

**SYNDEMIC PROCESSES AMONG YOUNG MEN WHO HAVE SEX WITH MEN
(MSM): PATHWAYS TOWARD RISK AND RESILIENCE**

by

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University of Pittsburgh, 2011

Men who have sex with men (MSM) in the US experience great disparities in health outcomes, most notably in HIV. This dissertation will take a look at these disparities and offer a framework for understanding their etiology and for understanding the processes by which these disparities are sustained, propagated and eventually broken down. First, we provide an overview of the literature regarding health disparities among MSM and the current theories that exist to understand where these disparities come from. Specifically, we focus on Syndemics Theory and the Theory of Syndemic Production as the best models for understanding health among MSM. Finally, we suggest a new theoretical model, Cultural Resilience Theory, which can be used to conceptualize health promotion within the syndemic framework. We also test components of Syndemics Theory – interaction and mediation – that until now have functioned as assumed premises with no empirical support for their assertion. Finally, we test Cultural Resilience Theory as a model that can be used in prevention programming to break down syndemic processes among MSM. In the final chapter we look into the practical implications of Cultural Resilience Theory as it applies to the prevention (or abatement) of health disparities among MSM.

The findings of this study have great public health significance and important implications for HIV prevention among MSM. First, the synergism analysis is the first to test the assertion that co-occurring psychosocial health conditions interact to increase HIV risk among MSM. These results suggest that there is a synergistic effect present. Likewise, the mediation

analysis is the first to test the theory of syndemic production that states that early life adversity impacts HIV outcomes through syndemic processes; an assertion that was supported by these analyses. These two studies further our understanding of how syndemics function within MSM to produce health disparities. Finally, we identify several variables that break down syndemic processes through either their negative association with poor health outcomes, or by buffering the pathways from adversity to HIV risk through syndemics. These results will provide the foundation upon which a culturally tailored Theory of Cultural Resilience among MSM can be developed.

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PREFACE

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This dissertation is dedicated to the queer youth of Chicago and everywhere whose sadness, torment, hope, pride, and resilience inspire every piece of HIV work I have ever done and will ever do.

1.0 HEALTH DISPARITIES AMONG MEN WHO HAVE SEX WITH MEN: AN INTRODUCTION

Debates are currently being had throughout the United States about equal rights for sexual minorities. Each month there are new headlines in national and local papers about marriage rights, the repeal of the US military's Don't Ask/Don't Tell policy, the constitutionality of the Defense of Marriage Act, and other stories that signal a shift in the legal and social standing of sexual minorities in this country. However, accompanying these stories are the arguments, oftentimes inflammatory, against these steps toward equal rights. What does not tend to make headlines are the outcomes that result from long standing marginalization and discrimination. When groups of people are regarded and treated as second class citizens, inequalities will inevitably be seen in the health and life expectancy within that group.

Men who have sex with men (MSM) in the US experience great disparities in health outcomes, most notably in Human Immunodeficiency Virus (HIV) infection. The following chapters will take a look at these disparities and offer a framework for understanding their etiology and for understanding the processes by which these disparities are sustained and propagated. Most importantly, I will offer a framework for prevention that may work to reduce health disparities among MSM.

In the following chapter I will provide an overview of the literature regarding health disparities among MSM and the current theories that exist to understand where these disparities

come from. Specifically, I will focus on Syndemics Theory and the Theory of Syndemic Production as the best models for understanding health among MSM. Finally, I will suggest a new theoretical model, Cultural Resilience Theory, which can be used to conceptualize health promotion within the syndemic framework. In chapters three and four I will test components of Syndemics Theory – interaction and mediation – that until now have functioned as assumed premises with no empirical support for their assertion. In chapter five I will test Cultural Resilience Theory as a model that can be used in prevention programming to break down syndemic processes among MSM. In the final chapter I will look into the practical implications of Cultural Resilience Theory as it applies to the prevention (or abatement) of health disparities among MSM.

2.0 CULTURAL RESILIENCE THEORY: UNDERSTANDING AND ADDRESSING HEALTH DISPARITIES AMONG YOUNG MEN WHO HAVE SEX WITH MEN

According to the U.S. Department of Health and Human Services (HHS), a health disparity is population specific differences in the presence of disease, health outcomes, or access to health care (HRSA, 2000). One population that experiences immense health disparities is men who have sex with men (MSM). This chapter explores health disparities among men, specifically young men, who identify as gay, bisexual, queer, same gender loving, or some other sexual minority term, or men who engage in same-sex sexual behavior or who experience same-sex attractions. Sexual orientation is a complex multi-dimensional construct and we do not intend to minimize the diversity inherent in this group, yet for the sake of simplicity, we will collectively refer to these individuals as men who have sex with men (MSM). In this chapter we will discuss why health disparities exist and offer a framework to address them. Specifically, we suggest that current prevention and health promotion efforts could be greatly improved by expanding the current public health paradigm to include a focus on resilience.

2.1 HEALTH DISPARITIES AMONG YOUNG MEN WHO HAVE SEX WITH MEN (MSM)

Evidence of health disparities among MSM can only be as deep as extant research. Therefore, the information we have about health disparities among MSM is limited. Most information available about health inequalities experienced by MSM concerns sexual health (Richard J. Wolitski, Stall, & Valdiserri, 2008). This is not necessarily because this is the area of greatest disparity, but, as a result of the HIV/AIDS epidemic, because this is where the greatest amount of research has been done. As more research is conducted that examines the association between same-sex sexual orientation and/or behavior and other health outcomes, we are likely to see evidence of health disparities in many other areas of health. For instance, many studies have shown that MSM smoke cigarettes at greater rates than heterosexual men (Greenwood, et al., 2005; Ryan, Wortley, Easton, Pederson, & Greenwood, 2001; Tang, et al., 2004). However, to our knowledge there is no evidence of disparities in rates of lung cancer. This is not necessarily because the disparity doesn't exist, but because research has not yet been done to identify it as such.

Another limiting factor in our understanding of health disparities among sexual minorities is the homogeneity in the samples in most research studies. Historically, the majority of sexual minority health research has been conducted among samples that are disproportionately white. A survey of MSM health research may give the impression that MSM in the US are uniformly white, middle class, and well educated – an understanding that clearly does not accurately portray the great diversity of MSM individuals and communities. Non-MSM health research has demonstrated immense disparities based on race/ethnicity with African Americans and Latinos faring much worse than whites on many health indicators (Arias, 2007; Hummer,

1996; Orsi, Margellos-Anast, & Whitman, 2010). The limited research that has been conducted with MSM of color suggests that these race/ethnicity based health disparities also exist among MSM (R. Diaz, Peterson, & Choi, 2007; Harawa, et al., 2004). However, more research is needed to fully understand the context and the extent of health disparities among MSM of color.

Another issue that limits a full understanding of health disparities among MSM is inconsistencies in the operationalization of sexual orientation. Studies typically use identity, behavior, attraction, *or* a combination of these constructs to categorize an individual as an MSM. However, none of these methods are without problems and all of them likely miss important components of the community. For instance, terms used for self-identification as MSM are not necessarily consistent across different MSM communities. Whereas “queer” or “yag” (gay spelled backwards) are terms often embraced by young MSM, these terms are less frequently used, or may even be perceived as offensive, by older MSM. Similarly inconsistent patterns of identification appear across racial/ethnic groups with some African American MSM more likely to prefer the term “same gender loving” to the more commonly used “gay” or “homosexual”. Discrepant methods of collecting sexual orientation data are often unavoidable as each research question and health topic requires a tailored approach. For a study of STD infection it may be most appropriate to classify individuals based on same-sex sexual behaviors, whereas a study of adolescent suicide risk may be better suited to attraction or identity as the signifier of sexual minority status. Nonetheless, the inability to compare across studies and the inconsistencies in what is defined as sexual minority limits the generalizations and conclusions we can draw about MSM health disparities.

Perhaps the greatest limiting factor in our understanding of health disparities among MSM is the exclusion of sexual orientation information in population-based studies and in

clinical trials. Currently, few large scale studies include questions about same sex sexual behavior, sexual identity or sexual attraction, making it impossible to draw conclusions about how rates of conditions such as cancer, diabetes, or heart disease compare between MSM and non-MSM populations. The large scale studies that do include sexual orientation questions - such as The National Longitudinal Study of Adolescent Health, National Health and Nutrition Examination Survey, and the Youth Risk Behavior Survey - have contributed greatly to our understanding of health among MSM (Galliher, Rostosky, & Hughes, 2004; Garofalo, Wolf, Kessel, Palfrey, & DuRant, 1998; Marshal, Friedman, Stall, & Thompson, 2009; Saewyc, et al., 2006). Many sexual minority health researchers and advocates have been calling for inclusion of sexual orientation on population based research questionnaires for many years. Until a sexual orientation assessment item, or preferably, multiple items, are added to such data collection tools, our depth and breadth of understanding about MSM health disparities will be limited.

Despite all of these limitations, there is still quite a bit of information detailing health disparities among MSM. Though it would be impossible to synthesize all of the literature documenting disparate negative health outcomes among MSM in this chapter, HIV is discussed in brief below. We have opted to focus on HIV for two main reasons. First, HIV represents perhaps the greatest health disparity faced by MSM and is arguably the most pressing health concern for MSM in the last few decades. Second, the HIV epidemic, as presented below, can provide a framework for examining health disparities generally, the etiology of health disparities, and offer a structure for addressing other disparities. We will also focus broadly on the mechanisms by which MSM have developed other health disparities as a result of social marginalization and homophobia.

2.2 HIV AMONG MEN WHO HAVE SEX WITH MEN (MSM)

According to a surveillance report released by the Centers for Disease Control and Prevention (CDC) in 2010 regarding HIV prevalence rates in the US, males accounted for 73% of all new HIV infections and 75% of all individuals currently living with HIV. The majority (53%) of all new infections are attributed to male-to-male sexual contact (CDC, July 2010). Subpopulation estimates from the same year suggested that 72% of all new HIV infections among males were in MSM (CDC, 2008b). Epidemiological data indicate that not only are the rates of HIV infection high and disparate among MSM, but the trends in infection are alarming. From 2004 to 2007, there was an estimated 26% annual increase in HIV/AIDS diagnoses among MSM (CDC, 2009b).

Nearly thirty years into the epidemic, HIV is quickly becoming a disease of adolescents and young adults. It is estimated that one half of all new HIV infections in the US occur among individuals under the age of 25 (CDC, 2005b). Similar to subpopulation disparities among adults, the burden of HIV disease in youth is also being shouldered by MSM. Recent surveillance data indicate that the majority (76%) of new youth HIV infections occur among MSM (R. J. Wolitski, Valdiserri, Denning, & Levine, 2001). The magnitude of this disparity in infection rates is further demonstrated by the fact that only 5-7% of the US male population reports having had sex with other men, yet MSM make up over two thirds of all persons currently infected with HIV (CDC, 2007). A study of high risk young persons who visited sexually transmitted disease (STD) clinics found seroprevalence rates among young heterosexual men to be less than 3% compared to 21% for young MSM (CDC, 2001b).

Within the MSM population, the burden of HIV infection is also unequally distributed. In particular, racial and ethnic minorities are more likely to be infected with HIV than white

MSM, with African Americans experiencing the highest rates of infection (CDC, 2000, 2001a; Easterbrook, et al., 1993; Lemp, et al., 1994; Valleroy, et al., 2000). The CDC estimates that in 2005, 49% of all new HIV infections occurred in African Americans, despite the fact that African Americans make up an estimated 13% of the US population (CDC, 2006). Among these individuals, male-to-male sexual contact accounted for 63% of the new infections (CDC, 2008a). In a study of MSM in 5 major US cities, 46% of African American MSM were HIV positive (CDC, 2005a). The racial disparity in rates of HIV is even more pronounced among young MSM (YMSM). CDC surveillance data has shown that adult African American MSM are 5 times more likely to be infected with HIV than white MSM. In comparison, African American YMSM ages 13 to 19 have a rate of infection 19 times higher than of white YMSM (Hall, Byers, Ling, & Espinoza, 2007). The vast majority (76%) of HIV seropositive youth (Rangel, Gavin, Reed, Fowler, & Lee, 2006), regardless of race/ethnicity or sexual minority identity, were infected through unprotected anal intercourse (URAI) (Kingsley, et al., 1987; Vittinghoff, et al., 1999). Latino men also experience higher rates of HIV compared to white men. In 2006, the rate of new HIV infections among Latinos was 2.5 times that of whites. In the same year, HIV/AIDS was the fourth leading cause of death among Latino men aged 35–44 (CDC, August 2009). As with white and African American men, the leading pathway to HIV infection among Latino men is sexual contact with same sex partners (CDC, 2009a).

Despite over two decades of prevention efforts aimed at men who have sex with men, the rates of HIV infection continue to rise. A 2008 report released by the CDC showed that MSM accounted for 46% of all new HIV/AIDS infections and HIV infection rates among young MSM increased at a rate of approximately 12% each year between 2001 and 2006 (CDC, 2008c). During the same 6 year time period, the number of HIV/AIDS cases among African Americans

increased regardless of age, but the number of new HIV/AIDS cases among African American MSM aged 13 to 24 increased by an astounding 93% (CDC, 2008c). This report further noted that men who have sex with men were the only risk group who experienced an increase in infection rates during this time.

It must be noted that CDC incidence and prevalence estimates – including the estimates presented here – are typically made available two to three years after the data are collected. It is therefore likely that the HIV risk that MSM are currently facing is much worse than the data suggests. In fact, according to analysis conducted by Stall and colleagues, even if HIV incidence among MSM remains at the current level, by the time a cohort of young MSM (18 years old) reach the age of 40, 41% of them will be HIV positive (Stall, et al., 2009). Thus, the trends that have been seen in rates of HIV among MSM show no indication of abating.

2.3 UNDERSTANDING HEALTH DISPARITIES AMONG MSM

2.3.1 Psychosocial Health Outcomes

Men who have sex with men also experience disparities in rates of other psychosocial health outcomes, such as illicit drug use, alcohol misuse/abuse, and depression. Marshal et al. conducted a meta-analysis of the relationship between sexual orientation and substance use. This study, which included 18 studies and 125 independent effect size estimates found that, overall, the odds of substance use among sexual minority youth was significantly higher than among heterosexual youth (Marshal, et al., 2008). This pattern of increased rates of substance use has long been shown to exist among adult MSM as well (Chesney, Barrett, & Stall, 1998; McCabe,

Hughes, Bostwick, West, & Boyd, 2009; Woody, et al., 2001). In a recent study of over one thousand high school youth in Massachusetts, sexual minority male youth were found to have significantly higher depressive symptomology scores than heterosexual youth (Almeida, Johnson, Corliss, Molnar, & Azrael, 2009). A meta-analysis of the relationship between mental health outcomes and sexual orientation conducted by King, et al., found that MSM were more than twice as likely to experience both lifetime depression and depression in the last 12 months compared to heterosexual men (King, et al., 2008). These studies demonstrate that disparities in psychosocial health outcomes are present in MSM at a young age and that these disparities continue into adulthood (see related chapters, this volume).

2.3.2 Syndemic Processes

These negative psychosocial health outcomes are thought to interact to form a syndemic – a set of co-occurring health conditions that together can lower an individual’s overall health thereby making them more susceptible to disease. According to the Centers for Disease Control and Prevention, a syndemic is, “Two or more afflictions, interacting synergistically, contributing to excess burden of disease in a population” (CDC, 2009c). For example, psychosocial health problems such as substance use, depression and intimate partner violence have been found to interact so that their impact on the overall health of the individual is greater than one would expect the additive effect to be (Stall, Mills, Williamson, Hart, Greenwood, Paul, Pollack, Binson, Osmond, Catania, et al., 2003). While many studies involving MSM have shown interconnections between health problems, such as substance use and high risk sex (Hirshfield, Remien, Humberstone, Walavalkar, & Chiasson, 2004; Stall, et al., 2001), two recent studies have focused on documentation of the syndemic condition in samples of adult MSM (Stall,

Mills, Williamson, Hart, Greenwood, Paul, Pollack, Binson, Osmond, Catania, et al., 2003) and young MSM (B. Mustanski, Garofalo, Herrick, & Donenberg, 2007). Using a probability sample of MSM in four major US cities, Stall et al. found that the more psychosocial health problems an individual reported, the greater their risk for both participation in sexual risk behaviors and HIV infection (Stall, Mills, Williamson, Hart, Greenwood, Paul, Pollack, Binson, Osmond, Catania, et al., 2003). Mustanski et al. found similar results among a sample of young MSM where the experience of each additional psychosocial health problem significantly increased the odds of unprotected anal intercourse, having multiple sex partners, and HIV seroprevalence (B. Mustanski, et al., 2007). These two studies demonstrated that as the number of psychosocial conditions endorsed by an individual increases, their likelihood of engagement in HIV sexual risk behaviors increased, as did their likelihood of HIV infection. It has been suggested that this set of co-occurring psychosocial health problems (i.e. the presence of a syndemic condition) may actually be driving the HIV epidemic among MSM and may similarly reinforce other health disparities among MSM (Stall, Mills, Williamson, Hart, Greenwood, Paul, Pollack, Binson, Osmond, Catania, et al., 2003).

2.3.3 Theoretical Explanations of Syndemic Processes

In order to fully understand the syndemic process, we must also look into what is causing the disparities in psychosocial health outcomes that make up the syndemic condition. Several theories have been posited to explain these disparities by focusing on the relationship between adversity and health outcomes. One such theory is Minority Stress Theory. This theory suggests that experiences of social discrimination based on sexual orientation work to lower the overall health profile of sexual minority individuals (Rafael M. Diaz, 1998; Meyer, 1995, 2003). This

process happens over time as minority individuals are exposed to both explicit and implicit discrimination and social marginalization. These experiences cause stress, which negatively impacts an individual's self-esteem, and increases emotional distress and a sense of social isolation that renders the individual more vulnerable to health problems such as depression and substance use.

Meyer originally conceived of minority stress as stemming from 3 sources; Internalized Homophobia, Perceived Stigma, and Prejudice (violence and/or discrimination) (Meyer, 1995). With a sample of 741 gay men recruited from New York City, he found that these three forms of minority stress, when taken together, significantly predicted the five psychological distress items in question (demoralization, guilt, suicide, AIDS related traumatic stress response, and sex problems). These findings support Meyer's hypothesis that experiences of Minority Stress contribute to poor health among MSM.

In their study on the effects of minority stress in the lives of Latino MSM, Diaz, et al., found that the vast majority of the participants were exposed to negative views toward sexuality while growing up (R. M. Diaz, Ayala, Bein, Henne, & Marin, 2001). Specifically, 91% reported hearing that gays were not normal people, 71% heard that gay people grow up to be alone, and 70% were led to believe that their homosexuality would damage their family relationships. These experiences of social discrimination were associated with low self-esteem and social isolation which in turn were correlated to elevated levels of psychological distress. This study, along with others (Meyer, 1995; Stall, Friedman, & Catania, 2007), suggests that social marginalization experienced during development has effects on health outcomes in adulthood.

