegativity* was reported to be a common barrier to HIV testing, especially for those testing for their first time. Additionally, it was suggested that newly immigrated Asians and individuals with lower education would hold higher level of homonegativity towards Asian American MSM. Also, *HIV risk perception*, based upon actual risk behaviors such as frequency of sexual activities and unprotected sexual intercourse, drove participants' HIV testing decisions.

Implications for Public Health Research and Practice

Given the scarcity of knowledge about HIV prevention among Asian Americans and Asian American MSM, I implemented the three corresponding studies in a funneling approach. It began with 1) identifying the most relevant factors related to HIV testing behavior; 2) examining measurement scales validity among the general Asian American population; 3) proposing and testing a theoretically informed conceptual framework of the identified factors among Asian American men – a subgroup at high risk of HIV infection; and 4) contextualizing the learnings from the previous study in the target group, Asian American MSM.

In a formative assessment which had been conducted prior to this dissertation and helped shaped my research agenda, it was recognized that *homonegativity* was prevalent among Asian Americans; and the findings urged for further research to explore this pervasive phenomenon in this minority population group. As the construct of homonegativity had not been previously validated in the population of Asian Americans, Study 1 was proposed to address this emerging need and was followed by Studies 2 and 3 which sought to understand how homonegativity and

other salient factors found in existing literature relate to HIV testing intention among Asian American men, and eventually, Asian American MSM.

Eventually, findings from my studies will help inform future interventions that aims to promote HIV testing among this population, such as the inclusion of positive messaging about positive norms of Asian American males getting tested through provider recommendations or community-based outreach activities.

Implications on measurement in behavioral health research

Employing sound measurement is important to ensure epistemic validity of behavioral health research (Truijens, Cornelis, Desmet, De Smet, & Meganck, 2019). Psychometric properties of assessment tools are essential in various fields of research related to clinical, psychological, and behavioral health (Balsamo, Innamorati, & Lamis, 2019) as it offers researchers with reliable and valid research measures for the inter-disciplinary diagnostic assessments as well as the design and outcome evaluation of health intervention programs (Balsamo, Innamorati, & Lamis, 2007).

Since the measurement of homonegativity had been identified as one of the core constructs in two of the three studies in my dissertation research, Study 1 was implemented to investigate performance of the Modern Homonegativity scale (M. A. Morrison & Morrison, 2002) in the Asian American population. The validity of a measure is often conceptualized as "*measuring what is purported to measure*" [p.1061] (Borsboom, Mellenbergh, & van Heerden, 2004). Study 1, thus, assessed if homonegativity was validly measuring relevant aspects of negative prejudice towards homosexuality in Asian Americans before it could be used in the following studies among Asian Americans.

Collectively, this study generated evidence of the measure psychometrics (reliability and validity), construct structure (exploratory factor analysis), and factors associated with homonegativity. The results suggested that the scale is valid for health science research among Asian Americans. The impact of this work reaches beyond the scope of this dissertation research as findings will be available for use by researchers interested in using this construct in their studies of behavioral psychology and the health of Asian Americans. Using this instrument with Asian American communities, future studies involving measurement of homonegativity will not only result in the **epistemological quality improvement overall**, but also the **credibility of research measurement**.

Specifically, the validated scale will offer a useful guide for the appropriate design of research questionnaire, acceptable analysis approaches, and accurate interpretation of data (Balsamo et al., 2007; Mohajan, 2017) in the utilization of this psycho-behavioral construct among the population of Asian Americans. Future behavioral health research will also greatly benefit from new measurement development efforts that examine scales' functions among different groups of Asian Americans, especially the differential item functioning.

Implications on the research and practice of HIV testing among Asian American men and Asian American MSM

Limited systematic reviews about the facilitators and barriers to HIV testing among Asian Americans have pointed to the dire need for greater attention on the use of theoretical frameworks to investigate community, institutional, or structural level factors predicting HIV testing (J. J. Lee & Zhou, 2019). Studies 2 and 3 were among the first to employ a theoretically grounded conceptual framework expanded to include empirically derived cultural and socio-psychological factors associating with HIV testing intention among Asian American men.

Highlighted results from Study 2 suggested that homonegativity was a strong mediating variable in a path model predicting HIV testing intention among Asian Americans. This important finding supported my initially hypothesized conceptual framework expanding from the TPB to include acculturation, masculinity, social norms, perceived HIV risk, and homonegativity to predict HIV testing intention. More importantly, it proved that my initial proposition to examine the mediating role of homonegativity in a path model predicting HIV testing intention is appropriate for this minority population, Asian Americans. The results also supported my hypotheses that, **in addition to the TPB constructs, social norms and perceived HIV risk were also salient factors directly related to HIV testing intention.**

Another important strategy employed in Study 2 was the introduction of an expanded conceptual framework drawing upon the TPB, which helped explained greater variance accounted for in the model compared to the TPB alone (C. C. Meadowbrooke et al., 2014). My results showed that using the proposed framework, our model explained 35% and 46% (p-value < 0.001) of the models with homonegativity and HIV testing intention as outcomes, respectively, compared to 18.1% (TPB alone) documented in existing literature (C. C. Meadowbrooke et al., 2014). I found homonegativity to be a mediator in the interrelationships of several salient factors, such as social norms, attitude, perceived HIV risk and HIV testing intention. As previous studies have not examined the role of homonegativity in the relationship with HIV testing intention among Asian Americans, this finding signifies the need to include this factor in future research on barriers to HIV testing, as well as underscores the importance of this measure in programs promoting HIV testing in this population.

Study 2's findings enabled an important observation that the **TPB appeared to explain greater total variance in an expanded model when combining with other relevant factors** to

investigate their relationships with HIV testing intention among Asian Americans; this is also a key learning in my hypothesis testing of this study. This study makes a significant contribution to the developing body of knowledge about the utilization of theories in behavioral health research among Asian Americans, especially the application of the TPB in combination with other relevant factors in HIV testing studies. Existing literature has found that the use of an expanded model comprising the TPB's constructs and other salient factors could explain more effectively the total variance of a model predicting HIV testing (C. C. Meadowbrooke et al., 2014). That predication is well supported in my study, thus proving that the approach should be promoted to enhance our knowledge about the development of socio-ecological factors influencing health behaviors, including HIV testing.

Informed by results from this quantitative study, Study 3 was subsequently formulated to gain deeper understanding about how the learning could be contextualized in our target research population – Asian American MSM. In study 3, I documented diverse perspectives in the discussion about whether homonegativity acted as a barrier to HIV testing and especially how social norms would interfere in participants' HIV testing intention. While most participants, who were Asian American MSM, felt that they would not be comfortable going for the test in presence of negative attitude towards their sexual orientation by others, there were a couple of participants who expressed opposite views, i.e., homonegativity would not interfere with their HIV testing behavior. Diverse opinions regarding the role of social norms were expressed by the participants, . The majority of participants shared that they observed rather negative social norms about HIV testing among the general Asian American population. However, social norms about HIV testing were quite positive among the Asian American MSM. This finding was instrumental

to the interpretation of one of the results in Study 2 suggesting that positive social norms were strongly associated with stronger intention of HIV testing among Asian American men.

Together, these findings suggest that future interventions involving social norms as a measure should consider the divergence of dynamics around social norms between the general Asian American population and Asian American men to ensure appropriate identification of intervention strategies for each target group.

In summary, Study 3's findings have important implications for the development of interventions to promote HIV testing among the population of Asian American MSM, a priority sub-population for intensifying HIV prevention efforts within Asian Americans. Identifying and understanding the influence of socio-psychological factors on HIV testing intention among this minority group would help policy-making agencies, health service providers and community organizations better mobilize resources to address underlying barriers and promoting facilitators to HIV testing intention through initiatives that are culturally relevant and appropriate, especially for the first-time testers and the community of gay men originally from South Asia. My results help inform public health efforts in promoting HIV testing and meeting other health needs of this racial and sexual minority group – Asian American MSM. Specifically, future programs could consider intervention strategies aiming at provider-level or community-level with positive messaging about the positive social norms about HIV testing observed among Asian American men.

Collectively, findings from this dissertation research will help guide future intervention programs promoting HIV testing among the population of Asian Americans. For example, it is suggested that interventions aiming to holistically address psychological factors related to HIV testing should place greater focus on mitigating negative prejudice towards homosexuality

together with other factors (social norms, perceived HIV risk and the TPB constructs), especially among the group of Asian American MSM originating from the region of South Asia.

Specifically, most important findings from Studies 2 and 3 echoed previous research indicating that homonegativity, an underlying barrier to HIV testing, is strongly present among heterosexual male population (Gregory M. Herek, 1988) as well as underscored the association between social norms, perceived HIV risk and HIV testing (J. J. Lee & Zhou, 2019). The design and implementation of future intervention programs focusing on promoting HIV testing uptake should take into consideration these important dynamics. Addressing sensitive topics such as homonegativity and HIV testing social norms may require a multi-level framework for future intervention programs. *At the community level,* a community-based approach through social networks to promote positive messaging campaigns or featuring iconized champions flagging the importance of HIV testing may be appropriate (Veinot et al., 2016). In addition, the programming of interventions to address these issues at the *interpersonal and individual levels* could adopt strategies that have been suggested elsewhere, including the captivation of network homophily (e.g. targeting smaller groups sharing similar social and demographic characteristics) (Veinot et al., 2016) or group interventions (e.g. classroom-based, computer-based, or community-based) for younger individuals, such as college students (Burk et al., 2018; Cotten-Huston & Waite, 2000).

Future research should attempt to further disaggregate these results by possibly performing sub-group analyses by HIV testing status (e.g., never been tested vs. has been tested), geography (e.g., country of origin and/or ethnicity), age, education attainment, and other socio-cultural aspects such as lifestyle or household characteristics (e.g., living alone, living with partner, or living in a multi-generation family) for studies similar to Study 2. In addition,

considering this is a formative dissertation research using path analysis, future efforts should focus on explaining some of the findings found in Study 2, that were reverse to the initial hypotheses, through a qualitative study among Asian American men, possibly, via in-depth interviews to attain deeper contexts, if feasible. Another approach could be the implementation of a quantitative study among Asian American MSM replicating the strategies of Study 2 and assess the results of both.

