

**Elucidating the HIV Paradox:  
Sexual Partner Networks in Men Who Have Sex With Men**

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THESIS

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This thesis is dedicated to my mother and the guy who knows how I take my tea.

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## **LIST OF ABBREVIATIONS**

MSM	Men Who Have Sex With Men
AAMSM	African American Men Who Have Sex With Men
STI	Sexually Transmitted Infection
UAI	Unprotected Anal Intercourse

## SUMMARY

African American MSM (AAMSM) have higher rates of HIV, despite having less unprotected anal intercourse (UAI) than Caucasian. Clearly AAMSM have riskier sex partners than do other ethnic groups. Having older sexual partners is a risk factor for HIV and STI's in young African American women. However, this has not been thoroughly examined among African American MSM. We hypothesized that AAMSM would have more age-discordant partners, and that age-discordance would underlie AAMSM's greater likelihood of reporting an HIV sero-discordant partner, UAI with recent partners, and STI infection. We also tested three psychosocial variables that may lead AAMSM toward older partners: diminished social support, internalized homophobia, and drug use. These effects were assessed among 55 African American and 99 Caucasian MSM aged 18 - 29.

African-American and Caucasian MSM did not differ in their likelihood of UAI, but AAMSM did report older sexual partners. Race was not associated with participant STI infection, HIV status, or UAI with recent partners. More African-American participants reported an HIV sero-discordant partner than did Caucasians. There were no racial differences in social support, internalized homophobia, and drug use. Diminished social support predicted age discordant partnering among both AAMSM and Caucasian MSM. AAMSM's greater number of HIV sero-discordant partners was not mediated by their having older partners, but was associated with their experiencing diminished social support.

These findings indicate that AAMSM are more likely than Caucasian MSM to expose themselves to HIV with each sexual episode, with concomitant risk for HIV



## **SUMMARY (continued)**

infection. While AAMSM were more likely to report older sexual partners, social support, internalized homophobia and drug use do not underlie that effect. Contrary to our hypothesis, older partners did not put these AAMSM at risk for HIV sero-discordant partners. Rather, diminished social support played a key role in both Caucasian MSM and AAMSM's exposure to risky sexual partners. Future studies should focus on developing interventions to address the mechanisms of HIV sero-discordant partnering among AAMSM. Interventions to facilitate social support may help younger MSM make safer partner choices.

## **I. INTRODUCTION**

### **A. The HIV Paradox**

African-American men who have sex with men (MSM) are significantly more likely to be HIV infected than are Caucasian men. For all ethnic groups, unprotected anal intercourse is the biggest risk factor for HIV exposure among MSM (Millet et al. 2006; Raymond, 2009). However, the rate of unprotected sex in MSM has not been able to explain the HIV paradox: African American MSM (AAMSM) have significantly higher rates of HIV than do Caucasian MSM despite participating in lower rates of unprotected anal intercourse (UAI) (CDC, 2005; Stokes, Venable, & McKirnan, 1996). If African American MSM are not having more unprotected sex than Caucasian MSM, each of their sexual encounters must expose them to a higher risk of contracting HIV. The sex partners of African American MSM appear to be inherently riskier than those of Caucasian MSM.

This HIV paradox has been discussed in multiple studies (Millet et al. 2006; Millet et al. 2007; Peterson & Jones, 2007). While UAI alone has not been able to fully explain the increased risk for HIV that young AAMSM face, a new line of research concerning partner network characteristics of AAMSM has offered promising leads. Research examining the spread of HIV and drug use among social networks in MSM (Bingham et al., 2003; Latkin et al., 1996; Tobin & Latkin, 2008) and research in young African American women engaging in age discordant intercourse (Hargreaves et al. 2009; Miller, 1997; DiClemente et al. 2002), has suggested that partner network characteristics could play an important role in explaining the HIV paradox in AAMSM. Enhanced HIV

risk among MSM is likely not simply a product of individual risk behavior, but also of the network context of sexual activity.

**B. Age Discrepancy Among Adolescent African-American Females**

Research among adolescent African American females provides a foundation for a network perspective. Age discordance (in this case, adolescent females involved with males at least 2 years their senior) in sexual relations age is heavily linked to HIV risk in general (Hargreaves et al., 2009; Miller, 1997) and even more so in young African American females (DiClemente et al., 2002). It is plausible that some characteristics of young AAMSM social networks are similar to their female counterparts. Auerswald et al. (2006) suggest that sexually transmitted infection (STI) and HIV risk in African American adolescent females may be determined more by the risk of their sexual partners rather than their own risk. African American adolescent females are more likely than other ethnicities to have older partners that are also African American (Bauermeister et al. 2009, Begley et al. 2003, DiClemente et al. 2002) and a number of these partners have other risk factors such as having spent time in jail (Staras et al. 2009). This is linked with increased risk for STIs and HIV.

Another factor that increases the risk for STIs and HIV among African-American adolescent females is their older partners' propensity for concurrent sexual partners (Ellen et al. 2005, Begley et al. 2003, Staras et al. 2003). Older men who have sex with multiple partners may be particularly risky for their younger partners due to their higher rates of HIV and STI infection (Begley et al. 2003). This suggests that age discordant partners are also more likely to be sero-status discordant, that is, HIV or STI –positive when partnering with a younger HIV or STI –negative. Thus, there is an inherent

increased STI risk for African-American girls engaging in age-discordant intercourse (Marin, et al., 2000; Rickert, Wiemann, & Berenson 1997; Staras, Cook, & Clark, 2009). Few studies have addressed age discordant partnering among Caucasian girls, although Staras, Cook, & Clark (2009) suggest that there may be a similar process in those groups.