Another theory that recognizes the importance of life circumstances on the health status of minority populations is the Theory of Syndemic Production. Similar to Minority Stress Theory, the Theory of Syndemic Production (Stall, et al., 2007) posits that cultural and social marginalization experienced by MSM negatively impacts their psychosocial and behavioral profiles, thereby putting them at higher risk for long term negative health outcomes. Syndemic Production differs from Minority Stress in that it focuses on the impact of early life events and the collective effect of marginalization throughout the life-course. In other words, the adversity that a young gay man experiences during boyhood and adolescence contributes to the development of the negative psychosocial health conditions across the life course and into adulthood.

Both Minority Stress Theory and the Theory of Syndemic Production focus on the long term negative health effects of existing in a world that is unsupportive or outwardly hostile toward sexual minorities. It is the social response to an individual's minority sexual identity (or non-traditional gender presentation) that negatively impacts long term health outcomes, rather than the identity or presentation itself. Studies have found that YMSM who reported serious childhood adversity were significantly less likely to exhibit positive outcomes when compared to their peers who did not (Gwadz, et al., 2006; Koblin, et al., 2006; Safren & Heimberg, 1999; Savin-Williams, 1994).

The correlation between experiences of adversity and negative health outcomes is particularly concerning given the prevalence of adversity within this highly stigmatized population. It is estimated that sexual minority youth hear homophobic slurs like “faggot” or “sissy” approximately 26 times during a typical school day (Bart, 1998) and that 31% of sexual minority youth report having been threatened or injured at school in the past year (Chase, 2001).

In a national probability sample of lesbian, gay, bisexual and transgender (LGBT) individuals, Herek found that approximately one in four individuals had experienced a hate crime based on their sexual orientation at some point in their adult lives (Herek, Gillis, & Cogan, 1999). Perhaps even more detrimental are the pervasive forms adversity such as institutionalized homophobia and heterosexism. For example, looking at data from a national probability sample, Hatzenbuehler, et al. found that among LGBT individuals living in states that instituted same sex marriage bans during the 2004/2005 elections, psychiatric disorders increased significantly from before to after the ban (Hatzenbuehler, McLaughlin, Keyes, & Hasin, 2010). No such increases in psychiatric disorders were observed among heterosexual men and women in these states, or among LGBT individuals in states that did not enact same sex marriage bans. MSM of color, compared to white MSM, may experience even more adversity based on sexual orientation due to cultural norms that consider heterosexuality the only acceptable sexual identity (Ernst, Francis, Nevels, & Lemeh, 1991; Harper, 2007; Stokes & Peterson, 1998).

2.4 UNDERSTANDING RESILIENCE

2.4.1 Overcoming Adversity: Evidence for Strengths and Protective Factors

Men who have sex with men exist in a world where adversity and marginalization are pervasive. Many MSM grew up in a world with messages telling them they were abnormal or even immoral, and they live in a world where they are denied equal rights. However, the negative health outcomes that result from this hostile environment are not universal. While the vast majority of MSM have experienced some form of adversity, the majority have not experienced

the deleterious effects of those experiences in terms of co-occurring psychosocial health problems or HIV acquisition. Rather, most of these men survive adversity and are somehow protected from the potential negative consequences of those negative experiences. This capacity for an individual to cope successfully with adversity is “resilience”. Thus, resilience necessitates two components: 1) exposure to adversity; and 2) achievement of positive situational adaptation despite this exposure (Luthar, Cicchetti, & Becker, 2000).

The difference between those who survive and/or thrive and those who do not may be in part explained by the existence of protective factors. That is, some individuals may have strengths and resources (skills, supports, personality traits, etc.) that help to buffer the effects of adverse experiences, thereby preventing the development of multiple co-occurring health disparities (i.e. syndemics).

2.4.2 Resilience Theory and the Role of Protective Factors

Resilience Theory states that there are traits, skills and support systems that help individuals to survive despite adverse conditions. The theory further acknowledges that all persons possess the capacity for resilience, but in order for resilience to be fully developed, protective factors must be present that offset the effect of adversity. Protective factors can work in two ways to promote resilience. First, type I protective factors are directly associated with positive outcomes. For example, the Search Institute, a youth advocacy organization, developed an index of 40 protective factors, known as the Developmental Assets Framework (DAF), that have been shown to predict resilience among youth at risk (Roehlkepartain, Benson, & Sesma, 2003). Specifically, they have found that there is an inverse relationship between the number of assets

endorsed by an individual and the likelihood that that individual participates in risky behaviors. Thus, the presence of protective factors can lessen, if not eliminate, the deleterious effects of adversity.

Type II protective factors serve to moderate the relationship between adversity and risk by providing the individual with assets and resources with which to cope with the adversity (Rew & Horner, 2003). Very little research exists that explores protective factors that function in this manner. However, it is likely that some protective factors that are directly associated with resilience (type I factors) such as those in the DFA may also function as moderators of risk (type II factors). Resilience is not a characteristic of an individual, but rather a product or condition that results from the complex interplay of individual and environmental factors (Garmezy, 1991; Olsson, Bond, Burns, Vella-Brodrick, & Sawyer, 2003). When individuals have access to sufficient protective resources, they are able to recover from adverse situations and events. Nonetheless, this ability to recover does not render a person invincible. Under certain conditions, or at increased levels of adversity, factors that were previously protective may no longer be (Garmezy, 1991).

Protective factors are the building blocks of resilience, and not unlike risk factors, protective factors exist on multiple levels of influence with reciprocal associations among these levels (Luthar, et al., 2000). In some cases, protective factors may be the obverse of risk factors (and vice versa). For instance, high levels of self-esteem might protect against engagement in health risk behaviors such as unprotected anal intercourse, whereas low levels of self-esteem might predict this behavior. However, in some cases risk factors and protective factors are not the obverse of each other. For example, MSM who report high levels of outness about their sexual orientation are at risk for HIV related conditions including experienced victimization

(Chesir-Teran & Hughes, 2009). Yet the obverse of outness is also a risk factor rather than a protective factor (Hays, et al., 1997; Waldo, McFarland, Katz, MacKellar, & Valleroy, 2000). In some cases, factors may only serve as protective and have little or nothing to do with risk. For example, participation in school based gay/straight alliances (GSAs) appears to be protective against risks taking behaviors(Lee, 2002), but it is highly unlikely that not participating in these groups would constitute risk. Protective factors, not unlike risk factors, will not be the same for all people, nor will they necessarily be the same across the life-course. Many variables, including developmental stage, age, individual personality, etc., may cause protective factors to be more or less effective across individuals or over time. Further, protective factors may interact with other factors to change the degree or direction of effect.

2.5 EVIDENCE OF STRENGTHS AND PROTECTIVE FACTORS

Very few studies have been conducted that investigate resilience in MSM communities. There has, however, been some investigation of specific protective factors that contribute to resilience. Most protective factors research has focused on type I social cognitive determinants. Studies focusing on sexual minority youth have found that condom self efficacy, perceived susceptibility to HIV infection, positive attitudes towards practicing safe sex, and perceived self control are associated with consistent safer sex (Rotheram-Borus, Rosario, Reid, & Koopman, 1995; Waldo, et al., 2000). Being more educated and more homosexually identified (on the Kinsey Scale) predicted safer anal sex (Michael W. Ross, Henry, Freeman, Caughy, & Dawson, 2004), and data from the Add Health study showed that high levels of self esteem were correlated with low levels of emotional distress among adolescents (Resnick, et al., 1997). In terms of type II

protective factors, self acceptance, when combined with family support, buffered the effects of victimization on mental health outcomes, but neither factor was protective when measured alone (Hershberger & D'Augelli, 1995). In fact, self acceptance (defined as a positive view of one's sexual orientation) was much more highly correlated to mental health than victimization was.

Some of the strongest factors protective against risk taking behaviors among young MSM can be found on the interpersonal level. Based on existing evidence, parental relationships appear to be quite influential in protecting against HIV risk. Analysis of data from the Add Health study showed that parental/family connectedness was protective against emotional distress, experienced violence, substance use, and risky sexual activity in general youth populations (Resnick, et al., 1997). Studies have found similar patterns of protection among young MSM populations (Jaccard, Dittus, & Gordon, 1996; Voisin, 2002); however, sexual minority youth report less parental/family connectedness than their heterosexual peers (T. Williams, Connolly, Pepler, & Craig, 2005). Qualitative studies have found that parental relationships were perceived as important protective factors even when coming out was not well received one's parents (Warwick, Douglas, Aggleton, & Boyce, 2003) and that most parents came to accept their child's sexuality and were generally concerned about their child's health (LaSala, 2007). Another study found that most youth reported that their relationship with their parents influenced their decision to engage in safer sex, regardless of how accepting their parents were of their sexuality (LaSala, 2007). Thus, parents may not need to be accepting of their child's sexual orientation to provide the general support that fosters resilience (Fenaughty & Harre, 2003).

Peer relationships also play an important role in protecting against HIV risk, although this relationship does not appear to be as straightforward for sexual minorities as it is for

heterosexuals. For instance, peer support for condom use is associated with abstinence, safer sex behaviors and health promoting behaviors (smoking cessation, etc.) in heterosexual populations (Diclemente, 1991; DiIorio, et al., 2001; Maxwell, 2002), but this same association has not been found for sexual minorities (Hays, Kegeles, & Coates, 1990; Rotheram-Borus, et al., 1995). This may be due in part to the victimization and heteronormative pressures sexual minorities experience at the hands of their peers, rendering their influence less salient. Likewise, Williams et al., found that sexual minority youth reported less companionship with their best friends than did heterosexual youth (T. Williams, et al., 2005). However, peer relationships with other sexual minority youth may provide some protection against risk (Ueno, 2005).

In general, the social support provided by the daily presence of close personal relationships cannot be undervalued. Where these relationships have been evaluated, they have been shown to be strong protectors against risk. Perceived social support is correlated to reduced likelihood of depression and suicide, increased self esteem and lower sexual risk behaviors (Anderson, 1998; T. Williams, et al., 2005). Nonetheless, the interpersonal relationships of young MSM have only been superficially examined and much more work is needed to fully understand how these relations function and how they can be promoted to increase resilience.

Though religious affiliation and high values placed on religiosity have shown some protective effects (Resnick, et al., 1997; Rostosky, Danner, & Riggle, 2007), the organizational/community level factor that appears to be most important in the development of resilience among youth is the school community. Results from Add Health have shown that school context variable, such as school connectedness, had a consistent influence on the emotional health of youth as measured by emotional distress, violence and suicidality (Resnick, et al., 1997). However, very little is known about how school environments – and other

organizational/community level environments – influence the healthy development of sexual minority youth and how these factors during development impact the health of adult MSM.

As previously mentioned, most of the research about protective factors that contribute to resilience among MSM has been focused specifically on adolescent and young adult MSM. While further research is need to identify protective factors specific to adult MSM population, it's likely that many factors, such as self-esteem, social support, etc., will be protective regardless of an individual's age.

2.6 CULTURAL RESILIENCE THEORY

Protective factors present in MSM at a young age may develop or become stronger across the life course. For instance, pride, or shamelessness, is a quality that is often associated with MSM communities. Despite the negative messages that MSM hear about their sexuality, many learn to cast off this shame and internalized homophobia and take pride in their sexuality and pride in their community. For example, unpublished data from a multi-site longitudinal cohort study of MSM showed that exposure to homophobia and gay related victimization were significantly and positively associated with internalized homophobia during the time men were coming out (Herrick & Stall, In preparation). However, homophobic experiences were not significantly associated with current levels of internalized homophobia. This finding suggests that men were able to reconcile their feelings of shame as they aged in a way that may be unique to sexual minority communities.

Due to the fact that MSM occupy a “secondary status” in our culture, many individuals have experienced a significant amount of adversity in their lives. As previously noted, these

experiences of adversity can contribute significantly to risk behaviors, and therefore, contribute to the negative health outcomes of MSM. This is because an individual's development is affected by their environment, and when one's environment is hostile, development can be negatively affected. However, MSM communities and MSM individuals often resist this cultural attack and turn marginalization into pride. This is an example of cultural resilience in two ways. First, MSM, and other sexual minorities, have developed a culture where pride is a central tenant. This culture of pride may well increase the resilience of MSM and MSM communities. Second, this culture of pride has had a somewhat insulating effect that promotes resilient to the negative messages of the dominant culture.

Cultural Resilience Theory (Figure 2-1) is an attempt to explain the process of overcoming adversity specifically as it relates to MSM and other sexual minority communities and individuals. Strengths and protective factors can theoretically break down the syndemic process thereby preventing the effects of adversity from turning into negative health outcomes. Until such a time that adversity experienced by MSM through homophobia and cultural marginalization is eliminated, there will need to be ways to prevent the harmful effects of this adversity. Understanding and capitalizing on Cultural Resilience will likely increase the effectiveness of existing prevention programs, thereby improving the health of MSM.

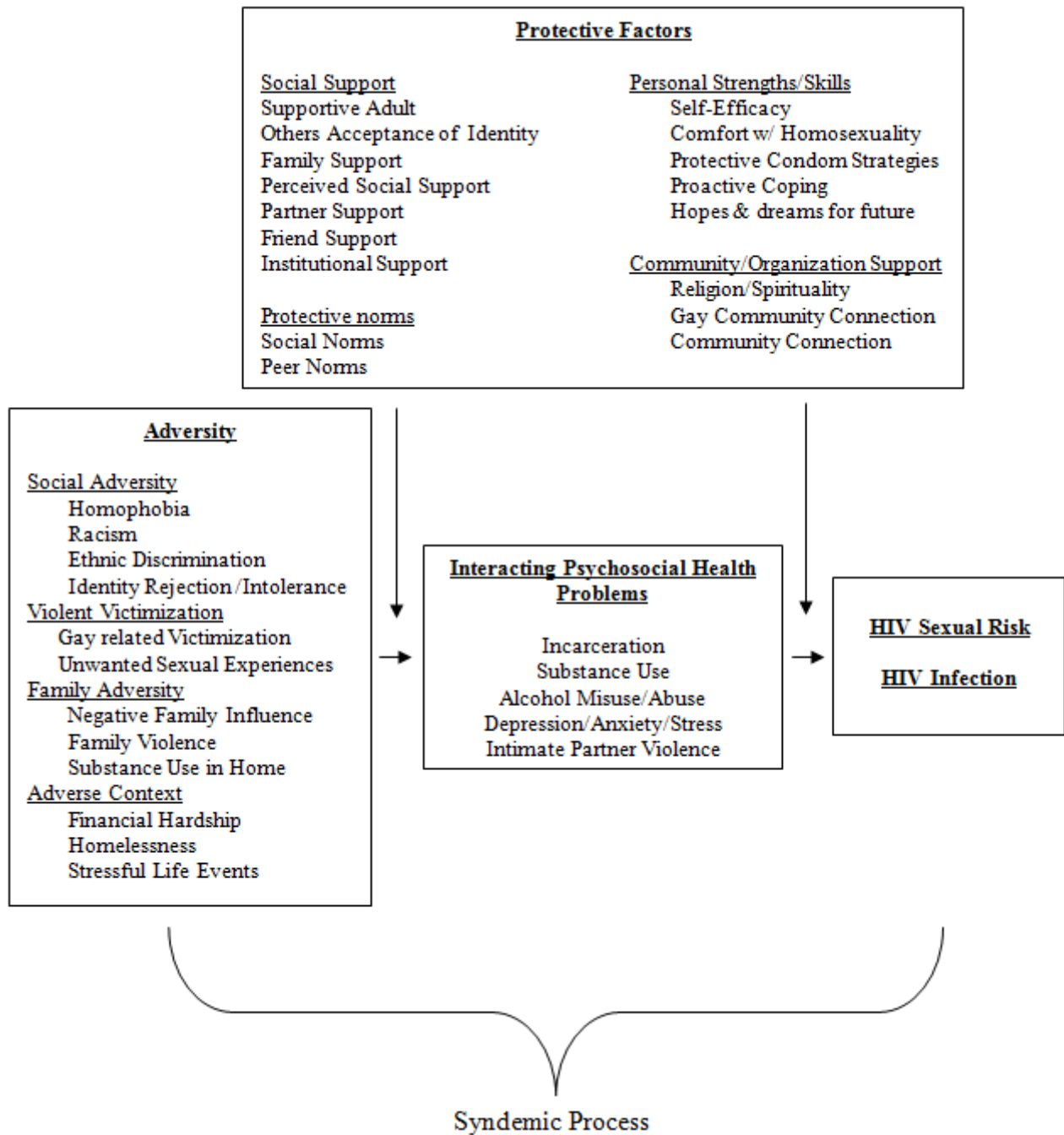


Figure 2-1. Cultural Resilience Theory

2.7 IMPLICATIONS FOR PREVENTION

In a meta-analysis of the efficacy of HIV prevention interventions targeted at MSM, Herbst, et al., found that these interventions resulted in a 23% reduction in the odds of engaging in unprotected anal intercourse and a 61% increase in odds of condom use during anal sex (Herbst, et al., 2005). This suggests that current prevention paradigms are effectively addressing some degree of risk. Nonetheless, there is little to no evidence that health disparities between MSM and non-MSM are diminishing. In order to minimize or eliminate health disparities, the efficacy of current prevention efforts will need to be increased. Cultural Resilience Theory offers a means to accomplish this.

As depicted in Figure 2-1, Cultural Resilience Theory suggests that experiences of adversity lead to increased participation in risky behaviors and to the development of co-occurring psychosocial health conditions. These syndemic conditions, in turn, contribute to health disparities. Both steps in this process could be moderated by protective factors. The predominant public health approach is to attempt to eliminate health disparities by eliminating adversity, eliminating risk factors, and/or eliminating psychosocial health problems that are risk factors for downstream health problems. As demonstrated by Herbst, et al., this approach has been somewhat effective. However, interventions and health promotion efforts could be improved by also addressing protective factors that moderate these processes.

The content and impact of positive youth development (PYD) programs supports our contention that health promotion may be as important as risk reduction in the elimination of health disparities. PYD programs are driven by the philosophy that resilience and competency building are critical in supporting healthy development among youth (Roth & Brooks-Gunn, 2003). PYD programs seek to promote bonding, build competencies, enhance belief in the

future, self-efficacy, positive identity, prosocial norms, spirituality, and self-determination (R. F. Catalano, Berglund, & Ryan, 2002). Such programs often attempt to strengthen familial, educational, and community systems (Gavin, Catalano, David-Ferdon, Gloppen, & Markham, 2010). A comprehensive review found that PYD programs improve interpersonal skills, strengthen relationships with peers and adults, increase self-control, self-efficacy, academic achievement, problem solving and other competencies. These programs may also decrease drug and alcohol use, aggressive behavior, violence, and high-risk sexual behavior (R. Catalano, Berglund, Ryan, Lonczak, & Hawkins, 2004). Other reviews have found that PYD programs are effective in promoting adolescent sexual and reproductive health and that the effects are *sustained over time* (Gavin, et al., 2010; Kirby, 2001; Solomon & Card, 2004). Gavin et al. (2010) suggests that PYD programs target a different and complementary set of factors compared to traditional health education programs and that while traditional programs provide youth with certain skills and knowledge to reduce risk, PYD programs may "... provide them with the motivation and confidence needed to use those skills." Together, the findings suggest that health disparities among gay and bisexual men could be reduced by promoting healthy development through a focus on protective factors and resilience.