Strengths and Limitations

The dissertation research project possessed several strengths. *First*, the sequential design of the three studies enabled findings from the previous aim to be translated into the implementation of the next study. Specifically, I learned from Study 1 that the homonegativity scale could be used in the population of Asian American men based upon its satisfactory performance in this population group. Subsequently, findings of Study 2 facilitated the formulation of the structure and topics of Study 3, where salient factors were introduced in the focus group guide for data collection (social norms, homonegativity, perceived HIV risk, and the constructs of the TPB). *Second*, two of the three studies (Studies 2 and 3) had samples of Asian American men that were from across the US, with rigorous data quality assurance protocols for Study 2. *Last*, I employed a comprehensive behavioral health conceptual framework with the TPB as the core theoretical ground in combination with other empirically informed cultural and socio-psychological factors that were salient to assess among Asian Americans. This framework informed the design and implementation of Studies 2 and 3.

However, there were some limitations of this research. *First* to mention is the non-representativeness of the sample I collected for Study 1. The sample was not representative of the entire Asian American population due to the study's convenience sampling approach as well

as the recruitment method that was limited to certain geographical areas. As a result, the study population comprised of participants largely from the East and Southeast Asian regions. This hindered representations from other Asian regions (e.g., Desi population groups), whose data could have allowed greater diversity in cultures, social norms, and beliefs. The under-representation of participants ultimately impacted the interpretability and generalizability of our findings from this study. Additionally, the study sample was rather small (less than 200 participants), possibly impacting testability of significance in sub-group analyses of findings from Study 1. *Second*, for all three studies, I relied on self-reported data, which might have introduced recall bias (Rosenman et al., 2011) and social desirability bias (Adong et al., 2019). Further, I used cross-sectional data collected from one survey for Study 2, which hindered interpretations of causal relationships among variables (Saunders et al., 2012). To address this limitation, future studies can consider a longitudinal study design with repeated measurements to explore factors associated with testing over time. While there have been recent efforts employing longitudinal study designs to examine factors associated with HIV testing history among Chinese female sex workers living in China (Xu et al., 2011), or factors associated with HIV risk among young Black MSM in the US (Skaathun, Voisin, Cornwell, Lauderdale, & Schneider, 2019), no studies have been found that specifically investigated these topics among Asian American men. Findings from such studies will help enhance causal inference of factors influencing HIV testing among this understudied population.

Furthermore, for Studies 2 and 3, I used data collected via an online platform with surveys in English only. This limited participation to only those who had access to internet and could read and converse in English. This might have led to potential sampling biases resulting in some possible differences of the sample characteristics in relation to the general population of

Asian American men. Future studies may consider a more inclusive recruitment approach, such as combining web-based and mail surveys, and respondent driven sampling to enable greater representation of Asian America men (McCabe et al., 2006). *Last*, Study 3 was qualitative, which implied that findings might not be generalized across settings and contexts. Topics discussed in the focus group discussions were personal and sensitive. Despite the efforts put in by the research personnel to ensure research protocols, including assurance of privacy and confidentiality, only a small group of participants (4/18) were willing to provide personal demographic information at the end of the focus group discussions. The discussions were held in English entirely, thus, participants (especially immigrants) who were not fluent might have not been able to articulate their thoughts comfortably. Future studies should consider these limitations in the design and implementation to facilitate broader participation and better data collection.

Conclusion

Being the population with lowest HIV testing rates and one of the fastest growing populations in the U.S., it is critical that research about HIV testing practices in this population to be prioritized (CDC, 2017). My dissertation research advances our understanding of salient factors impacting HIV testing intention among Asian Americans men – a group at heightened risk for HIV infection. At a policy level, this research responds to one of the priorities outlined in a statement by the White House in 2014 emphasizing the need to address HIV/AIDS in Asian American and Pacific Islander communities (The White House, 2014). Low HIV testing and late testing were the leading reasons for making Asian Americans a priority group to focus efforts for promoting HIV testing uptake (Sen, Aguilar, & Petty, 2021; The White House, 2014).

Methodologically, my dissertation made important contributions to the health science knowledge of a fast-growing minority population, Asian American, through the validation work of an important psychological measure, homonegativity, as well as employing a comprehensive conceptual framework and rigorous analytic methods to identify salient factors influencing HIV testing intention. Importantly, findings regarding the underlying cultural differences toward homosexuality, a common determinant of HIV testing behaviors among Asian Americans, corresponds to the need for *developing more culturally relevant HIV services for this population*, as outlined in the government's agenda (The White House, 2014) and existing literature (Sen et al., 2021; Sen et al., 2017; Shiu et al., 2016).

Together, findings from this research will inform future research to promote HIV testing behaviors among the population of Asian American men. My studies furthered the development of the Asian health research with a goal of improving overall well-being of the Asian American population.

Chapter 5 References

Abamecha, F., Godesso, A., & Girma, E. (2013). Intention to voluntary HIV counseling and testing (VCT) among health professionals in Jimma zone, Ethiopia: the theory of planned behavior (TPB) perspective. *BMC Public Health, 13*(1), 140. doi:10.1186/1471-2458-13-140

Adih, W. K., Campsmith, M., Williams, C. L., Hardnett, F. P., & Hughes, D. (2011). Epidemiology of HIV among Asians and Pacific Islanders in the United States, 2001-2008. *J Int Assoc Physicians AIDS Care (Chic), 10*(3), 150-159. doi:10.1177/1545109711399805

Adong, J., Fatch, R., Emenyonu, N. I., Cheng, D. M., Muyindike, W. R., Ngabirano, C., . . . Hahn, J. A. (2019). Social Desirability Bias Impacts Self-Reported Alcohol Use Among Persons With HIV in Uganda. *Alcohol Clin Exp Res, 43*(12), 2591-2598. doi:10.1111/acer.14218

AETC. (2023). *Asian American People and HIV*. Retrieved from https://www.neaetc.org/files/attachment/attachment/6055/EP%20-%20Asian%20Americans%20and%20HIV%20(2021-06).pdf:

Ajzen, I. (2013). The theory of planned behavioral questionnaire. Measurement Instrument Database for the social science. In.

Ammerman, A., Lindquist, C., Lohr, K., & Hersey, J. (2002). The efficacy of behavioral interventions to modify dietary fat and fruit and vegetable intake: a review of the evidence. *Prev Med, 35*(1), 25-41.

Anhalt, K., Toomey, R. B., & Shramko, M. (2020). Latinx sexual minority youth adjustment in the context of discrimination and internalized homonegativity: The moderating role of cultural orientation processes. *Journal of Latinx Psychology, 8*(1), 41-57. doi:10.1037/lat0000134

Ayodele, O. (2017). The theory of planned behavior as a predictor of HIV testing intention. *American Journal of Health Behavior, 41*(2), 147-151. doi:10.5993/AJHB.41.2.5.

Ayodele, O. (2017). The Theory of Planned Behavior as a Predictor of HIV Testing Intention. *Am J Health Behav, 41*(2), 147-151. doi:10.5993/ajhb.41.2.5

Baker, H. D. (2015). *Chinese Family & Kinship*: Macmillan International Higher Education.

Ballard, A. M., Cardwell, T., & Young, A. M. (2019). Fraud detection protocol for web-based research among men who have sex with men: development and descriptive evaluation. *JMIR Public Health and Surveillance, 5*(1), e12344.

Balsamo, M., Innamorati, M., & Lamis, D. A. (2007). CLINICAL PSYCHOMETRICS: OLD ISSUES AND NEW PERSPECTIVES.

Balsamo, M., Innamorati, M., & Lamis, D. A. (2019). Clinical psychometrics: Old issues and new perspectives. In (Vol. 10, pp. 947): Frontiers Media SA.

Barth, K. R., Cook, R. L., Downs, J. S., Switzer, G. E., & Fischhoff, B. (2002). Social stigma and negative consequences: factors that influence college students' decisions to seek testing for sexually transmitted infections. *Journal of American College Health, 50*(4), 153-159.

Benson, P. L., & Vincent, S. (1980). Development and Validation of the Sexist Attitudes Toward Women Scale (SATWS). *Psychology of women quarterly, 5*(2), 276-291. doi:10.1111/j.1471-6402.1980.tb00962.x

Berg, R. C., Munthe-Kaas, H. M., & Ross, M. W. (2016). Internalized Homonegativity: A Systematic Mapping Review of Empirical Research. *Journal of Homosexuality, 63*(4), 541-558. doi:10.1080/00918369.2015.1083788

Berg, R. C., Ross, M. W., Weatherburn, P., & Schmidt, A. J. (2013). Structural and environmental factors are associated with internalised homonegativity in men who have sex with men: Findings from the European MSM Internet Survey (EMIS) in 38 countries. *Social Science & Medicine, 78*, 61-69.

Berry, J. W., & Padilla, A. M. (1980). Acculturation: Theory, models and some new findings. *Acculturation as varieties of adaption, 9*, 25.

Beyrer, C., Sullivan, P., Sanchez, J., Baral, S. D., Collins, C., Wirtz, A. L., . . . Mayer, K. (2013). The increase in global HIV epidemics in MSM. *AIDS, 27*(17), 2665-2678. doi:10.1097/01.aids.0000432449.30239.fe

Bhattacharya, G. (2004). Health care seeking for HIV/AIDS among South Asians in the United States. *Health & Social Work, 29*(2), 106-115.

Bicchieri, C., Ryan Muldoon, Alessandro Sontuoso. (2018). Social Norms. *The Stanford Encyclopedia of Philosophy Winter 2018 Edition*. doi:https://plato.stanford.edu/entries/social-norms/

Boateng, G. O., Neilands, T. B., Frongillo, E. A., Melgar-Quiñonez, H. R., & Young, S. L. (2018). Best Practices for Developing and Validating Scales for Health, Social, and Behavioral Research: A Primer. *Frontiers in public health, 6*, 149-149. doi:10.3389/fpubh.2018.00149

Booth, A., Harris, P., Goyder, E., & Norman, P. (2012). Beliefs about chlamydia testing amongst young people living in relatively deprived areas. *Journal oof Public Health, 35*(2). doi:DOI: 10.1093/pubmed/fds082

Borsboom, D., Mellenbergh, G. J., & van Heerden, J. (2004). The concept of validity. *Psychol Rev, 111*(4), 1061-1071. doi:10.1037/0033-295x.111.4.1061

Boudewyns, V., & Paquin, R. S. (2011). Intentions and beliefs about getting tested for STDs: Implications for communication interventions. *Health Communication, 26*(8), 701-711.

Brown, M. J., & Gladstone, N. (2012). Development of a short version of the gender role beliefs scale. *International Journal of Psychology and Behavioral Sciences, 2*(5), 154-158.

Buchacz, K., Patel, P., Taylor, M., Kerndt, P. R., Byers, R. H., Holmberg, S. D., & Klausner, J. D. (2004). Syphilis increases HIV viral load and decreases CD4 cell counts in HIV-infected patients with new syphilis infections. *AIDS, 18*(15), 2075-2079.