Two variables that may dispose young African American heterosexual women toward older, potentially riskier sex partners are social resources and cultural norms. NBC, (Lutz, 2009) for example, reported on a predominately African American high school in the Southside of Chicago where 115 of the 800 girls were either pregnant or had a child. According to the principal of the school, these girls came from a culture of absentee fathers where if older men show them any attention and support, they have a tendency to get involved with them. This may be directly applicable to the young AAMSM partner network paradigm.

**C. Age discrepancy and sexual risk among African American MSM**

The relationship between partner network characteristics and STI and HIV risk in African American adolescent females could be duplicated for young AAMSM. Several studies have suggested a partner network theory of HIV transmission in AAMSM (Bingham et al. 2003; Latkin et al. 1996; Morris, Zavisca, & Dean, 1995; Newcomb et al. 2010; Tobin & Latkin, 2008). Bingham et al. (2003) and Morris, Zavisca, & Dean (1995) found that HIV risk for young MSM, particularly AAMSM, is associated with age discordance. Older AAMSM are more likely to have HIV (CDC, 2005; Lance & Ball, 2010) and are less likely to be taking antiretroviral medications or have access to healthcare compared to their Caucasian counterparts (Millet et al. 2007).

HIV+ older AAMSM are more likely to have high levels of serum HIV than HIV+ Caucasians, which makes them more infectious to others (Hallet et al., 2010). If young AAMSM are having intercourse with older AAMSM at similar rates of Caucasian MSM, then their risk of contracting HIV is already increased. AAMSM have higher rates of race concordance (engaging in intercourse with other AAMSM) and partner concurrency in their sexual partnering compared to Caucasian MSM (Bohl et al. 2009). This helps ensure that HIV is kept within the smaller AAMSM community.

Raymond and McFarland (2009) also found that attitudes and preferences of non AAMSM and social environment constrain AAMSM to each other. This suggests that the propensity of AAMSM to partner with each other is not only a function of their own preference, but of outgroup preferences as well. With the higher rate of HIV among AAMSM, the increased interconnectedness of this group as a result of race concordance and concurrency and the smaller sexual network this promotes, HIV and STIs have a potential to spread faster among and stay within the AAMSM community. This indicates that every race concordant sexual encounter AAMSM have is inherently more risky than their sexual encounters with MSM of a different race.

Social power differences in sexual encounters are linked to failure to use condoms (Albarrcin, Kumkale, & Johnson, 2004). This further exacerbates HIV risk in age discordant AAMSM partnerships. This also suggests the presence of psychosocial and resource factors that might be occurring within the AAMSM community. Sero-discordant UAI within AAMSM is more likely to occur if one of the partners is socially isolated and has unstable housing (Mimiaga et al., 2009). Older AAMSM are more likely to be established financially and socially as they have had more time to do so. Due to a

number of social factors discussed below, it is more likely the case that young AAMSM are socially isolated and have unstable housing, which puts them at risk for age discordant sexual encounters.

### *Social Support & Internalized Homophobia*

Negative attitudes toward homosexuality – “homophobia” – appear to be more prevalent in the African American community than the Caucasian community (Johnson, 1982; Lewis, 2003; Jenkins et al., 2009; Schulte & Battle, 2004). This may leave young AAMSM less able to be open about their homosexuality to their families and friends (Brown, 2005; Kennamer et al. 2000). AAMSM are less likely to identify themselves as “homosexual” (Edwards, 1996) as this would lead to ostracism from their community and main source of social support.

Affective social support is necessary in the African American community to deal with racism and prejudice and to support a sense of community (Goode-Cross & Good, 2008; Goode-Cross & Good, 2009). Previous research has shown that cultural norms about gender and masculinity prevent AAMSM from receiving social support from their families, friends, and ethnic community in general (Operario, Smith, & Kegeles, 2008). Affective social support is characterized as being open and able to talk to one’s family and friends about issues regarding sexual orientation. This is linked to better adaptive mental and physical health and less drug use among young LGBT populations (Eisenberg & Resnick, 2006; Ryan et al. 2009; Ueno, 2005). Homophobia in the African American community is a clear indicator of low social support for AAMSM.

The lack of support and fear of ostracism from the African American community could lead to the development of internalized homophobia. For the present study,

internalized homophobia is the internalization of negative attitudes and assumptions about gay people, and discomfort with or hatred of oneself because of one's own homosexuality caused by that internalization (Herek, 2004; Meyer, 2003; Sophie, 1987). The African American community's endorsement of homophobia could lead to young AAMSM internalizing those values. While the African American community might not be supportive of MSM in general, young AAMSM might find solace in the gay community.

The gay community would be a natural source of support for young AAMSM who feel a lack of support from the African American community. Unfortunately, the gay community is largely Caucasian, which is an initial deterrent to many AAMSM. African Americans MSM are less likely to associate with gay groups and feel integrated into the gay community (Fukuyama & Ferguson, 2000). Prejudice and racism within the gay community make it hard for AAMSM to find the support they need when coming to terms with their sexuality (Goode-Cross, 2008, 2009; Greene, 1994). With the combined prejudice from both the African American and the gay communities, young AAMSM may have few resources to come to terms with their sexuality, support themselves if they have been evicted from their living situations, and feel connected to a community that has people of a similar background. A lack of social support and internalized homophobia should theoretically be linked with higher rates of age discordance, particularly in AAMSM as they experience less social support and, theoretically, more internalized homophobia than Caucasian MSM.

### *Drug Use*

Older AAMSM are more likely to be financially stable than young AAMSM and they can provide a sense of community for young AAMSM. Lack of social and monetary power may place young MSM at risk for drug use when partnering with older MSM (Mimiaga et al., 2009). If an older man likes to incorporate drugs into sex, it will be hard for those young men to say no if said older man is providing compensation. The incidence of UAI is linked to drug use in a multitude of studies (Carey et al., 2009; Fendrich et al., 2010; Klein, 2009; McKirnan, Ostrow, & Hope, 1996). Drug use also makes it easier for young MSM to rationalize having unprotected sex with a partner in exchange for resources (Harawa et al. 2009). Thus, any drug use along with an age discordant sexual episode is highly likely to expose young MSM to HIV or STIs.