2.8 DISCUSSION

It has been almost 30 years since HIV began to decimate the MSM population in the US and health disparities among MSM were forced into the forefront of LGBT consciousness. Since that time much prevention work has been done to address these disparities. Nonetheless, health disparities still exist among men who have sex with men.

Future studies are needed to expand our knowledge of the ecological context of health risk among a highly vulnerable population. To accomplish this, it will first be important to expand the scope of prevention research to focus on protective factors as well as risk factors. There is much to be learned from those who have faced adversity and thrived, relative to those who have experienced the negative outcomes that prevention programs aim to avoid. Second, there is a need to examine protective factors beyond those at the individual level. Resilience Theory suggests that community and interpersonal protective factors are needed in order for an individual to develop resilience. To the extent that this view is correct, a narrow focus on individual level risk and protective factors will not be likely to eliminate health disparities. Finally, there needs to be a focus on identifying modifiable protective factors so that there is direct applicability to prevention and health promotion programs.

Many MSM health studies have demonstrated an association between health risk behaviors and individual personality characteristics such as sensation seeking (Adam, Teva, & de Wit, 2008; M. Newcomb, Clerkin, & Mustanski, 2010) or impulsivity (Patterson, Semple, Zians, & Strathdee, 2005; Semple, Zians, Grant, & Patterson, 2006). While knowledge of these factors is necessary for our understanding of prevention, the particular factors themselves are very difficult to affect through diffusive and effective interventions. It is more feasible to affect change on the interpersonal or community level by developing a mentor program or setting up community centers, or by making policy level changes like the adoption of anti-bullying legislation, or federal laws that recognize sexual minorities as full and equal citizens (same-sex marriage and adoption laws).

It has long been acknowledged that sexual minorities face health disparities, not because of who they are, but because of the environment in which they live. Nonetheless, prevention

efforts have a tendency to focus on changing the individual with messages about more condom use, less substance use, and so forth. Although data show that MSM exhibit considerable strength in reducing or avoiding health-related risks, this strength has been underemphasized in public health prevention work. Cultural Resilience Theory and strength-based approaches to prevention provide a framework to advance prevention and health promotion by indentifying new variables and new mechanisms that will increase the effectiveness of current public health models and improve the health of MSM.

3.0 SYNDEMICS AMONG MSM: IS THERE SUPPORT FOR THE ASSERTION OF SYNERGISTIC INTERACTION?

3.1 INTRODUCTION

It has long been demonstrated that men who have sex with men (MSM) experience disparities in many facets of health (Cochran & Mays, 2000b; Stall & Wiley, 1988; Richard J. Wolitski, et al., 2008). The most notable of these disparities is in rates of HIV infection (CDC, 2009a, 2010a, 2010b). These disparities are likely to be, in part, a result of high rates of many of the psychosocial predictors of HIV in MSM populations. For instance, depression, substance use and problematic alcohol use exist at higher rates within MSM population compared to non-MSM populations, and are highly associated with risk for HIV infection (Cochran & Mays, 2000a; Remafedi, French, Story, Resnick, & Blum, 1998; Stall, et al., 2001; Stall & Wiley, 1988). Perhaps more important than the presence of these risk factors is the fact that among MSM these risk factors tend to co-occur (Stall, Mills, Williamson, Hart, Greenwood, Paul, Pollack, Binson, Osmond, Catania, et al., 2003).

The co-occurrence of psychosocial health problems has been termed a “syndemic” (Singer, 1994; Singer & Clair, 2003). The CDC provides this exact definition of a syndemic: *Two or more afflictions, interacting synergistically, contributing to excess burden of disease in a population (CDC, 2009c)*. Increased attention has been paid to the role of syndemics in driving

the disparate rates of HIV among MSM. Several studies have shown that an increasing number of psychosocial health conditions is associated with increased HIV risk, prevalence and incidence (McCarthy, et al., 2010; B. Mustanski, et al., 2007; Stall, Mills, Williamson, Hart, Greenwood, Paul, Pollack, Binson, Osmond, Catania, et al., 2003). These data taken together support the notion that co-occurring psychosocial health problems are contributing to high rates of HIV among MSM. Nonetheless, the existing literature does not support the claim that these co-occurring conditions have a synergistic effect on HIV rates. In fact, to the best of our knowledge, no one has attempted to evaluate whether or not the presence of more than one psychosocial health condition impacts HIV risk in a greater than additive manner. That is, as many psychosocial health problems, such as those mentioned above, have a direct negative effect on HIV risk levels, we would assume that any combination of risk factors would result in increased levels of risk. However, we do not know if HIV risk increases by the amount one would suspect (i.e. the risk of one condition plus the risk of another), or if the effect of more than one condition is greater than additive.

The purpose of this study is to determine if the presence of co-occurring psychosocial health problems have a synergistic effect on HIV risk within a sample of young MSM. The findings of this study will provide evidence relating to one of the underlying premises of Syndemics Theory and will test the appropriateness of the CDC's definition of syndemics.

3.2 METHODS

To test the assertion that co-occurring psychosocial health problems interact synergistically to increase HIV risk behavior we use data collected for the Healthy Young Men's (HYM) Study.

The HYM study utilized a mixed methods approach to identify factors related to health risk behaviors among YMSM. Data was collected between February 2005 and January 2006 in Los Angeles, California. This study received approval from the Institutional Review Board of Children's Hospital Los Angeles and the University of Pittsburgh. Methods for the HYM study have been described in detail elsewhere (Kipke, Kubicek, et al., 2007; Kipke, Weiss, et al., 2007; Wong, Kipke, Weiss, & McDavitt, 2009), however those directly relevant to the study at hand are discussed below.

3.2.1 Sampling and Recruitment

A total of 526 young men were recruited for the HYM study. Young men were eligible to participate in the study if they were: 1) 18–24 years old; 2) self identified as gay, bisexual, or questioning and/or reported having had sex with a male partner; 3) a resident of Los Angeles County and anticipated living in Los Angeles for at least 6 months; and 4) self-identified as Caucasian, African American, or Latino of Mexican descent. Overall average retention rate was 93%.

Young MSM were recruited from public venues such as bars, cafes, parks, youth groups, etc., using venue-day-time (VDT) sampling. Forty-seven venues were evaluated over a 3 month period to ensure adequate numbers of eligible young men accessed those venues, of which 36 venues were selected for recruitment. Young men who entered these venues on the day and time selected for VDT who appeared to be eligible for the study (i.e. appeared to be between the ages of 18 and 24) were asked to complete a brief eligibility screening interview offered in both English and Spanish. Eligible individuals were given a detailed description of the study. Informed consent and contact information were obtained from interested individuals. A total of

4648 individuals were screened during 203 sampling events, 1371 (30%) of whom met study eligibility criteria and 938 (68% of those eligible) expressed an interest in participating. Fifty-six percent of those who expressed an interest (N=526) participated in the study.

Participants completed a 1-1.5 hour assessment using either an audio computer assisted survey instrument (ACASI) or an on-line testing format. Participants completed this survey at baseline, and 6, 12, 18 and 24 month follow ups for a total of 5 visits. Participants received \$35 as compensation for each wave of assessment completion.

3.2.2 Measures

3.2.2.1 Psychosocial Health Conditions

This study evaluated the joint effects of three different psychosocial health conditions measured at wave 3 of the HYM study: 1) Distress – Centers for Epidemiological Studies Distress (CES-D) scale (Radloff, 1977) score of 16 or greater (Ostrow, et al., 1989); 2) Illicit substance use – use of any illicit drug (except marijuana) in the past 3 months; 3) Alcohol misuse – binge drinking in past 30 days defined as 5 or more drinks in a single evening (McNall & Remafedi, 1999). All conditions were coded “0”=condition not present or “1”=condition present.

3.2.2.2 HIV Risk Outcomes

The outcome of interest in this analysis was HIV sexual risk behaviors. Sexual risk was defined as: 1) Unprotected receptive anal intercourse (URAI) – defined as less than consistent condom use for receptive anal sex in the past 3 months; 2) Unprotected insertive anal intercourse (UIAI) – defined as less than consistent condom use for insertive anal sex in the past 3 months;

and 3) Unprotected anal intercourse (UAI) – defined as less than consistent condom use for either of the two aforementioned risk factors. Sexual risk behaviors were measured at wave 5 (month 24) of data collection.

3.2.3 Statistical Analysis

All statistical analyses were conducted using SPSS Version 18. Listwise deletion was used to handle missing data. YMSM who did not participate in the waves from which data from this study was taken (waves 3 and 5) or were missing data for the outcome variable were excluded from analysis leaving a final analytic sample of 470 participants. Three dummy variables were created to look at the joint effects of each pair of psychosocial conditions: 1) alcohol misuse and illicit drug use, 2) alcohol misuse and distress, and 3) illicit drug use and distress. Dummy variables were coded as follows: “0”=presence of neither condition (referent), “1”= presence of condition A, but not condition B, “2”= presence of condition B, but not condition A, and “3”= presence of both conditions. A series of logistic regression were run with UAI, UIAI, and URAI regressed separately on each of the three dummy coded variables (9 regression models in total).

A final set of logistic regression models were run with a dummy coded IV that included all three psychosocial health outcomes in order to look at the additive effect of having all three conditions on HIV sexual risk outcomes. This categorical variable included 8 levels – one level for each possible combination of the three factors.

It has been argued that additive interaction, as opposed to multiplicative interaction, is the appropriate way to conceive of the interaction of behavioral elements and is the best way to statistically approximate the underlying causal mechanisms in studies of health behavior (Kalilani & Atashili, 2006; K. J. Rothman, 1974, 1976, 1978). Thus, three measures of additive

interaction developed by Rothman, et al. (Kenneth J. Rothman, Greenland, & Lash, 2008; K. J. Rothman, Greenland, & Walker, 1980) were used to address the question of synergism among psychosocial health conditions. The first indice, RERI, is the relative excess risk due to interaction relative to what the risk would be with no exposure (null value=0, equation 1). This value is equal to the observed OR less the expected OR. The second indice, AP, is the attributable proportion of risk due to interaction (null value=0, equation 2). Finally, S is the synergy index, which measures the risk from exposure to both conditions when there is interaction relative to exposure to both when there is no interaction (null value=1, equation 3).

$$RERI = OR_{A-b-} - OR_{A+b-} - OR_{A-b+} + OR_{A+b+} \quad \text{equation 1}$$

$$AP = (OR_{A-b-} - OR_{A+b-} - OR_{A-b+} + OR_{A+b+}) / OR_{A+b+} \quad \text{equation 2}$$

$$S = (OR_{A+b+} - OR_{A-b-}) / ((OR_{A+b-} - 1) + (OR_{A-b+} - 1)) \quad \text{equation 3}$$

All three of Rothman's measures of interaction have been widely applied to the evaluation of synergism, however, the AP has been shown to be most robust in situations when effect sizes are measured in terms of odds ratios. Regardless, all three methods were used in this study to provide a range in estimation of interaction. In more recent writing, Rothman and others have proposed methods for estimating a confidence interval around RERI, AP and S. However, in all cases very large sample sizes – substantially larger than those available in this study – are needed for these analyses to be adequately powered. For this reason, estimations of statistical significance of the interaction measures are not provided.

3.3 RESULTS

Demographic characteristics of the sample are presented in Table 3-1. The average age of the sample is just over 20 years old (range 18 to 24; SD=1.57) and the self-reported racial/ethnic identification of the sample was primarily Latino of Mexican decent (40%) followed by white (36.8%) and African American (23.2%). The majority of the sample identified as “gay” (74.9%) and indicated that they were attracted to “men only” (70.6%). Approximately half of the sample (48.3%) was “currently in school” at baseline.

Approximately one-third of the sample reported each of psychosocial health outcomes: alcohol misuse (32.6%), distress (32.1%) and illicit drug use (31.5%). A much smaller percentage of individuals endorsed the co-occurrence of only two conditions: alcohol misuse and distress with no illicit drug use, N=23 (4.9%); alcohol misuse and illicit drug use with no distress, N=47 (10.0%); and distress and illicit drug use with no alcohol misuse, N=32 (6.8%). Finally, 27 (5.7%) individuals endorsed all three psychosocial health conditions. The frequency of sexual risk outcome variables is as follows: unprotected insertive anal intercourse in the past three months, N=170 (36.2%), unprotected receptive anal intercourse in the past three months, N=152 (32.3%), any unprotected anal intercourse in the past three months (receptive or insertive), N=207 (44.0%).

Results of the two-way joint interaction logistic regression models are presented in Table 3-2. Each set of four odds ratios (including the referent) represent a single bivariate logistic model with one of the three sexual risk outcome variables regressed on a four level categorical IV that represents the main and joint effect of two psychosocial health conditions. The additive interaction of alcohol misuse and illicit drug use was associated with significantly higher odds of sexual risk taking for all sexual risk outcome variables when compared to those who had

Table 3-1. Baseline demographics of young men who have sex with men (MSM) recruited into the Healthy Young Men’s (HYM) Study, Los Angeles, CA 2005-2006.

N=470	N (%)
Age, M (SD)	20.14 (1.57)
Race, N (%)	
African American	109 (23.2)
Mexican	188 (40.0)
White	173 (36.8)
Attraction, N (%)	
Men Only	332 (70.6)
Men and Women	129 (27.4)
Women Only	5 (1.1)
Sexual Identity, N (%)	
Gay	352 (74.9)
Bi	77 (16.4)
Other	41 (8.7)
Currently in School, N (%)	
Yes	227 (48.3)
No	243 (49.1)

neither condition. Similarly, the joint effect of distress and drug use was positively and significantly associated with greater odds of sexual risk for all outcome variables. The combined effect of alcohol misuse and distress was significantly associated with HIV sexual at the level $p < .05$ only in the case of unprotected insertive anal sex. However, this joint effect trended toward significance ($p = .06$) with UAI as the outcome variable.

The results of the three-way additive model are presented in Table 3-3. For all three sexual risk outcomes, UAI, UIAI, and URAI, the three-way joint effect was associated with significantly greater odds of participation in sexual risk behaviors at $p \leq .01$ (.008, .001, and .010, respectively). With the exception of the independent effect of illicit drug use on UIAI, none of the one- or two- way levels were significantly associated with greater odds of sexual risk

outcomes compared to those with no conditions when the three-way interaction was in the model.

In order to test the hypothesis that the joint effects of syndemic conditions have a greater than additive (i.e. synergistic) effect on HIV risk taking, we computed three indices of interaction (see Table 3-4). The first index, the relative excess risk due to interaction (RERI), is the difference between the expected and observed joint odds ratios. Aside from the joint effect of alcohol misuse and drug use on UIAI, all observed joint effects were greater than additive. The AP, which measures the attributable proportion of risk due to interaction, has a null value of zero, which would indicate that the interaction of the two effects did not contribute to risk above that of the independent effects. Again, with the exception of the joint effect of alcohol misuse and drug use on UIAI, all observed joint effects were greater than additive. The final index, the synergy index (S), measures the risk from exposure to both conditions when there is interaction relative to exposure to both when there is no interaction. Thus, an S value of 3.15 – as in the case of the joint effect of depression and alcohol misuse on UAI – suggests that the risk of exposure to both conditions is just over three times greater than what would be expected if there was no synergistic interaction. Like the RERI and AP values, the S indicated a greater than additive joint effect for all interaction other than alcohol misuse and drug use on UIAI.

3.4 DISCUSSION

This study, to the best of our knowledge, is the first to examine the assertion of Syndemics Theory that co-occurring psychosocial health outcomes interact synergistically to

Table 3-2. Odds ratios from categorical logistic regression models of main and joint effects of psychosocial conditions on HIV sexual risk behaviors of young men who have sex with men (MSM) in the Healthy Young Men’s (HYM) Study, Los Angeles, CA 2005-2006.

		Odds Ratio		
Alcohol Misuse	Drug Use	URAI	UIAI	UAI
-	-	1	1	1
+	-	0.88	1.26	1.20
-	+	1.36	2.26**	1.67^
+	+	1.95*	2.38**	1.97*
Distress	Drug Use			
-	-	1	1	1
+	-	0.70	0.97	1.03
-	+	1.26	1.94*	1.56^
+	+	2.09*	2.56**	2.08*
Alcohol Misuse	Distress			
-	-	1	1	1
+	-	1.12	1.16	1.20
-	+	0.98	0.97	1.06
+	+	1.38	2.00*	1.82^

**p<.01, *p<.05, ^p<.10.

Table 3-3. Odds ratios from categorical logistic regression models of main and two- and three-way joint effects of psychosocial conditions on HIV sexual risk behaviors of young men who have sex with men (MSM) in the Healthy Young Men’s (HYM) Study, Los Angeles, CA 2005-2006.

Alcohol Misuse	Distress	Drug Use	UAI	Odds Ratio	
				UIAI	URAI
-	-	-	1	1	1
+	-	-	1.20	1.24	0.97
-	+	-	1.03	0.95	0.79
-	-	+	1.76	2.58**	1.11
+	+	-	1.23	1.25	0.49
+	-	+	1.53	1.65	1.38
-	+	+	1.60	1.83	1.52
+	+	+	3.19**	4.43**	3.03**

**p<.01, *p<.05, ^p<.10. UAI = Unprotected Anal Intercourse. UIAI = Unprotected Insertive Anal Intercourse. URAI = Unprotected Receptive Anal Intercourse.

Table 3-4. Observed and expected odds ratios of joint effects of psychosocial conditions on UAI, UIAI and URAI among young men who have sex with men (MSM) in the Healthy Young Men’s (HYM) Study, Los Angeles, CA 2005-2006.

			Odds Ratio		RERI	AP	S
			Expected	Observed			
UAI							
	Alcohol Misuse	Drug Use	1.87	1.97	0.10	0.05	1.11
	Drug Use	Depression	1.59	2.08	0.49	0.24	1.83
	Depression	Alcohol Misuse	1.26	1.82	0.56	0.31	3.15
UIAI							
	Alcohol Misuse	Drug Use	2.52	2.38	-0.14	-0.06	0.91
	Drug Use	Depression	1.91	2.56	0.65	0.25	1.71
	Depression	Alcohol Misuse	1.13	2.00	0.87	0.44	7.69
URAI							
	Alcohol Misuse	Drug Use	1.24	1.95	0.71	0.36	3.96
	Drug Use	Depression	0.96	2.09	1.13	0.54	27.25
	Depression	Alcohol Misuse	1.10	1.38	0.28	0.20	3.80

RERI = Relative Excess Risk due to Interaction ($H_0=0$), AP= Attributable Proportion due to Interaction ($H_0=0$), S = Synergy index ($H_0=1$). UAI = Unprotected Anal Intercourse. UIAI = Unprotected Insertive Anal Intercourse. URAI = Unprotected Receptive Anal Intercourse.

produce HIV risk behaviors among men who have sex with men. This study addressed this question in two ways. First, in a series of logistic regressions we found that the joint effects of nearly all two- and three-way combinations of three separate psychosocial health outcomes were significantly associated with increased odds of participation in HIV risk behaviors compared to the absence of these conditions. These results suggest that in the majority of the models run the combined effect of syndemic conditions were associated with HIV risk but the individual effect were not.