Buetow, S. (2010). Thematic analysis and its reconceptualization as 'saliency analysis'. *Journal of health services research & policy, 15*(2), 123-125.

Burk, J., Park, M., & Saewyc, E. M. (2018). A Media-Based School Intervention to Reduce Sexual Orientation Prejudice and Its Relationship to Discrimination, Bullying, and the Mental Health of Lesbian, Gay, and Bisexual Adolescents in Western Canada: A Population-Based Evaluation. *Int J Environ Res Public Health, 15*(11). doi:10.3390/ijerph15112447

Cangur, S., & Ercan, I. (2015). Comparison of model fit indices used in structural equation modeling under multivariate normality. *Journal of Modern Applied Statistical Methods, 14*(1), 14.

Carteret, M. (2011). Cultural Values of Asian Patients and Families.

CDC. (2014). Revised Surveillance Case Definition for HIV Infection - United States, 2014. *Accessed online at: https://www.cdc.gov/mmwr/preview/mmwrhtml/rr6303a1.htm?s_cid=rr6303a1_e*.

CDC. (2017). *HIV among Asians*. May 2017

CDC. (2018a). Estimated HIV Incidence and Prevalence in the United States, 2010–2015. *HIV Surveillance Report, 23*(1), Accessed online at https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-supplemental-report-vol-23-21.pdf.

CDC. (2018b). Health Disparities in HIV/AIDS, Viral Hepatitis, STDs, and TB. *CDC webpage at https://www.cdc.gov/nchhstp/healthdisparities/asians.html*.

CDC. (2018c). HIV Surveillance Supplemental Report. *Official webpage: https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-supplemental-report-vol-23-1.pdf*.

CDC. (2018d). HIV Testing Guidelines. *Accessed online at https://www.cdc.gov/hiv/guidelines/testing.html*.

CDC. (2019a). HIV and Asians. *Official webpage at https://www.cdc.gov/hiv/group/racialethnic/asians/index.html*.

CDC. (2019b). HIV Incidence: Estimated Annual Infections in the U.S., 2010 - 2016. *Official webpage at https://www.cdc.gov/nchhstp/newsroom/2019/HIV-incidence.html*.

CDC. (2019c). HIV Surveillance Report *Official webpage at https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-supplemental-report-vol-24-1.pdf*, *24*(1), Table 2, page 24.

CDC. (2019d). HIV Surveillance Report *Official webpage at https://www.cdc.gov/hiv/pdf/library/reports/surveillance/cdc-hiv-surveillance-supplemental-report-vol-24-1.pdf*, *24*(1), Table 1, page 17-21.

CDC. (2019e). HIV Testing Basics. *Official webpage: https://www.cdc.gov/hiv/basics/testing.html*.

CDC. (2019f). HIV/AIDS: HIV Risk and Prevention using Pre-Exposure Prophylaxis (PrEP). *https://www.cdc.gov/hiv/risk/prep/index.html accessed 3.28.19.*

CDC. (2019g). Patient Information Sheet - Acute HIV Infection (Information about Acute HIV Infection and PrEP). *Accessed online at https://www.cdc.gov/hiv/pdf/prep_gl_patient_factsheet_acute_hiv_infection_english.pdf*.

CDC. (2019h). Statistics Overview, HIV Surveillance Report. *Official webpage at https://www.cdc.gov/hiv/statistics/overview/index.html*.

CDC. (2021). *HIV Surveillance Report: Diagnoses of HIV Infection in the United States and Dependent Areas, 2019*. https://minorityhealth.hhs.gov/omh/browse.aspx?lvl=4&lvlid=51

CDC. (2022). Diagnoses of HIV Infection in the United States and dependent areas, 2020. *33*.

CDC. (2023a). *Impact on Racial and Ethnic Minorities*.

CDC (Producer). (2023b, 1/24/23). Screening in Clinical Settings. Retrieved from https://www.cdc.gov/hiv/clinicians/screening/clinical-settings.html#:~:text=CDC%20recommends%20that%20clinicians%20screen,increased%20risk%20for%20HIV%20Infection.

CDC/National Center for Health Statistics. (2018). National Health Interview Survey. *Official webpage at https://ftp.cdc.gov/pub/Health_Statistics/NCHS/NHIS/SHS/2018_SHS_Table_P-1.pdf*.

CDC/National Center for Health Statistics. (2020). National Health Interview Survey. *Accessed online at https://www.cdc.gov/nchs/nhis/index.htm*.

Chae, D. H., & Yoshikawa, H. (2008). Perceived group devaluation, depression, and HIV-risk behavior among Asian gay men. *Health Psychology, 27,* 140–148. doi:10.1037/0278-6133.27.2.140

Chi, X., & Hawk, S. (2016). Attitudes toward Same-Sex Attraction and Behavior among Chinese University Students: Tendencies, Correlates, and Gender Differences. *Front. Psychol.* doi:https://doi.org/10.3389/fpsyg.2016.01592

Chin, D., & Kroesen, K. W. (1999). Disclosure of HIV infection among Asian/Pacific Islander American women: Cultural stigma and support. *Cultural Diversity and Ethnic Minority Psychology, 5*(3), 222.

Chin, J., Leung, M., Sheth, L., & Rodriguez, T. (2007). Let's not ignore a growing HIV problem for Asians and Pacific Islanders in the US. *Journal of Urban Health, 84*(5), 642-647.

Chng, C. L., Wong, F. Y., Park, R. J., Edberg, M. C., & Lai, D. S. (2003a). A model for understanding sexual health among Asian American/Pacific Islander men who have sex with men (MSM) in the United States. *AIDS Education and Prevention, 15*(1 Supplement), 21-38.

Chng, C. L., Wong, F. Y., Park, R. J., Edberg, M. C., & Lai, D. S. (2003b). A model for understanding sexual health among Asian American/Pacific Islander men who have sex with men (MSM) in the United States. *AIDS Educ Prev, 15*, 21-38. doi:https://doi.org/10.1521/aeap.15.1.5.21.23611

Choi, K., Han, C., Hudes, E., & Kegeles, S. (2002). Unprotected sex and associated risk factors among young Asian and Pacific Islander men who have sex with men. *AIDS Education and Prevention, 14*, 472–481. doi:10.1521/aeap.14.8.472.24114

Choi, K., Kumekawa, E., Dang, Q., Kegeles, S., Hays, R., & Stall, R. (1999). Risk and protective factors affecting sexual behavior among young Asian and Pacific Islander men who have sex with men: implications for HIV prevention. *Journal of Sex Education and Therapy, 24*(1-2), 47–55.

Choi, K., Wong, F., & Sy, F. (2005). HIV/AIDS among Asians and Pacific Islanders in the United States. *AIDS Education and Prevention, 17*, iii-v.

Choi, K. H., Yep, G. A., & Kumekawa, E. (1998). HIV prevention among Asian and Pacific Islander American men who have sex with men: a critical review of theoretical models and directions for future research. *AIDS Education and Prevention*.

Chou, W. (2001). Homosexuality and the cultural politics of Tongzhi in Chinese society. *Journal ofHomosexuality, 40*, 27-46.

Chow, E. N. L. (1998). The development of feminist consciousness among Asian American women. *Asian American Women and Gender, 3*, 2.

Cialdini, R. B., & Goldstein, N. J. (2004). Social influence: Compliance and conformity. *Annu. Rev. Psychol., 55*, 591-621.

Clifton, S., Nardon, A., Field, N., Mercer, C., Tanton, C., Macdowall, W., . . . Sonnenberg, P. (2016). HIV testing, risk perception, and behaviour in the British population. *AIDS, 30*(6), 943-952. doi:10.1097/QAD.0000000000001006

Cooper, M., Loue, S., & Lloyd, L. S. (2001). Perceived susceptibility to HIV infection among Asian and Pacific Islander women in San Diego. *Journal of Health care for the Poor and Underserved, 12*(2), 208-223.

Cotten-Huston, A. L., & Waite, B. M. (2000). Anti-homosexual attitudes in college students: predictors and classroom interventions. *J Homosex, 38*(3), 117-133. doi:10.1300/j082v38n03_07

CPACS. (2018). HIV testing among Asian Americans in Georgia, U.S. *Unpublished qualitative data from 3 focus group discussions among Asian Americans (Korean, Chinese, and Vietnamese)*.

Creswell, J., & Poth, C. (2017). Qualitative Inquiry and Research Design: Choosing Among Five Approaches. *Sage Publications*.

Creswell, J. W., & Miller, D. L. (2000). Determining Validity in Qualitative Inquiry. *Theory Into Practice, 39*(3), 124-130. doi:10.1207/s15430421tip3903_2

Deepak, A. C. (2005). Parenting and the Process of Migration: Possibilities Within South Asian Families. *Child Welfare, 84*(5), 585-606. Retrieved from http://www.jstor.org/stable/45398734

Dieleman, J. L., Haakenstad, A., Micah, A., Moses, M., Abbafati, C., Acharya, P., . . . Alam, K. (2018). Spending on health and HIV/AIDS: domestic health spending and development assistance in 188 countries, 1995–2015. *The lancet, 391*(10132), 1799-1829.

Diez-Roux, A. V. (2000). Multilevel analysis in public health research. *Annual review of public health, 21*(1), 171-192.

Dingake, O., & Bethuel, K. (2018). The state of human rights in relation to key populations, HIV and sexual and reproductive health. *Reproductive Health Matters, 26*(52), 46-50.

DiStefano, A. S., Hui, B., Barrera-Ng, A., Quitugua, L. F., Peters, R., Dimaculangan, J., . . . Tanjasiri, S. P. (2012). Contextualization of HIV and HPV risk and prevention among Pacific Islander young adults in Southern California. *Social Science & Medicine, 75*(4), 699-708.

Do, T. D., Hudes, E. S., Proctor, K., Han, C. S., & Choi, K. H. (2006). HIV testing trends and correlates among young Asian and Pacific Islander men who have sex with men in two U.S. cities. *AIDS Educ Prev, 18*(1), 44-55. doi:10.1521/aeap.2006.18.1.44

Dong, Y., & Peng, C. Y. (2013). Principled missing data methods for researchers. *Springerplus, 2*(1), 222. doi:10.1186/2193-1801-2-222

Estrada, D., & Rutter, P. (2006). Using the Multiple Lenses of Identity: Working With Ethnic and Sexual Minority College Students. *Journal of College Counseling, 9*(2), 158-166. doi:https://doi.org/10.1002/j.2161-1882.2006.tb00102.x

Evangeli, M., Ferris, K., Kenney, N. M., Baker, L. L. E., Jones, B., & Wroe, A. L. (2018). A systematic review of psychological correlates of HIV testing intention. *AIDS Care, 30*(1), 18-26. doi:10.1080/09540121.2017.1344351

Evangeli, M., Pady, K., & Wroe, A. L. (2016). Which Psychological Factors are Related to HIV Testing? A Quantitative Systematic Review of Global Studies. *AIDS Behav, 20*(4), 880-918. doi:10.1007/s10461-015-1246-0

Evans, C., Turner, K., Suggs, L., Occa, A., Juma, A., & Blake, H. (2016). Developing a mHealth intervention to promote uptake of HIV testing among African communities in the UK: a qualitative study. *BMC Public Health, 16*(1), 1-16.