While the aforementioned findings might suggest that drug use is linked to age discordance and UAI in AAMSM, previous research suggests that Caucasian MSM are more likely to use drugs than AAMSM (Greenwood et al., 2001; Halkitis, Green, & Mourgues, 2005; Harawa et al., 2004; Kelly & Parsons, 2010; McNall & Remafedi, 1999). Therefore, there should be a stronger association of drug use with age discordant sexual partnering and UAI in Caucasian men than in AAMSM.

### **D. The Present Study**

Exploring age discordance within partner networks may help explain the high rates of HIV among AAMSM. Younger AAMSM may be made vulnerable to age discordant partnerships insofar as they experience lower social support from their communities, greater internalized homophobia, and, potentially, more drug use with older partners. This study has three purposes. First, we will test differences in age discordant



partnering among young African-American and Caucasian MSM in a large, national sample of very high risk, drug-using men. Second, we plan to test three potential mediators of ethnic differences in age discordance in partnering: social support, self-homophobia, and drug use. Third, we will assess the effects of age discordance on HIV risk.

*Ethnic Differences in age-discordant partnering and sexual risk.* We expected to replicate the basic finding that AAMSM have a lower rate of UAI than do Caucasian MSM, but paradoxically have a higher rate of STIs. Consistent with Bingham et al. (2003), we also expected more young AAMSM to report an age-discordant sexual partner than would young Caucasian MSM, and for HIV-negative AAMSM to be more likely to report an HIV-positive (i.e., HIV sero-discordant) partner than among Caucasians.

*Psychosocial variables and age-discordant partnering.* We expected age discordant partnering to be associated with three psychosocial variables: internalized homophobia, general social support, and drug use. We expect the ethnic groups to differ in these variables. Specifically, AAMSM will report lower social support and more internalized homophobia than will Caucasian MSM, and these two variables will strongly predict age discordant partnering amongst AAMSM. In contrast, we expect drug use to be higher amongst Caucasian MSM, and for this variable to emerge as the strongest predictor of age-discordant partnerships in this ethnic group. Support for these hypotheses would both highlight key vulnerabilities for age-discordant partnering among younger, high risk MSM, and would demonstrate key ethnic differences in psychosocial vulnerability.

*The effect of age-discordant partnering on sexual risk.* In general, we expected age discordant partnerships to underlie AAMSM's greater risk for STI and HIV infection. Thus, even though AAMSM may report less UAI than Caucasians, the partners they do have UAI with may be more likely to transmit an STI or HIV. Specifically, we expected racial differences in age-discordant partnering to mediate race differences in sero-status discordance and STIs. That is, AAMSMs tendency toward older partners would account for their greater rate of HIV-sero-discordant partners and, as a proxy for infection risk, their greater rate of STIs.

## **II. METHOD**

### **A. Overview**

The data used in these analyses are from the baseline interview of Project MIX, a large multisite study examining a behavioral intervention for risky drug and sexual behaviors among MSM. The intervention was performed at 4 different collaborating sites: Howard Brown Health Center and the University of Illinois at Chicago, New York Blood Center and the New York Academy of Medicine, the Health Research Association in Los Angeles, and PHFE Management Solutions, Inc. and the San Francisco Department of Public Health AIDS office. MSM were recruited for a study consisting of a baseline assessment, screening, HIV counseling and testing, group sessions, and follow-up assessments at the 3- 6- and 12-month points. Participants were recruited using active and passive recruitment methods.

### **B. Procedures**

During active recruitment, each potential participant was given a card or flyer with general information regarding the study. Recruiters provided more general

information than what was on either the flyers or the cards. Passively recruited participants called the study phone call number to inquire further. Recruitment procedures were designed to enlist similar numbers of African-American and Caucasian men. Participants who agreed to it were prescreened either in person or over the phone and then invited for full screening.

At baseline, eligible participants provided informed consent and then completed a computer administered, self interview (ACASI). The ACASI collected information pertaining to demographics, psychosocial variables, substance use and sexual behavior of the participant during the previous three months, as well as substance use and sexual behavior during his two most recent anal sex encounters with non-primary partners. The men were reimbursed for time and travel to the study sites.

Inclusion criteria consisted of the following: Participation in at least two episodes of drug or alcohol use immediately prior to or during intercourse with a non-primary partner during the last six months and unprotected anal intercourse (UAI) during the past six months with a partner of unknown sero-status. Eligible participants who were not planning on moving in the next 15 months, involved in another study, and did not use methamphetamines completed interviews and a group based, six-session intervention.

#### C. **Participants**

There was even distribution of participants across the study sites. Young MSM have typically been defined as 18-25 yrs of age (Tobin & Latkin, 2008; NIMH, 2008). However, to increase sample size we will include participants from 18 to 29.

#### D. Measures

The unit of analysis for this study will be participants' most recent and second most recent sexual encounters. Sexual activity, drug use, and partner characteristics will be taken from those episodes. Psychosocial variables and participant characteristics were measured in general terms.

*Drug Use.* Participants were presented with a list of thirteen different substances (e.g. ecstasy, cocaine, recreational use of prescription drugs) and told to indicate which ones they used during their last and second to last sexual encounters. Participants will be coded as "drug using" in each encounter if they used any drug other than alcohol or marijuana.

*Sexual behavior.* To assess partner-wise sexual behavior, participants were asked to provide the initials of their most recent non-primary anal sex episode. They then described their sexual activity, drug use and partner characteristics for that episode. Participants then provided the initials of their second most recent partner, and repeated the behavioral measures. For these analyses we coded whether the participant reported unprotected anal intercourse (UAI) with each partner, the partner's age, and their partner's HIV status (HIV-positive, -negative or -unknown).