Second, to better understand the nature of these joint effects we looked at measures of synergism to determine if these joint effects were greater than we would expect them to be knowing what we know about the individual effects. Eight out of the nine tested joint effects showed a greater than additive interaction regardless of the indice used. These results provide qualitative support for the assertion that syndemic conditions interact synergistically to increase the HIV risk among MSM.

However, because of limitations inherent in tests of synergism, we are unable to say whether the joint effects of co-occurring psychosocial health outcomes are statistically greater than the presence of two independent effects. All three methods of assessing synergism developed by Rothman, et al., are limited in their power to detect statistical differences. Despite these limitations they are the best methods available to assess interaction of factors that could have clinical significance even if not shown to have statistical significance. Another limitation in evaluating the synergistic effects of syndemics on HIV risk is the inability to test for interactions beyond two exposures. Syndemics Theory states that HIV risk increases for every additional negative psychosocial health outcome endorsed by an individual. A quick look at the odds ratios for the three-way interaction model (Table 3-3) suggests that the combination of three conditions

may also be greater than additive, but there is no consensus within the literature on a rigorous way to calculate or quantify this.

3.5 IMPLICATIONS FOR PUBLIC HEALTH

Beyond the methodological and theoretical implications of testing synergism among syndemic conditions, these results provide information that could be useful in HIV prevention efforts. First, the interaction of syndemic conditions, (regardless of the lack of evidence that these interactions are statistically synergistic) have a significant impact on HIV risk taking behaviors among this sample of young MSM. For example, participants who used illicit drugs and misused alcohol were almost twice as likely to have unprotected anal intercourse – receptive and insertive – than those who had not participated in either risk behavior over the past 30 days.

Another interesting finding of this study is the effect of substances on the risk profiles of individuals who show symptoms of distress. Distressed individuals had lower odds of engaging in sexual risk behaviors than those who were not distressed. However, distressed individuals who also used substances (both illicit drugs and alcohol) had greater odds of UAI, UIAI and URAI than people who used substances alone. This suggests that the protective effect of distress is ameliorated by the presence of substances. Young MSM who are experiencing emotional distress or depression may benefit from programs that teach them coping mechanism other than self-medication or avoidance through substance use.

4.0 SYNDEMIC CONDITIONS MEDIATE THE EFFECT OF ADVERSITY ON HIV RISK BEHAVIORS

4.1 INTRODUCTION

Extensive public health research has shown that men who have sex with men (MSM), especially young MSM, engage in higher rate of health risk behaviors and experience higher rates of negative health outcomes than their heterosexual peers (Herrick, Marshal, Smith, Sucato, & Stall, 2010; Marshal, et al., 2008). An important feature of these disparities among MSM is that they are often co-occurring and operate in ways to suggest that they are mutually reinforcing, thereby creating a “syndemic” (Singer & Clair, 2003). The Centers for Disease Control and Prevention (CDC) define a syndemic as “two or more afflictions, interacting synergistically, contributing to excess burden of disease in a population” (CDC, 2009c).

Syndemic conditions, which are produced, at least in part through exposure to adverse conditions (Herrick, et al.), have been shown to be associated with HIV risk and HIV infection among MSM (K. McCarthy, et al., 2010; B. S. Mustanski, 2007; Stall, Mills, Williamson, Hart, Greenwood, Paul, Pollack, Binson, Osmond, Catania, et al., 2003). However, it is still unclear what forms of adverse experiences and contexts impact syndemic production and the how these conditions impact HIV risk among populations of MSM. The purpose of this study is to test the

theory that the presence of co-occurring psychosocial health conditions mediate the impact of adversity on HIV risk behaviors.

4.2 METHODS

To test the mediated pathway suggested by Syndemic Theory we use data collected for the Healthy Young Men's (HYM) Study, a study that utilized a mixed method approach to identify factors related to health risk behaviors among YMSM. Data was collected between February 2005 and January 2006 in Los Angeles, California. This study received approval from the Institutional Review Board of Children's Hospital Los Angeles and the University of Pittsburgh. Methods for the HYM study have been described in detail elsewhere (Kipke, Kubicek, et al., 2007; Kipke, Weiss, et al., 2007; Wong, et al., 2009), however those directly relevant to the study at hand are discussed below.

4.2.1 Sampling and Recruitment

A total of 526 young men were recruited for the HYM study. Young men were eligible to participate in the study if they were: 1) 18–24 years old; 2) self identified as gay, bisexual, or questioning and/or reported having had sex with a male partner; 3) a resident of Los Angeles County and anticipated living in Los Angeles for at least 6 months; and 4) self-identified as Caucasian, African American, or Latino of Mexican descent. Overall average retention rate was 93%.

Young MSM were recruited from public venues such as bars, cafes, parks, etc., using venue-day-time (VDT) sampling. Forty-seven venues were evaluated over a 3 month period to ensure adequate numbers of eligible young men accessed those venues, of which 36 venues were selected for recruitment. Young men who entered these venues on the day and time selected for VDT who appeared to be eligible for the study (i.e. appeared to be between the ages of 18 and 24) were asked to complete a brief eligibility screening interview offered in both English and Spanish. Eligible individuals were given a detailed description of the study. Informed consent and contact information were obtained from interested individuals. A total of 4648 individuals were screened during 203 sampling events, 1371 (30%) of whom met study eligibility criteria and 938 (68% of those eligible) expressed an interest in participating. Fifty-six percent of those who expressed an interest (N=526) participated in the study.

Participants completed a 1-1.5 hour assessment using either an audio computer assisted survey instrument (ACASI) or an on-line testing format. Participants completed this survey at baseline, and 6, 12, 18 and 24 month follow ups for a total of 5 visits. Participants received \$35 as compensation for each wave of assessment completion.

4.2.2 Measures

4.2.2.1 Socio-Demographics

Socio-demographic variables include age, race/ethnicity, educational status, parental socioeconomic status (SES), and sexual identity and attraction taken from the baseline assessment.

4.2.2.2 Predictors

Experiences of Adversity: Independent variables taken from the baseline survey summarize a range of adverse conditions and events that are both retrospective (i.e. Family violence) and current life events (i.e. stress). All individual items were dichotomized (“0”=adversity was not experienced, “1”=adversity was experienced) and averaged with higher mean scores reflecting higher levels of adversity (range 0 to 1). Composite variables were also created to encompass four different forms of adversity: social adversity (4 items), victimization (4 items), family adversity (3 items), and adverse context (3 items).

Social Adversity

1) Homophobia- 8 questions about frequency of hearing denigrating comments about homosexuals while growing up (Cronbach’s $\alpha=.79$)(R. M. Diaz, et al., 2001). Coded as “1” for participant with scores greater than 1 standard deviation above the mean. 2) Gay related discrimination– 4 questions about frequency of experiencing discrimination based on sexual orientation as an adult. Coded as “1” for participant with scores greater than 1 standard deviation above the mean. 3) Identity rejection- reaction of “person most influential in your life” to disclosure of identity on 5 point scale from very accepting to rejecting. Coded as “1” for participants who indicated the person was either “intolerant” or rejecting”. 4) Racism/ethnic discrimination- 2 questions about frequency of victimization based on one’s race or ethnicity as an adult or while growing up. Coded as “1” for participant with scores greater than 1 standard deviation above the mean.

Victimization

1) Gay related victimization- 2 questions about being physically victimized for being gay or being perceived as effeminate as an adult or while growing up. Coded as “1” for participants indicating that such an event happened. 2) Unwanted sexual experience-Participants asked “How much you wanted this to happen?” for each of 5 types of sexual acts (received or performed oral, insertive or receptive anal, or vaginal). Coded as “1” for participants indicating they experienced any of the 5 unwanted acts. 3) Sexual assault– Coded as “1” for participant who answered affirmatively to a question regarding ever having “non-consensual or forced sex”.

Family Adversity

1) Negative family influence- Coded as “1” for participants who answered affirmatively to the question “Is there someone in your family that has been a negative influence on your life?”. 2) Sexual Abuse in the home- Coded as “1” for participants who answered affirmatively to the question “When you were growing up, did your parents or any other adults in your home ever sexually abuse any of the children in your home?”. 3) Drug/alcohol problem in household growing up- Coded as “1” for participants who answered affirmatively to the question “When you were growing up, did anyone in your family have a drug or alcohol problem?”. 4) Physical abuse– Coded as “1” for participants who answered affirmatively to a question regarding being hit by a parent or guardian when growing up.

Adverse Context

1) Poverty- Coded as “1” for participants who reported being “without light or heat because of financial difficulty” while growing up? 2) Homelessness - Coded as “1” for participants who answered affirmatively to the question “Have you ever lived on the streets?”.

3) Stressful life events- 43 item scale concerning potentially stressful life events in the last 3 months ranging from family arguments to death of a loved one (Cronbach's $\alpha=.76$) (Nott, Vedhara, & Power, 1995). Coded as "1" for participants with composite score greater than 1 standard deviation above the mean.

4.2.2.3 Mediator

Syndemic

The syndemic mediator is a count variable of the number of co-occurring psychosocial health outcomes endorsed by an individual at wave 3 (month 18) of data collection (range 0 to 3, mean = .963). The component variables is comprised of: 1) Distress– current Centers for Epidemiological Studies Distress (CES-D) scale (Radloff, 1977) score of 16 or greater (Ostrow, et al., 1989); 2) Illicit substance use- use of any illicit drug (except marijuana) in the past 3 months; and 3) Alcohol misuse– binge drinking in past 30 days defined as 5 or more drinks in a single evening (McNall & Remafedi, 1999).

4.2.2.4 Outcome

Unprotected Anal Intercourse (UAI)

UAI– defined as less than consistent condom use for either insertive or receptive anal sex in the past 3 months. UAI taken from wave 5 data (month 24).

4.2.3 Statistical Analysis

All statistical analyses were conducted using SPSS Version 18. Listwise deletion was used to handle missing data. YMSM who did not participate in any of the 3 waves relevant to this study (waves 1, 3 and 5) or were missing data for the outcome variable were excluded from analysis leaving a final analytic sample of 470 participants. A series of linear regressions were run to examine the impact of the baseline adversity variables on syndemics at wave 3, while controlling for age, race and syndemics at the previous wave. Similarly, a series of logistic regressions were run to look at the impact of these adversity variables on unprotected anal intercourse at wave 5 after controlling for age, race and unprotected anal intercourse at the previous wave. Additional models were run with the adversity divided into four different categories of adversity: 1) social adversity, 2) victimization, 3) family adversity, and 4) adverse context. A final model was run with composites of all four types of adversity entered simultaneously. All models were run with tolerance statistics; all variance inflation factors ≤ 1.40 suggesting no problems with multicollinearity. Socioeconomic status (highest education level of most educated parent) was not related to the outcome variables and was therefore omitted as a covariate from all models.

The primary goal of this study was to determine if the effects of adversity on HIV risk behaviors (UAI) are mediated by syndemics. In order to assess mediation, several effects must be evaluated: a) effect of adversity on syndemics, b) effect of syndemics on UAI, controlling for adversity, c) total effect of adversity on UAI, and c') direct effect of adversity on UAI controlling for syndemics (see Figure 4-1). The indirect effect of adversity on UAI through syndemics must also be evaluated in order to test for mediation. The indirect effect for all mediation models were tested using bootstrapping as recommended by Precher and Hayes (A. Hayes, 2009; Preacher & Hayes, 2004). Bootstrapping is a nonparametric sampling procedure that is used to estimate the

indirect effect of the predictor variable on the outcome variable through the mediator variable. Bootstrapping also allows the calculation of a confidence interval around the indirect effect in order to determine statistical significance. This method of testing mediation has advantages over more popular methods (ex. Barron and Kenny Method or Sobel test) as it has greater statistical power and does not rely on the often faulty assumption of normality of the sampling distribution (A. Hayes, 2009). Rather, the sampling distribution is tested empirically using the data from the original sample (MacKinnon, Lockwood, & Williams, 2004; J. Williams & Mackinnon, 2008).

Bootstrapping analyses were conducted using a publically available SPSS macro (<http://www.comm.ohio-state.edu/ahayes/SPSS%20programs/indirect.htm>) developed by Hayes (A. Hayes, 2009). To test for mediation, a parameter estimate of the indirect effect ($a \times b$, or the product of the regression coefficient from adversity to syndemics; (a) and from syndemics to UAI controlling for adversity (b), *see* Figure 4-1) was generated by creating 5,000 random samples with replacement from the 470 participants in the original study. These 5,000 parameter estimates were also used to estimate a 95% confidence interval so that the study hypothesis could be directly tested.

4.3 RESULTS

Demographic characteristics of the sample are presented in Table 4-1. The average age of the sample is just over 20 years old (range 18 to 24; SD=1.57) and the self-reported racial/ethnic identification of the sample was primarily Latino of Mexican decent (40%) followed by white (36.8%) and African American (23.2%). The majority of the sample identified as “gay” (74.9%)

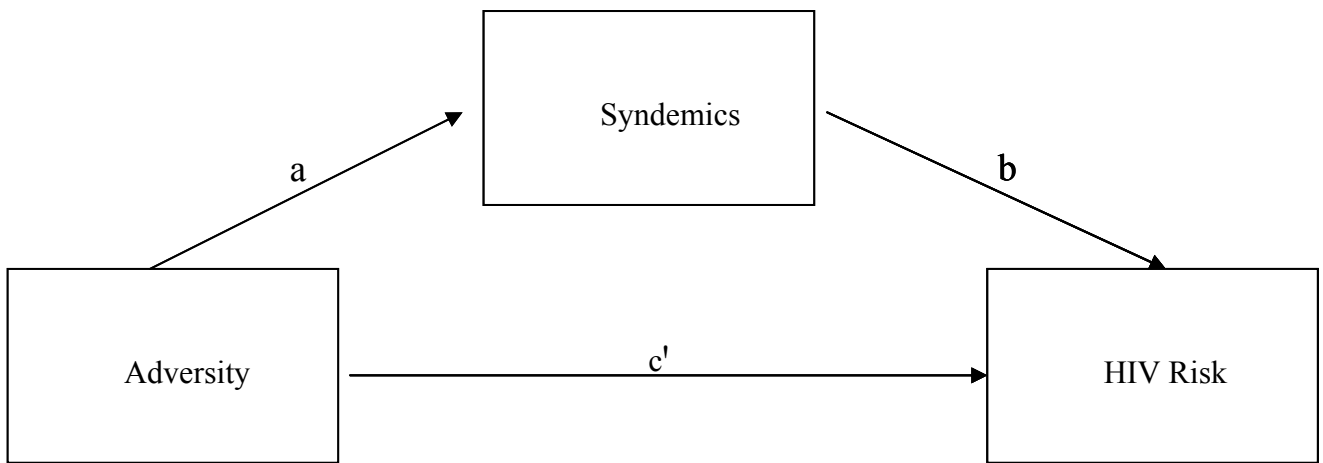
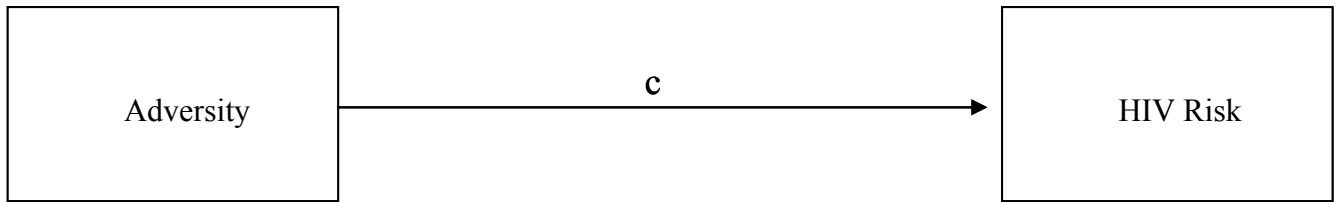


Figure 4-1. Mediated Syndemic Process

and indicated that they were attracted to “men only” (70.6%). Approximately half of the sample (48.3%) was “currently in school” at baseline.

A frequency distribution of the syndemic count variable with a range from 0 to 3 conditions is as follows: no conditions: n=174, 37.0%, 1 condition: n=167, 35.5%, 2 conditions: n=102, 21.7%, and 3 conditions: n=27, 5.7%. The mean syndemic count score was .963 (SD=.904). Approximately one-third of the sample reported each of alcohol misuse (32.6%), distress (32.1%) and illicit drug use (31.5%). Table 4-2 presents the results of associations between adversity variables and each of the three component syndemic conditions controlling for age and race.

All significant results were in the expected direction meaning experiences of adversity at wave one are associated with greater odds of negative psychosocial outcomes at wave three. Physical abuse, sexual abuse in the home, poverty, and identity rejection by the most influential person in ones’ life were not significantly related to any of the psychosocial outcomes at a $p < .05$ level.

A series of linear regressions to evaluate the effect of adverse events prior to or at wave one on the syndemic condition at wave 3 controlling for age and race are presented in Table 4-3. All of the adversity variables were positively related to syndemic production, though only gay related discrimination, gay-related victimization, sexual assault, the presence of a negative family influence, childhood poverty, and stressful life events were significantly related at a $p < .05$. Table 4-3 also presents the results of a series of logistic regressions evaluating the effect of these same adverse events on unprotected anal intercourse reported at wave 5, also controlling for age and race. Notably, the syndemic variable was positively and significantly associated with UAI with a 31% increase in odds of engaging in unprotected anal intercourse for each additional

Table 4-1. Baseline demographics of young men who have sex with men (MSM) recruited into the Healthy Young Men’s (HYM) Study, Los Angeles, CA 2005-2006.

4N=470	N (%)
Age, M (SD)	20.14 (1.57)
Race, N (%)	
African American	109 (23.2)
Mexican	188 (40.0)
White	173 (36.8)
Attraction , N (%)	
Men Only	332 (70.6)
Men and Women	129 (27.4)
Women Only	5 (1.1)
Sexual Identity, N (%)	
Gay	352 (74.9)
Bi	77 (16.4)
Other	41 (8.7)
Currently in School, N (%)	
Yes	227 (48.3)
No	243 (49.1)

syndemic condition endorsed. Racial victimization, sexual assault, the presence of sexual abuse in the home and family substance abuse were also significantly and positively related to UAI.

Results of 5 multivariate models of syndemics and UAI regressed on adversity presented in Table 4-4. All four different forms of adversity – social, victimization, family and context – significantly predicted syndemics with R^2 s ranging from .030 to .059. In each of these models only one component adversity variable predicted syndemics above and beyond all other variables in the model (parameter estimates for significant variables are presented in the table). The four different types of adversity also predicted unprotected anal intercourse with the exception of adverse context. The final model included each of the four different forms of adversity in a single model. This model significantly predicted syndemics ($R^2=.071$, $p<.001$) and UAI ($R^2=.059$, $p=.002$). In the model predicting syndemics, adverse context remained significant after

controlling for all other forms of adversity. In the model predicting UAI, social adversity remained significant after controlling for the other forms of adversity.