Fauci, A. S., Redfield, R. R., Sigounas, G., Weahkee, M. D., & Giroir, B. P. (2019). Ending the HIV epidemic: a plan for the United States. *Jama, 321*(9), 844-845.

Fauk, N. K., Sukmawati, A. S., Wardojo, S. S. I., Teli, M., Bere, Y. K., & Mwanri, L. (2018). The intention of men who have sex with men to participate in voluntary counseling and HIV testing and access free condoms in Indonesia. *American Journal of Men's Health, 12*(5), 1175-1184.

Feng, Y., Wu, Z., & Detels, R. (2010). Evolution of men who have sex with men community and experienced stigma among men who have sex with men in Chengdu, China. *Acquir. Immune Defic. Syndr. , 53*(S98–S103.). doi: 10.1097/QAI.0b013e3181c7df71

Fereday, J., & Muir-Cochrane, E. (2006). Demonstrating Rigor Using Thematic Analysis: A Hybrid Approach of Inductive and Deductive Coding and Theme Development.

International Journal of Qualitative Methods, 5(1), 80-92. doi:10.1177/160940690600500107

Figueroa, C., Johnson, C., Verster, A., & Baggaley, R. (2015). Attitudes and acceptability on HIV self-testing among key populations: a literature review. *AIDS and Behavior, 19*(11), 1949-1965.

Fiorentino, M., Eubanks, A., Coulaud, P. J., Couderc, C., Keita, B. D., Anoma, C., . . . Sagaon-Teyssier, L. (2021). Homonegativity, sexual violence and condom use with women in men who have sex with men and women in West Africa. *AIDS, 35*(4), 681-687. doi:10.1097/qad.0000000000002782

Fishbein, M. A. (2010). Predicting and changing behavior: The reasoned action approach. *New York: Psychology Press.*

Fleming, P. J., DiClemente, R. J., & Barrington, C. (2016). Masculinity and HIV: Dimensions of Masculine Norms that Contribute to Men's HIV-Related Sexual Behaviors. *AIDS and Behavior, 20*(4), 788-798. doi:10.1007/s10461-015-1264-y

Flood, J., McLaughlin, C., & Prentice, G. (2013). Minority Stress, Homonegativity, Alcohol Use and Mental Health Among College Gay Males. *Journal of Gay & Lesbian Mental Health, 17*(4), 367-386. doi:10.1080/19359705.2013.800006

Fuks, N., Smith, N., Pelaez, S., Stefano, J., & Brown, T. (2018). Acculturation Experiences Among Lesbian, Gay, Bisexual, and Transgender Immigrants in Canada. *The Counseling Psychologist, 46*(3), 296-323. doi:https://doi.org/10.1177/0011000018768538

Gadermann, A. M., Guhn, M., & Zumbo, B. D. (2012). Estimating ordinal reliability for Likert-type and ordinal item response data: A conceptual, empirical, and practical guide. *Practical Assessment, Research, and Evaluation, 17*(1), 3.

Gavlas, J. T. (2018). *Psychometric Properties of the Modern Homonegativity Scale in the Southern United States.* Walden University,

Glanz, K., & Rimer, B. (1997). Theory at a glance: A guide for health promotion practice: US Dept. of Health and Human Services, Public Health Service, National Institutes of Health, National Cancer Institute.

Glanz, K., Rimer, B., & Viswanath, K. (2008). Health behavior and health education: theory, research, and practice: . *John Wiley & Sons*.

Glasgow, R., & Emmons, K. (2007). How can we increase translation of research into practice? Types of evidence needed. *Annu Rev Public Health, 28*, 413-433.

Glasgow, R., & Linnan, L. (2008). Evaluation of theory-based interventions. *Health behavior and health education: theory, research, and practice 4th ed San Francisco, CA: Jossey-Bass.*, 487-508.

Golafshani, N. (2003). Understanding reliability and validity in qualitative research. *Qual. Rep., 8*, 597-606.

Goldenberg, T., Stephenson, R., & Bauermeister, J. (2018). Community stigma, internalized homonegativity, enacted stigma, and HIV testing among young men who have sex with men. *Journal of Community Psychology, 46*(4), 515-528. doi:https://doi.org/10.1002/jcop.21957

Gordon, M. M. (1964). *Assimilation in American life: The role of race, religion, and national origins*: Oxford University Press on Demand.

Górska, P., Bilewicz, M., Winiewski, M., & Waszkiewicz, A. (2017). On old-fashioned versus modern homonegativity distinction: Evidence from Poland. *Journal of Homosexuality, 64*(2), 256-272.

Grace J. (2018). Why Homophobia Is More Common Among Asian Populations? *https://studybreaks.com/news-politics/homophobia/ accessed 3.20.19.*

Gray, K., Annabell, L., & Kennedy, G. (2010). Medical students' use of Facebook to support learning: Insights from four case studies. *Medical teacher, 32*(12), 971-976.

Grey, J. A., Robinson, B. B., Coleman, E., & Bockting, W. O. (2013). A systematic review of instruments that measure attitudes toward homosexual men. *J Sex Res, 50*(3-4), 329-352. doi:10.1080/00224499.2012.746279

Grol RP, B. M., Hulscher ME, Eccles MP, Wensing M, Milbank Q.,. (2007). Planning and studying improvement in patient care: the use of theoretical perspectives., *85*(1), 93-138.

Grover, K. W., & Miller, C. T. (2014). Effects of mortality salience and perceived vulnerability on HIV testing intentions and behaviour. *Psychol Health, 29*(4), 475-490. doi:10.1080/08870446.2013.866672

Gu, J., Lau, J., & Tsui, H. (2011). Psychological factors in association with uptake of voluntary counselling and testing for HIV among men who have sex with men in Hong Kong. *Public health, 125*(5), 275-282.

Hahm, H., Lee, J., Ozonoff, A., & Amodeo, M. (2007). Predictors of STDs Among Asian and Pacific Islander Young Adults. *Perspectives on Sexual and Reproductive Health, 39*(4), 231-239.

Hahm, H., Lee, J., Rough, K., & Strathdee, S. (2012). Gender Power Control, Sexual Experiences, Safer Sex Practices, and Potential HIV Risk Behaviors Among Young Asian-American Women. *AIDS and Behavior, 16*(1), 179-188. doi:10.1007/s10461-011-9885-2

Han, C.-S., Proctor, K., & Choi, K.-H. (2014). We Pretend like Sexuality Doesn't Exist: Managing Homophobia in Gaysian America. *The Journal of Men's Studies, 22*(1), 53-63. doi:10.3149/jms.2201.53

Hancock, G., Mueller, R., & Stapleton, L. (2019). The Reviewer's Guide to Quantitative Methods in the Social Sciences. *Texbook.*

Hennink, M., Hutter, I., & Bailey, A. (2010). *Qualitative research methods*: Sage.

Herek, G. M. (1988). Heterosexuals' attitudes toward lesbians and gay men: Correlates and gender differences. *Journal of Sex Research, 25*(4), 451-477.

Herek, G. M. (1988). Heterosexuals' attitudes toward lesbians and gay men: Correlates and gender differences. *The Journal of Sex Research, 25*(4), 451-477. doi:10.1080/00224498809551476

Herek, G. M., & McLemore, K. A. (1998). Attitudes toward lesbians and gay men scale. *Handbook of sexuality-related measures*, 392-394.

HHS. (2019). 'Ending the HIV Epidemic: A Plan for America'? *Accessed online at https://www.hiv.gov/federal-response/ending-the-hiv-epidemic/overview*.

HHS. (2022). HIV Basics, U.S. Statistics, Fast Facts. *Official webpage at https://www.hiv.gov/hiv-basics/overview/data-and-trends/statistics*.

Hickson, F., Reid, D., Weatherburn, P., Stephens, M., Nutland, W., & Boakye, P. (2008). HIV, sexual risk, and ethinicity among men in England who have sex with men. *Sexually Transmitted Infections, 80*(6), 443-450. doi:10.1136/sti.2004.010520

Hogben, M., Janet, S., Lawrence, T., Hennessy, M., & Eldridge, G. (2003). Using The Theory Of Planned Behavior To Understand The STD Risk Behaviors Of Incarcerated Women. *Sage Publications*. doi:https://doi.org/10.1177/0093854802251003

Homayoon, B., Shahidi, N. C., & Cheung, W. Y. (2013). Impact of Asian ethnicity on colorectal cancer screening: a population-based analysis. *American journal of clinical oncology, 36*(2), 167-173.

Hsu, D., & Waters, J. (2001). Filial piety and sexual prejudice in Chinese culture. *Attitude measures, 11 Paper Presented at the Annual Conference of the American Psychological Association, San Francisco, CA.*

Hsu, K., & Iwamoto, D. K. (2014). Testing for Measurement Invariance in the Conformity to Masculine Norms-46 Across White and Asian American College Men: Development and Validity of the CMNI-29. *Psychol Men Masc, 15*(4), 397-406. doi:10.1037/a0034548

Hsueh, L., Layland, E. K., Kipke, M. D., & Bray, B. C. (2021). Linking racism and homonegativity to healthcare system distrust among young men of color who have sex with men: Evidence from the Healthy Young Men's (HYM) study. *Social Science & Medicine, 284*, 114219. doi:https://doi.org/10.1016/j.socscimed.2021.114219

Huang, Z. J., He, N., Nehl, E. J., Zheng, T., Smith, B. D., Zhang, J., . . . Wong, F. Y. (2012). Social network and other correlates of HIV testing: findings from male sex workers and other MSM in Shanghai, China. *AIDS Behavior, 16*(4), 858-871. doi:doi: 10.1007/s10461-011-0119-4.

Huang, Z. J., Wong, F. Y., De Leon, J. M., & Park, R. J. (2008). Self-reported HIV testing behaviors among a sample of Southeast Asians in an urban setting in the United States. *AIDS Education and Prevention, 20*(1), 65.