*Social support* was measured by six face-valid items rated on five-point scales ranging from "strongly disagree" to "strongly agree," "People close to me let me know they care," "I have someone I can trust completely". Cronbach's alpha = .86. Support scores represented the mean of the six items.

*Internalized homophobia* represented the mean of four face valid items, e.g. "I dislike myself for being gay," "I wish I were not gay." Cronbach's Alpha = .87.

*Age discordant partnering* will be assessed as a continuous variable. The mean age difference between the participants' ages and their last 2 partners ages will be calculated. Assessing age discordance as a continuous variable is consistent with previous studies (Bingham et al., 2003; Morris, Zavisca, & Dean, 1995).

*Sero-discordant partnering* will use data concerning participants' own self-reported HIV-status and the perceived status of their last two sex partners. We will consider a partnership to be "discordant" if the participant does not know his own sero-status or if he reports himself to be HIV-negative and his partner to be HIV-positive or -unknown.

### III. Results

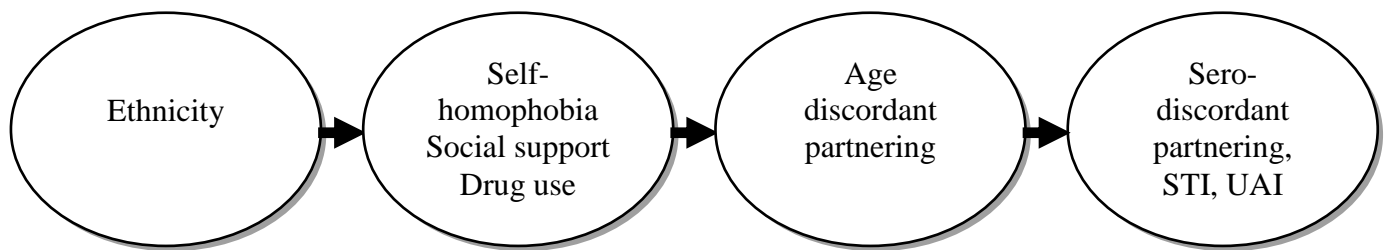


Figure 1. Overall Model

#### A. Sample Comparisons

One hundred and fifty-six participants were included in these analyses. Of these participants, 57 identified as African American and 99 identified as Caucasian. The mean age of the African American participants was 23.91. The average African American participant had a high school education and made between \$30 and \$40 thousand per year. The mean age of Caucasian participants was 24.52. They made over \$40 thousand per year, and tended to have some college completed. African-American and Caucasian MSM did not differ in drug use ( $F(9, 146) = .08, p = .78$ ), self-homophobia ( $F(9, 146) =$

1.62,  $p = .21$ ) or social support ( $F(9, 146) = 2.03, p = .16$ ). There were no differences between African American and Caucasian participants in the percentage that reported a sexually transmitted infection in the past 12 months (African American = 36.84% vs. Caucasian = 33.33%,  $F(9, 146) = .06, p = .82$ ) who participated in unprotected anal intercourse (African American = 78.95% vs. Caucasian = 79.80%,  $F(9, 146) = .37, p = .55$ ), or percentage that reported HIV infection (African American = 26.30%,  $n = 15$  vs. Caucasian = 14.10%,  $n = 14$ ,  $F(9, 146) = 2.26, p = .14$ ).

As indicated in Table 1, none of the proposed mediating variables were correlated with participant STI infection and UAI when including all participants regardless of HIV status. Social support and internalized homophobia were inversely correlated. Consistent with Table 1, Table 2 shows an inverse correlation between social support and internalized homophobia. In addition, social support has an inverse relationship with HIV sero-discordant partnering.

Table I. Mediator correlations with the outcome variables in the total sample.

	Support	Self-homophobia	Drug Use	UAI	STI
Support	1	-.21*	-.13	-.05	0
Self-homophobia	-.21*	1	-.09	.03	-.02
Drug Use	-.13	-.09	1	.01	-.02
UAI	-.05	.03	.01	1	.04
STI	0	-.02	-.02	.04	1

\* $p < .05$

Table II. Mediator correlations with the outcome variables in the HIV-negative and – unknown sample

	Support	Self-homophobia	Drug Use	UAI	STI	Sero-Discordance
Support	1	-.27*	-.11	.03	.09	-.19*
Self-homophobia	-.27*	1	-.07	.03	-.05	.09
Drug Use	-.11	-.07	1	-.01	-.06	.08
UAI	.03	.03	-.01	1	-.01	-.01
STI	.09	-.05	-.06	-.01	1	-.03
Sero-Discordance	-.19*	.09	.08	-.01	-.03	1

\* $p < .05$

#### **B. Age and HIV Sero-Discordant Partnering**

We tested whether African American and Caucasian participants differed in the mean age discordance between themselves and their recent sex partners. Partner age discordance was defined as the mean difference between the participant age and the ages reported for his most recent and second most recent partners. To capture only the effect of older partners, all instances where a participant had a younger partner were set to zero. We used hierarchical regressions to test all participant-wise variables.

African-American participants' sexual partners were older than Caucasian participants' sexual partners ( $M = 10.00$ ,  $SE = 6.93$  v.  $M = 7.31$ ,  $SE = 4.58$ ,  $F(9,146) = 4.77$ ,  $p = .03$ ). To illustrate this difference, 61.40% of African American MSM versus 50.51% of Caucasian MSM reported at least one of their two partners was more than 5 years older than them.

In analyses limited to HIV sero-negative or HIV status unknown participants ( $n = 127$ ), African Americans were more likely to report at least one of their partners to be HIV sero-discordant, 21.4% ( $n = 9$ ), than were Caucasians, 7.1% ( $n = 6$ ) ( $B = -1.45$ ,  $SE = .66$ ,  $\chi^2 = 4.79$ ,  $p = .03$ ). African-Americans and Caucasians did not differ in the percentage of men reporting at least one partner of unknown HIV-status,  $\chi^2 = .89$ ,  $p = .34$ . When the HIV status unknown partners are combined with the HIV positive partners, racial differences disappear ( $\chi^2 = .24$ ,  $p = .63$ ). This indicates that the real racial difference lies in HIV-positive partners.