The primary objective of this paper was to test the hypothesis that experiences of adversity increase the likelihood that an individual engages in unprotected anal intercourse mediated by the presence of syndemics. The results of the mediational analyses that directly address this question are presented in Table 4-5. As previously demonstrated, pathway a (from adversity to syndemics) and pathway b (from syndemics to UAI) was significant for all models. Pathway c, which represents the total effect of adversity on syndemics, was significant for victimization only. The direct effect (path c') of adversity on UAI controlling for syndemics was not significant for any of the models.

The indirect effects ($a \times b$), which directly test the mediated pathway in question, were significant at $p < .05$ for victimization, adverse context, but not for social adversity or family adversity. The indirect effect for the total adversity variable was also significant indicating that adversity impacts UAI through syndemics.

Several additional models were run to address the question of whether or not the mediation results could be driven by one or two of the component conditions rather than by a syndemic. First, bootstrapped models were run with each of the three psychosocial health conditions as individual mediators controlling for race and prior existence of that condition. The estimated coefficients and the 95% confidence intervals of the indirect effects of those four models are as follows: substance use = .0011 (-.0991, .1163), distress = .0839 (-.1125, .3041), and alcohol misuse = .0551 (-.0128, .2562). As evidenced by confidence intervals overlapping

Table 4-2. Association between adversity variables and psychosocial health outcomes among young men who have sex with men (MSM) in the Healthy Young Men's (HYM) Study, controlling for age and race, Los Angeles, CA 2005-2006.

	Alcohol Misuse	Distress	Substance Use
	OR (95% CI)	OR (95% CI)	OR (95% CI)
Homophobia	1.11 (.669, 1.85)	1.81* (1.10, 2.96)	.856 (.500, 1.46)
Gay Related Discrimination	1.64* (1.00, 2.68)	1.87* (1.15, 3.06)	1.37 (.826, 2.28)
Racial Victimization	2.53* (1.25, 5.13)	.855 (.397, 1.84)	1.39 (.661, 2.93)
Gay Related Victimization	1.32 (.840, 2.07)	1.77* (1.13, 2.77)	1.15 (.723, 1.84)
Identity Rejection	1.73^ (.983, 3.04)	.983 (.545, 1.77)	1.13 (.625, 2.04)
Unwanted Sex	.868 (.560, 1.34)	1.75* (1.15, 2.66)	1.01 (.651, 1.57)
Sexual Assault	1.13 (.712, 1.78)	2.19** (1.40, 3.41)	1.71* (1.08, 2.69)
Negative Family Influence	1.55* (1.05, 2.30)	2.15** (1.44, 3.19)	1.23 (.822, 1.83)
Physical abuse (Self)	1.13 (.755, 1.68)	1.28 (.857, 1.92)	1.12 (.741, 1.68)
Sexual Abuse (In Home)	.984 (.419, 1.97)	1.61 (.831, 3.12)	1.14 (.571, 2.28)
Family Substance Use	.990 (.668, 1.47)	1.84** (1.24, 2.74)	1.08 (.719, 1.61)
Poverty	1.47 (.848, 2.56)	1.36 (.781, 2.37)	1.52 (.865, 2.68)
Lifetime Homelessness	.742 (.320, 1.72)	3.20** (1.51, 6.81)	.990 (.435, 2.25)
Stressful Life Events	1.45 (.886, 2.37)	3.54** (2.18, 5.77)	1.94** (1.18, 3.18)

^p≤.10, *p≤.05, **p≤.01. OR = Odds Ratios.

Table 4-3. Number and percent of participants endorsing each adverse event, as well as associations between adversity variables and 1) syndemic outcome and 2) unprotected anal intercourse, controlling for age and race.

N=470	N (%)	Syndemic		UAI	
		B	(95% CI)	OR	(95% CI)
Syndemic				1.31**	(1.06, 1.60)
Homophobia	81 (17.2)	.130	(-.096, .356)	1.42	(.876, 2.31)
Gay Related Discrimination	81 (17.2)	.328**	(.137, .584)	1.35	(.832, 2.12)
Racial Victimization	35 (7.4)	.255	(.042, .689)	2.78**	(1.33, 5.80)
Gay Related Victimization	107 (22.8)	.222*	(.046, .450)	1.40	(.901, 2.15)
Identity Rejection (Influential)	59 (12.6)	.149	(-.073, .441)	1.72^	(.982, 3.00)
Unwanted Sex	211 (44.9)	.100	(-.088, .290)	.797	(.528, 1.20)
Sexual Assault	133 (28.3)	.324**	(.148, .549)	1.99**	(1.28, 3.08)
Negative Family Influence	209 (44.5)	.304**	(.165, .504)	1.02	(.707, 1.48)
Physical abuse (Self)	261 (55.5)	.136	(-.071, .274)	.790	(.542, 1.15)
Sexual Abuse (In Home)	40 (8.5)	.102	(-.153, .459)	2.49**	(1.26, 4.92)
Family Substance Use	227 (48.3)	.142^	(-.024, .321)	1.62*	(1.12, 2.36)
Poverty	64 (13.6)	.248*	(.061, .559)	1.02	(.592, 1.74)
Lifetime Homelessness	31 (6.6)	.222	(-.029, .659)	1.28	(.606, 2.70)
Stressful Life Events	85 (18.1)	.523**	(.377, .808)	1.03	(.636, 1.66)

^p<.10, *p<.05, **p<.01. UAI = Unprotected Anal Intercourse.

Table 4-4. Associations of adversity groups on syndemic and UAI outcomes among young men who have sex with men (MSM) in the Healthy Young Men's (HYM) Study, controlling for age and race, Los Angeles, CA 2005-2006.

	Syndemic B (95% CI)	Adj. R ²	UAI OR (95% CI)	Nagelkerke R ²
Model 1: Social Adversity		.030, p=.004		.042, p=.029
Homophobia	<i>NS</i>		<i>NS</i>	
Gay Related Discrimination	.317** (.093, .540)		<i>NS</i>	
Identity Rejection	<i>NS</i>		<i>NS</i>	
Model 2: Victimization		.038, p=.001		.067, p=.001
Gay Related Victimization	<i>NS</i>		<i>NS</i>	
Unwanted Sex	<i>NS</i>		<i>NS</i>	
Sexual Assault	.287** (.091, .483)		1.93** (1.22, 3.05)	
Racial Victimization	<i>NS</i>		2.36* (1.11, 5.04)	
Model 3: Family Adversity		.042, p<.001		.067, p=.002
Negative Family Influence	.329** (.152, .506)		1.68* (1.13, 2.51)	
Sexual Abuse (In Home)	<i>NS</i>		2.52* (1.22, 5.19)	
Physical abuse	<i>NS</i>		.625* (.416, .940)	
Family Substance Use	<i>NS</i>		<i>NS</i>	
Model 4: Adverse Context		.059, p<.001		.018, p=.406
Poverty	<i>NS</i>		<i>NS</i>	
Lifetime Homelessness	<i>NS</i>		<i>NS</i>	
Stressful Life Events	.507** (.294, .720)		<i>NS</i>	
Model 5: Total Adversity		.071, p<.001		.059, p=.002
Social Adversity	<i>NS</i>		2.62* (1.04, 6.61)	
Victimization	<i>NS</i>		<i>NS</i>	
Family Adversity	<i>NS</i>		<i>NS</i>	
Adverse Context	.663** (.213, 1.11)		<i>NS</i>	

*p<.05, **p<.01.

Table 4-5. Summary of mediation results among young men who have sex with men (MSM) in the Healthy Young Men’s (HYM) Study, controlling for age and race and syndemics at previous wave, Los Angeles, CA 2005-2006.

	<i>a</i>	<i>b</i>	<i>c</i>	<i>c'</i>	Indirect Effect (<i>a</i> x <i>b</i>)
Social adversity	.229*	.296*	.754	.695	.068 (-.008, 213)
Victimization	.327*	.391*	.929*	.849	.095* (.001, .305)
Family adversity	.093*	.306*	.318	.392	.029 (-.039, 137)
Adverse context	.338*	.313*	-.052	-.162	.106* (.003, .310)
Total adversity	.480*	.291**	1.09	.960	.140* (.011, .390)

* $p < .05$, ** $p < .01$. All estimates provided are unstandardized betas. Path *a* = the direct effect of adversity on Syndemics. Path *b* = the direct effect of syndemics on HIV risk, controlling for adversity. Path *c* = the total effect of adversity on HIV risk. Path *c'* = the effect direct effect of adversity on HIV risk controlling for syndemics

the null value, none of the models showed significant mediation for any of the component conditions alone. To further test the relative importance of each of the psychosocial outcome, three bootstrapped mediation models were run each with one of the syndemic conditions removed. The estimated coefficients and the 95% confidence intervals of the indirect effects of the three models are as follows: substance use removed = .1855 (-.0081, .5156), distress removed = .0275 (-.0978, .2234), and alcohol misuse removed = .1243 (-.0011, .3890). None of these models remained significant when components of the syndemic condition were removed suggesting that the mediated pathway is intact only when all three conditions are in the model.

4.4 DISCUSSION

Consistent with past literature (K. McCarthy, et al., 2010; B. Mustanski, et al., 2007; Stall, Mills, Williamson, Hart, Greenwood, Paul, Pollack, Binson, Osmond, Catania, et al., 2003), these findings show an increase in odds of HIV risk for each additional psychosocial condition endorsed by an individual, suggesting that co-occurring psychosocial health conditions may be contributing to HIV risk among young MSM. These findings also suggest that experiences of adversity play a key role in both syndemic development and HIV risk taking behaviors. Further, these results indicate that syndemic conditions mediate the pathway from adversity to HIV risk taking behaviors. Thus, the impact of certain types of adversity on HIV risk may be obscured if syndemics are not taken into account. For example, the adverse context variable, that included poverty, lifetime homelessness and stressful life events, did not, by itself, have a significant impact on unprotected anal intercourse. However, when taking syndemics into account (defined as the co-occurrence of psychological distress, illicit substance use, and alcohol misuse), the indirect impact of this type of adversity significantly predicted UAI with a higher estimated coefficient than any of the other types of adversity alone.

Despite these findings, there is reason to interpret these results with great caution. Syndemics Theory suggests that negative psychosocial health conditions have a tendency to intertwine and snowball making the impact of the syndemic condition more deleterious in terms of HIV outcomes than any single condition (K. McCarthy, et al., 2010; B. Mustanski, et al., 2007; Stall, Mills, Williamson, Hart, Greenwood, Paul, Pollack, Binson, Osmond, Catania, et al., 2003). However, to date there is little information above and beyond the preliminary work here (*see* chapter 3) about how this process works. It is possible that certain conditions have a much greater negative impact than others, or that a certain pairing or set of conditions is necessary for

there to truly be a syndemic. Additional analyses were conducted to rule out these possibilities, the results of which suggest no single condition is driving the mediated effect of adversity on UAI. Most importantly, the data used to conduct these analyses most likely does not capture the true complexity of syndemics, how they are produced or how they play out to impact HIV.

Above and beyond the inherent complexities of defining and testing syndemics, there are other limitations that should be noted. First, the data used for this study are based on self report therefore may be subject to recall bias or social desirability factors. This may cause participants to underreport illicit or risky behaviors. However, sensitive information was collected using an ACASI program which has been shown to reduce self report bias (Kissinger, et al., 1999; Morrison-Beedy, Carey, & Tu, 2006). Also, inclusion in this study required retention of an individual over two years. It may be that those who failed to return to subsequent visit are the highest risk individuals that are most likely to be wrapped up in syndemic processes; thus, because those individuals are not included in this analysis the effect sizes may be underestimated.

Additionally, the sampling method used to identify potential participants, VTD, is not a true probability sample and may therefore impact generalizability to the wider young MSM population. However, the rigorous use of a quasi-probability sample such as VTD has been shown to yield far more representative samples than snowballing or other convenience approaches (Muhib, et al., 2001; A. Stueve, L.N. O'Donnell, R. Duran, A. San Doval, & J. Blome, 2001). Finally, Syndemics Theory, as it applies to MSM, has been used to address the relationship between co-occurring psychosocial conditions and HIV seroprevalence (Stall, Mills, Williamson, Hart, Greenwood, Paul, Pollack, Binson, Osmond, Catania, et al., 2003), or recently, seroincidence (McCarthy, et al., 2010). Because this study did not include the collection of

biological specimens, we relied on unprotected sex as a proxy for seropositivity. Although using risk behaviors as an outcome of syndemics is not unprecedented (B. Mustanski, et al., 2007), it may not be the ideal way to model syndemic processes. However, unprotected anal intercourse has been shown repeatedly to be an antecedent to HIV infections and therefore may be the best predictor of seropositivity, or the potential for future seropositivity, available for this and other behavioral studies.

Despite those limitations, this study has several notable strengths. First, this study is the first, to the best of our knowledge, to test the mediated pathway proposed by Syndemics Theory and the Theory of Syndemic Production (Stall, et al., 2007). The relationship between early life adverse experiences and syndemic conditions has been tested previously with similar results (Herrick, et al.), however, that analysis relied on retrospective data collected cross-sectionally and did not look at syndemics as a mediator of HIV sexual risk behaviors. Other strengths of this study are the racial and ethnic diversity of the sample, the longitudinal design with high retention levels, and the use of a rigorous, quasi-probability sampling design.

4.4.1 Implications

The results of this study have important implications for the prevention of HIV and other health disparities among young MSM. Primarily, experiences of adversity may impact HIV risk taking behaviors through syndemics as well as directly. Thus, previous research that has shown null relationships between adversity variables and HIV risk behaviors may be missing an important part of the picture. There were situations in this study where the relationship between the independent variable and HIV risk behaviors (path c) were non-significant. However, analysis of the indirect effect shows a significant relationship between these two variables. To illustrate this

point take, for example, the relationship between adverse context and UAI. The direct relationship between these variables is not statistically significant. This is because the direct effect of context adversity on UAI is the sum of many different pathways of influence, such as personality traits, availability of condoms, and innumerable other factors that are not included in the model. If several of these factors influence the relationship in opposite ways they may cancel out the direct effect (Preacher & Hayes, 2004). However, when alternative pathways are taken into account, such as the presence of a syndemic, the relationship between context adversity and UAI becomes significant. Thus, previous studies that have found that there is no relationship between adversity variables and UAI (M. E. Newcomb & Mustanski, 2009), or those relationships that gone unpublished due to null results, may be prematurely taking focus away from factors important to HIV prevention for YMSM.

The primary value in studying syndemic processes among young MSM is not only to understand how syndemics are formed and how they impact HIV risk, but also to identify innovative approaches to interventions that will positively impact the health of young MSM. This test of the mediating effects of syndemics suggests several avenues by which innovative health promotion interventions among MSM might be developed. First, it is important to note the varied and serious effects of adversity experienced by young people. While all the forms of adversity evaluated in this study are negative in and of themselves, the sequelae of these events may be much more dire. Results of this study suggest that abatement of adversity may impact the long term health of MSM. Programs that target homophobia or gay-related discrimination at the level of the school or community, or national policy decisions that impact homelessness and poverty, may have a positive impact on downstream health outcomes.

The role of syndemics in mediating the pathway to HIV risk behaviors suggests a need to target co-occurring health outcomes in HIV prevention efforts. However, the results also suggest that removing distress, substance use, or alcohol misuse from the model mitigates the mediating effect of syndemics. This may imply that impacting any one of these conditions could have a positive impact on syndemic processes and HIV risk behavior. However, there is still much to be learned about how syndemics develop and play out to impact the health of MSM, therefore further research is needed before interventions can be developed with confidence that will interrupt syndemic processes. For instance, it is important to note that less than 10% of the sample reported none of the forms of adversity evaluated in this study, yet over a third of the sample (37.0%) reported having none of the syndemic conditions. This suggests that many of the youth who experienced adversity, even those who experienced high levels of adversity, avoided distress, substance use, and alcohol misuse. Further, of those who endorsed two or more psychosocial health conditions, only half (52.6%) reported unprotected anal intercourse. These results point to unmistakable resilience among this group of young men. Further research is needed to understand how youth who experience adversity avoid developing syndemics, and how those youth who develop syndemics avoid participation in HIV risk behaviors. Only when these processes are better understood are we likely to see the desperately needed reductions in health disparities among young men who have sex with men.

5.0 MODERATORS OF SYNDEMIC PROCESSES AMONG YOUNG MEN WHO HAVE SEX WITH MEN (MSM)

5.1 INTRODUCTION

Immediately following the first reports of the existence of HIV, advocates for MSM health turned their efforts toward prevention. While impressive advancements have been achieved over these past three decades, HIV among men who have sex with men (MSM) is far from eradicated. Despite over two decades of prevention efforts aimed at men who have sex with men, the rates of HIV infection continue to rise. A 2008 report released by the Centers for Disease Control and Prevention (CDC) showed that MSM accounted for 46% of all new HIV/AIDS infections and HIV infection rates among young MSM increased at a rate of approximately 12% each year between 2001 and 2006 (CDC, 2008c). This report further noted that men who have sex with men were the only risk group who experienced an increase in infection rates during this time. In fact, according to analysis conducted by Stall and colleagues, even if HIV incidence among MSM remains at the current level, by the time a cohort of young MSM (18 years old) reach the age of 40, 41% of them will be HIV positive (Stall, et al., 2009). Thus, the trends that have been seen in rates of HIV among MSM show no indication of abating.

These surveillance estimates suggest that current prevention efforts are not as successful as they need be. A set of meta-analyses show that current HIV behavioral prevention

interventions targeting MSM reduce HIV risk taking behaviors around 30% (Herbst, et al., 2005; Johnson, Hedges, & Diaz, 2003). These studies also found that intervention effects are rarely sustainable after active participation in the intervention has ended. Both increasing infection rates and the low success rate of behavioral interventions suggest a need to examine alternative approaches to HIV prevention among MSM.

Currently the design of HIV behavioral prevention interventions are informed by the lessons learned from the relatively small percentage of MSM who exhibit qualities of extreme risk such as methamphetamine use, engagement in sex work or who are experiencing a syndemic (defined as the interaction of co-occurring psychosocial health conditions). Interventions are therefore designed to help MSM avoid these risk behaviors despite the fact that these behaviors tend to exist in a minority of men. It is possible that intervention design that focus on the strength and resilience exhibited by the majority of MSM will be more effective than those that focus on deficits. For example, experiences of adversity have been shown to be associated with subsequent syndemic development, which is in turn associated with increased HIV risk (B. Mustanski, et al., 2007), HIV seroprevalence (Stall, Mills, Williamson, Hart, Greenwood, Paul, Pollack, Binson, Osmond, & Catania, 2003), HIV seroincidence (McCarthy, et al., 2010), and has been hypothesized to be the driving force behind HIV infection rates among MSM. However, the negative effects of adversity are not experienced universally.