Huang, Z. J., Wong, F. Y., De Leon, J. M., & Park, R. J. (2008). Self-reported HIV testing behaviors among a sample of southeast Asians in an urban setting in the United States. *AIDS Educ Prev, 20*(1), 65-77. doi:10.1521/aeap.2008.20.1.65

Hudson, W. W., & Ricketts, W. A. (1980). A strategy for the measurement of homophobia. *Journal of Homosexuality, 5*(4), 357-372.

Human Rights Campaign. (2019). Family and Coming out Issues for Asian Pacific Americans. *https://www.hrc.org/resources/family-and-coming-out-issues-for-asian-pacific-americans accessed 4.1.19.*

Human Rights Watch. (2017). South Korea Events of 2017. *Accessed online at https://www.hrw.org/world-report/2018/country-chapters/south-korea*.

Humanity in Action USA. (2020,). Human Rights Diplomacy Amidst "World War LGBT": Re-examining Western Promotion of LGBT Rights in Light of the "Traditional Values" Discourse. *Accessed online at https://www.humanityinaction.org/knowledge_detail/human-rights-diplomacy-amidst-world-war-lgbt-re-examining-western-promotion-of-lgbt-rights-in-light-of-the-traditional-values-discourse/*.

Immigration Policy Institute. (2021). Asian Immigrants in the United States. *Official webpage https://www.migrationpolicy.org/article/asian-immigrants-united-states*.

Iott, B. E., Loveluck, J., Benton, A., Golson, L., Kahle, E., Lam, J., . . . Veinot, T. C. (2022). The impact of stigma on HIV testing decisions for gay, bisexual, queer and other men who have sex with men: a qualitative study. *BMC Public Health, 22*(1), 471. doi:10.1186/s12889-022-12761-5

Ivankova N V., C. J., Stick SL., . (2006). Using Mixed-Methods Sequential Explanatory Design: From Theory to Practice. *Field methods*. doi:doi:10.1177/1525822X05282260

Iwamoto, Derek, K., & Kaya, A. (2009). Asian American men and Asianized attribution: Intersections of masculinity, race, and sexuality. *Asian American Psychology: Current Perspectives*, 211-232.

Jeffries, W. L. t., & Johnson, O. D. (2015). Homonegative Attitudes and Risk Behaviors for HIV and Other Sexually Transmitted Infections Among Sexually Active Men in the United States. *Am J Public Health, 105*(12), 2466-2472. doi:10.2105/ajph.2015.302780

Ju, D. H. (2021). Factors shaping Asian Americans' attitudes toward homosexuality. *Ethnic and Racial Studies*, 1-24. doi:10.1080/01419870.2021.1884732

Ju, D. H. (2022). Factors shaping Asian Americans' attitudes toward homosexuality. *Ethnic and Racial Studies, 45*(5), 851-874. doi:10.1080/01419870.2021.1884732

Kaestle, C., & Waller, M. (2011). Bacterial STDs and Perceived Risk Among Sexual Minority Young Adults. *Perspec Sex Reprod Health, 43*(3), 158-163. doi:10.1363/4315811

Kaiser Family Foundation. (2019a). The Global HIV/AIDS Epidemic. *Official webpage https://www.kff.org/global-health-policy/fact-sheet/the-global-hivaids-epidemic/*.

Kaiser Family Foundation. (2019b). Key Facts on Health and Health Care by Race and Ethnicity (Section 2: Health Access and Utilization). *Official webpage at https://www.kff.org/report-section/key-facts-on-health-and-health-care-by-race-and-ethnicity-section-2-health-access-and-utilization/*.

Kakoko, D. C., Astrøm, A. N., Lugoe, W. L., & Lie, G. T. (2006). Predicting intended use of voluntary HIV counselling and testing services among Tanzanian teachers using the theory of planned behaviour. *Soc Sci Med, 63*(4), 991-999. doi:10.1016/j.socscimed.2006.02.016

Kanuha, V. (2000). The impact of sexuality and race/ethnicity on HIV/AIDS risk among Asian and Pacific Island American (A/PIA) gay and bisexual men in Hawaii. *AIDS Education and Prevention, 12*, 505–518.

Kapp, J. M., Peters, C., & Oliver, D. P. (2013). Research recruitment using Facebook advertising: big potential, big challenges. *Journal of Cancer Education, 28*(1), 134-137.

Kim, J. E., & Zane, N. (2016). Help-seeking intentions among Asian American and White American students in psychological distress: Application of the health belief model. *Cultural Diversity and Ethnic Minority Psychology, 22*(3), 311.

Kim, W., & Keefe, R. H. (2010). Barriers to healthcare among Asian Americans. *Social Work in Public Health, 25*(3-4), 286-295.

Klabunde, C. N., Brown, M., Ballard-Barbash, R., White, M. C., Thompson, T., Plescia, M., & King, S. C. (2012). Cancer Screening-United States, 2010 (Reprinted from MMWR, vol 61, pg 41-45, 2012). *JAMA-JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION, 307*(12), 1248-1250.

Klem, L. (1995). Path analysis. p. 65-98.

Klem, L. (2000). Structural equation modeling. p. 227-259.

Kramer, S., Schmidt, A., Berg, R., Furegato, M., Hospers, H., Folch, C., & Marcus, U. (2016). Factors associated with unprotected anal sex with multiple non-steady partners in the past 12 months: results from the European Men-Who-Have-Sex-With-Men Internet Survey (EMIS 2010). *BMC Public Health, 16*, 47. doi:10.1186/s12889-016-2691-z

Kumar, E. M., & Poulakis, M. . (April 2013). Uncovering an Invisible Population: South Asian Gay Men. *Society for the Psychology of Sexual Orientation and Gender Diversity*,

Division 44 Newsletter. doi: https://www.apadivisions.org/division-44/publications/newsletters/division/2013/04/south-asian-gay

Kyung-Hee C. et al. (1998). HIV prevention among Asian and Pacific Islander American men who have sex with men: A critical review of theoretical models and directions for future research. *AIDS Educ Prev, 10*(3), 19-30.

Lai D. S. (1998). Self-esteem and unsafe sex in Chinese-American and Japanese-American gay men. *Unpublished doctoral dissertation, California School of Professional Psychology, Alameda.*

Lee, H., Operario, D., Agénor, M., Yi, H., Choo, S., & Kim, S.-S. (2022). Internalized homophobia and HIV testing among Korean gay and bisexual men: a study in a high-income country with pervasive HIV/AIDS stigma. *AIDS Care*, 1-6. doi:10.1080/09540121.2022.2083056

Lee, J. J., & Zhou, Y. (2019). Facilitators and barriers to HIV testing among Asians in the United States: a systematic review. *AIDS Care, 31*(2), 141-152. doi:10.1080/09540121.2018.1533231

Legler J, M. H., Coyne C, Breen N, Chollette V, Rimer BK,. (2002). The effectiveness of interventions to promote mammography among women with historically lower rates of screening. *Cancer Epidemiol Biomarkers Prev, 11*(1), 59–71.

Li, C.-H. (2016). Confirmatory factor analysis with ordinal data: Comparing robust maximum likelihood and diagonally weighted least squares. *Behavior research methods, 48*(3), 936-949.

Lima, K. d. S., Tenório, J. M. V., Romário, F., Melo, L. M. F. d., & Andrade, J. M. d. (2019). Evidence of Validity of a Modern Homonegativity Measure against Gays and Lesbians. *Psico-USF, 24*, 673-684.

Liu J. & Choi K. (2006). Experiences of social discrimination among men who have sex with men in Shanghai. China. *AIDS Behav., 10*(25–33). doi:10.1007/s10461-006-9123-5

Loehlin, J. (1988). Latent Variable Models-an Introduction to Factor, Path, and Structural-Analysis-Loehlin, Jc. *Applied Psychological Measurement, 12*(2), 211-213.

Lorenc, T., Marrero-Guillamón, I., Llewellyn, A., Aggleton, P., Cooper, C., Lehmann, A., & Lindsay, C. (2011). HIV testing among men who have sex with men (MSM): systematic review of qualitative evidence. *Health Educ Res, 26*(5), 834-846. doi:10.1093/her/cyr064

Lottes, I. L., & Grollman, E. A. (2010). Conceptualization and assessment of homonegativity. *International Journal of Sexual Health, 22*(4), 219-233. doi:10.1080/19317611.2010.489358

Luu, T. D., & Bartsch, R. A. (2011). Relationship Between Acculturation and Attitudes Toward Gay Men and Lesbians in the Vietnamese American Community. *Journal of Applied Social Psychology, 41*(11), 2621-2633. doi:https://doi.org/10.1111/j.1559-1816.2011.00840.x

Ma, G. (2000). Barriers to the use of health services by Chinese Americans. *Journal of Allied Health, 29*(2), 64-70.

Marcus, U., Gassowski, M., & Drewes, J. (2016). HIV risk perception and testing behaviours among men having sex with men (MSM) reporting potential transmission risks in the previous 12 months from a large online sample of MSM living in Germany. *BMC Public Health, 16*(1), 1111. doi:10.1186/s12889-016-3759-5

Marin, B., Gomez, C., & Tschann, J. (1993). Condom use among men with secondary female sexual partners. *Public Health Reports,, 108,* 742-750.

Matteson DR. (1997). Bisexual and homosexual behavior and HIV risk among Chinese-, Filipino-, and Korean-American men. *Journal of Sex Research, 34,* 93–104. doi:10.1080/00224499709551870

Maxwell, J. A. (2012). *Qualitative research design: An interactive approach* (Vol. 41): Sage publications.

McCabe, S. E., Diez, A., Boyd, C. J., Nelson, T. F., & Weitzman, E. R. (2006). Comparing web and mail responses in a mixed mode survey in college alcohol use research. *Addictive behaviors, 31*(9), 1619-1627.

McLeroy KR. et al. (1988). An ecological perspective on health program programs. *Review, 15*(4), 351-377.

Meadowbrooke, C. C., Veinot, T. C., Loveluck, J., Hickok, A., & Bauermeister, J. A. (2014). Information Behavior and HIV Testing Intentions Among Young Men at Risk for HIV/AIDS. *J Assoc Inf Sci Technol, 65*(3), 609-620. doi:10.1002/asi.23001

Meadowbrooke, C. C., Veinot, T. C., Loveluck, J., Hickok, A., & Bauermeister, J. A. (2014). Information behavior and HIV testing intentions among young men at risk for HIV/AIDS. *Journal of the Association for Information Science and Technology, 65*(3), 609-620.