### **C. Initial Mediating Models**

We analyzed three mediating models of the effect of racial group on age discordance. Each used the PRODCLIN cross-sectional products approach of MacKinnon (2002, 2007). We separately tested the effect of social support, self-homophobia and drug use as mediators. These variables themselves had low to moderate correlations: Support related to self-homophobia and drug use at  $r = -.21$  and  $r = -.13$  respectively. Self-homophobia and drug use were correlated at  $r = -.13$ . For each analysis we regressed race on the mediator, and the mediator on to age discordance while controlling for race. The resultant betas were then input to the PRODCLIN program.



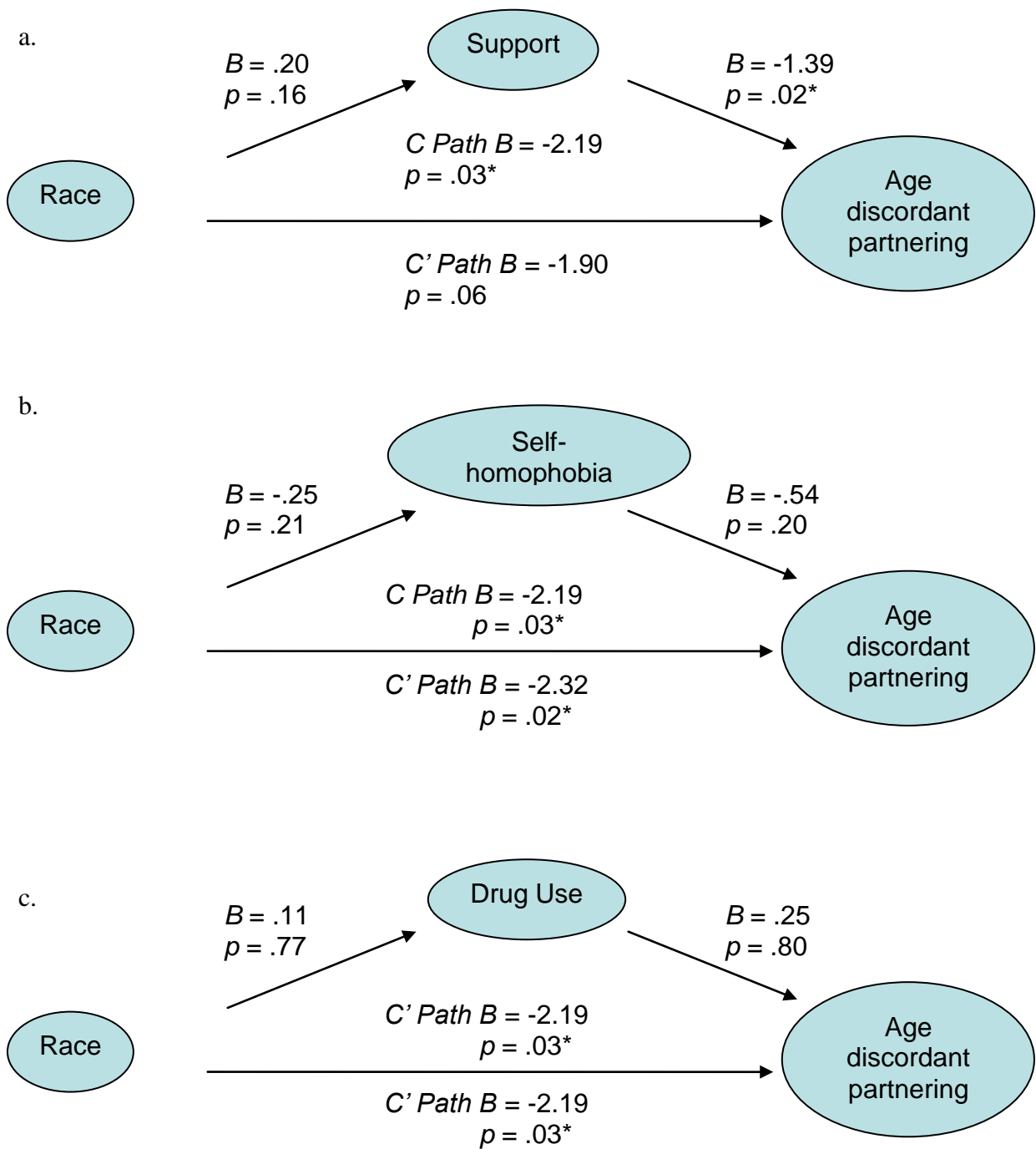


Figure 2. Psychosocial variables mediate the effect of race on age-discordant partnering.

As shown in Figure 2a, while participants with low social support were more likely to report age discordant partners and African Americans were more likely to report

age discordant partners, racial group was not associated with social support. As indicated in Figure 2b, the racial groups did not differ in self-homophobia. Further, self-homophobia was itself not associated with the likelihood of reporting an age discordant partner. Figure 2c illustrates that racial groups did not differ in their drug use and that drug use was not associated with reporting an age discordant partner. None of the potential mediators met the required criteria set forth by MacKinnon (2002) for mediation to occur.