This study looks upstream of syndemic development to identify factors that may have assisted a group of young men who have sex with men in avoiding both the development of syndemics and the resulting HIV risk behaviors despite experiencing adversity. Specifically, this study attempts to test the theory that intervention design could be improved by a focus on strengths and protective factors by addressing three specific questions: 1) Are there factors that

are directly protective against the development of syndemic conditions and participation in HIV risk behaviors (type I protective factors)?; 2) Do protective factors moderate the effect of adversity on syndemic development (type II protective factors)?; and 3) Do protective factors moderate the effect of syndemics on HIV risk taking behaviors (type II protective factors)?

5.2 METHODS

To test the role of protective factors in avoiding the deleterious effects of adversity on negative health outcomes among youth we use data collected for the Healthy Young Men's (HYM) Study, a study that utilized a mixed method approach to identify factors related to health risk behaviors among YMSM. Data was collected between February 2005 and January 2006 in Los Angeles, California. This study received approval from the Institutional Review Board of Children's Hospital Los Angeles and the University of Pittsburgh. Methods for the HYM study have been described in detail elsewhere (Kipke, Kubicek, et al., 2007; Kipke, Weiss, et al., 2007; Wong, et al., 2009), however those directly relevant to the study at hand are discussed below.

5.2.1 Sampling and Recruitment

A total of 526 young men were recruited for the HYM study. Young men were eligible to participate in the study if they were: 1) 18–24 years old; 2) self identified as gay, bisexual, or questioning and/or reported having had sex with a male partner; 3) a resident of Los Angeles County and anticipated living in Los Angeles for at least 6 months; and 4) self-identified as

Caucasian, African American, or Latino of Mexican descent. Overall average retention rate was 93%.

Young MSM were recruited from public venues such as bars, cafes, parks, etc., using venue-day-time (VDT) sampling. Forty-seven venues were evaluated over a 3 month period to ensure adequate numbers of eligible young men accessed those venues, of which 36 venues were selected for recruitment. Young men who entered these venues on the day and time selected for VDT who appeared to be eligible for the study (i.e. appeared to be between the ages of 18 and 24) were asked to complete a brief eligibility screening interview offered in both English and Spanish. Eligible individuals were given a detailed description of the study. Informed consent and contact information were obtained from interested individuals. A total of 4648 individuals were screened during 203 sampling events, 1371 (30%) of whom met study eligibility criteria and 938 (68% of those eligible) expressed an interest in participating. Fifty-six percent of those who expressed an interest (N=526) participated in the study.

Participants completed a 1-1.5 hour assessment using either an audio computer assisted survey instrument (ACASI) or an on-line testing format. Participants completed this survey at baseline, and 6, 12, 18 and 24 month follow ups for a total of 5 visits. Participants received \$35 as compensation for each wave of assessment completion.

5.2.2 Measures

5.2.2.1 Socio-Demographics

Socio-demographic variables include age, race/ethnicity, educational status, parental socioeconomic status (SES) and sexual identity and attraction taken from the baseline assessment.

5.2.2.2 Distal Predictors

Experiences of Adversity

The adversity variable is a count of 14 different forms of adversity (range 0 to 14) taken from the baseline data summarizing a range of adverse conditions and events that are both retrospective (i.e. family violence) and current life events (i.e. stress). Prior to computing the overall composite adversity variable all 14 individual items were dichotomized (“0”=adversity was not experienced, “1”=adversity was experienced) and averaged with higher mean scores reflecting higher levels of adversity (range 0 to 1).

Social Adversity

1) Homophobia- 8 questions about frequency of hearing denigrating comments about homosexuals while growing up (Cronbach’s $\alpha=.79$)(R. M. Diaz, et al., 2001). Coded as “1” for participant with scores greater than 1 standard deviation above the mean. 2) Gay related discrimination– 4 questions about frequency of experiencing discrimination based on sexual orientation as an adult. Coded as “1” for participant with scores greater than 1 standard deviation above the mean. 3) Identity rejection- reaction of “person most influential in your life” to disclosure of identity on 5 point scale from very accepting to rejecting. Coded as “1” for participants who indicated the person was either “intolerant” or rejecting”. 4) Racism/ethnic discrimination- 2 questions about frequency of victimization based on one’s race or ethnicity as an adult or while growing up. Coded as “1” for participant with scores greater than 1 standard deviation above the mean.

Victimization

5) Gay related victimization- 2 questions about being physically victimized for being gay or being perceived as effeminate as an adult or while growing up. Coded as “1” for participants indicating that such an event happened. 6) Unwanted sexual experience- Participants asked “How much you wanted this to happen?” for each of 5 types of sexual acts (received and gave oral, insertive and receptive anal, and vaginal). Coded as “1” for participants indicating they experienced any of the 5 unwanted acts. 7) Sexual assault– Coded as “1” for participant who answered affirmatively to a question regarding ever having “non-consensual or forced sex”.

Family Adversity

8) Negative family influence- Coded as “1” for participant who answered affirmatively to the question “Is there someone in your family that has been a negative influence on your life?”. 9) Sexual Abuse in the home- Coded as “1” for participant who answered affirmatively to the question “When you were growing up, did your parents or any other adults in your home ever sexually abuse any of the children in your home?”. 10) Drug/alcohol problem in household growing up- Coded as “1” for participant who answered affirmatively to the question “When you were growing up, did anyone in your family have a drug or alcohol problem?”. 11) Physical abuse– Coded as “1” for participant who answered affirmatively to a question regarding being hit by a parent or guardian when growing up.

Adverse Context

12) Poverty- Coded as “1” for participant who reported being “without light or heat because of financial difficulty” while growing up? 13) Homelessness- Coded as “1” for participant who answered affirmatively to the question “Have you ever lived on the streets?”.

14) Stressful life events- 43 item scale concerning potentially stressful life events in the last 3 months ranging from family arguments to death of a loved one (Cronbach's $\alpha=.76$)(Nott, et al., 1995). Coded as "1" for participant with scores composite score greater than 1 standard deviation above the mean.

5.2.2.3 Negative Health Outcomes

Syndemic

The syndemic mediator is a count variable of three co-occurring psychosocial health outcomes endorsed by an individual at wave 3 (month 18) of data collection (range 0 to 3, mean = .962). The syndemic variable is comprised of 1) Distress– current Centers for Epidemiological Studies Distress (CES-D) scale (Radloff, 1977) score of 16 or greater (Ostrow, et al., 1989). 2) Illicit substance use- use of any illicit drug (except marijuana) in the past 3 months, and 3) Alcohol misuse– binge drinking in past 30 days defined as 5 or more drinks in a single evening (McNall & Remafedi, 1999).

Unprotected Anal Intercourse (UAI)

UAI– defined as less than consistent condom use for either insertive or receptive anal sex in the past 3 months. UAI taken from wave 5 data (month 24).

5.2.2.4 Protective factors

Social Support

1) Family Connectedness– 12 items from the Family Cohesion and Adaptability Scale describing perceptions of interactions between family members (Cronbach's $\alpha=.87$) (Olson,

Sprenkle, & Russell, 1979). 2) Family Support and 3) Friend Support– subscales from the Multidimensional Scales of Perceived Social Support measuring emotional support specific to friends and family (Zimet, Dahlem, Zimet, & Farley, 1988).

Community

4) Community Connectedness- single item asking “how much do you feel part of the community you live in now” with response option from “not at all” to “a lot”. 5) Gay Community Connection- single item asking “how much do you feel part of the gay community” with response option from “not at all” to “a lot”. Both community connection variables were dichotomized “a lot”=1 and all other responses = 0.

Skills

6) Protective Condom Strategies– 9 item scale regarding intentions to use condoms in varied situation including “If my partner told me they were HIV negative...” and “If I were really high or drunk...”. Response options range from “would not use a condom” to “definitely use a condom” (Cronbach’s $\alpha=.88$). 7) Proactive Coping– the 14 item proactive subscale of the Proactive Coping Index (Cronbach’s $\alpha=.78$). (Greenglass, Schwarzer, & Taubert, 1999).

Norms and Beliefs

8) Perceived Social Norms– participants were asked what percentage “Of men who have sex with men today who are your age and ethnicity...” would believe it is ok to engage in certain risk behaviors including not using condoms when in love or becoming infected with HIV. Percentages were averaged across all 6 items (Cronbach’s $\alpha=.78$). 9) Peer Norms– 5 questions regarding how many of their 5 closest friends use illicit drugs in varied situations (Cronbach’s $\alpha=.77$). 10) Health as a Value– single item stating “I would rather have fun than be healthy”

with answer options from “completely true” to “not true”. 11) Pride– 19 item scale covering perceptions of homosexuality adapted from Ross and Rosser (Cronbach’s $\alpha=.80$) (M.W. Ross & Rosser, 1996). 12) Social Network Condom Norms– Single question asking respondents to “think about their five closest friends” and say “how many of them would think it was okay not to use a condom at least some of the time?” Response options were on a four point Likert from “all of them” to “none of them”. 13) Outness- 6 questions regarding how many of the individuals in your life are aware of your sexual identity from “all” to “none”.

5.2.3 Statistical Analysis

All statistical analyses were conducted using SPSS Version 18. Listwise deletion was used to handle missing data. Young MSM who did not participate in any of the 5 waves relevant to this study or were missing data for the outcome variable were excluded from analysis leaving a final analytic sample of 450 participants. A series of linear regressions were run to examine the association between protective factors at wave 2 with syndemic outcomes at wave 3, and the association of protective factors at wave 4 with unprotected anal intercourse at wave 5, while controlling for age and race.

To test for moderation of the protective factors, multivariate regression analyses were conducted predicting syndemic development at wave 3 by adversity at wave 1, protective factors at wave 2 and the interaction of the two (i.e. protective factors X adversity) (model 1); and syndemics at wave 3, protective factors at wave 4 and the interaction of the two (i.e. protective factors X syndemics) to predict unprotected anal intercourse at wave 5 (model 2) (see Figure 5-1). Both models were run controlling for age and race and all independent variables, including interaction terms, were centered to aid in interpretation and to reduce multicollinearity.

Relationships in which the interaction term was significant at $p \leq .05$ were considered moderators and these relationships were further probed to explore the nature of the moderation.

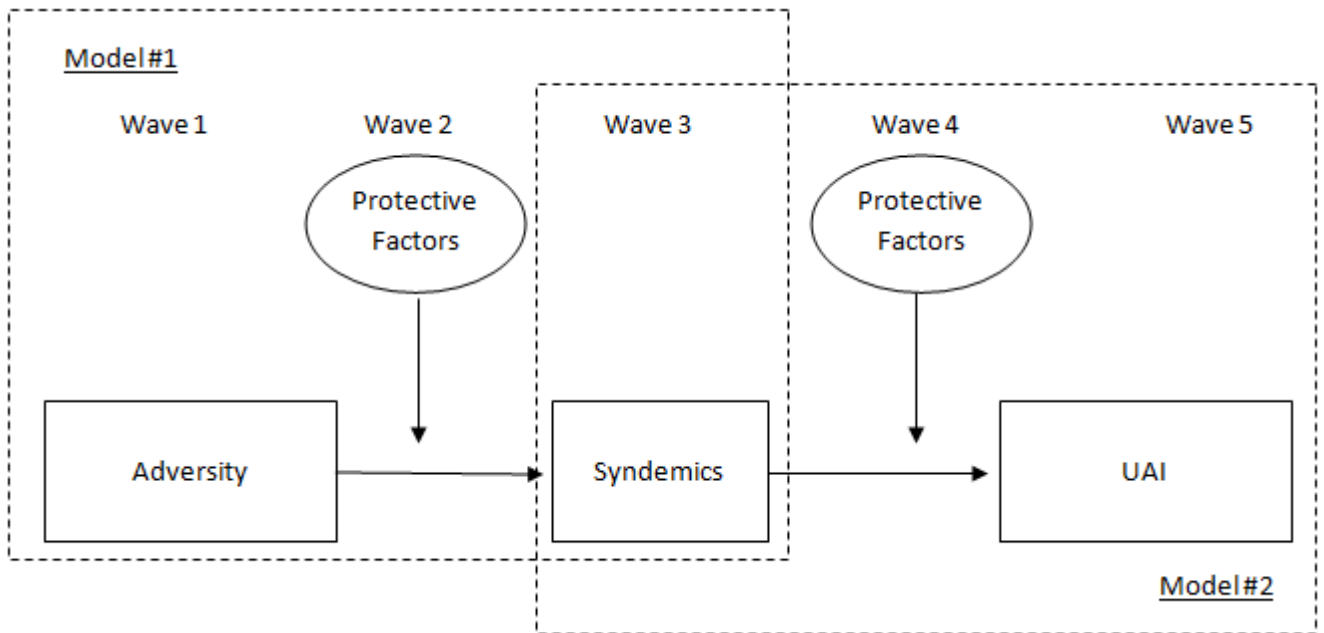


Figure 5-1. Protective factors as moderators of syndemic processes.

In order to probe the moderators we used MODPROBE, which is a computational aide developed by Hayes and Matthes used for probing interactions in SPSS (A. F. Hayes & Matthes, 2009). The model, in addition to estimating moderation effects, produces tests of the conditional effect of the independent variable on the dependent variable a various levels of the moderator. For continuous moderator variables conditional effects were estimated at the mean, one standard deviation above the mean, and one below the mean. For dichotomous moderator variables conditional effects were estimated at both values of the centered variable.

5.3 RESULTS

As shown in Table 5-1, the mean age of the study sample was approximately 20 years old. The majority of participants identified their race/ethnicity as Mexican, followed by white and African American. More than three quarters of the sample identified as “gay” with the remainder identifying as either bisexual or some other sexual minority identity.

Table 5-1. Baseline demographics of study participants in the Healthy Young Men’s (HYM) Study, Los Angeles, CA 2005-2006.

N=450	
Age, M (SD)	20.1 (1.57)
Race, N (%)	
African American	99 (22.0)
Mexican	181 (40.2)
White	170 (37.8)
Attraction , N (%)	
Men Only	319 (70.5)
Men and Women	123 (27.7)
Women Only	4 (0.9)
Sexual Identity, N (%)	
Gay	345 (76.6)
Bi	71 (15.9)
Other	34 (7.4)
Currently in School, N (%)	
Yes	208 (45.6)
No	242 (54.4)

Table 5-2. Association of protective factors at wave two and syndemics at wave three (model 1) and protective factors at wave 4 and unprotected anal intercourse at wave 5 (model 2), among young men who have sex with men (MSM) in the Healthy Young Men's (HYM) Study, controlling for age and race, Los Angeles, CA 2005-2006.

N=450	Model 1: Syndemics B	Model 2: UAI OR
Adversity	1.36** (.770, 1.75)	--
Syndemics	--	1.34** (1.08, 1.65)
Social Support		
Family Connectedness	-.106* (-.223, .010)	1.14 (.877, 1.48)
Family Support	-.119* (-.240, .003)	1.06 (.805, 1.14)
Friend Support	.183* (.030, .337)	1.56 (.734, 1.52)
Community		
Community Connectedness	-.005 (-.191, .202)	1.32 (.882, 1.98)
Gay Community Connectedness	.144 (-.041, .330)	.977 (.649, 1.47)
Skills		
Protective Condom Strategies	-.422** (-.616, -.228)	.213** (.135, .337)
Proactive Coping	-.281* (-.504, -.059)	.784 (.516, 1.36)
Norms/Beliefs		
Perceived Social Norms	.002 (-.003, .007)	.992 (.982, 1.00)
Peer Norms	-.529** (-.682, -.377)	.792 (.557, 1.14)
Value Health	-.201** (-.290, -.112)	.813* (.662, .998)
Pride	.085 (-.157, .327)	1.27 (.718, 2.24)
Social Network Condom Norms	-.223** (-.334, -.113)	.663** (.526, .836)
Outness	.119* (.001, .237)	1.25 (.951, 1.65)

**p<.01, *p<.05, ^p<.10. UAI = Unprotected Anal Intercourse.

Table 5-2 displays the associations between protective factors and the outcome variables. In model 1 (syndemics at wave 3 regressed on protective factors at wave 2), both Family Connectedness and Family Support were negatively and significantly associated with syndemics, whereas friend support was positively and significantly associated with syndemics. Neither of the community connection variables were associated with syndemics at $p \leq .05$. Both of the skill based protective factors, Protective Condom Strategies and Proactive Coping, were negatively associated with syndemic conditions at $p < .001$ indicating that higher levels of these skills were associated with a lower number of syndemic conditions. Of the norms and beliefs protective factors, Peer norms, Valuing Health, and Social Network Condom Norms were negatively and significantly associated with syndemics indicating that higher levels of these protective factors were associated with a lower number of syndemic conditions. However, Outness was positively associated with syndemics at $p < .05$ indicating that the more an individual's friends and family were aware of their sexual-minority identity the higher the count on the syndemic variable.

Results for the association between protective factors at wave 4 and unprotected anal intercourse at wave 5 are presented in the right hand column of Table 5-2. Protective Condom Strategies, Valuing Health and Social Network Condom Norms were the only protective factors significantly associated with unprotected anal intercourse and all significant associations were in the expected direction.

The results that address the question of whether or not protective factors moderate the pathway from adversity to syndemics, or from syndemics to unprotected anal intercourse are presented in Table 5-3. Relationships where the interaction term was significant at $p \leq .05$ were considered moderators and these relationships were further probed to explore the nature of the moderation. Protective factors that moderate the pathway from adversity to syndemics are 1)

friend support, 2) community connection, 3) peer norms, and 4) health as a value. Social network condom norms was the only protective factor that was found to moderate the pathway from syndemics to UAI. The conditional effects of each significant moderator for both model one and two are depicted in Figures 5-2 through 5-6, and the corresponding values of those effects are presented in Tables 5-4 through 5-9.

Experiences of adversity are significantly associated with syndemic production at all levels of friend support, valuing health and peer norms with the impact of adversity on syndemics increasing at higher levels of each protective factor. However, at average levels of adversity, high levels of peer norms and valuing health seem to be protective against syndemics. For individuals with high community connection or high gay community connection adversity was not significantly related to syndemics, but at low levels of both variables adversity was significantly associated with syndemic conditions. Only social network condom norms was found to moderate the effect of syndemics on unprotected anal intercourse. At low levels of the moderator, syndemics were unrelated to unprotected anal intercourse. At both moderate and high levels syndemics were significantly and positively related to UAI.