Miller, B., & Lewallen, J. (2015). The Effects of Portrayals of Gay Men on Homonegativity and the Attribution of Gender-Based Descriptors. *Communication Studies, 66*(3), 358-377. doi:10.1080/10510974.2015.1018446

Mirkuzie, A. H. (2011a). Applying the theory of planned behavior to explain HIV testing in antenatal settings in Addis Ababa - a cohort study. *BMC Health Serv Res, 11*, 196. doi:https://doi.org/10.1186/1472-6963-11-196

Mirkuzie, A. H. (2011b). Applying the theory of planned behaviour to explain HIV testing in antenatal settings in Addis Ababa - a cohort study. *BMC Health Serv Res, 11*, 196. doi:10.1186/1472-6963-11-196

Miyazaki, Y., Bodenhorn, N., Zalaquett, C., & Ng, K.-M. (2008). Factorial structure of Brief COPE for international students attending US colleges. *College Student Journal*, *42*(3).

Miyoshi, M., Asner-Self, K., Yanyan, S., & Koran, J. M. (2017). Psychometric Properties of the Abbreviated Multidimensional Acculturation Scale and the Multigroup Ethnic Identity Measure With Japanese Sojourners. *Assessment, 24*(1), 104-114. doi:10.1177/1073191115601208

Mizuno, Y., Borkowf, C., Millett, G. A., Bingham, T., Ayala, G., & Stueve, A. (2012). Homophobia and Racism Experienced by Latino Men Who Have Sex with Men in the United States: Correlates of Exposure and Associations with HIV Risk Behaviors. *AIDS and Behavior*, *16*(3), 724-735. doi:10.1007/s10461-011-9967-1

Mohajan, H. K. (2017). Two criteria for good measurements in research: Validity and reliability. *Annals of Spiru Haret University. Economic Series*, *17*(4), 59-82.

Montanaro, E. A., & Bryan, A. D. (2014). Comparing theory-based condom interventions: Health belief model versus theory of planned behavior. *Health Psychology*, *33*, 1251-1260. doi:10.1037/a0033969

Morandini, J. S., Blaszczynski, A., Ross, M. W., Costa, D. S., & Dar-Nimrod, I. (2015). Essentialist beliefs, sexual identity uncertainty, internalized homonegativity and psychological wellbeing in gay men. *Journal of counseling psychology, 62*(3), 413.

Morrison, M. A., & Morrison, T. G. (2002). Development and validation of a scale measuring modern prejudice toward gay men and lesbian women. *J Homosex, 43*(2), 15-37. doi:10.1300/j082v43n02_02

Morrison, M. A., & Morrison, T. G. (2003). Development and validation of a scale measuring modern prejudice toward gay men and lesbian women. *Journal of Homosexuality, 43*(2), 15-37.

Morrison, M. A., & Morrison, T. G. (2013). Modern Homonegativity Scale. In *Handbook of sexuality-related measures* (pp. 414-426): Routledge.

Morrison, M. A., Morrison, T. G., & Franklin, R. (2009). Modern and old-fashioned homonegativity among samples of Canadian and American university students. *Journal of Cross-Cultural Psychology, 40*(4), 523-542.

Morrison, T. G., Kenny, P., & Harrington, A. (2005). Modern prejudice toward gay men and lesbian women: Assessing the viability of a measure of modern homonegative attitudes within an Irish context. *Genetic, Social, and General Psychology Monographs, 131*(3), 219-250.

Morrison, T. G., McLeod, L. D., Morrison, M. A., Anderson, D., & O'Connor, W. E. (1997). Gender stereotyping, homonegativity, and misconceptions about sexually coercive behavior among adolescents. *Youth & Society, 28*, 351-382. doi:10.1177/0044118X97028003004

Mulholland, E., & Van Wersch, A. (2007). Stigma, sexually transmitted infections and attendance at the GUM Clinic: an exploratory study with implications for the theory of planned behaviour. *Journal of Health Psychology, 12*(1), 17-31.

Murray, K., & Oraka, E. (2014). Racial and ethnic disparities in future testing intentions for HIV: United States, 2007–2010: results from the National Health Interview Survey. *AIDS and Behavior, 18*, 1247-1255.

Musumari, P. M., Techasrivichien, T., Srithanaviboonchai, K., Tangmunkongvorakul, A., Ono-Kihara, M., & Kihara, M. (2020). Factors associated with HIV testing and intention to test for HIV among the general population of Nonthaburi Province, Thailand. *PLoS One, 15*(8), e0237393. doi:10.1371/journal.pone.0237393

Negy, C., & Eisenman, R. (2005). A comparison of African American and white college students' affective and attitudinal reactions to lesbian, gay, and bisexual individuals: An exploratory study. *The Journal of Sex Research, 42*(4), 291-298. doi:10.1080/00224490509552284

Nemoto, T., Wong, F., Ching, A., Chng, C. L., Bouey, P., Henrickson, M., & Sember, R. (1998). HIV seroprevalence, risk behaviors, and cognitive factors among Asian and Pacific Islander American men who have sex with men: a summary and critique of empirical studies and methodological issues. *AIDS education and prevention: official publication of the International Society for AIDS Education, 10*(3 Suppl), 31-47.

Nicholls, E. J., Samba, P., McCabe, L., Gafos, M., Philips, A. N., Trevelion, R., . . . Witzel, T. C. (2022). Experiences of and attitudes towards HIV testing for Asian, Black and Latin American men who have sex with men (MSM) in the SELPHI (HIV Self-Testing Public

Health Intervention) randomized controlled trial in England and Wales: implications for HIV self-testing. *BMC Public Health, 22*(1), 809. doi:10.1186/s12889-022-13189-7

Noar SM, B. C., Harris MS,. (2007). Does tailoring matter? Meta-analytic review of tailored print health behavior change interventions. *Psychol Bull, 133*(4), 673-693.

Noble, M., Jones, A. M., Bowles, K., DiNenno, E. A., & Tregear, S. J. (2017). HIV testing among internet-using MSM in the United States: systematic review. *AIDS and Behavior, 21*(2), 561-575.

O.Nyumba, T., Wilson, K., Derrick, C. J., & Mukherjee, N. (2018). The use of focus group discussion methodology: Insights from two decades of application in conservation. *Methods in Ecology and Evolution, 9*(1), 20-32. doi:https://doi.org/10.1111/2041-210X.12860

Occhipinti, S., Laurie, K., Hyde, M. K., Martin, S., Oliffe, J., Wittert, G., & Chambers, S. K. (2019). Measuring Masculinity in Men With Chronic Disease. *Am J Mens Health, 13*(4), 1557988319859706. doi:10.1177/1557988319859706

Onwuegbuzie, A. J., Dickinson, W. B., Leech, N. L., & Zoran, A. G. (2009). A Qualitative Framework for Collecting and Analyzing Data in Focus Group Research. *International Journal of Qualitative Methods, 8*(3), 1-21. doi:10.1177/160940690900800301

Oyarce-Vildósola, O., Rodríguez-Fernández, A., & Maury-Sintjago, E. (2022). Association between Homophobia and Sociodemographic Characteristics in Health Workers in Southern Chile. *Int J Environ Res Public Health, 19*(21). doi:10.3390/ijerph192113749

Padela, A. I., Vu, M., Muhammad, H., Marfani, F., Mallick, S., Peek, M., & Quinn, M. T. (2016). Religious beliefs and mammography intention: findings from a qualitative study

of a diverse group of American Muslim women. *Psychooncology, 25*(10), 1175-1182. doi:10.1002/pon.4216

Paine, E. A., Lee, Y. G., Vinogradov, V., Zhakupova, G., Hunt, T., Primbetova, S., . . . Wu, E. (2021). HIV Stigma, Homophobia, Sexual and Gender Minority Community Connectedness and HIV Testing Among Gay, Bisexual, and Other Men and Transgender People Who Have Sex with Men in Kazakhstan. *AIDS and Behavior, 25*(8), 2568-2577. doi:10.1007/s10461-021-03217-9

Palaniappan, L., Araneta, M., Assimes, T., Barrett-Connor, E., Carnethon, M., & Criqui, M. (2010). Call to action: cardiovascular disease in Asian Americans: a science advisory from the American Heart Association. . *Circulation, 122*(12), 1242-1252. doi:10.1161/CIR.0b013e3181f22af4

Pendse, R., Gupta, S., Yu, D., & Sarkar, S. (2016). HIV/AIDS in the South-East Asia region: progress and challenges. *Journal of virus eradication, 2*(Suppl 4), 1.

Perkins, J. M., Nyakato, V. N., Kakuhikire, B., Mbabazi, P. K., Perkins, H. W., Tsai, A. C., . . . Bangsberg, D. R. (2018). Actual Versus Perceived HIV Testing Norms, and Personal HIV Testing Uptake: A Cross-Sectional, Population-Based Study in Rural Uganda. *AIDS Behav, 22*(2), 616-628. doi:10.1007/s10461-017-1691-z

Pew Research Center. (2015). Modern Immigration Wave Brings 59 Million to U.S., Driving Population Growth and Change Through 2065: Views of Immigration's Impact on U.S. Society Mixed. *Official webpage* *https://www.pewresearch.org/hispanic/2015/09/28/modern-immigration-wave-brings-59-million-to-u-s-driving-population-growth-and-change-through-2065/*.

Pew Research Center. (2017a). Facts on U.S. Immigrants: *Statistical portrait of the foreign-born population in the United States*. *Official webpage* *https://www.pewresearch.org/hispanic/2019/06/03/facts-on-u-s-immigrants/*.

Pew Research Center. (2017b). Key facts about Asian Americans, a diverse and growing population. *Official webpage: https://www.pewresearch.org/fact-tank/2017/09/08/key-facts-about-asian-americans/*.

Pew Research Center. (2021). *Key facts about Asian Americans, a diverse and growing population*. Retrieved from https://www.pewresearch.org/short-reads/2021/04/29/key-facts-about-asian-americans/:

Pikard, J. L. (2009). *HIV voluntary counselling and testing among Kenyan male youth aged 13-15 years: the theory of planned behaviour applied.* Queen's University,

Population Council. (1999). Literature Review: Challenging HIV-Related Stigma and Discrimination in Southeast Asia: Past Successes and Future Priorities. *Accessed online at https://pdfs.semanticscholar.org/b285/8e02447799321164c61eadeace54b02c7235.pdf*.

Population Council. (2019). Key Populations at Risk for HIV. *Accessed online at https://www.popcouncil.org/research/key-populations-at-risk-for-hiv*.

Portal, M. D. (2019). Migration and Health. *Accessed online at https://migrationdataportal.org/themes/migration-and-health*.