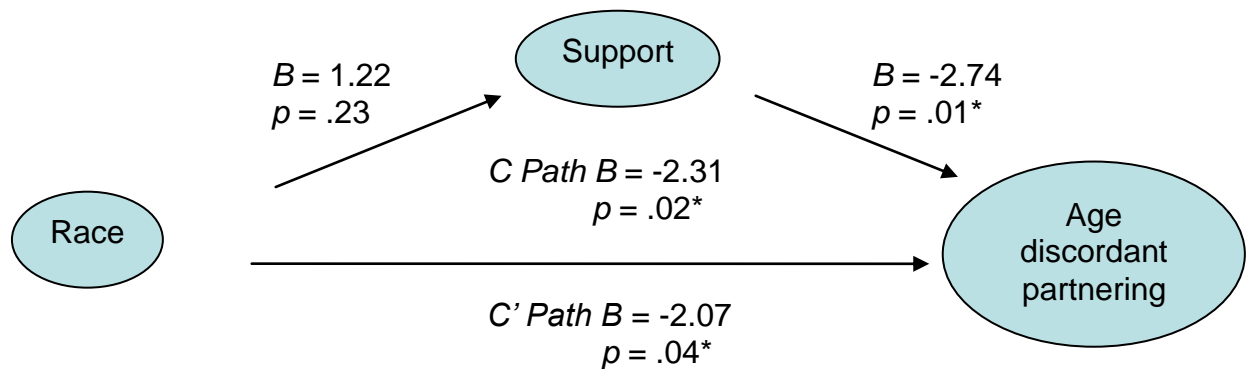


Figure 3. The mediating effect of social support on racial differences in age discordant partnering controlling for drug use and self-homophobia.

We decided to control for self-homophobia and drug use while testing the mediating effect of social support on age discordant sexual partnering because social support was the only potential mediating variable predictive of having older partners. This will elucidate the variance that social support has on age discordant sexual partnering separate from drug use and self-homophobia. As seen in Figure 3, the effect of social support on age discordant partnering increased slightly. However, there were still racial differences in age discordant partnering in the presence of social support.

#### D. Outcome Variables

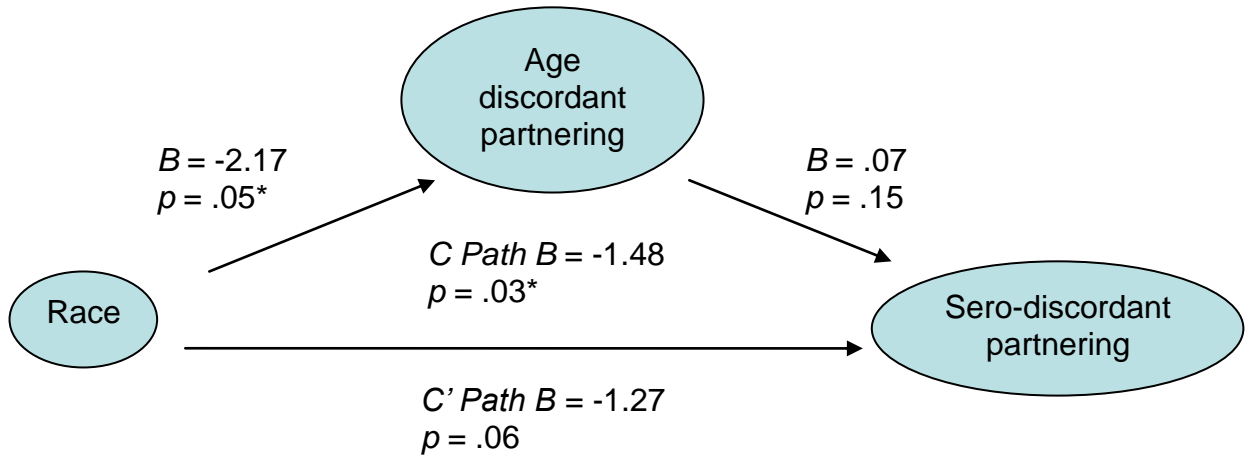


Figure 4. Testing whether age discordant partnering mediates racial differences in HIV sero-discordant partnering.

As social support, participant drug use, and self-homophobia did not mediate the effect of race on the likelihood of an age discordant partner, we decided to examine the effect that race and age discordant partnering have on UAI, HIV sero-discordant partnering, and participant STI infection. We expected that age discordant partnering would mediate any effect race had and our outcome variables.

As noted, race did not have an effect on UAI or participant STI infection. In contrast, HIV-negative or –unknown African American MSM were more likely to have a HIV sero-discordant sexual partner than were their Caucasian participants. In addition, AAMSM and were more likely to report an age-discordant partner than Caucasian MSM. However, as indicated in Figure 3, reporting an age discordant partner did not increase the likelihood of having an HIV sero-discordant partner. Thus, African-American

participants' greater likelihood of reporting an HIV sero-discordant partner was not mediated by their tendency toward age-discordant partners.

*Psychosocial predictors of outcome variables*

We found above that participants with low social support were more likely to have an age discordant partner. We expanded those analyses to include the outcomes of UAI, HIV sero-discordant partnering, and participant STI infection. Social support was not associated with UAI ( $B = .17$ ,  $SE = .28$ ,  $\chi^2 = .34$ ,  $p = .56$ ) or participant STI status ( $B = .14$ ,  $SE = .23$ ,  $\chi^2 = .74$ ,  $p = .54$ ).