5.4 DISCUSSION

Findings revealed that several of the protective factors examined were associated with lower levels of syndemic conditions among study participants. Though this is the first study to our knowledge to look at the relationship between protective factors and syndemic outcomes, previous studies have looked at the relationships between these factors and other negative health

Table 5-3. Multivariate regression analyses using adversity at wave one, protective factors at wave two and protective factors X adversity interactions to predict syndemic development at wave three (model 1); and syndemics at wave three, protective factors at wave four and protective factors X syndemics to predict UAI at wave five (model 2)

	Model 1 (adversity ->syndemics) B	Model 2 (syndemics->UAI) OR
Social Support		
Family Connectedness	.013	1.21
interaction	.002	.977
Family Support	-.033	1.13
interaction	-.004	.874
Friend Support	.211**	1.03
interaction	1.06*	1.02
Community		
Community Connectedness	-.002	1.29
interaction	-1.38*	.975
Gay Community Connectedness	.117	.961
interaction	-1.01^	1.01
Skills		
Protective Condom Strategies	-.384**	.210**
interaction	.066	1.55
Proactive Coping	-.223*	.958
interaction	-.223	.742
Norms/Beliefs		
Perceived Social Norms	.003	.992
interaction	.001	1.01
Peer Norms	-.507**	.895
interaction	.916*	1.27
Value Health	-.202**	.880
interaction	.544*	.862
Pride	.187	1.26
interaction	-.912	1.02
Social Network Condom Norms	-.219**	.646**
interaction	.217	1.46**
Outness	.103^	1.21
interaction	-.317	1.07

**p<.01, *p<.05, ^p<.10.

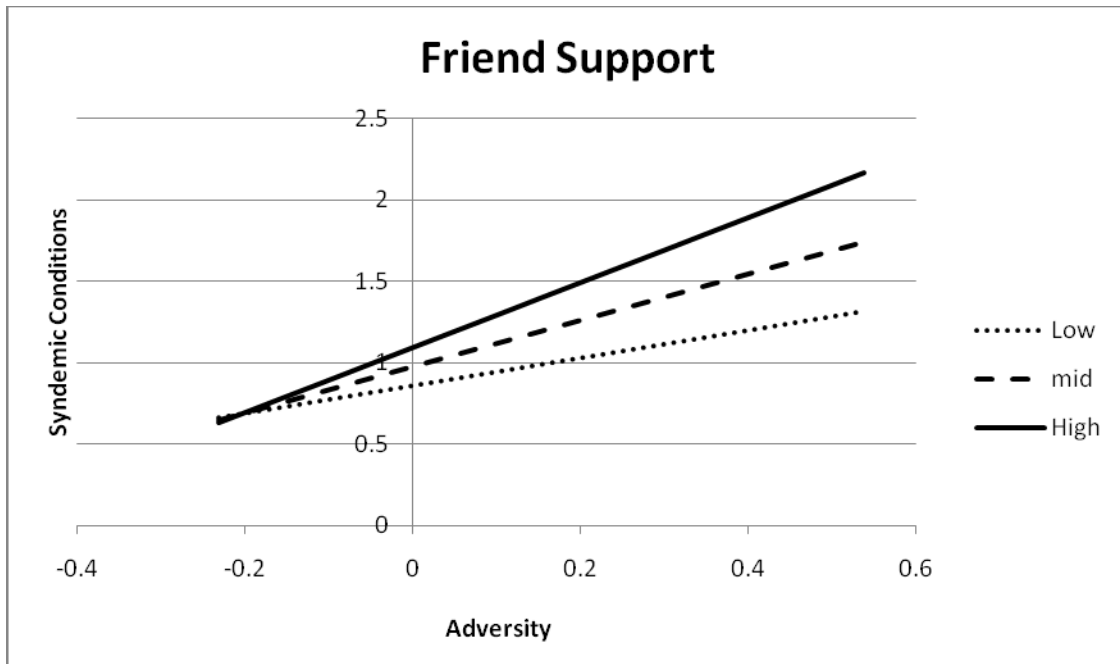


Figure 5-2. Moderating effect of friend support on the relationship between adversity and syndemics among young men who have sex with men (MSM) in the Healthy Young Men’s (HYM) Study, controlling for age and race, Los Angeles, CA 2005-2006.

Table 5-4. Conditional effects of adversity on syndemics at low, medium and high levels of friend support among young men who have sex with men (MSM) in the Healthy Young Men’s (HYM) Study, controlling for age and race, Los Angeles, CA 2005-2006.

	B (95%CI)	SE	t	p
Low	.845 (.200, 1.49)	.328	2.58	.010
Mid	1.42 (.934, 1.91)	.249	5.72	<.001
High	2.00 (1.28, 2.72)	.365	5.48	<.001

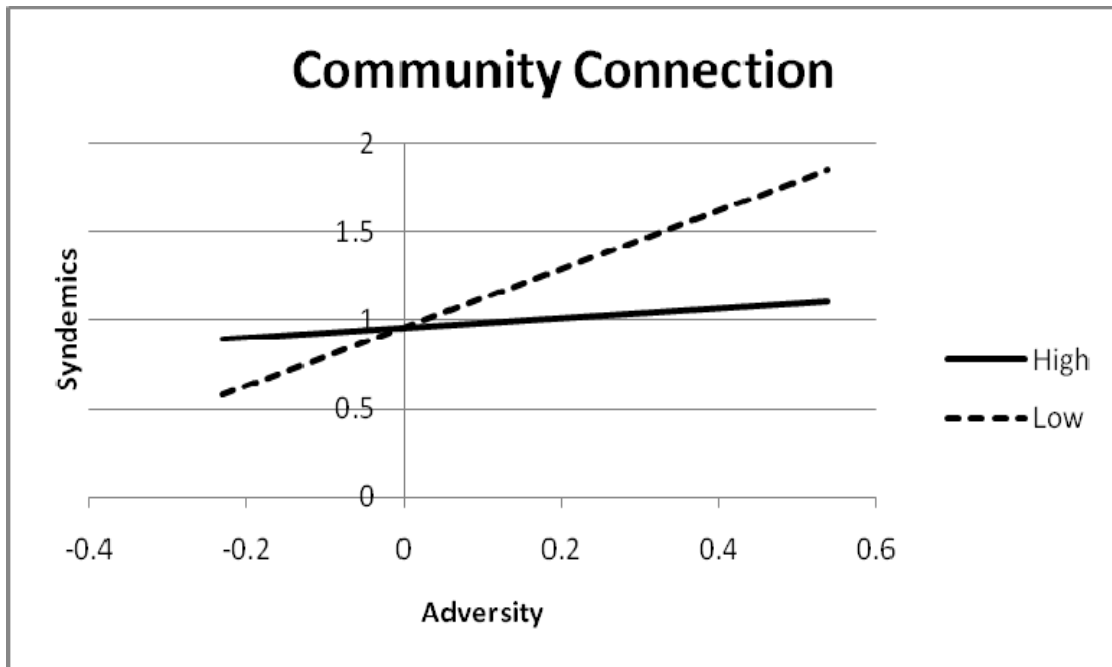


Figure 5-3. Moderating effect of community connection the relationship between adversity and syndemics among young men who have sex with men (MSM) in the Healthy Young Men’s (HYM) Study, controlling for age and race, Los Angeles, CA 2005-2006.

Table 5-5. Conditional effects of adversity on syndemics at low and high levels of community connection among young men who have sex with men (MSM) in the Healthy Young Men’s (HYM) Study, controlling for age and race, Los Angeles, CA 2005-2006.

	B (95%CI)	SE	t	p
Low	1.65 (1.07, 2.23)	.296	5.57	<.001
High	.268(-.660, 1.19)	.471	.565	.573

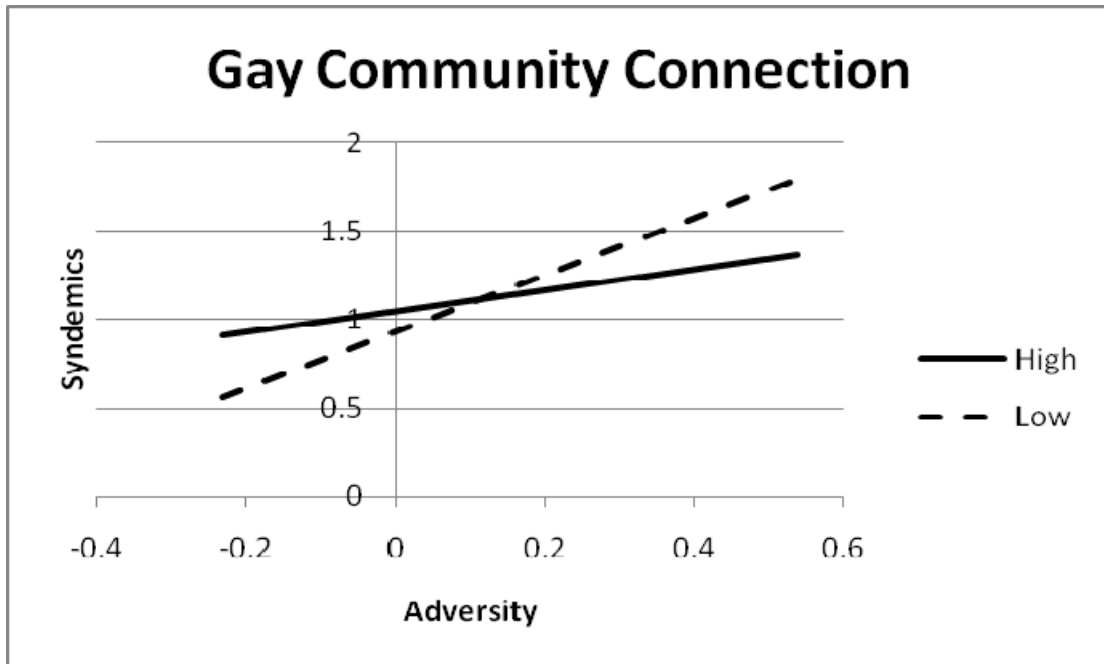


Figure 5-4. . Moderating effect of gay community connection on the relationship between adversity and syndemics among young men who have sex with men (MSM) in the Healthy Young Men’s (HYM) Study, controlling for age and race, Los Angeles, CA 2005-2006.

Table 5-6. Conditional effects of adversity on syndemics at low and high levels of Gay community connection among young men who have sex with men (MSM) in the Healthy Young Men’s (HYM) Study, controlling for age and race, Los Angeles, CA 2005-2006.

	B (95%CI)	SE	t	p
Low	1.60 (.978, 2.23)	.318	5.04	<.001
High	.590 (-.216, 1.40)	.410	1.44	.151

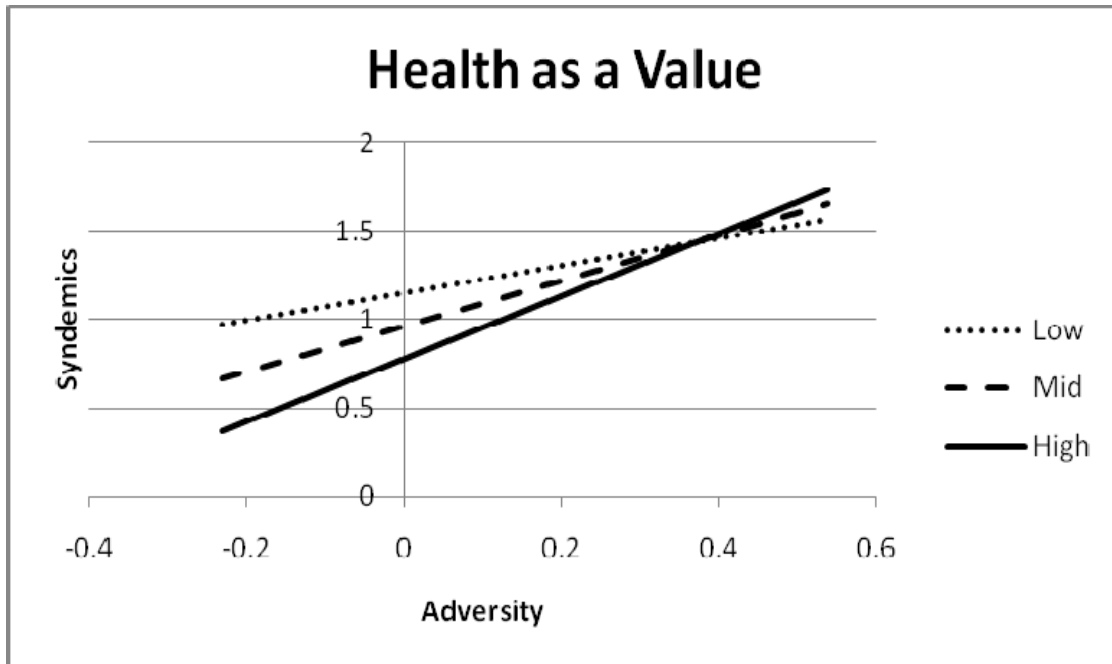


Figure 5-5. Moderating effect of health as a value on the relationship between adversity and syndemics among young men who have sex with men (MSM) in the Healthy Young Men’s (HYM) Study, controlling for age and race, Los Angeles, CA 2005-2006.

Table 5-7. Conditional effects of adversity on syndemics at low, medium and high levels of health as a value among young men who have sex with men (MSM) in the Healthy Young Men’s (HYM) Study, controlling for age and race, Los Angeles, CA 2005-2006.

	B (95%CI)	SE	t	p
Low	.771 (.115, 1.43)	.334	2.31	.021
Mid	1.28 (.798, 1.75)	.243	5.25	<.001
High	1.12 (1.32, 2.44)	.338	5.27	<.001

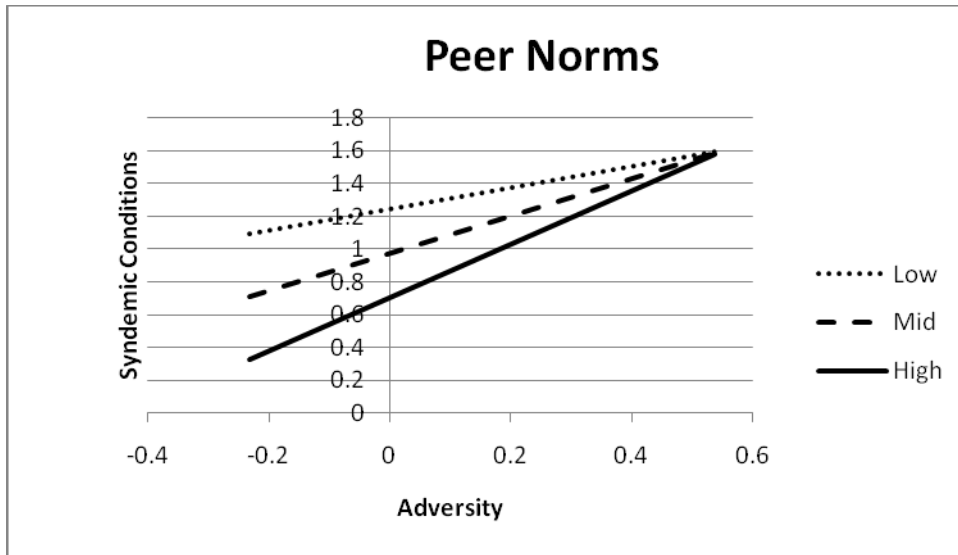


Figure 5-6. Moderating effect of peer norms on the relationship between adversity and syndemics among young men who have sex with men (MSM) in the Healthy Young Men’s (HYM) Study, controlling for age and race, Los Angeles, CA 2005-2006.

Table 4-8. Conditional effects of adversity on syndemics at low, medium and high levels of peer norms among young men who have sex with men (MSM) in the Healthy Young Men’s (HYM) Study, controlling for age and race, Los Angeles, CA 2005-2006.

	B (95%CI)	SE	t	p
Low	.645 (.069, 1.22)	.293	2.20	.028
Mid	1.13 (.657, 1.61)	.242	4.68	<.001
High	1.62 (.966, 2.28)	.334	4.86	<.001

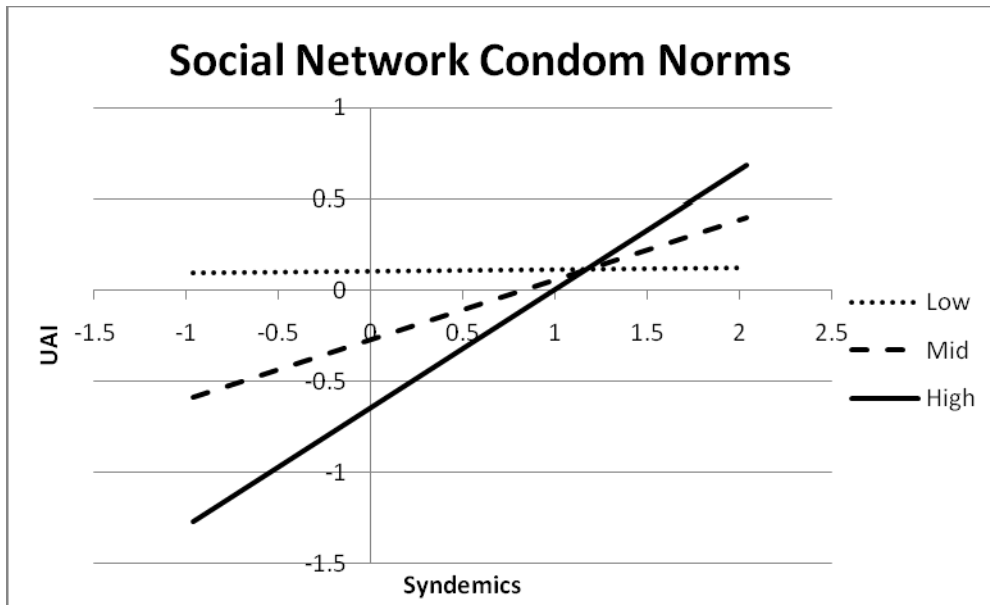


Figure 5-7. Moderating effect of condom norms on the relationship between syndemics and UAI among young men who have sex with men (MSM) in the Healthy Young Men’s (HYM) Study, controlling for age and race, Los Angeles, CA 2005-2006.

Table 4-9. Conditional effects of syndemics on UAI at low, medium and high levels of condom norms among young men who have sex with men (MSM) in the Healthy Young Men’s (HYM) Study, controlling for age and race, Los Angeles, CA 2005-2006.

	OR	B (95%CI)	SE	Z	p
Low	.003	.008 (-.301, .317)	.158	.0521	.959
Mid	8.65	.329 (.110, .548)	.112	2.94	.003
High	16.40	.650 (.335, .964)	.161	4.05	<.001

outcomes. Consistent with that literature, peer norms concerning substance use (Finke & Bowman, 1997; Steinberg, Fletcher, & Darling, 1994), protective condom strategies (Sheeran & Orbell, 1998), proactive coping skills (Martin, et al., 2005), and friend's beliefs about condom use (Kegeles, Hays, Pollack, & Coates, 1999; Waldo, et al., 2000) were positively associated with avoidance of negative health outcomes. However, the lack of significant association between negative health outcomes and 1) community connection and 2) perceived social norms contradicts the findings of others (Hays, et al., 1997; Romer, et al., 1994).

Interestingly, fewer factors appear to be protective in the pathway from syndemics to UAI compared to the pathway from adversity to syndemic conditions. Only condom strategies and the condom norms of one's closest friends protect against UAI (i.e. were significantly and negatively associated with), with only the later moderating the effect of syndemics. None of the social support variables were independently associated with lower rates of UAI, which contradicts previous research (Darbes, Lewis, Darbes, & Lewis, 2005; Garofalo, Mustanski, & Donenberg, 2008; Nott, et al., 1995; Schwarzer, Dunkel-Schetter, & Kemeny, 1994; Strathdee, et al., 1998; T. Williams, et al., 2005; Wright & Perry, 2006). Also of note, perceived social norms, which measures what an individual believes other youth think about condom use, was not associated with UAI, whereas the participants perception of his five closest friends views on condom use is negatively associated with UAI. This suggests that the immediate social network of these young men may be more influential than more general social beliefs.