Ratti, R., Bakeman, R., & Peterson, J. (2000). Correlates of high-risk sexual behavior among Canadian men of South Asian and European origin who have sex with men. *AIDS Care, 12*, 193–202. doi:10.1080/09540120050001878

Renzetti, C. M., & Edleson, J. L. (2008). *Encyclopedia of interpersonal violence*: Sage Publications.

Ricketts, W. A., & Hudson, W. W. (1980). Index of homophobia (Index of attitudes toward homosexuals). *Handbook of sexuality-related measures*, 367-368.

Robinson, J. L., & Rubin, L. J. (2016). Homonegative Microaggressions and Posttraumatic Stress Symptoms. *Journal of Gay & Lesbian Mental Health, 20*(1), 57-69. doi:10.1080/19359705.2015.1066729

Roder A. (2015). Immigrants' Attitudes toward Homosexuality: Socialization, Religion, and Acculturation in European Host Societies. *The International Migration Review, 49*(4), 1042-1070. Retrieved from http://www.jstor.org/stable/43948596

Romero, D. H. (2011). *Assessing the measurement invariance of the modern homonegativity scale*: The University of Texas at El Paso.

Romero, D. H., Morera, O. F., & Wiebe, J. S. (2015). Assessing the gender invariance of the Modern Homonegativity Scale. *Journal of Homosexuality, 62*(11), 1539-1559.

Rosenman, R., Tennekoon, V., & Hill, L. G. (2011). Measuring bias in self-reported data. *International journal of behavioural & healthcare research, 2*(4), 320.

Ross M. (2018). Homophobia among Asian Americans and HIV testing. *Expert opinion via personal conversation Dated Jul 12, 2018*.

Ross, M. W., Berg, R. C., Schmidt, A. J., Hospers, H. J., Breveglieri, M., Furegato, M., & Weatherburn, P. (2013). Internalised homonegativity predicts HIV-associated risk behavior in European men who have sex with men in a 38-country cross-sectional study: some public health implications of homophobia. *BMJ Open, 3*(2), e001928. doi:10.1136/bmjopen-2012-001928

Ross, M. W., Kajubi, P., Mandel, J. S., McFarland, W., & Raymond, H. F. (2013). Internalized homonegativity/homophobia is associated with HIV-risk behaviours among Ugandan gay

and bisexual men. *International journal of STD & AIDS, 24*(5), 409-413. doi:10.1177/0956462412472793

Ross, M. W., Rosser, B. R. S., & Neumaier, E. R. (2008). The Relationship of Internalized Homonegativity to Unsafe Sexual Behavior in HIV-Seropositive Men Who Have Sex With Men. *AIDS Education and Prevention, 20*(6), 547-557. doi:10.1521/aeap.2008.20.6.547

Rye, B., & Meaney, G. J. (2010). Measuring homonegativity: A psychometric analysis. *Canadian Journal of Behavioural Science/Revue canadienne des sciences du comportement, 42*(3), 158.

Sabatier R. (1996). Migrants and AIDS: Themes of vulnerability and resistance. In M.Haour-Knipe, & R. Rector (Eds). Crossing borders: Migration, ethnicity and AIDS. *London: Taylor & Francis,* 86-101.

Safari M, S.-Z. D., Ghofranipour F, Heydarnia A, Pakpur A.,. (2012). Theories, models and methods of health education and health promotion. 2 ed. Tehran: Asaresobhan.

Salazar, L. F., Crosby, R. A., & DiClemente, R. J. (2015). *Research methods in health promotion*: John Wiley & Sons.

Sales, J. M., & Sheth, A. N. (2019). Associations Among Perceived HIV Risk, Behavioral Risk and Interest in PrEP Among Black Women in the Southern US. *AIDS Behav, 23*(7), 1871-1876. doi:10.1007/s10461-018-2333-9

Salud, M. C., Marshak, H. H., Natto, Z. S., & Montgomery, S. (2014). Exploring HIV-testing intentions in young Asian/Pacific Islander (API) women as it relates to acculturation, theory of gender and power (TGP), and the AIDS risk reduction model (ARRM). *AIDS Care, 26*(5), 642-647. doi:10.1080/09540121.2013.841836

Saunders, M., Lewis, P., & Thornhill, A. (2012). Research methodology—Convenience sampling. In.

Schulz, K.-H., Kroencke, S., Ewers, H., Schulz, H., & Younossi, Z. M. (2008). The factorial structure of the Chronic Liver Disease Questionnaire (CLDQ). *Quality of Life Research, 17*(4), 575-584. doi:10.1007/s11136-008-9332-7

Schwartz, S. J., Unger, J. B., Zamboanga, B. L., & Szapocznik, J. (2010). Rethinking the concept of acculturation: implications for theory and research. *American Psychologist, 65*(4), 237.

Sen, S., Aguilar, J. P., & Petty, M. (2021). An ecological framework for understanding HIV- and AIDS-related stigma among Asian American and Pacific Islander men who have sex with men living in the USA. *Culture, Health & Sexuality, 23*(1), 85-97. doi:10.1080/13691058.2019.1690164

Sen, S., Nguyen, H. D., Kim, S. Y., & Aguilar, J. (2017). HIV knowledge, risk behavior, stigma, and their impact on HIV testing among Asian American and Pacific Islanders: a review of literature. *Social Work in Public Health, 32*(1), 11-29.

Shapiro, J., & Vives, G. (1999). Demographic and attitudinal variables related to high-risk behaviors in Asian males who have sex with other men. *AIDS Patient Care and STDs, 13*, 667–675. doi:10.1089/apc.1999.13.667

Shariff, A. (2009). Ethnic identity and parenting stress in South Asian families: Implications for culturally sensitive counselling. *Canadian Journal of Counselling and Psychotherapy, 43*(1).

Shiu, C., Voisin, D., Chen, W., Lo, Y., Hardestry, M., & Nguyen, H. (2016). A Synthesis of 20 Years of Research on Sexual Risk Taking Among Asian/Pacific Islander Men Who Have

Sex With Men in Western Countries. *Am J Mens Health, 10*(3), 170-180. doi:10.1177/1557988314561489

Shoptaw, S., Weiss, R. E., Munjas, B., Hucks-Ortiz, C., Young, S. D., Larkins, S., . . . Gorbach, P. M. (2009). Homonegativity, Substance Use, Sexual Risk Behaviors, and HIV Status in Poor and Ethnic Men Who Have Sex with Men in Los Angeles. *Journal of Urban Health, 86*(1), 77-92. doi:10.1007/s11524-009-9372-5

Sileo, K. M., & Kershaw, T. S. (2020). Dimensions of Masculine Norms, Depression, and Mental Health Service Utilization: Results From a Prospective Cohort Study Among Emerging Adult Men in the United States. *Am J Mens Health, 14*(1), 1557988320906980. doi:10.1177/1557988320906980

Sim, M. (2014). A Review of Homosexuality in China: Urban Attitudes toward Homosexuality In Light Of Channges age in the One-Child Policy. *http://works.bepress.com/melissa_sim/1/*.

Statnews. (2019). Simone, M. [Mobile application software]

Singer, E. J., & Thames, A. D. (2016). Neurobehavioral manifestations of human immunodeficiency Virus/AIDS: diagnosis and treatment. *Neurologic clinics, 34*(1), 33-53.

Skaathun, B., Voisin, D. R., Cornwell, B., Lauderdale, D. S., & Schneider, J. A. (2019). A Longitudinal Examination of Factors Associated with Network Bridging Among YMSM: Implications for HIV Prevention. *AIDS Behav, 23*(5), 1326-1338. doi:10.1007/s10461-018-2258-3

Solorio, R., Forehand, M., & Simoni, J. (2013). Attitudes towards and Beliefs about HIV Testing among Latino Immigrant MSM: A Comparison of Testers and Nontesters. *AIDS Res Treat, 2013*, 563537. doi:10.1155/2013/563537

Spielberg, F., Kurth, A., Gorbach, P. M., & Goldbaum, G. (2001). Moving from apprehension to action: HIV counseling and testing preferences in three at-risk populations. *AIDS Education and Prevention, 13*(6), 524-540.

Stapleton, S. M., Oseni, T. O., Bababekov, Y. J., Hung, Y.-C., & Chang, D. C. (2018). Race/ethnicity and age distribution of breast cancer diagnosis in the United States. *JAMA surgery, 153*(6), 594-595.

Stephenson, R., White, D., Darbes, L., Hoff, C., & Sullivan, P. (2015). HIV testing behaviors and perceptions of risk of HIV infection among MSM with main partners. *AIDS and Behavior, 19*(3), 553-560.

Stephenson, R., White, D., Darbes, L., Hoff, C., & Sullivan, P. (2015). HIV testing behaviors and perceptions of risk of HIV infection among MSM with main partners. *AIDS Behav, 19*(3), 553-560. doi:10.1007/s10461-014-0862-4

Stewart, D. W., & Shamdasani, P. N. (1990). Focus groups: Theory and practice. *Applied social research methods series, Thousand Oaks, CA: Sage Publications, Inc.*

Sue, S., Cheng, J. K. Y., Saad, C. S., & Chu, J. P. (2012). Asian American mental health: A call to action. *American Psychologist, 67*(7), 532.

Sychareun, V., Thomsen, S., Chaleunvong, K., & Faxelid, E. (2013). Risk perceptions of STIs/HIV and sexual risk behaviours among sexually experienced adolescents in the Northern part of Lao PDR. *BMC Public Health, 13*, 1126. doi:10.1186/1471-2458-13-1126

Szymanski, D. M., & Gupta, A. (2009). Examining the Relationships Between Multiple Oppressions and Asian American Sexual Minority Persons' Psychological Distress. *Journal of Gay & Lesbian Social Services, 21*(2-3), 267-281. doi:10.1080/10538720902772212

Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2007). *Using multivariate statistics* (Vol. 5): Pearson Boston, MA.

Taber, K. S. (2018). The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education. *Research in Science Education, 48*(6), 1273-1296. doi:10.1007/s11165-016-9602-2

Takaki, R. (1989). Strangers from a different shore: A history ofAsian Americans. *Boston: Little, Brown.*

Tang, K., & Chen, W. T. (2018). HIV and religion in HIV-infected Asians and their families: A qualitative study. *Appl Nurs Res, 44*, 18-24. doi:10.1016/j.apnr.2018.09.003

The White House. (2014). Ten Reasons to Address HIV/AIDS in Asian American and Pacific Islander Communities. *Accessed online at https://obamawhitehouse.archives.gov/blog/2014/05/19/ten-reasons-address-hivaids-asian-american-and-pacific-islander-communities*.