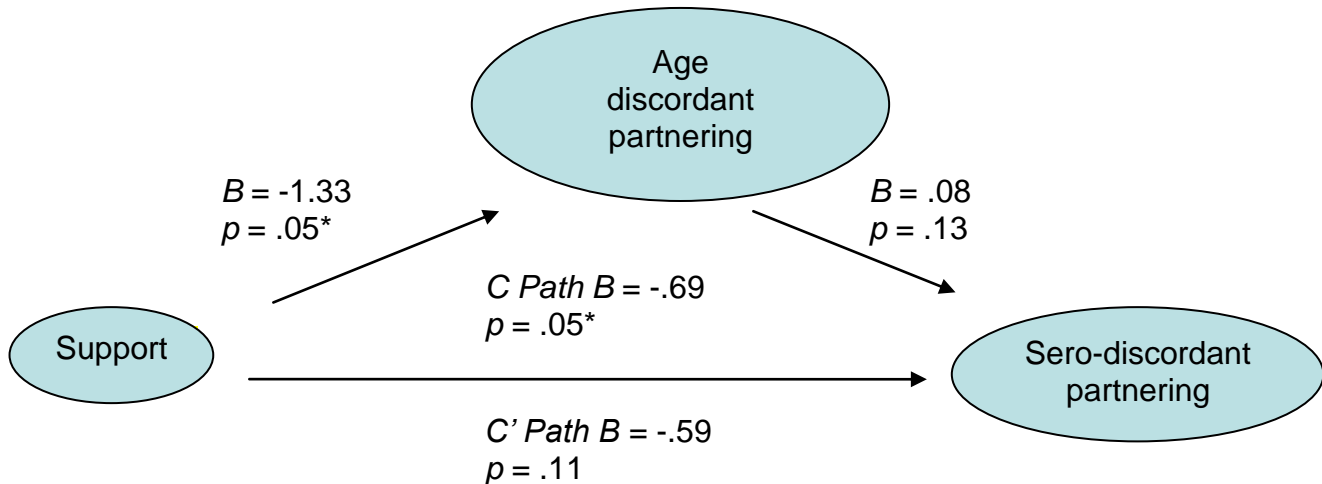


Figure 5. The effect of support on sero-discordance as mediated by age discordance.

In contrast, as detailed in Figure 4, participants with low social support were more likely to report at least one HIV sero-discordant partner, and reported older partners. However, reporting age discordant partners did not predict reporting an HIV sero-discordant partner. Thus, social support was associated with both age-discordant partners and the likelihood of a sero-discordant partner, but age discordance did not mediate the effect of support on sero-discordant partnering.

#### **IV. Discussion**

We used a national sample of high-risk young men who have sex with men (YMSM) to examine age-discordant sexual partnering. We had anticipated that age-discordant partnering may help to explain the “HIV paradox”, wherein African-American YMSM have higher HIV and STI infection rates than Caucasian YMSM, despite reporting less unprotected sex. We expected African-American YMSM to report older sex partners, who would themselves be more likely to be HIV- or STI-infected. While African American MSM may have equal or fewer unprotected sexual episodes than Caucasians, each episode may carry a higher risk of HIV or STI transmission. We further expected that African-American’s penchant for older, riskier partners may be associated with less affective social support, internalized homophobia, and drug use.

Consistent with our hypothesis, African American MSM reported older partners than did Caucasian MSM. We had predicted that race differences in age discordant partnering would be mediated by race differences in affective social support, internalized homophobia, and drug use. However, none of these hypotheses were supported. Further, having an age discordant sexual partner did not lead to an increased risk for an STI, increased likelihood of unprotected sex, or, for HIV negative participants, an increased likelihood of having sex with an HIV infected partner.

The one clear race difference was our finding that HIV negative or unknown African American MSM were more likely than their Caucasian counterparts to report HIV sero-discordant partners, indicating increased risk for HIV infection with each sexual episode for African American MSM.

Low affective social support was associated with age discordant partnering for all participants, and with HIV positive partners among HIV negative participants. Perceived social support was thus associated with two sexual patterns that may confer risk for HIV or STI infection, although this effect did not vary by racial group.

There has been a rise in positive sero-status in MSM, particularly in AAMSM, in recent years (CDC, 2005) and simple rates of UAI cannot explain the disparity between sero-status infection between AAMSM and Caucasian MSM. Given this, it was important that we examine the HIV paradox within the context of participant risk factors. Individual differences were tested to inform interventions in this high-risk population. Specifically, while this study does not support age discordant partnering as a mechanism behind the HIV paradox, this study does support interventions targeted specifically at providing social support services to young adult MSM.

The effect of low social support conferring increased HIV-risk has been found in recent studies in diverse samples of MSM (Berg & Grimes, 2010; Carlos et al., 2010; Tsui & Joseph, 2010). Low social support seems to be predictive of many risk factors such as lower condom use. Additionally, some of these studies suggest that there is a normative culture of low condom use amongst some groups of young MSM. Tsui & Joseph found that young MSM receiving social support from a community where low condom use is endorsed increases risky sexual behaviors. Clearly, social support is an important variable to consider when creating targeted interventions for young MSM. This study adds to the growing literature that suggests the mechanistic quality of social support for HIV-risk. Many community centers in medium to large urban centers are able to provide positive social support to young MSM. However, this requires that the young

MSM come to seek the services of the community center and it denies young MSM in more rural areas the opportunity to receive social support. The findings suggest that, especially for young AAMSM, low social support is a more concrete predictor of HIV risk than UAI alone. It is of particular importance that future research focus on the mechanisms behind the effect of social support on HIV risk.

There were limitations to this study. Unfortunately, the ethnicity of the participants' last two partners was not assessed, so the effects of partner ethnic concordance cannot be assessed. Also, this research is only exploring baseline data available in MIX instead of the longitudinal data. This allows us to do initial research into this phenomenon, but it does not allow us to look at the long-term pattern of age discordant partnering in this high-risk population. This research also depends on the retroactive reports of participants. While African Americans, those with age discordant partners, and those endorsing low affective social support were more likely to have HIV sero-discordant partners, the number of HIV negative participants reporting HIV sero-discordant partners was low. This indicates a lack of power in the analysis. However, it also suggests that the effect is strong enough to produce findings in this small sample. It will be important to replicate these findings in a much larger analysis to support these findings.

There might be sample specific and methodological reasons why we did not find that age discordant sexual partnering led to increased probability of exposure to HIV risk. This sample was recruited specifically for their risky sex and drug behaviors. As most of this sample took part in these practices, the lack of variability may wash out any effect of the psychosocial mediators and age discordant sexual partnering. Conducting this study

in a sample of MSM that are more representative of the general population may show effects where they are absent in this sample. Additionally, the measures of self-homophobia and social support were face-valid and created specifically for this study. Significant results might be obtained if standardized measures were used in both cases. However, this research does provide support for social support as an integral mechanism for HIV sero-discordant partnering. More research should be conducted looking at low social support as a risk factor for HIV sero-discordant partnering, building on the previous research that suggests that an age discordant partnering hypothesis is relevant to the HIV paradox for this vulnerable population.