The analyses that addressed the question of whether or not protective factors moderate the impact of adversity on syndemic production identified several moderating factors, some of which functioned opposite of the hypothesized direction. For instance, the effect of adversity on syndemic production was greater for individuals who reported high levels of friend support

compared to those who reported moderate or low levels. Similarly, the effect of syndemic production on UAI was greater for individuals who reported high levels of peer support for condom use compared to those who reported moderate or low levels when the individual reported a high number of syndemic conditions. These findings may suggest that the role that friends and other peers play in the syndemic pathways is more complicated than was captured by these data.

Additionally, individuals who reported high levels of the moderators valuing health over fun and peer norms concerning substance use had lower syndemic scores than those with moderate or low levels of these protective factors at average levels of adversity. However, as the amount of adversity that an individual experienced increased, the effect of both valuing health and health peer norms was less protective. Similarly, youth with high levels of perceived social norms and social network condom norms were less likely to report unprotected anal intercourse than those with moderate or low levels at mean level of syndemic conditions; yet as youth experience more co-occurring negative psychosocial health outcomes, the ability of these factors to protect against engaging in UAI dissipates.

The only protective factors that performed in the general hypothesized manner were the community connection variables and pride. Adversity was not associated with syndemic production for individuals with high levels of community connection, but for individuals with low levels of perceived community support, adversity was significantly and positively associated with syndemic production. Adversity was significantly associated with syndemic production at all levels of pride, however, as pride increased, the negative impact of adversity lessened substantially.

Despite these findings, there is reason to interpret these results with great caution. First, the data used for this study are based on self report, and therefore may be subject to recall bias or social desirability factors. This may cause participants to underreport illicit or risky behaviors. However, sensitive information was collected using an ACASI program which has been shown to reduce self report bias.(Kissinger, et al., 1999; Morrison-Beedy, et al., 2006) Also, inclusion in this study required retention of an individual for all five visits over two years. While each wave had a high percentage of participants retained (w2=95%; w3=92%; w4=92%; w5=93%), only 86% of individuals were present at all five waves and therefore included in this study. Further, overall retention rates appear to differ somewhat by race with African American having higher attrition (21%) than whites (12%) or Mexicans (13%). It may be that those who failed to return to subsequent visit are the highest risk individuals that are most likely to be wrapped up in syndemic processes, thus, because those individuals are not included in this analysis the effect sizes may be underestimated.

Additionally, the sampling method used to identify potential participants, VTD, is not a true probability sample and may therefore impact generalizability to the wider young MSM population. However, the rigorous use of a quasi-probability sample such as VTD has been shown to yield far more representative samples than snowballing or other convenience approaches (Muhib, et al., 2001; A. Stueve, L. N. O'Donnell, R. Duran, A. San Doval, & J. Blome, 2001). Finally, measurement of many of the variables used in this analysis is simplistic in a way that likely does not represent the complexity of syndemic processes. For example, the variable used to measure adversity is a count variable that equally weights several different forms of adversity such as sexual assault and experiences of discrimination. The way that these experiences impact syndemic processes and the way that protective factors can impede said

impact are probably different depending on the form of adversity at hand. Thus, both models tested here are overly simplistic and likely do not represent the true complexity in the development of individual health. However, the findings of this study provide a starting point from which to understand how to break down syndemic processes among young MSM.

5.4.1 Implications

In many ways, experiencing some adversity is part of the human experience and a natural part of development. However, young sexual minority men are, on average, subject to greater adversity than their heterosexual peers. Evidence exists to suggest that syndemic conditions exist in young MSM in greater rates than non-MSM youth starting at very young ages (Friedman, et al., In Press; Herrick, et al., 2010; Marshal, et al., 2008). Higher rates of adversity may be in part responsible for these higher rates of negative health outcomes among young MSM. The results of this study suggest that protective factors may be a way to break down the deleterious impact of adversity in the lives of young MSM. Adversity has been shown to relate to syndemic production, which in turn is related to HIV risk behaviors. The presence of certain protective factors anywhere along this pathway is likely to have beneficial effects. However, of the protective factors measured in this study, there were more moderators of the relationship between adversity and syndemics than there were between syndemics and UAI. This may suggest that interventions to promote strengths and protective factors are more effective before syndemics develop. Once syndemic processes develop and begin to snowball it may be harder for protective factors to help an individual to avoid HIV risk than if these protective factors were in place to help the individual avoid developing syndemic conditions in the first place.

Public health research has long established the link between adversity and negative health outcome. Yet in all populations, including young MSM, there are individuals and groups of individuals in whom negative experience do not necessarily impact health in a deleterious manner. For instance, of the young men who participated in this study, less than 10 % reported no adversity, yet over a third of the sample (36.4%) reported having none of the syndemic conditions. Further, of those who endorsed two or more psychosocial health conditions, only half (52.6%) reported unprotected anal intercourse. This suggests that many of the youth who experienced adversity, even some of those who experienced high levels of adversity, avoided heading down the pathways toward syndemic development. This study begins to look at how protective factors can help to moderate the impact of adversity and lead to resiliencies among vulnerable youth. Nonetheless, further research is needed to understand how specific factors impact resilience. For example, friend support was shown to be an important factor in breaking down syndemics, but the mechanisms by which this form of support helps young MSM avoid risky health behaviors remains unknown. Does it function as general social support would in promoting health? Or, are there specific aspects of the friendship groups of young MSM, such as having friends who are also MSM, that are particularly protective? Or, perhaps it functions in a manner previously unconsidered.

As it is not possible to eliminate all adversity that young MSM experience, public health practice must focus on helping these individuals cope with adverse experiences so that they do not have a negative downstream impact on long term health outcomes. Focusing on protective factors may be the ideal strategy to interrupting the progression toward poor health. Prevention efforts that focus on enhancing factors such as social support or community connection may be more effective in promoting health than interventions that focus specifically on the negative

outcomes (i.e. avoiding substance use). The vast majority of young MSM in this and other studies profile as resilient individuals that are on par with non-MSM youth. When we understand the mechanisms by which these young men achieve and/or sustain resilience in the face of adversity we will be in a better position to intervene among those who are not faring as well.

6.0 RESILIENCE AS AN UNTAPPED RESOURCE IN BEHAVIORAL INTERVENTION DESIGN FOR GAY MEN

6.1 SYNDEMIC THEORY AND THE THEORY OF SYNDEMIC PRODUCTION

Homophobia is a pervasive cultural phenomenon that impacts all members of society. Institutionalized forms of homophobia – such as marriage, adoption, and tax laws that favor heterosexual couples, or “glass ceiling” style inequalities in the workplace – help to reinforce the belief that sexual minorities are less deserving of rights and protections than heterosexuals. Overt forms of homophobia such as hate crimes, anti-gay rhetoric and public demonstrations in opposition to gay rights reinforce these messages of inequality and create hostile environments in which sexual minorities must exist. The marginalizing effects of homophobia and heterosexism are consistent with Meyer’s Minority Stress Theory as applied to sexual minorities. This theory suggests that experiences of social discrimination based on sexual orientation work to reduce the overall health profile of sexual minority individuals (Rafael M. Diaz, 1998). This process happens over time as minority individuals are exposed to both explicit and implicit discrimination and social marginalization. These experiences cause stress to the individual, thereby lowering self-esteem and increasing emotional distress and a sense of social isolation, all of which render the individual more vulnerable to serious psychosocial health problems.

Among men who have sex with men (MSM), evidence suggests that minority stress increases their risk for multiple health issues, including depression, anxiety, substance use, and sexual risk behaviors (Meyer, 2003). While a fully matured adult gay man may be able to withstand these stressors, sexual identity development, or at least a sense of “differentness” often occurs long before adulthood, when young men do not necessarily have the skills and resources to cope with such adversity. It has been well demonstrated that experiences of adversity during adolescence in the general population are associated with the development of psychosocial health problems such as substance use, depression and anxiety, victimization and participation in high risk sexual behaviors in later life (see chapter 4) (Braveman & Barclay, 2009; Weich, Patterson, Shaw, & Stewart-Brown, 2009). It is therefore not surprising that MSM face marked disparities in levels of these psychosocial health outcomes compared to their heterosexual peers (Mills, et al., 2004; Stall & Wiley, 1988; Richard J. Wolitski, et al., 2008).

It has further been shown that these psychosocial health problems have a tendency to co-occur in vulnerable MSM populations (Ciesla & Roberts, 2001; Cruz & Peralta, 2001; Greenwood, et al., 2002; Paul, Catania, Pollack, & Stall, 2001). While each of these problems independently has a negative impact on the overall health and quality of life of the individual, an increasing body of evidence suggests that when these problems co-occur, they interact in a way that amplifies the effects of each other. There is evidence that these syndemics among MSM not only intensify psychosocial health outcomes, but may also be driving the HIV epidemic (Stall, Mills, Williamson, Hart, Greenwood, Paul, Pollack, Binson, Osmond, Catania, et al., 2003) as well as contributing to other health disparities among MSM.

A number of studies provide support for a Syndemic Theory in MSM. Analyzing data from the Urban Men’s Health Study, a probability sample of MSM in 4 major US cities, Stall et

al. found that partner violence, substance abuse, childhood sexual abuse, and depression were all positively associated with each other. A further analysis of this data showed that the greater the number of psychosocial health problems, the stronger the association with high-risk sexual behaviors and HIV infection (Stall, Mills, Williamson, Hart, Greenwood, Paul, Pollack, Binson, Osmond, Catania, et al., 2003). Similarly, Mustanski, et al. found that among a sample of young MSM, endorsement of each additional psychosocial health problem significantly increased the odds of unprotected anal intercourse, multiple sex partners, and HIV seroprevalence (B. Mustanski, et al., 2007). These syndemic analyses have recently been replicated, for the first time, in a non-US based sample of MSM. Investigators in Bangkok, Thailand found that increasing numbers of psychosocial health conditions were positively and significantly associated with increasing rates of both unprotected anal intercourse and HIV prevalence (K. McCarthy, et al., 2010). Analyses described previously (see Chapter 3) provide evidence that when these conditions co-occur they interact so that their effect on HIV risk taking is greater than additive.

6.2 COROLLARIES OF SYNDEMIC THEORY

6.2.1 Syndemic processes begin during youth

Given that homophobia is a culture-wide phenomenon in the US, it follows that children are exposed to homophobic messages and actions, and therefore that syndemic processes among MSM likely begin at a young age. As mentioned previously, sexual identity formation tends to start during or near adolescence. Without access to social support and acceptance during this

period, young men may internalize negative attitudes towards sexual minorities, and eventually develop mental and behavioral health problems. This has been demonstrated through a series of meta-analyses comparing rates of psychosocial health outcomes between heterosexual and sexual minority youth. In brief, these studies showed that sexual minority youth are significantly more likely to experience depression (Marshal, Under Review), victimization (Friedman, et al., In Press), substance use (Marshal, et al., 2008) and sex under the influence of drugs and alcohol (Herrick, et al., 2010) compared to their heterosexual peers.

6.2.2 Addressing multiple epidemics may raise HIV prevention effectiveness

Besides giving us a framework for understanding the high rates of psychosocial outcomes and HIV among MSM, Syndemic Theory also provides insight into ways to raise HIV prevention effectiveness. According to Syndemic Theory, raising levels of health across any or all psychosocial health conditions will have a positive impact on levels of HIV risk and HIV prevalence as well as the other component epidemics that together constitute the set of syndemic conditions. If syndemic conditions work together to *increase* vulnerability to HIV, then mitigation of one or more of these conditions should work to *decrease* HIV vulnerability. Therefore, interventions for MSM that successfully address psychosocial health conditions will likely improve HIV prevention behaviors even if there is not a direct focus on HIV prevention.

6.2.3 Despite syndemic processes, most MSM are resilient

Finally, although it is necessary to acknowledge and study syndemic processes, it is just as important to recognize that not all sexual minorities who have experienced adversity go on to

develop syndemic conditions, and not all of those who develop syndemic conditions become HIV infected. In fact, the original investigation of syndemic production among MSM found that, of the men who experienced three or more psychosocial health problems, 23% had recently engaged in high risk sex and 22% were HIV positive (Stall, et al., 2007). These numbers are certainly alarming, but perhaps the most important story here is that 77% of these men had avoided engaging in high risk sexual behaviors and 78% had remained HIV negative despite the fact that they were dealing with a myriad of psychosocial health problems. For these individuals to be able to withstand persistent cultural marginalization and avoid the natural sequelae of those experiences indicates remarkable resilience and strength within this population. Resilience as a sub-cultural phenomenon is an area of study that has yet to receive much focus, but that appears to have great potential as an approach for the health promotion of MSM.

6.2.4 Deficit assumptions underlying HIV intervention design for MSM

Currently, the design of HIV behavioral prevention interventions is informed by the lessons learned from the relatively small percentage of MSM who have fallen victim to syndemic processes. This approach leads to an attempt to rectify the perceived “wrongs” evidenced by this small group of men. The underlying assumption of this approach is that these MSM are flawed or are deficit of the skills and/or abilities needed to prevent HIV. Below are examples of frequently employed intervention aims and the deficit assumptions upon which they are based:

Raise condom use skills (MSM don't know how to use condoms)

Raise condom negotiation skills (MSM don't know how to negotiate sex)

Change peer norms (MSM have unhealthy peer norms, especially around sex)

Raise skills to face homophobia (MSM have few skills to face homophobia)

A set of meta-analyses showed that current HIV behavioral prevention interventions for MSM reduce HIV risk taking by approximately one-third (Herbst, et al., 2005; Johnson, et al., 2003). While a reduction in risk behaviors of this magnitude is admirable, much greater impact is needed to alter the current trends in infection rates among MSM. Because existing interventions are focused on deficits, MSM may perceive the negative focus as judgmental and they may therefore be less likely to accept, adhere to, and complete the intervention. Interventions that focus on strength and resilience rather than deficits could improve both intervention acceptability and efficacy.

6.3 RESILIENCE IS COMMON AMONG MSM

Evidence for strengths and resilience among MSM is widespread in both scientific literature and historical accounts of gay culture. For instance, in an investigation of tobacco use among MSM, Greenwood et al. found that a greater proportion of gay men reported cessation of tobacco use than reported current daily tobacco use (26.9% vs. 25.7%), indicating a voluntary inclination towards health promotion and recovery (Greenwood, et al., 2005). Most MSM have also managed to avoid problematic drug use despite widespread use of recreational drugs generally perceived to be addictive (Mills, et al., 2004; Stall, et al., 2001). Most notable, however, is that over the past 40 or so years, gay men have been part of one of the most impressive and effective bids for civil rights in history, all while facing community-wide devastation from the HIV epidemic. This suggests that taking advantage of naturally occurring strengths could improve prevention efforts by capitalizing on the skills, resources, and strengths that already exist among MSM and within MSM communities.

6.4 STRENGTHS AND HEALTH PROMOTION

A move toward strength-based health promotion interventions does not necessitate that we ignore deficits in knowledge or skills that contribute to risky behaviors. Rather, a strength-based approach can address these deficits by relying on strengths. Table 6-1 below lists a few examples of correlates of HIV risk behaviors that can be addressed by focusing interventions or intervention activities on strengths.

Table 6-1. Strengths that can be addressed to promote strength.

Strengths	Deficit/Risk Addressed
Shamelessness	Counters homophobia (internalized homophobia, depression)
Sexual Creativity	Counters HIV risk (alternative strategies to create safe sexual expression)
Social Creativity	Counters loneliness, lack of social support (internalized homophobia, depression)
Volunteerism/Social Activism	Counters social vulnerability (violence victimization, homophobia)
Self-Monitoring	Counters loss of control (substance abuse, depression, sexual risks)
Social Support	Counters unhealthy social relationships, loneliness (substance abuse, depression, sexual risks)

Strength-based approaches to health promotion can be utilized not just in HIV prevention programs, but also in addressing the psychosocial health conditions (syndemic conditions) that increase susceptibility to HIV. The study described in the previous chapter identified several variables that may be used to promote strength among MSM. While there is undoubtedly many

more protective factors that need to be identified before effective interventions can be developed or robust theories can be tested, there now is evidence that protective factors can work to break down syndemic processes.

6.5 TOWARDS THE DEVELOPMENT OF A THEORY OF RESILIENCE AMONG MSM

Strength-based approaches to HIV prevention will be aided greatly by the further development of a theory of cultural resilience that is specifically tailored to MSM. This can be accomplished through further investigation of naturally occurring strengths and resiliencies that exist within both individuals and communities. For instance, investigations into substance-using MSM often focus on the correlates of problematic substance use behaviors; however, studies that focus on the correlates of abstinence, non-problematic use, or spontaneous remission from use may be more informative for prevention and intervention programs. Similarly, studying how men with multiple syndemic conditions remain sexually safe and HIV negative over time or how community mobilization can strengthen community interactions and supports will likely improve health promotion efforts among MSM.

Without sufficient information about what strengths exist among MSM, and how these strengths contribute to resilience, it is difficult to envision an empirically supported theory of cultural resilience. However, it is possible to imagine how family supports and school programs such as Gay/Straight Alliances could help young MSM fend off the negative effects of bullying or institutionalized homophobia. Having these supports for young MSM (or gay adolescents) would likely attenuate the association between early life adversity and syndemic production.

Further, if that same individual were exposed to healthy coping strategies and community supports as an adult, he may also develop a sense of shamelessness that could be protective against the effects of overt homophobia and marginalization. This sense of shamelessness or pride may be one of the greatest strengths that sexual minority communities have developed and it may be very important in disrupting the progression of syndemic development and its impact on HIV risk and infections.

The work presented here was a first look at factors that may be protective against syndemic processes among MSM. Several variables were identified that are associated with fewer syndemic conditions and lower odds of participation in HIV risk behaviors. However, much more work must be carried out to further develop and hone the theory proposed here. The data used to conduct these analyses were collected for another purpose and therefore do not capture the nuanced qualities necessary to truly test the theory of cultural resilience. Future work must start with rigorous qualitative research to identify constructs and variables that young MSM believe are protective against syndemic processes. Work must also be done to operationalize resilience in a way that can be measured without relying strictly on the absence of negative health outcomes. There are undoubtedly varying degrees to which a person can be protected against negative health outcomes that are not captured by a dichotomous variable defined as resilient (does not have condition X) or non-resilient (has condition X). Once the qualitative work has been done to further define protective factors and resilience in a measurable way, survey research can be conducted to gather data to quantitatively test the cultural resilience model.

Sexual minority individuals and communities have evidenced considerable strengths over the past 30 years, and they have done this in the face of extreme homophobia and

marginalization. Even more impressive is the fact that the momentum of the initial, post-Stonewall Gay Rights Movement was not derailed or diminished by the AIDS epidemic that soon followed. In fact, our communities have used this adversity as a motivating force to stand up and demand equal rights in all facets of life from health care to marriage. This strength and resilience has helped our communities overcome considerable challenges and still thrive in the face of adversity. The theory of cultural resilience among MSM can provide a template to harness these strengths and so increase the impact of health promotion efforts among MSM and eliminate health disparities within the vulnerable population.

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