Thornton, L., Batterham, P. J., Fassnacht, D. B., Kay-Lambkin, F., Calear, A. L., & Hunt, S. (2016). Recruiting for health, medical or psychosocial research using Facebook: Systematic review. *Internet Interventions, 4*, 72-81.

Truijens, F. L., Cornelis, S., Desmet, M., De Smet, M. M., & Meganck, R. (2019). Validity Beyond Measurement: Why Psychometric Validity Is Insufficient for Valid Psychotherapy Research. *Front Psychol, 10*, 532. doi:10.3389/fpsyg.2019.00532

UNAIDS. (2015). Rights, Roles and Responsibilities of Men in Fast-trackinng the end of AIDS. *Accessed online at http://menengage.org/wp-content/uploads/2016/08/UNAIDS-Discussion-Paper-on-Men-and-HIV-for-HLM-Decembe-2015.pdf*.

UNAIDS. (2019). Core Epidemiology Slides: AIDSinfo (slide #6). *Official webpage at https://www.unaids.org/en/resources/documents/2019/core-epidemiology-slides*.

US Census Bureau. (2017). Asian alone or in any combination by selected groups. *2017 American Community Survey 1-Year Estimates. Official webpage: https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?src=bkmk*.

US Census Bureau. (2023). *Asian American, Native Hawaiian and Pacific Islander Heritage Month: May 2023*. https://www.census.gov/newsroom/facts-for-features/2023/asian-american-pacific-islander.html

USAIDS. (2019). Being LGBT in Asia. *Accessed online at https://www.usaid.gov/asia-regional/being-lgbt-asia*.

Van der Bracht, K., & Van de Putte, B. (2014). Homonegativity among first and second generation migrants in Europe: the interplay of time trends, origin, destination and religion. *Soc Sci Res, 48,* 108-120. doi:10.1016/j.ssresearch.2014.05.011

Van Griensven, F., & Van Wijngaarden, J. (2010). A review of the epidemiology of HIV infection and prevention responses among MSM in Asia. *AIDS 24*(Suppl 3), s30-s40.

Veinot, T. C., Caldwell, E., Loveluck, J., Arnold, M. P., & Bauermeister, J. (2016). HIV Testing Behavior and Social Network Characteristics and Functions Among Young Men Who have Sex with Men (YMSM) in Metropolitan Detroit. *AIDS Behav, 20*(11), 2739-2761. doi:10.1007/s10461-016-1296-y

Ventriglio, A., Castaldelli-Maia, J. M., Torales, J., De Berardis, D., & Bhugra, D. (2021). Homophobia and mental health: a scourge of modern era. *Epidemiol Psychiatr Sci, 30*, e52. doi:10.1017/s2045796021000391

Vlassoff, C., & Ali, F. (2011). HIV-related stigma among South Asians in Toronto. *Ethnicity & health, 16*(1), 25-42.

Vu, M., Bednarczyk, R. A., Escoffery, C., Ta, D., Huynh, V. N., & Berg, C. J. (2022). U.S. Vietnamese parents' HPV vaccine decision-making for their adolescents: an exploration of practice-, provider-, and patient-level influences. *J Behav Med, 45*(2), 197-210. doi:10.1007/s10865-021-00265-3

Vu, M., Escoffery, C., Srivanjarean, Y., Do, E., & Berg, C. J. (2019). Acculturation and Exposure to Secondhand Smoke in the Home Among Vietnamese Immigrants in Metropolitan Atlanta. *Journal of immigrant and minority health*, 1-8.

Vu, M., Huynh, V. N., Berg, C. J., Allen, C. G., Nguyen, P. H., Tran, N. A., . . . Escoffery, C. (2021). Hepatitis B Testing Among Vietnamese in Metropolitan Atlanta: The Role of Healthcare-Related and Acculturation-Related Factors. *J Community Health, 46*(4), 767-776. doi:10.1007/s10900-020-00947-0

Wei, C., Cheung, D., Yan, H., Li, J., Shi, L., & Raymond, H. (2016). The Impact of Homophobia and HIV Stigma on HIV Testing Uptake among Chinese Men Who Have Sex with Men: A Mediation Analysis. *Journal Acquiried Immune Deficiency Syndrom, 71*(1), 87-93. doi:10.1097/QAI.0000000000000815

Wei, C., Cheung, D. H., Yan, H., Li, J., Shi, L. E., & Raymond, H. F. (2016). The Impact of Homophobia and HIV Stigma on HIV Testing Uptake Among Chinese Men Who Have

Sex With Men: a Mediation Analysis. *J Acquir Immune Defic Syndr, 71*(1), 87-93. doi:10.1097/qai.0000000000000815

WHO. (2016). Consolidated guidelines on HIV prevention, diagnosis, treatment and care for key populations, 2016 update. Retrieved from https://www.who.int/publications/i/item/9789241511124

WHO. (2019). HIV/AIDS Key Facts. *https://www.who.int/news-room/fact-sheets/detail/hiv-aids accessed 3.28.19.*

WHO. (2016). Sexually transmitted infections (STIs): World Health Organization. *Available from: http://www.who.int/mediacentre/factsheets/fs110/en/. Cited 2 /15/2019*

Wilson, P. A., & Yoshikawa, H. (2004). Experiences of and responses to social discrimination among Asian and Pacific Islander gay men: Their relationship to HIV risk. *AIDS Education and Prevention, 16*(1: Special issue), 68-83.

Wong, F., Chng, C., Ross, M., & Mayer, K. (1998). Sexualities as social roles among Asian and Pacific Islander gay, bisexual, lesbian, and transgender individuals: Implications for community-based education and prevention. *Journal of Gay and Lesbian Medical Association, 2*, 157-166.

Wong, F. Y., Nehl, E. J., Han, J. J., Huang, Z. J., Wu, Y., Young, D., & Ross, M. W. (2012). HIV testing and management: findings from a national sample of Asian/Pacific islander men who have sex with men. *Public Health Rep, 127*(2), 186-194. doi:10.1177/003335491212700207

Wong FY. et al. (2004). HIV testing and awareness of care-related services among a group of HIV-positibe Asian Americans and Pacific Islanders in the United States: findings from a

supplemental HIV/AIDS surveillance project. *AIDS Education and Prevention, 16*(5), 440-447.

World Population Review. (2019). Asian Population 2019. *Official webpage at http://worldpopulationreview.com/states/asian-population/*.

Xia, Y., Do, K., & Xia, X. (2013). The Adjustment of Asian American Families to the U.S. Context: The Ecology of Strengths and Stress. *Digital Commons at University of Nebraska - Lincoln, Access online at https://digitalcommons.unl.edu/cgi/viewcontent.cgi?referer=https://www.google.com/&httpsredir=1&article=1082&context=famconfacpub*.

Xu, J., Brown, K., Ding, G., Wang, H., Zhang, G., Reilly, K., . . . Wang, N. (2011). Factors associated with HIV testing history and HIV-test result follow-up among female sex workers in two cities in Yunnan, China. *Sex Transm Dis, 38*(2), 89-95. doi:10.1097/OLQ.0b013e3181f0bc5e

Ye, J., Mack, D., Fry-Johnson, Y., & Parker, K. (2012). Health care access and utilization among US-born and foreign-born Asian Americans. *Journal of immigrant and minority health, 14*(5), 731-737.

Yeung, W.-J. J., Desai, S., & Jones, G. W. (2018). Families in southeast and South Asia. *Annual Review of Sociology, 44*, 469-495.

Yoshikawa, H., Alan-David Wilson, P., Chae, D. H., & Cheng, J.-F. (2004). Do family and friendship networks protect against the influence of discrimination on mental health and HIV risk among Asian and Pacific Islander gay men? *AIDS Education and Prevention, 16*(1: Special issue), 84-100.

Yoshikawa, H., Wilson, P. A., Hsueh, J., Rosman, E. A., Chin, J., & Kim, J. H. (2003). What Front-Line CBO Staff Can Tell Us About Culturally Anchored Theories of Behavior Change in HIV Prevention for Asian/Pacific Islanders. *American Journal of Community Psychology, 32*(1-2), 143-158.

Yoshioka, M. R., & Schustack, A. (2001). Disclosure of HIV status: cultural issues of Asian patients. *AIDS Patient Care and STDs, 15*(2), 77-82.

Young, S. D., & Goldstein, N. J. (2021). Applying social norms interventions to increase adherence to COVID-19 prevention and control guidelines. *Preventive Medicine, 145*, 106424. doi:https://doi.org/10.1016/j.ypmed.2021.106424

Young, S. D., Hlavka, Z., Modiba, P., Gray, G., Van Rooyen, H., Richter, L., . . . Coates, T. (2010). HIV-related stigma, social norms, and HIV testing in Soweto and Vulindlela, South Africa: National Institutes of Mental Health Project Accept (HPTN 043). *J Acquir Immune Defic Syndr, 55*(5), 620-624. doi:10.1097/QAI.0b013e3181fc6429

Zaidi, I. F., Crepaz, N., Song, R., Wan, C. K., Lin, L. S., Hu, D. J., & Sy, F. S. (2005). Epidemiology of HIV/AIDS among asians and pacific islanders in the United States. *AIDS Education & Prevention, 17*(5), 405-417.

Zea, M. C., Asner-Self, K. K., Birman, D., & Buki, L. P. (2003). The Abbreviated Multidimentional Acculturation Scale: Empirical validation with two Latino/Latina samples. *Cultural Diversity and Ethnic Minority Psychology, 9*(2), 107.

Zea MC. et al. (2003). The Abbreviated Multidimensional Acculturation Scale: Empirical validation with two Latino/Latina samples. *Cultural Diversity and Ethnic Minority Psychology, 9*(2), 107-126. doi:10.1037/1099-9809.9.2.107

Zhao, P., Liu, L., Zhang, Y., Cheng, H., Cao, B., Liu, C., . . . Tang, W. (2018). The interaction between HIV testing social norms and self-efficacy on HIV testing among Chinese men who have sex with men: results from an online cross-sectional study. *BMC Infectious Diseases, 18*(1), 541. doi:10.1186/s12879-018-3454-5

Zhao, Y., Bromberg, D. J., Khoshnood, K., & Sheng, Y. (2020). Factors associated with regular HIV testing behavior of MSM in China: a cross-sectional survey informed by theory of triadic influence. *International journal of STD & AIDS, 31*(14), 1340-1351. doi:10.1177/0956462420953012

Zhou, Y., Coleman, W., Huang, Y., Sinding, C., & Wei, W. (2017). Exploring the intersections of transnationalism, sexuality and HIV risk. *Culture, Health and Sexuality, 19*(6), 645-652. doi:https://doi.org/10.1080/13691058.2017.1300327