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## Appendix A

### UNIVERSITY OF ILLINOIS AT CHICAGO

Office for the Protection of Research Subjects (OPRS)  
Office of the Vice Chancellor for Research (MC 672)  
203 Administrative Office Building  
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Chicago, Illinois 60612-7227

#### Approval Notice Continuing Review

May 13, 2010

David McKirnan, PhD  
Psychology  
1007 W. Harrison Street  
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Chicago, IL 60612  
Phone: (312) 413-2634 / Fax: (312) 413-4122

**RE: Protocol # 2004-0481**  
**“Project Mix: Behavioral Intervention to Reduce Sexual Risk Behavior of**  
**Substance-**  
**Using (Non-Injection) Men Who Have Sex with Men”**

Please note that Anna Veluz and Antonia Jiminez were removed as key research personnel, as their training credits expired on August 22, 2007 and December 31, 2008. Jennifer Hopwood was also removed key research personnel at this time as she has no initial investigator training on file at the UIC Office of Protection for Research Subjects (OPRS). All investigators and key research personnel involved in human subject research must complete a minimum of three hours of initial investigator training in human subject protection, as well as two hours of continuing investigator training every two years thereafter. For more information regarding UIC's investigator training requirements, please visit the OPRS website at:  
<http://tigger.uic.edu/depts/ovcr/research/protocolreview/irb/education>

Dear Dr. McKirnan:

Your Continuing Review was reviewed and approved by the Expedited review process on May 10, 2010. You may now continue your research.

Please note the following information about your approved research protocol:

**Protocol Approval Period:** June 1, 2010 - May 31, 2011

**Approved Subject Enrollment #:** 2000 (Limited to analysis of data from 569 subjects)

**Additional Determinations for Research Involving Minors:** These determinations have not been made for this study since it has not been approved for enrollment of minors.

**Performance Sites:**

UIC, Howard Brown Health Center

**Sponsor:**

Centers for Disease Control and Prevention

**PAF#:**

Not available

**Grant/Contract No:**

U65/CCU522209-1

**Grant/Contract Title:**

Reducing Risk of HIV Transmission in

Substance

Using Men Who Have Sex with Men

**Research Protocol(s):**

- a) Reducing Risk of HIV Transmission in Substance Using Men Who Have Sex With Men (CDC Grant #: U65/CCU522209-01)
- b) "Project Mix - Trial Phase of Protocol", 04/18/2006

**Recruitment Material(s):**

- a) Not Applicable – Data Analysis Only

**Informed Consent(s):**

- a) Not Applicable – Data Analysis Only

Your research meets the criteria for expedited review as defined in 45 CFR 46.110(b)(1) under the following specific category:

(9) Continuing review of research, not conducted under an investigational new drug application or investigational device exemption where categories two (2) through eight (8) do not apply but IRB has determined and documented at a convened meeting that the research involves no greater than minimal risk and no additional risks have been identified.

**Please note the Review History of this submission:**

Receipt Date	Submission Type	Review Process	Review Date	Review Action
05/06/2010	Continuing Review	Expedited	05/10/2010	Approved

Please remember to:

→ Use your **research protocol number** (2004-0481) on any documents or correspondence with the IRB concerning your research protocol.

→ Review and comply with all requirements on the enclosure,  
"UIC Investigator Responsibilities, Protection of Human Research Subjects"

**Please note that the UIC IRB has the prerogative and authority to ask further questions, seek additional information, require further modifications, or monitor the conduct of your research and the consent process.**

**Please be aware that if the scope of work in the grant/project changes, the protocol must be amended and approved by the UIC IRB before the initiation of the change.**

We wish you the best as you conduct your research. If you have any questions or need further help, please contact OPRS at (312) 996-1711 or me at (312) 996-9299. Please send any correspondence about this protocol to OPRS at 203 AOB, M/C 672.

Sincerely,

Marissa Benni-Weis, M.S.  
IRB Coordinator, IRB # 2  
Office for the Protection of Research

Subjects

Enclosure(s):

- 1. UIC Investigator Responsibilities, Protection of Human Research Subjects**
- 2. Optional Form 310 - Protection of Human Subjects, Assurance Identification/Certification/Declaration**

cc: Gary E. Raney, Psychology, M/C 285



## VITA

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McKirnan, D. J., Du Bois, S., Alvy, L. M., & **Jones, K.** (In press). Healthcare access and health behaviors among men who have sex with men: The cost of health disparities. *Health Education & Behavior*.

PAPER PRESENTATIONS: **Jones, K.** (2012). Explaining the HIV paradox: Partner networks men who have sex with men. Paper presented at the 4<sup>th</sup> Annual Research Summit of the Black Gay Research Group, New Orleans, LA

POSTER PRESENTATIONS: **Jones, K.** & Devos, T. (2010). Implicit vs. explicit internalized homophobia: Gay men's views on gay male romantic relationships. Poster submitted for presentation at the 118<sup>th</sup> Annual Convention of the American Psychological Association, San Diego, CA  
**Jones, K.**, McIntyre, D., Gaffud, T., Ma, D.S., & Devos, T. (2008). Is Barack Obama less American than Hillary Clinton?

Poster submitted for presentation at the 88<sup>th</sup> Annual Convention of the Western Psychological Association, Irvine, CA

**Jones, K.**, (2007). When Harry Met... Harry?: Friendship, Affection, and Gender Roles in Gay Men. Poster submitted for presentation at the 87<sup>th</sup> Annual Convention of the Western Psychological Association, Vancouver, BC., Canada